

Chemical Analysis Report

SW-DIST-2020-06-16-01

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

Event Description: **LVIs_Crystal & Halloway**
Request ID: **RQ-2020-06-15-46**
Customer: **SW-DIST**
Project ID: **SMP**

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Date Certified: 02-JUL-2020 10:12



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: Crystal Lake @ Center

Collection Date/Time: 06/15/2020 11:00

Field ID: G3SW0076

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2176968	EPA 180.1 Rev. 2.0	Turbidity	4.9	A	NTU	P383295	
	EPA 300.0 Rev. 2.1	Chloride	9.3		mg Cl/L	P383436	
		Sulfate	5.1		mg SO4/L	P383438	
	SM 2120 B-2011	Color (true)	21		PCU	P383301	
	SM 2320 B-2011	Total Alkalinity	55		mg CaCO3/L	P383401	
	SM 2540 C-2011	TDS	92		mg/L	P383662	
	SM 2540 D-2011	TSS	6	I	mg/L	P383598	
	SM 4500 F-C-2011	Fluoride	0.22		mg F/L	P383404	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P383467	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P383360	
2176970	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P383316	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P383349	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P383365	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P383297	
	dissolved						

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Isabell Center

Collection Date/Time: 06/15/2020 13:35

Field ID: G4SW0095

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2176969	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P383295	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P383436	
		Sulfate	22		mg SO4/L	P383438	
	SM 2120 B-2011	Color (true)	49		PCU	P383301	
	SM 2320 B-2011	Total Alkalinity	8.2		mg CaCO3/L	P383401	
	SM 2540 C-2011	TDS	104		mg/L	P383662	
	SM 2540 D-2011	TSS	4	I	mg/L	P383598	
	SM 4500 F-C-2011	Fluoride	0.10		mg F/L	P383404	
2176971	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P383467	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P383360	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P383316	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P383349	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P383365	
2176973	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P383297	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Isabell Center

Collection Date/Time: 06/15/2020 13:35

Field ID: G4SW0095

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2176976	EPA 200.7 Rev. 4.4	Barium	10.6		ug/L	P383291	
		Calcium	6.64		mg/L	P383291	
		Iron	37	I	ug/L	P383291	
		Magnesium	6.79		mg/L	P383291	
		Potassium	9.2		mg/L	P383291	
		Sodium	6.2		mg/L	P383291	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P383291	
		Aluminum	22		ug/L	P383291	
		Antimony	0.085	I	ug/L	P383291	
		Arsenic	0.76		ug/L	P383291	
		Boron**	42.3		ug/L	P383291	
		Cadmium	0.020	U	ug/L	P383744	
		Chromium	0.40	U	ug/L	P383291	
		Copper	2.78		ug/L	P383291	
		Lead	0.20	U	ug/L	P383744	
		Nickel	0.50	U	ug/L	P383291	
		Selenium	0.20	U	ug/L	P383291	
		Silver	0.010	U	ug/L	P383291	
		Thallium	0.10	U	ug/L	P383744	
		Hardness	44.6		mg/L	P383291	
	SM 2340B						

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P383295

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383291

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: P383291

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
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383744

Component	Result	Code	Units
Cadmium	0.020	U	ug/L
Lead	0.20	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383436

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383438

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383467

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383467

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383360

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383316

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383349

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383297

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

Reference Method: SM 2120 B-2011
Batch ID: P383301

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P383401

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

Reference Method: SM 2540 C-2011
Batch ID: P383662

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P383598

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P383404

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P383365

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: P383291

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	103		P	85 - 115
Iron	101		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	98.1		P	85 - 115
Sodium	99.1		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383291

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.7		P	85 - 115
Antimony	97.1		P	85 - 115
Arsenic	97.3		P	85 - 115
Boron	98.8		P	85 - 115
Chromium	99.8		P	85 - 115
Copper	97.6		P	85 - 115
Nickel	98.2		P	85 - 115
Selenium	94.2		P	85 - 115
Silver	99.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383744

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	98.0		P	85 - 115
Lead	96.1		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383436

