Chemical Analysis Report

SO-DIST-2018-02-07-01

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

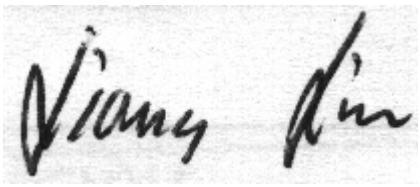
Event Description: **NFM->LaBelle : Yellow Fever, Telegraph, Bee, Pollywog**
Request ID: **RQ-2018-02-05-55**
Customer: **SO-DIST**
Project ID: **SMP**

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

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

Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-MAR-2018 14:49



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: Telegraph Swamp South **Collection Date/Time: 02/06/2018 09:25**

Field ID: G3SD0100 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1965176	EPA 180.1 Rev. 2.0	Turbidity	6.7		NTU	P339492	
	EPA 300.0 Rev. 2.1	Chloride	220		mg Cl/L	P340128	
		Sulfate	54		mg SO4/L	P340133	
	SM 2120 B	Color (true)	69		PCU	P339498	
	SM 2320 B-97	Total Alkalinity	120		mg CaCO3/L	P340206	
	SM 2540 C-97	TDS	639		mg/L	P339839	
	SM 2540 D-97	TSS	8	I	mg/L	P339803	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P340474	
1965177	EPA 350.1 Rev. 2.0	Ammonia-N	0.44		mg N/L	P339961	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P339556	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.095		mg N/L	P339854	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P339659	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P340090	
1965178	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.031		mg P/L	P339540	
1965240	EPA 200.7 Rev. 4.4	Calcium	71.6		mg/L	P339758	
		Iron	440		ug/L	P339758	
		Magnesium	18.9		mg/L	P339758	
		Potassium	5.2		mg/L	P339758	
		Sodium	103		mg/L	P339758	
		Zinc	5.0	U	ug/L	P339758	
	EPA 200.8 Rev. 5.4	Arsenic	0.98		ug/L	P339758	
		Cadmium	0.020	U	ug/L	P339758	
		Chromium	0.48	I	ug/L	P339758	
		Copper	0.49	I	ug/L	P339758	
		Lead	0.19	I	ug/L	P339758	
		Nickel	0.42	I	ug/L	P339758	
		Silver	0.010	U	ug/L	P339758	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Bee Branch @LoblollyBay **Collection Date/Time: 02/06/2018 10:55**

Field ID: G3SD0085 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1965170	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P339492	
	EPA 300.0 Rev. 2.1	Chloride	42		mg Cl/L	P339950	
		Sulfate	29		mg SO4/L	P339954	
	SM 2120 B	Color (true)	120		PCU	P339498	
	SM 2320 B-97	Total Alkalinity	20		mg CaCO3/L	P340205	
	SM 2540 C-97	TDS	194		mg/L	P339839	
	SM 2540 D-97	TSS	2	I	mg/L	P339803	
	SM 4500 F-C-97	Fluoride	0.090	I	mg F/L	P340474	
1965172	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P339961	

Field ID: G3SD0085 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1965172	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P339556	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P339854	
	EPA 365.1 Rev. 2.0	Total-P	0.087		mg P/L	P339659	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P340090	
1965174	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.060		mg P/L	P339541	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Pollywog Creek @ SR 78 **Collection Date/Time: 02/06/2018 11:25**

Field ID: G3SD0098 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1965171	EPA 180.1 Rev. 2.0	Turbidity	5.8	A	NTU	P339492	
	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P339950	
		Sulfate	8.8		mg SO4/L	P339954	
	SM 2120 B	Color (true)	89	A	PCU	P339498	
	SM 2320 B-97	Total Alkalinity	38		mg CaCO3/L	P340206	
	SM 2540 C-97	TDS	136		mg/L	P339839	
	SM 2540 D-97	TSS	4	I	mg/L	P339803	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P340474	
1965173	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P339961	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60	J	mg N/L	P339556	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.023		mg N/L	P339854	
	EPA 365.1 Rev. 2.0	Total-P	0.91		mg P/L	P339659	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P340090	
1965175	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.77		mg P/L	P339540	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Refer to the narrative for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339492

