Chemical Analysis Report

NE-DIST-2018-02-06-02

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

Event Description: **Rice creek**
Request ID: **RQ-2018-01-29-12**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
7825 Baymeadows Way
Suite B 200
Jacksonville, FL 32256-7577
Attn: Jeremy Parrish

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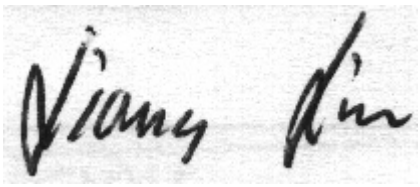
Certified by: Liang Lin, Environmental Administrator

Date Certified: 06-MAR-2018 11:15



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: Rice Creek @ 309B **Collection Date/Time: 02/05/2018 09:45**

Field ID: 20030254 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1964728	EPA 180.1 Rev. 2.0	Turbidity	6.7	A	NTU	P339409	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P339701	
		Sulfate	5.5		mg SO4/L	P339706	
	SM 2120 B	Color (true)	370		PCU	P339420	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P340123	
	SM 2540 C-97	TDS	165		mg/L	P339749	
	SM 2540 D-97	TSS	2	I	mg/L	P339688	
	SM 4500 F-C-97	Fluoride	0.064	I	mg F/L	P340137	
1964730	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P339774	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P339440	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P339851	
	EPA 365.1 Rev. 2.0	Total-P	0.039		mg P/L	P339581	
	SM 5310 B-00	Organic Carbon	35		mg C/L	P339914	
1964732	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P339448	
1964736	EPA 200.7 Rev. 4.4	Calcium	12.5		mg/L	P339505	
		Iron	980		ug/L	P339505	
		Magnesium	3.77		mg/L	P339505	
		Potassium	0.50	I	mg/L	P339505	
		Sodium	13.2		mg/L	P339505	
		Zinc	5.0	U	ug/L	P339505	
	EPA 200.8 Rev. 5.4	Arsenic	0.45		ug/L	P339505	
		Cadmium	0.020	U	ug/L	P339505	
		Chromium	0.97	I	ug/L	P340191	
		Copper	0.20	U	ug/L	P339505	
		Lead	0.44		ug/L	P339505	
		Nickel	0.60	I	ug/L	P340191	
		Silver	0.010	U	ug/L	P339505	

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: Rice Creek @ Wooden Bridge GP **Collection Date/Time: 02/05/2018 11:00**

Field ID: 20030252 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1964729	EPA 180.1 Rev. 2.0	Turbidity	4.2		NTU	P339409	
	EPA 300.0 Rev. 2.1	Chloride	27		mg Cl/L	P339701	
		Sulfate	6.1		mg SO4/L	P339706	
	SM 2120 B	Color (true)	350		PCU	P339420	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P340123	
	SM 2540 C-97	TDS	180		mg/L	P339749	
	SM 2540 D-97	TSS	4	I	mg/L	P339688	
	SM 4500 F-C-97	Fluoride	0.064	I	mg F/L	P340137	
1964731	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P339774	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P339440	

Field ID: 20030252 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1964731	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P339851	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P339581	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P339914	
1964733	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.025		mg P/L	P339448	
1964737	EPA 200.7 Rev. 4.4	Calcium	13.4		mg/L	P339505	
		Iron	880		ug/L	P339505	
		Magnesium	3.81		mg/L	P339505	
		Potassium	0.68	I	mg/L	P339505	
		Sodium	15.2		mg/L	P339505	
		Zinc	5.0	U	ug/L	P339505	
	EPA 200.8 Rev. 5.4	Arsenic	0.46		ug/L	P339505	
		Cadmium	0.020	U	ug/L	P339505	
		Chromium	0.88	I	ug/L	P340191	
		Copper	0.20	U	ug/L	P339505	
		Lead	0.43		ug/L	P339505	
		Nickel	0.83		ug/L	P340191	
		Silver	0.010	U	ug/L	P339505	

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: P339409

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339505

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339505

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Silver	0.010	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339440

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339581

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339448

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

Reference Method: SM 2120 B
Batch ID: P339420

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P340123

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

Reference Method: SM 2540 C-97
Batch ID: P339749

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339688

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P340137

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P339914

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: P339505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	105		P	85 - 115
Magnesium	111		P	85 - 115
Potassium	104		P	85 - 115
Sodium	105		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	106		P	85 - 115
Cadmium	104		P	85 - 115
Copper	102		P	85 - 115
Lead	107		P	85 - 115
Silver	91.4		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	98.3		P	85 - 115
Nickel	99.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339440