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383438

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383467

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383360

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383360

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: P383316

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383349

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383297

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

Reference Method: SM 2120 B-2011
Batch ID: P383301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P383401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P383404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P383365

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176121	Barium	102		P	80 - 120
2176121	Calcium	102		P	80 - 120
2176121	Iron	102		P	80 - 120
2176121	Magnesium	102		P	80 - 120
2176121	Potassium	95.0		P	80 - 120
2176121	Sodium	99.9		P	80 - 120
2176121	Zinc	108		P	80 - 120
2176243	Barium	105	106	P/P	80 - 120
2176243	Calcium	106	105	P/P	80 - 120
2176243	Iron	103	104	P/P	80 - 120
2176243	Magnesium	105	105	P/P	80 - 120
2176243	Potassium	104	103	P/P	80 - 120
2176243	Sodium	99.9	99.7	P/P	80 - 120
2176243	Zinc	108	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176121	Aluminum	93.3		P	80 - 120
2176121	Antimony	94.9		P	80 - 120
2176121	Arsenic	97.5		P	80 - 120
2176121	Boron	96.4		P	80 - 120
2176121	Chromium	93.2		P	80 - 120
2176121	Copper	96.5		P	80 - 120
2176121	Nickel	96.2		P	80 - 120
2176121	Selenium	93.2		P	80 - 120
2176121	Silver	96.0		P	80 - 120
2176243	Aluminum	92.8	92.5	P/P	80 - 120
2176243	Antimony	94.1	94.2	P/P	80 - 120
2176243	Arsenic	94.9	94.8	P/P	80 - 120
2176243	Boron	95.2	94.6	P/P	80 - 120
2176243	Chromium	97.5	97.1	P/P	80 - 120
2176243	Copper	96.7	96.6	P/P	80 - 120
2176243	Nickel	94.2	95.0	P/P	80 - 120
2176243	Selenium	90.1	91.9	P/P	80 - 120
2176243	Silver	96.6	96.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383744

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2175770	Cadmium	93.6	101	P/P	80 - 120
2175770	Lead	89.9	97.9	P/P	80 - 120
2175770	Thallium	102	112	P/P	80 - 120
2175771	Cadmium	94.6		P	80 - 120
2175771	Lead	89.3		P	80 - 120
2175771	Thallium	103		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383436

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176855	Chloride	96.4		P	90 - 110
2176919	Chloride	99.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383438

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176855	Sulfate	97.6		P	90 - 110
2176919	Sulfate	99.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383467

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176921	Ammonia-N	99.7	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383360

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176970	Kjeldahl Nitrogen	94.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176922	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383349

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176957	Total-P	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383297

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176860	O-Phosphate-P	94.8	96.3	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P383404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176956	Fluoride	101	101	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P383365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2176907	Organic Carbon	103	102	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P383295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176968	Turbidity	12.8	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176243	Barium	0.732	Spike	P	0 - 20
2176243	Calcium	0.419	Spike	P	0 - 20
2176243	Iron	0.419	Spike	P	0 - 20
2176243	Magnesium	0.142	Spike	P	0 - 20
2176243	Potassium	0.993	Spike	P	0 - 20
2176243	Sodium	0.100	Spike	P	0 - 20
2176243	Zinc	0.399	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176243	Aluminum	0.371	Spike	P	0 - 20
2176243	Antimony	0.0296	Spike	P	0 - 20
2176243	Arsenic	0.133	Spike	P	0 - 20
2176243	Boron	0.641	Spike	P	0 - 20
2176243	Chromium	0.414	Spike	P	0 - 20
2176243	Copper	0.0300	Spike	P	0 - 20
2176243	Nickel	0.846	Spike	P	0 - 20
2176243	Selenium	1.94	Spike	P	0 - 20
2176243	Silver	0.133	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383744

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2175770	Cadmium	7.68	Spike	P	0 - 20
2175770	Lead	8.36	Spike	P	0 - 20
2175770	Thallium	8.96	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383436

