Chemical Analysis Report

CEN-DIST-2019-12-10-01

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

Event Description: **SJR above Lk Poinsett + HA**
Request ID: **RQ-2019-11-11-51**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Colin Wright, Program Administrator

Date Certified: 27-DEC-2019 09:12

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: 12/09/2019 12:09**

Field ID: G2CE0164 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2141687	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P375624	
	EPA 300.0 Rev. 2.1	Chloride	190		mg Cl/L	P376318	
		Sulfate	41		mg SO4/L	P376320	
	SM 2120 B	Color (true)	170		PCU	P375533	
	SM 2320 B-97	Total Alkalinity	73		mg CaCO3/L	P375873	
	SM 2540 C-97	TDS	508	A	mg/L	P376057	
	SM 2540 D-97	TSS	2	I A	mg/L	P376062	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P375877	
2141688	EPA 350.1 Rev. 2.0	Ammonia-N	0.045		mg N/L	P375866	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P375602	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P375683	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P375697	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P375830	
2141689	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.039		mg P/L	P375524	
2141692	EPA 200.7 Rev. 4.4	Barium	19.5		ug/L	P375741	
		Calcium	42.3		mg/L	P375741	
		Iron	300		ug/L	P375741	
		Magnesium	15.8		mg/L	P375741	
		Potassium	4.1		mg/L	P375741	
		Sodium	106		mg/L	P375741	
		Zinc	5.0	U	ug/L	P375741	
	EPA 200.8 Rev. 5.4	Aluminum	50		ug/L	P375741	
		Antimony	0.068	I	ug/L	P375741	
		Arsenic	0.71		ug/L	P375741	
		Boron**	56.1		ug/L	P375741	
		Cadmium	0.020	U	ug/L	P375741	
		Chromium	0.40	U	ug/L	P375741	
		Copper	0.40	U	ug/L	P375741	
		Lead	0.24	I	ug/L	P375741	
		Nickel	0.50	U	ug/L	P375741	
		Selenium	0.23	I	ug/L	P375741	
		Silver	0.010	U	ug/L	P375741	
		Thallium	0.10	U	ug/L	P375741	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference and matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable 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: P375624

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375741

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P375741

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376318

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376320

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375866

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375602

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375683

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375697

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375524

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

Reference Method: SM 2120 B
Batch ID: P375533

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P375873

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

Reference Method: SM 2540 C-97
Batch ID: P376057

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P376062

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P375877

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P375830

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: P375741

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	107		P	85 - 115
Iron	106		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	106		P	85 - 115
Sodium	109		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375741

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	105		P	85 - 115
Antimony	109		P	85 - 115
Arsenic	103		P	85 - 115
Boron	107		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	104		P	85 - 115
Copper	100		P	85 - 115
Lead	111		P	85 - 115
Nickel	101		P	85 - 115
Selenium	104		P	85 - 115
Silver	108		P	85 - 115
Thallium	112		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376318

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376320

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375866

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375602

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375683

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375697

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.5		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P375533

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.3		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P375873

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P375877

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P375830

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: P375741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141882	Barium	99.2		P	80 - 120
2141882	Calcium	97.7		P	80 - 120
2141882	Iron	105		P	80 - 120
2141882	Magnesium	102		P	80 - 120
2141882	Potassium	104		P	80 - 120
2141882	Sodium	101		P	80 - 120
2141882	Zinc	99.6		P	80 - 120
2142694	Barium	103	103	P/P	80 - 120
2142694	Calcium	103	107	P/P	80 - 120
2142694	Iron	105	108	P/P	80 - 120
2142694	Magnesium	108	113	P/P	80 - 120
2142694	Potassium	105	104	P/P	80 - 120
2142694	Sodium	105	104	P/P	80 - 120
2142694	Zinc	100	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141882	Aluminum	104		P	80 - 120
2141882	Antimony	111		P	80 - 120
2141882	Arsenic	108		P	80 - 120
2141882	Boron	109		P	80 - 120
2141882	Cadmium	108		P	80 - 120
2141882	Chromium	107		P	80 - 120
2141882	Copper	101		P	80 - 120
2141882	Lead	113		P	80 - 120
2141882	Nickel	102		P	80 - 120
2141882	Selenium	107		P	80 - 120
2141882	Silver	107		P	80 - 120
2141882	Thallium	114		P	80 - 120
2142694	Aluminum	104	101	P/P	80 - 120
2142694	Antimony	108	107	P/P	80 - 120
2142694	Arsenic	104	104	P/P	80 - 120
2142694	Boron	108	106	P/P	80 - 120
2142694	Cadmium	102	103	P/P	80 - 120
2142694	Chromium	107	106	P/P	80 - 120
2142694	Copper	101	98.9	P/P	80 - 120
2142694	Lead	111	109	P/P	80 - 120
2142694	Nickel	102	99.3	P/P	80 - 120
2142694	Selenium	106	103	P/P	80 - 120
2142694	Silver	107	107	P/P	80 - 120
2142694	Thallium	109	109	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376318