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339758

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339758

Component	Result	Code	Units
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339758

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339950

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339954

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340128

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340133

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339961

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P3395565

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339854

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339659

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339540

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339541

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

Reference Method: SM 2120 B
Batch ID: P339498

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P340205

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

Reference Method: SM 2320 B-97
Batch ID: P340206

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

Reference Method: SM 2540 C-97
Batch ID: P339839

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339803

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P340474

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P340090

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: P339758

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	103		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	99.4		P	85 - 115
Sodium	101		P	85 - 115
Zinc	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339758

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	107		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	100		P	85 - 115
Copper	103		P	85 - 115
Lead	103		P	85 - 115
Nickel	106		P	85 - 115
Silver	99.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339950

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339954

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340128

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340133

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339961

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P3395565

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339854

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339659

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: P339540

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339541

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

Reference Method: SM 2320 B-97
Batch ID: P340205

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.8		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P340206

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	95 - 108

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P340474

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P340090

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339758

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965206	Calcium	110		P	80 - 120
1965206	Iron	101		P	80 - 120
1965206	Magnesium	106		P	80 - 120
1965206	Potassium	107		P	80 - 120
1965206	Sodium	109		P	80 - 120
1965206	Zinc	101		P	80 - 120
1965370	Calcium	100		P	80 - 120
1965370	Iron	99.2	100	P/P	80 - 120
1965370	Magnesium	103		P	80 - 120
1965370	Potassium	97.6	99.5	P/P	80 - 120
1965370	Sodium	101		P	80 - 120
1965370	Zinc	98.1	99.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339758

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965206	Arsenic	110		P	80 - 120
1965206	Cadmium	104		P	80 - 120
1965206	Chromium	95.8		P	80 - 120
1965206	Copper	99.9		P	80 - 120
1965206	Lead	105		P	80 - 120
1965206	Nickel	102		P	80 - 120
1965206	Silver	98.2		P	80 - 120
1965370	Arsenic	107	106	P/P	80 - 120
1965370	Cadmium	106	102	P/P	80 - 120
1965370	Chromium	98.4	97.6	P/P	80 - 120
1965370	Copper	100	99.7	P/P	80 - 120
1965370	Lead	103	102	P/P	80 - 120
1965370	Nickel	102	101	P/P	80 - 120
1965370	Silver	101	99.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339950

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339950

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964823	Chloride	103		P	90 - 110
1965134	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964823	Sulfate	106		P	90 - 110
1965134	Sulfate	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340128

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965191	Chloride	104		P	90 - 110
1965271	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965191	Sulfate	105		P	90 - 110
1965271	Sulfate	105		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339961

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965141	Ammonia-N	99.9	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P3395565

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965173	Kjeldahl Nitrogen	89.9	88.1	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965164	NO2NO3-N	98.2	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339659

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965186	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339540

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 dissolved
Batch ID: P339540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965142	O-Phosphate-P	99.7	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1965174	O-Phosphate-P	97.7	97.3	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P340090

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964906	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965171	Turbidity	0.344	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339758

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965370	Calcium	0.305	Spike	P	0 - 20
1965370	Iron	1.28	Spike	P	0 - 20
1965370	Magnesium	0.0432	Spike	P	0 - 20
1965370	Potassium	1.69	Spike	P	0 - 20
1965370	Sodium	0.0580	Spike	P	0 - 20
1965370	Zinc	1.28	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339758

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965370	Arsenic	1.11	Spike	P	0 - 20
1965370	Cadmium	4.44	Spike	P	0 - 20
1965370	Chromium	0.885	Spike	P	0 - 20
1965370	Copper	0.373	Spike	P	0 - 20
1965370	Lead	0.980	Spike	P	0 - 20
1965370	Nickel	0.552	Spike	P	0 - 20
1965370	Silver	1.33	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339950