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339581

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: P339448

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

Reference Method: SM 2320 B-97
Batch ID: P340123

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.5		P	95 - 108

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P340137

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

Reference Method: SM 5310 B-00
Batch ID: P339914

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964772	Calcium	100		P	80 - 120
1964772	Iron	107		P	80 - 120
1964772	Magnesium	109		P	80 - 120
1964772	Potassium	102		P	80 - 120
1964772	Sodium	103		P	80 - 120
1964772	Zinc	105		P	80 - 120
1964978	Calcium	103		P	80 - 120
1964978	Iron	107	106	P/P	80 - 120
1964978	Magnesium	111	109	P/P	80 - 120
1964978	Potassium	103	103	P/P	80 - 120
1964978	Sodium	105		P	80 - 120
1964978	Zinc	106	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964772	Arsenic	108		P	80 - 120
1964772	Cadmium	104		P	80 - 120
1964772	Copper	105		P	80 - 120
1964772	Lead	108		P	80 - 120
1964772	Silver	90.2		P	80 - 120
1964978	Arsenic	108	108	P/P	80 - 120
1964978	Cadmium	103	108	P/P	80 - 120
1964978	Copper	99.1	99.8	P/P	80 - 120
1964978	Lead	109	110	P/P	80 - 120
1964978	Silver	91.0	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964772	Chromium	98.8		P	80 - 120
1964772	Nickel	97.8		P	80 - 120
1964979	Chromium	99.2	97.9	P/P	80 - 120
1964979	Nickel	99.1	98.0	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964687	Chloride	97.1		P	90 - 110
1964822	Chloride	95.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964687	Sulfate	95.8		P	90 - 110
1964822	Sulfate	93.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964763	Ammonia-N	97.1	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964688	Kjeldahl Nitrogen	103	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964730	NO2NO3-N	98.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339581

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964806	Total-P	97.0	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964604	O-Phosphate-P	97.0	97.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P340137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964822	Fluoride	95.5	96.1	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P339914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964688	Organic Carbon	96.3	95.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964728	Turbidity	2.09	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964978	Calcium	0.104	Spike	P	0 - 20
1964978	Iron	1.22	Spike	P	0 - 20
1964978	Magnesium	1.12	Spike	P	0 - 20
1964978	Potassium	0.178	Spike	P	0 - 20
1964978	Sodium	0.365	Spike	P	0 - 20
1964978	Zinc	2.35	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964978	Arsenic	0.595	Spike	P	0 - 20
1964978	Cadmium	4.50	Spike	P	0 - 20
1964978	Copper	0.665	Spike	P	0 - 20
1964978	Lead	0.718	Spike	P	0 - 20
1964978	Silver	10.5	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P340191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964979	Chromium	1.26	Spike	P	0 - 20
1964979	Nickel	1.17	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Chloride	0.0559	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Sulfate	0.0422	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964763	Ammonia-N	2.70	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964688	Kjeldahl Nitrogen	2.07	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964730	NO2NO3-N	1.51	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964806	Total-P	5.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964604	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P339420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964673	Color (true)	3.04	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P340123

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Total Alkalinity	2.79	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P339749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964652	TDS	3.90	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P340137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964822	Fluoride	0.482	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P339914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964688	Organic Carbon	0.381	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A81879
Included Lab Sample IDs: 1964728, 1964729

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

Reference Method: SM 2120 B
Run ID: A81881
Included Lab Sample IDs: 1964728, 1964729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.7	99.3	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A81897
Included Lab Sample IDs: 1964732, 1964733

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A81938
Included Lab Sample IDs: 1964736, 1964737

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	105	104	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Copper	103	102	P/P	90 - 110
Lead	104	106	P/P	90 - 110
Silver	100	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A81939
Included Lab Sample IDs: 1964730, 1964731

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A81944
Included Lab Sample IDs: 1964736, 1964737

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.2	99.5	P/P	90 - 110
Calcium	99.0	98.2	P/P	95 - 105
Iron	98.7	99.2	P/P	90 - 110
Iron	99.3	98.7	P/P	95 - 105
Magnesium	100	99.8	P/P	95 - 105
Magnesium	99.8	101	P/P	90 - 110
Potassium	100	99.6	P/P	95 - 105
Potassium	99.6	100	P/P	90 - 110
Sodium	100	101	P/P	90 - 110
Sodium	99.9	100	P/P	95 - 105
Zinc	101	102	P/P	95 - 105
Zinc	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A81955
Included Lab Sample IDs: 1964731

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A81960
Included Lab Sample IDs: 1964730

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A81969
Included Lab Sample IDs: 1964728, 1964729

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A81995
Included Lab Sample IDs: 1964730, 1964731

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110
Ammonia-N	97.8	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82028
Included Lab Sample IDs: 1964730, 1964731