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141781	Chloride	97.9		P	90 - 110
2141919	Chloride	97.7		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376320

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141919	Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375866

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141683	Ammonia-N	103	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141654	Kjeldahl Nitrogen	100	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141683	NO2NO3-N	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141642	O-Phosphate-P	93.2	94.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P375877

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142132	Fluoride	98.6	97.5	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P375830

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141641	Organic Carbon	98.5	98.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P375624

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141849	Turbidity	1.46	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142694	Barium	0.263	Spike	P	0 - 20
2142694	Calcium	3.01	Spike	P	0 - 20
2142694	Iron	1.91	Spike	P	0 - 20
2142694	Magnesium	3.91	Spike	P	0 - 20
2142694	Potassium	0.703	Spike	P	0 - 20
2142694	Sodium	0.289	Spike	P	0 - 20
2142694	Zinc	0.693	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142694	Aluminum	1.88	Spike	P	0 - 20
2142694	Antimony	1.43	Spike	P	0 - 20
2142694	Arsenic	0.481	Spike	P	0 - 20
2142694	Boron	1.97	Spike	P	0 - 20
2142694	Cadmium	0.498	Spike	P	0 - 20
2142694	Chromium	1.61	Spike	P	0 - 20
2142694	Copper	2.40	Spike	P	0 - 20
2142694	Lead	1.41	Spike	P	0 - 20
2142694	Nickel	3.11	Spike	P	0 - 20
2142694	Selenium	2.35	Spike	P	0 - 20
2142694	Silver	0.423	Spike	P	0 - 20
2142694	Thallium	0.588	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376318

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141781	Chloride	0.698	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375866

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141683	Ammonia-N	1.07	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141654	Kjeldahl Nitrogen	0.0120	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141683	NO2NO3-N	0.232	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141654	Total-P	1.21	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141642	O-Phosphate-P	1.22	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P375533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141674	Color (true)	2.21	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P375873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142132	Total Alkalinity	0.167	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P376057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141687	TDS	0.787	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P375877

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142132	Fluoride	0.998	Spike	P	0 - 2.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P375830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141641	Organic Carbon	0.0	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A96226
Included Lab Sample IDs: 2141689

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.1	94.5	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A96231
Included Lab Sample IDs: 2141687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.9	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A96254
Included Lab Sample IDs: 2141687

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A96284
Included Lab Sample IDs: 2141688

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A96285
Included Lab Sample IDs: 2141688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A96319
Included Lab Sample IDs: 2141688

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

Reference Method: SM 5310 B-00
Run ID: A96328
Included Lab Sample IDs: 2141688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A96333
Included Lab Sample IDs: 2141692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.3	99.9	P/P	95 - 105
Calcium	101	101	P/P	95 - 105

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A96333
Included Lab Sample IDs: 2141692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	103	104	P/P	95 - 105
Magnesium	104	104	P/P	95 - 105
Potassium	102	102	P/P	95 - 105
Sodium	103	104	P/P	95 - 105
Zinc	101	101	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A96351
Included Lab Sample IDs: 2141688

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

Reference Method: SM 2320 B-97
Run ID: A96352
Included Lab Sample IDs: 2141687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A96352
Included Lab Sample IDs: 2141687

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A96374
Included Lab Sample IDs: 2141687