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176855	Chloride	1.99	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P383438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176855	Sulfate	2.21	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383467

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176921	Ammonia-N	1.55	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383360

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176970	Kjeldahl Nitrogen	3.46	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176922	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176957	Total-P	0.0151	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383297

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176860	O-Phosphate-P	1.42	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P383301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176956	Color (true)	0.991	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P383401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176956	Total Alkalinity	0.182	Sample	P	0 - 8.1

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P383662

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176867	TDS	9.52	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P383404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176956	Fluoride	0.502	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P383365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2176907	Organic Carbon	0.425	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A99351

Included Lab Sample IDs: 2176968, 2176969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	102	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A99352

Included Lab Sample IDs: 2176972, 2176973

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	101	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A99353

Included Lab Sample IDs: 2176968, 2176969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	103	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A99370

Included Lab Sample IDs: 2176970, 2176971

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

Reference Method: SM 5310 B-2011

Run ID: A99393

Included Lab Sample IDs: 2176970, 2176971

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	101	P/P	90 - 110
Organic Carbon	104	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A99401

Included Lab Sample IDs: 2176968, 2176969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.1	97.6	P/P	90 - 110
Sulfate	97.9	98.2	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A99406

Included Lab Sample IDs: 2176968, 2176969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.2	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A99406

Included Lab Sample IDs: 2176968, 2176969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-2011

Run ID: A99406

Included Lab Sample IDs: 2176968, 2176969

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A99413

Included Lab Sample IDs: 2176970, 2176971

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A99420

Included Lab Sample IDs: 2176970, 2176971

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.7	98.0	P/P	90 - 110
Kjeldahl Nitrogen	98.0	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A99434

Included Lab Sample IDs: 2176970, 2176971

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A99460

Included Lab Sample IDs: 2176976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	102	P/P	90 - 110
Calcium	102	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	98.3	98.0	P/P	90 - 110
Sodium	101	100	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A99537

Included Lab Sample IDs: 2176976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	93.0	91.3	P/P	90 - 110
Antimony	92.1	90.4	P/P	90 - 110
Arsenic	93.5	91.8	P/P	90 - 110
Boron	93.8	91.9	P/P	90 - 110
Chromium	93.8	91.4	P/P	90 - 110
Nickel	94.7	91.9	P/P	90 - 110
Selenium	93.2	90.8	P/P	90 - 110
Silver	93.9	93.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A99609

Included Lab Sample IDs: 2176976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	91.8	92.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A99618

Included Lab Sample IDs: 2176976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	95.9	97.8	P/P	90 - 110
Lead	94.9	95.7	P/P	90 - 110
Thallium	92.2	95.0	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					12.8	
EPA 200.7 Rev. 4.4	Barium	102	102	105	106		0.732
	Calcium	103	102	106	105		0.419
	Iron	101	102	103	104		0.419
	Magnesium	102	102	105	105		0.142
	Potassium	98.1	95.0	104	103		0.993
	Sodium	99.1	99.9	99.9	99.7		0.100
	Zinc	104	108	108	108		0.399
EPA 200.8 Rev. 5.4	Aluminum	95.7	92.8	92.5	93.3		0.371
	Antimony	97.1	94.1	94.2	94.9		0.0296
	Arsenic	97.3	94.9	97.5	94.8		0.133
	Boron	98.8	95.2	94.6	96.4		0.641
	Cadmium	98.0	93.6	101	94.6		7.68
	Chromium	99.8	97.5	97.1	93.2		0.414
	Copper	97.6	96.7	96.6	96.5		0.0300
	Lead	96.1	89.9	97.9	89.3		8.36
	Nickel	98.2	94.2	95.0	96.2		0.846
	Selenium	94.2	90.1	91.9	93.2		1.94
	Silver	99.3	96.6	96.4	96.0		0.133
	Thallium	101	102	112	103		8.96
EPA 300.0 Rev. 2.1	Chloride	98.1	96.4	99.8		1.99	
	Sulfate	99.5	97.6	99.5		2.21	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.7	101			1.55
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	94.0	100			3.46
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	108	108	108			0.0151
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	94.8	96.3			1.42
SM 2120 B-2011	Color (true)	104				0.991	
SM 2320 B-2011	Total Alkalinity	102				0.182	
SM 2540 C-2011	TDS					9.52	
SM 4500 F-C-2011	Fluoride	100	101	101			0.502
SM 5310 B-2011	Organic Carbon	102	103	102			0.425