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964823	Chloride	0.604	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964823	Sulfate	0.194	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340128

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965191	Chloride	2.37	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965191	Sulfate	3.56	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339961

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965141	Ammonia-N	1.12	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P3395565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965173	Kjeldahl Nitrogen	1.27	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965164	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965186	Total-P	1.71	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965142	O-Phosphate-P	1.30	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965174	O-Phosphate-P	0.254	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P339498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965171	Color (true)	1.65	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P340205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965947	Total Alkalinity	4.16	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P340206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965352	Total Alkalinity	0.306	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P339839

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964934	TDS	5.30	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P340474

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1965350	Fluoride	0.937	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P340090

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964906	Organic Carbon	0.0608	Spike	P	0 - 20

Quality Assurance Report
Precision

* 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: SM 2120 B
Run ID: A81904
Included Lab Sample IDs: 1965170, 1965171, 1965176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.9	97.9	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A81905
Included Lab Sample IDs: 1965170, 1965171, 1965176

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: A81920
Included Lab Sample IDs: 1965174, 1965175, 1965178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	97.5	P/P	90 - 110
O-Phosphate-P	98.5	100	P/P	90 - 110
O-Phosphate-P	99.6	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A81968
Included Lab Sample IDs: 1965172, 1965173, 1965177

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	106	P/P	90 - 110
Kjeldahl Nitrogen	106	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A81982
Included Lab Sample IDs: 1965172, 1965173, 1965177

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A82003
Included Lab Sample IDs: 1965170, 1965171, 1965176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	107	P/P	90 - 110
Chloride	103	101	P/P	90 - 110
Sulfate	102	108	P/P	90 - 110
Sulfate	106	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82028
Included Lab Sample IDs: 1965172, 1965173, 1965177

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A82029
Included Lab Sample IDs: 1965240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	104	102	P/P	90 - 110
Cadmium	99.3	98.6	P/P	90 - 110
Chromium	97.3	96.7	P/P	90 - 110
Copper	103	102	P/P	90 - 110
Lead	101	99.0	P/P	90 - 110
Nickel	103	102	P/P	90 - 110
Silver	98.6	97.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A82034
Included Lab Sample IDs: 1965240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.0	105	P/P	90 - 110
Iron	96.8	104	P/P	90 - 110
Magnesium	97.9	105	P/P	90 - 110
Potassium	99.0	107	P/P	90 - 110
Sodium	99.7	106	P/P	90 - 110
Zinc	99.5	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A82064
Included Lab Sample IDs: 1965172, 1965173, 1965177

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	100	P/P	90 - 110
Ammonia-N	102	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A82117
Included Lab Sample IDs: 1965172, 1965173, 1965177

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	97.6	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A82137
Included Lab Sample IDs: 1965170, 1965171, 1965176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.2	99.8	P/P	90 - 110
Total Alkalinity	99.5	97.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A82245
Included Lab Sample IDs: 1965170, 1965171, 1965176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	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		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.344	
EPA 200.7 Rev. 4.4	Calcium	100	110	100				0.305
	Iron	103	101	99.2	100			1.28
	Magnesium	103	106	103				0.0432
	Potassium	99.4	107	97.6	99.5			1.69
	Sodium	101	109	101				0.0580
	Zinc	99.7	101	98.1	99.4			1.28
EPA 200.8 Rev. 5.4	Arsenic	107	110	107	106			1.11
	Cadmium	104	104	106	102			4.44
	Chromium	100	95.8	98.4	97.6			0.885
	Copper	103	99.9	100	99.7			0.373
	Lead	103	105	103	102			0.980
	Nickel	106	102	102	101			0.552
	Silver	99.0	98.2	101	99.2			1.33
EPA 300.0 Rev. 2.1	Chloride	93.7	103	104			0.604	
	Chloride	101	104	104			2.37	
	Sulfate	106	106	106			0.194	
	Sulfate	102	105	105			3.56	
EPA 350.1 Rev. 2.0	Ammonia-N	98.5	99.9	98.5				1.12
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	89.9	88.1				1.27
EPA 353.2 Rev. 2.0	NO2NO3-N	105	98.2	98.2				0.0
EPA 365.1 Rev. 2.0	Total-P	105	103	101				1.71
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.8	99.7	101				1.30
	O-Phosphate-P	102	97.7	97.3				0.254
SM 2120 B	Color (true)						1.65	
SM 2320 B-97	Total Alkalinity	98.8					4.16	
	Total Alkalinity	99.4					0.306	
SM 2540 C-97	TDS						5.30	
SM 4500 F-C-97	Fluoride	97.6						0.937
SM 5310 B-00	Organic Carbon	101	102	102				0.0608