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A96520
Included Lab Sample IDs: 2141692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.9	102	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Boron	102	105	P/P	90 - 110
Cadmium	99.1	101	P/P	90 - 110
Chromium	102	106	P/P	90 - 110
Copper	99.3	99.1	P/P	90 - 110
Lead	105	107	P/P	90 - 110
Nickel	99.5	100	P/P	90 - 110
Thallium	96.2	98.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A96525
Included Lab Sample IDs: 2141692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	99.6	101	P/P	90 - 110
Selenium	102	104	P/P	90 - 110
Silver	103	106	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						1.46	
EPA 200.7 Rev. 4.4	Barium	102	99.2	103	103			0.263
	Calcium	107	97.7	103	107			3.01
	Iron	106	105	105	108			1.91
	Magnesium	112	102	108	113			3.91
	Potassium	106	104	105	104			0.703
	Sodium	109	101	105	104			0.289
	Zinc	100	99.6	100	101			0.693
EPA 200.8 Rev. 5.4	Aluminum	105	104	104	101			1.88
	Antimony	109	111	108	107			1.43
	Arsenic	103	108	104	104			0.481
	Boron	107	109	108	106			1.97
	Cadmium	104	108	102	103			0.498
	Chromium	104	107	107	106			1.61
	Copper	100	101	101	98.9			2.40
	Lead	111	113	111	109			1.41
	Nickel	101	102	102	99.3			3.11
	Selenium	104	107	106	103			2.35
	Silver	108	107	107	107			0.423
	Thallium	112	114	109	109			0.588
EPA 300.0 Rev. 2.1	Chloride	100	97.9	97.7			0.698	
	Sulfate	98.1	98.0					
EPA 350.1 Rev. 2.0	Ammonia-N	98.3	103	105				1.07
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.8	100	100				0.0120
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	96.5					0.232
EPA 365.1 Rev. 2.0	Total-P	104						1.21
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	93.2	94.4				1.22
SM 2120 B	Color (true)	96.3					2.21	
SM 2320 B-97	Total Alkalinity	103					0.167	
SM 2540 C-97	TDS						0.787	
SM 4500 F-C-97	Fluoride	97.0	98.6	97.5				0.998
SM 5310 B-00	Organic Carbon	101	98.5	98.5				0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2141687
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2141692
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2141692
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2141687
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2141687
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2141688
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2141688
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2141688
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2141688

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2141689
SM 2120 B / E31780	True Color measured at 450 nm	2141687
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2141687
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2141687
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2141687
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2141687
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2141688

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	12/10/2019			12/10/2019 16:40	Yen Ta	2141687
EPA 200.7 Rev. 4.4	12/10/2019	12/12/2019 16:45	Elliott D. Healy	12/13/2019 14:00	Betina Topolski	2141692
EPA 200.8 Rev. 5.4	12/10/2019	12/12/2019 16:45	Elliott D. Healy	12/20/2019 21:27	Justin Cutchin	2141692
	12/10/2019	12/12/2019 16:45	Elliott D. Healy	12/21/2019 21:02	Justin Cutchin	2141692
EPA 300.0 Rev. 2.1	12/10/2019			12/20/2019 15:50	Lipi Saha	2141687
EPA 350.1 Rev. 2.0	12/10/2019			12/13/2019 11:40	Ping Hua	2141688
EPA 351.2 Rev. 2.0	12/10/2019	12/11/2019 12:14	Sima Feizi	12/12/2019 13:09	Jhamieka S. Greenwood	2141688
EPA 353.2 Rev. 2.0	12/10/2019			12/12/2019 10:27	Beverly Y. Sanders	2141688
EPA 365.1 Rev. 2.0	12/10/2019	12/12/2019 10:19	Yen Ta	12/13/2019 12:07	Benjamin T. Nordmann	2141688
EPA 365.1 Rev. 2.0 dissolved	12/10/2019			12/10/2019 14:09	Lipi Saha	2141689
SM 2120 B	12/10/2019			12/10/2019 16:33	Madeline Funaro	2141687
SM 2320 B-97	12/10/2019			12/14/2019 02:49	Dale L. Simmons	2141687
SM 2540 C-97	12/10/2019			12/11/2019 15:32	Yijie Li	2141687
SM 2540 D-97	12/10/2019			12/11/2019 15:32	Yijie Li	2141687
SM 4500 F-C-97	12/10/2019			12/14/2019 02:49	Dale L. Simmons	2141687
SM 5310 B-00	12/10/2019			12/11/2019 20:13	Madeline Funaro	2141688