Chemical Analysis Report

CEN-DIST-2018-11-02-02

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

Event Description: **SJR above Woodruff X2 + HA**
Request ID: **RQ-2018-11-12-43**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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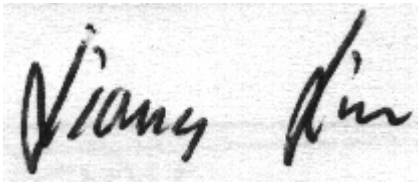
Date Certified: 28-NOV-2018 17:05



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: SJR @ 700m south of Lake Dexter **Collection Date/Time: 11/01/2018 11:50**

Field ID: G2CE0164 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2038806	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P354167	
	EPA 300.0 Rev. 2.1	Chloride	170		mg Cl/L	P354918	
		Sulfate	40		mg SO4/L	P354920	
	SM 2120 B	Color (true)	140		PCU	P354170	
	SM 2320 B-97	Total Alkalinity	76		mg CaCO3/L	P354554	
	SM 2540 C-97	TDS	454		mg/L	P354610	
	SM 2540 D-97	TSS	3	I	mg/L	P354531	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P354934	MS
2038807	EPA 350.1 Rev. 2.0	Ammonia-N	0.058		mg N/L	P354630	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99		mg N/L	P354424	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P354377	
	EPA 365.1 Rev. 2.0	Total-P	0.094		mg P/L	P354379	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P354400	
2038808	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.068		mg P/L	P354152	
2038813	EPA 200.7 Rev. 4.4	Calcium	40.0		mg/L	P354281	
		Iron	290		ug/L	P354281	
		Magnesium	13.5		mg/L	P354281	
		Potassium	4.0		mg/L	P354281	
		Sodium	85.1		mg/L	P354281	
		Zinc	5.0	U	ug/L	P354281	
	EPA 200.8 Rev. 5.4	Arsenic	0.74		ug/L	P354281	
		Cadmium	0.020	U	ug/L	P354281	
		Chromium	0.40	U	ug/L	P354281	
		Copper	0.63	I	ug/L	P354281	
		Lead	0.29		ug/L	P354281	
		Nickel	0.25	I	ug/L	P354281	
		Silver	0.010	U	ug/L	P354281	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354167

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354281

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: P354281

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: P354918

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354920

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354630

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354424

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: P354377

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354379

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354152

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

Reference Method: SM 2120 B
Batch ID: P354170

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P354554

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

Reference Method: SM 2540 C-97
Batch ID: P354610

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P354531

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P354934

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P354400

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: P354281

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	103		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	102		P	85 - 115
Sodium	97.5		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354281

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	100		P	85 - 115
Copper	97.9		P	85 - 115
Lead	93.0		P	85 - 115
Nickel	97.5		P	85 - 115
Silver	97.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354918

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354920

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354630

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: P354424

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354377

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354379

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: P354152

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

Reference Method: SM 2120 B
Batch ID: P354170

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P354554

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

Reference Method: SM 4500 F-C-97
Batch ID: P354934

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354400

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038195	Iron	99.4		P	80 - 120
2038195	Magnesium	104		P	80 - 120
2038195	Potassium	97.3		P	80 - 120
2038195	Sodium	100		P	80 - 120
2038195	Zinc	102		P	80 - 120
2038694	Calcium	97.3		P	80 - 120
2038694	Iron	107	107	P/P	80 - 120
2038694	Magnesium	101		P	80 - 120
2038694	Potassium	101		P	80 - 120
2038694	Sodium	96.2		P	80 - 120
2038694	Zinc	98.1	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038195	Arsenic	105		P	80 - 120
2038195	Cadmium	103		P	80 - 120
2038195	Chromium	98.6		P	80 - 120
2038195	Copper	96.8		P	80 - 120
2038195	Lead	94.5		P	80 - 120
2038195	Nickel	95.5		P	80 - 120
2038195	Silver	95.3		P	80 - 120
2038694	Arsenic	105	105	P/P	80 - 120
2038694	Cadmium	102	103	P/P	80 - 120
2038694	Chromium	99.7	99.5	P/P	80 - 120
2038694	Copper	101	101	P/P	80 - 120
2038694	Lead	97.0	94.8	P/P	80 - 120
2038694	Nickel	99.0	98.5	P/P	80 - 120
2038694	Silver	98.6	98.7	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038308	Chloride	90.9		P	90 - 110
2038703	Chloride	90.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354920

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038308	Sulfate	94.2		P	90 - 110
2038703	Sulfate	91.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038940	Ammonia-N	100	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354424

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038709	Kjeldahl Nitrogen	92.0	96.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038807	NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354379

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038940	Total-P	97.6	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038705	O-Phosphate-P	96.8	97.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P354934

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038777	Fluoride	105	105	F/F	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2038699	Organic Carbon	100	98.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038712	Turbidity	3.40	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038694	Calcium	0.715	Spike	P	0 - 20
2038694	Iron	0.175	Spike	P	0 - 20
2038694	Magnesium	0.881	Spike	P	0 - 20
2038694	Potassium	0.748	Spike	P	0 - 20
2038694	Sodium	0.280	Spike	P	0 - 20
2038694	Zinc	2.82	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038694	Arsenic	0.133	Spike	P	0 - 20
2038694	Cadmium	1.26	Spike	P	0 - 20
2038694	Chromium	0.121	Spike	P	0 - 20
2038694	Copper	0.0198	Spike	P	0 - 20
2038694	Lead	2.13	Spike	P	0 - 20
2038694	Nickel	0.420	Spike	P	0 - 20
2038694	Silver	0.0380	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038308	Chloride	1.61	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P354920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038308	Sulfate	2.12	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038940	Ammonia-N	0.242	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038709	Kjeldahl Nitrogen	3.67	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038807	NO2NO3-N	0.197	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038940	Total-P	2.72	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038705	O-Phosphate-P	0.337	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P354170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038790	Color (true)	1.35	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P354554