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2176968, 2176969
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2176976
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2176976
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2176968, 2176969
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2176968, 2176969
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2176970, 2176971
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2176970, 2176971
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2176970, 2176971
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2176970, 2176971
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2176972, 2176973
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2176968, 2176969
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2176968, 2176969
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2176976
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2176968, 2176969

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2176968, 2176969
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2176968, 2176969
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2176970, 2176971

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	06/16/2020			06/16/2020 15:55	Yen Ta	2176968, 2176969
EPA 200.7 Rev. 4.4	06/16/2020	06/16/2020 16:20	Elliott D. Healy	06/17/2020 21:28	Betina Topolski	2176976
EPA 200.8 Rev. 5.4	06/16/2020	06/16/2020 16:20	Elliott D. Healy	06/23/2020 23:00	Justin Cutchin	2176976
	06/16/2020	06/16/2020 16:20	Elliott D. Healy	06/30/2020 14:27	Justin Cutchin	2176976
	06/16/2020	06/26/2020 14:45	Justin Cutchin	06/30/2020 21:18	Justin Cutchin	2176976
EPA 300.0 Rev. 2.1	06/16/2020			06/18/2020 17:03	Elliott Rodriguez	2176968
	06/16/2020			06/18/2020 17:16	Elliott Rodriguez	2176969
EPA 350.1 Rev. 2.0	06/16/2020			06/20/2020 11:43	Ping Hua	2176970
	06/16/2020			06/20/2020 11:44	Ping Hua	2176971
EPA 351.2 Rev. 2.0	06/16/2020	06/18/2020 11:00	Sima Feizi	06/19/2020 10:24	Jhamieka S. Greenwood	2176970
	06/16/2020	06/18/2020 11:00	Sima Feizi	06/19/2020 10:43	Jhamieka S. Greenwood	2176971
EPA 353.2 Rev. 2.0	06/16/2020			06/17/2020 09:27	Beverly Y. Sanders	2176970
	06/16/2020			06/17/2020 09:29	Beverly Y. Sanders	2176971
EPA 365.1 Rev. 2.0	06/16/2020	06/17/2020 12:24	Yen Ta	06/19/2020 09:02	Lipi Saha	2176970
	06/16/2020	06/17/2020 12:24	Yen Ta	06/19/2020 09:03	Lipi Saha	2176971
EPA 365.1 Rev. 2.0 dissolved	06/16/2020			06/16/2020 16:01	Jhamieka S. Greenwood	2176972
	06/16/2020			06/16/2020 16:02	Jhamieka S. Greenwood	2176973
SM 2120 B-2011	06/16/2020			06/16/2020 16:57	Benjamin T. Nordmann	2176968
	06/16/2020			06/16/2020 16:58	Benjamin T. Nordmann	2176969
SM 2320 B-2011	06/16/2020			06/17/2020 20:37	Dale L. Simmons	2176968
	06/16/2020			06/17/2020 20:49	Dale L. Simmons	2176969
SM 2340B	06/16/2020			06/17/2020 21:28	Betina Topolski	2176976
SM 2540 C-2011	06/16/2020			06/18/2020 14:01	Yijie Li	2176968, 2176969
SM 2540 D-2011	06/16/2020			06/18/2020 14:01	Yijie Li	2176968, 2176969
SM 4500 F-C-2011	06/16/2020			06/17/2020 20:37	Dale L. Simmons	2176968
	06/16/2020			06/17/2020 20:49	Dale L. Simmons	2176969
SM 5310 B-2011	06/16/2020			06/17/2020 18:01	David Boose	2176970
	06/16/2020			06/17/2020 18:38	David Boose	2176971