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

Reference Method: SM 5310 B-00
Run ID: A82049
Included Lab Sample IDs: 1964730, 1964731

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.9	95.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A82122
Included Lab Sample IDs: 1964728, 1964729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.0	96.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A82122
Included Lab Sample IDs: 1964728, 1964729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	96.6	97.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A82182
Included Lab Sample IDs: 1964736, 1964737

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.2	100	P/P	90 - 110
Nickel	99.4	100	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						2.09	
EPA 200.7 Rev. 4.4	Calcium	104	100	103				0.104
	Iron	105	107	107	106			1.22
	Magnesium	111	109	111	109			1.12
	Potassium	104	102	103	103			0.178
	Sodium	105	103	105				0.365
	Zinc	102	105	106	108			2.35
EPA 200.8 Rev. 5.4	Arsenic	106	108	108	108			0.595
	Cadmium	104	104	103	108			4.50
	Chromium	98.3	99.2	97.9	98.8			1.26

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 200.8 Rev. 5.4	Copper	102	105	99.1	99.8			0.665
	Lead	107	108	109	110			0.718
	Nickel	99.6	99.1	98.0	97.8			1.17
	Silver	91.4	90.2	91.0	101			10.5
EPA 300.0 Rev. 2.1	Chloride	97.5	95.0	97.1			0.0559	
	Sulfate	95.9	93.9	95.8			0.0422	
EPA 350.1 Rev. 2.0	Ammonia-N	100	97.1	101				2.70
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	103	101				2.07
EPA 353.2 Rev. 2.0	NO2NO3-N	103	98.5	100				1.51
EPA 365.1 Rev. 2.0	Total-P	101	97.0	103				5.54
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.0	97.0				0.0
SM 2120 B	Color (true)						3.04	
SM 2320 B-97	Total Alkalinity	97.5					2.79	
SM 2540 C-97	TDS						3.90	
SM 4500 F-C-97	Fluoride	94.5	95.5	96.1				0.482
SM 5310 B-00	Organic Carbon	96.8	95.9	96.3				0.381

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1964728, 1964729
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1964736, 1964737
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1964736, 1964737
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1964728, 1964729
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1964728, 1964729
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1964730, 1964731
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1964730, 1964731
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1964730, 1964731
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1964730, 1964731
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1964732, 1964733
SM 2120 B / E31780	True Color measured at 450 nm	1964728, 1964729
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1964728, 1964729
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1964728, 1964729
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1964728, 1964729
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1964728, 1964729
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1964730, 1964731

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	02/06/2018			02/06/2018 17:02	DeAsia Armster	1964728, 1964729
EPA 200.7 Rev. 4.4	02/06/2018	02/07/2018	Elliott D. Healy	02/08/2018	Martin Acosta	1964736, 1964737
EPA 200.8 Rev. 5.4	02/06/2018	02/07/2018	Elliott D. Healy	02/08/2018	Nadine Brooks	1964736, 1964737
	02/06/2018	02/19/2018	Elliott D. Healy	02/20/2018	Nadine Brooks	1964736, 1964737
EPA 300.0 Rev. 2.1	02/06/2018			02/10/2018	Julia Storbeck	1964728, 1964729
EPA 350.1 Rev. 2.0	02/06/2018			02/12/2018	Julia Storbeck	1964730, 1964731
EPA 351.2 Rev. 2.0	02/06/2018	02/07/2018	Adrian Shelby	02/08/2018	Joseph Suarez	1964730, 1964731
EPA 353.2 Rev. 2.0	02/06/2018			02/13/2018	Lauren Bottorf	1964730, 1964731
EPA 365.1 Rev. 2.0	02/06/2018	02/08/2018	Sima Feizi	02/09/2018	Lipi Saha	1964730, 1964731
EPA 365.1 Rev. 2.0 dissolved	02/06/2018			02/06/2018 17:31	Megan Treadwell	1964732
	02/06/2018			02/06/2018 17:32	Megan Treadwell	1964733
SM 2120 B	02/06/2018			02/06/2018 19:06	Tanya Welborn	1964728
	02/06/2018			02/06/2018 19:07	Tanya Welborn	1964729
SM 2320 B-97	02/06/2018			02/16/2018	Dale L. Simmons	1964728, 1964729
SM 2540 C-97	02/06/2018			02/07/2018	Yijie Li	1964728, 1964729
SM 2540 D-97	02/06/2018			02/07/2018	Yijie Li	1964728, 1964729
SM 4500 F-C-97	02/06/2018			02/16/2018	Dale L. Simmons	1964728, 1964729
SM 5310 B-00	02/06/2018			02/14/2018	Megan Treadwell	1964730, 1964731