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1965170, 1965171, 1965176
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1965240

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1965240
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1965170, 1965171, 1965176
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1965170, 1965171, 1965176
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1965172, 1965173, 1965177
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1965172, 1965173, 1965177
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1965172, 1965173, 1965177
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1965172, 1965173, 1965177
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1965174, 1965175, 1965178
SM 2120 B / E31780	True Color measured at 450 nm	1965170, 1965171, 1965176
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1965170, 1965171, 1965176
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1965170, 1965171, 1965176
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1965170, 1965171, 1965176
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1965170, 1965171, 1965176
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1965172, 1965173, 1965177

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	02/07/2018			02/07/2018 16:34	DeAsia Armster	1965170, 1965171, 1965176
EPA 200.7 Rev. 4.4	02/07/2018	02/12/2018	Elliott D. Healy	02/13/2018	Martin Acosta	1965240
EPA 200.8 Rev. 5.4	02/07/2018	02/12/2018	Elliott D. Healy	02/13/2018	Nadine Brooks	1965240
EPA 300.0 Rev. 2.1	02/07/2018			02/14/2018	Julia Storbeck	1965170, 1965171
	02/07/2018			02/15/2018	Julia Storbeck	1965176
EPA 350.1 Rev. 2.0	02/07/2018			02/14/2018	Ping Hua	1965172, 1965173, 1965177
EPA 351.2 Rev. 2.0	02/07/2018	02/08/2018	Adrian Shelby	02/09/2018	Joseph Suarez	1965172, 1965173, 1965177
EPA 353.2 Rev. 2.0	02/07/2018			02/13/2018	Lauren Bottorf	1965172, 1965173, 1965177
EPA 365.1 Rev. 2.0	02/07/2018	02/09/2018	Sima Feizi	02/12/2018	Beverly Y. Sanders	1965172, 1965173, 1965177
EPA 365.1 Rev. 2.0 dissolved	02/07/2018			02/07/2018 15:16	Megan Treadwell	1965174
	02/07/2018			02/07/2018 15:36	Megan Treadwell	1965178
	02/07/2018			02/07/2018 15:53	Megan Treadwell	1965175
SM 2120 B	02/07/2018			02/07/2018 15:53	Tanya Welborn	1965170
	02/07/2018			02/07/2018 15:54	Tanya Welborn	1965171
	02/07/2018			02/07/2018 15:55	Tanya Welborn	1965176
SM 2320 B-97	02/07/2018			02/17/2018	Dale L. Simmons	1965170, 1965171, 1965176
SM 2540 C-97	02/07/2018			02/09/2018	Yijie Li	1965170, 1965171, 1965176
SM 2540 D-97	02/07/2018			02/09/2018	Yijie Li	1965170, 1965171, 1965176
SM 4500 F-C-97	02/07/2018			02/22/2018	Dale L. Simmons	1965170, 1965171, 1965176
SM 5310 B-00	02/07/2018			02/15/2018	Megan Treadwell	1965172, 1965173, 1965177