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038777	Total Alkalinity	0.322	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P354610

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038662	TDS	5.13	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P354934

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038777	Fluoride	0.0	Spike	P	0 - 3.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P354400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2038699	Organic Carbon	1.31	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: A87497
Included Lab Sample IDs: 2038808

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	98.4	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A87501
Included Lab Sample IDs: 2038806

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

Reference Method: SM 2120 B
Run ID: A87502
Included Lab Sample IDs: 2038806

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.1	102	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A87603
Included Lab Sample IDs: 2038807

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A87614
Included Lab Sample IDs: 2038807

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.1	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A87640
Included Lab Sample IDs: 2038807

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A87648
Included Lab Sample IDs: 2038813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	101	P/P	90 - 110
Cadmium	98.9	101	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Lead	96.1	96.1	P/P	90 - 110
Nickel	99.8	100	P/P	90 - 110
Silver	93.9	95.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A87652
Included Lab Sample IDs: 2038813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	96.4	99.1	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	98.4	98.0	P/P	90 - 110
Sodium	95.5	96.9	P/P	90 - 110
Zinc	102	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A87691
Included Lab Sample IDs: 2038807

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	104	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A87701
Included Lab Sample IDs: 2038806

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.1	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A87735
Included Lab Sample IDs: 2038807

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A87809
Included Lab Sample IDs: 2038806

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	104	P/P	90 - 110
Sulfate	99.6	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A87869
Included Lab Sample IDs: 2038806

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A87873
Included Lab Sample IDs: 2038813

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.7	99.1	P/P	90 - 110

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						3.40	
EPA 200.7 Rev. 4.4	Calcium	100	97.3					0.715
	Iron	103	99.4	107	107			0.175
	Magnesium	104	104	101				0.881
	Potassium	102	97.3	101				0.748
	Sodium	97.5	100	96.2				0.280
	Zinc	103	102	98.1	102			2.82
EPA 200.8 Rev. 5.4	Arsenic	102	105	105	105			0.133
	Cadmium	102	103	102	103			1.26
	Chromium	100	98.6	99.7	99.5			0.121
	Copper	97.9	96.8	101	101			0.0198
	Lead	93.0	94.5	97.0	94.8			2.13
	Nickel	97.5	95.5	99.0	98.5			0.420
	Silver	97.6	95.3	98.6	98.7			0.0380
EPA 300.0 Rev. 2.1	Chloride	100	90.9	90.2			1.61	
	Sulfate	98.5	94.2	91.4			2.12	
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	101				0.242
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	92.0	96.6				3.67
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100					0.197
EPA 365.1 Rev. 2.0	Total-P	101	97.6	101				2.72
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	96.8	97.3				0.337
SM 2120 B	Color (true)	103					1.35	
SM 2320 B-97	Total Alkalinity	102					0.322	
SM 2540 C-97	TDS						5.13	
SM 4500 F-C-97	Fluoride	98.0	105	105				0.0
SM 5310 B-00	Organic Carbon	98.2	100	98.6				1.31

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2038806
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2038813
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2038813
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2038806
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2038806
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2038807
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2038807
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2038807
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2038807
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2038808
SM 2120 B / E31780	True Color measured at 450 nm	2038806
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2038806
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2038806
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2038806
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2038806

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2038807

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	11/02/2018			11/02/2018 16:00	Megan Treadwell	2038806
EPA 200.7 Rev. 4.4	11/02/2018	11/06/2018 14:45	Elliott D. Healy	11/08/2018 19:22	Betina Topolski	2038813
EPA 200.8 Rev. 5.4	11/02/2018	11/06/2018 14:45	Elliott D. Healy	11/08/2018 21:11	Robert K Palmer	2038813
	11/02/2018	11/06/2018 14:45	Elliott D. Healy	11/19/2018 20:56	Robert K Palmer	2038813
EPA 300.0 Rev. 2.1	11/02/2018			11/17/2018 08:59	Julia Storbeck	2038806
EPA 350.1 Rev. 2.0	11/02/2018			11/09/2018 11:38	Ping Hua	2038807
EPA 351.2 Rev. 2.0	11/02/2018	11/08/2018 10:45	Adrian Shelby	11/09/2018 12:41	Joseph Suarez	2038807
EPA 353.2 Rev. 2.0	11/02/2018			11/07/2018 13:29	Lauren Bottorf	2038807
EPA 365.1 Rev. 2.0	11/02/2018	11/07/2018 14:05	Sima Feizi	11/08/2018 10:59	Beverly Y. Sanders	2038807
EPA 365.1 Rev. 2.0 dissolved	11/02/2018			11/02/2018 14:46	Lipi Saha	2038808
SM 2120 B	11/02/2018			11/02/2018 15:50	Chelsea Hernandez	2038806
SM 2320 B-97	11/02/2018			11/09/2018 02:45	Dale L. Simmons	2038806
SM 2540 C-97	11/02/2018			11/06/2018 15:10	Yijie Li	2038806
SM 2540 D-97	11/02/2018			11/06/2018 15:10	Yijie Li	2038806
SM 4500 F-C-97	11/02/2018			11/15/2018 06:58	Dale L. Simmons	2038806
SM 5310 B-00	11/02/2018			11/07/2018 05:34	Megan Treadwell	2038807