

Chemical Analysis Report

SW-DIST-2020-08-28-01

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

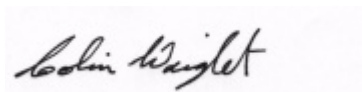
Event Description: **Run 13**
Request ID: **RQ-2020-08-31-03**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 17-SEP-2020 10:12

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

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: Lake Ida @ Center

Collection Date/Time: 08/27/2020 12:00

Field ID: G3SW0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2192975	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P386704	
	EPA 300.0 Rev. 2.1	Chloride	35		mg Cl/L	P387061	
	SM 2120 B-2011	Color (true)	34	A	PCU	P386710	
	SM 2320 B-2011	Total Alkalinity	78		mg CaCO3/L	P386763	
	SM 2540 C-2011	TDS	178	A	mg/L	P387160	
	SM 2540 D-2011	TSS	4	IA	mg/L	P387002	
	SM 4500 F-C-2011	Fluoride	0.16		mg F/L	P386902	
2192977	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P387023	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P386863	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386780	
	EPA 365.1 Rev. 2.0	Total-P	0.036		mg P/L	P386757	MS
	SM 5310 B-2011	Organic Carbon	9.3		mg C/L	P386768	
2192979	EPA 300.0 Rev. 2.1 dissolved	Sulfate	17		mg SO4/L	P387066	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386706	
2192988	EPA 200.7 Rev. 4.4	Barium	12.4		ug/L	P386749	
		Calcium	29.7		mg/L	P386749	
		Iron	30	U	ug/L	P386749	
		Magnesium	3.74		mg/L	P386749	
		Potassium	7.2		mg/L	P386749	
		Sodium	27.2		mg/L	P386749	
		Zinc	5.0	U	ug/L	P386749	
	EPA 200.8 Rev. 5.4	Aluminum	7.5	I	ug/L	P386749	
		Antimony	0.17	I	ug/L	P386749	
		Arsenic	1.06		ug/L	P386749	
		Boron**	53.2		ug/L	P386749	
		Cadmium	0.020	U	ug/L	P386749	
		Chromium	0.40	U	ug/L	P386749	
		Copper	0.48	I	ug/L	P386749	
		Lead	0.20	U	ug/L	P386749	
		Nickel	0.50	U	ug/L	P386749	
		Selenium	0.20	U	ug/L	P386749	
		Silver	0.010	U	ug/L	P386749	
		Thallium	0.10	U	ug/L	P386749	
		Hardness	89.5		mg/L	P386749	
	SM 2340B	Hardness	89.5		mg/L	P386749	

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 Van @ Center

Collection Date/Time: 08/27/2020 11:05

Field ID: G4SW0106

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2192981	EPA 180.1 Rev. 2.0	Turbidity	5.5		NTU	P386704	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P387061	
	SM 2120 B-2011	Color (true)	77		PCU	P386710	
	SM 2320 B-2011	Total Alkalinity	11		mg CaCO3/L	P386763	
	SM 2540 C-2011	TDS	109		mg/L	P387160	
	SM 2540 D-2011	TSS	4	I	mg/L	P387002	
	SM 4500 F-C-2011	Fluoride	0.29		mg F/L	P386902	
2192982	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P387023	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P386867	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386780	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P386759	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P386768	
2192983	EPA 300.0 Rev. 2.1 dissolved	Sulfate	20		mg SO4/L	P387066	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P386706	

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: FB082720

Collection Date/Time: 08/27/2020 08:40

Field ID: FB082720

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2192976	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P386704	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P387061	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P386710	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P386763	
	SM 2540 C-2011	TDS	15	U	mg/L	P387159	
	SM 2540 D-2011	TSS	2	U	mg/L	P387001	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P386902	
2192978	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P387023	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P386867	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386780	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P386759	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P386768	
2192980	EPA 300.0 Rev. 2.1 dissolved	Sulfate	0.20	U	mg SO4/L	P387066	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386706	
2192989	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P386749	
		Calcium	0.075	U	mg/L	P386749	
		Iron	30	U	ug/L	P386749	
		Magnesium	0.040	U	mg/L	P386749	
		Potassium	0.30	U	mg/L	P386749	
		Sodium	0.50	U	mg/L	P386749	
		Zinc	5.0	U	ug/L	P386749	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P386749	
		Antimony	0.050	U	ug/L	P386749	
		Arsenic	0.050	U	ug/L	P386749	
		Boron**	2.0	U	ug/L	P386749	
		Cadmium	0.020	U	ug/L	P386749	
		Chromium	0.40	U	ug/L	P386749	
		Copper	0.40	U	ug/L	P386749	
		Lead	0.20	U	ug/L	P386749	
		Nickel	0.50	U	ug/L	P386749	
		Selenium	0.20	U	ug/L	P386749	
		Silver	0.010	U	ug/L	P386749	
		Thallium	0.10	U	ug/L	P386749	
		Hardness	0.35	U	mg/L	P386749	
	SM 2340B						

Ref. Method and Comment:

SM 2540 D-2011: 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: P386704

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386749

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: P386749

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: P387061

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387066

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387023

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: P386863

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386867

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386780

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386757

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386759

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386706

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

Reference Method: SM 2120 B-2011
Batch ID: P386710

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P386763

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

Reference Method: SM 2540 C-2011
Batch ID: P387159

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P387160

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387001

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387002

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P386902

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P386768

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: P386749

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	97.9		P	85 - 115
Calcium	103		P	85 - 115
Iron	104		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	101		P	85 - 115
Sodium	100		P	85 - 115
Zinc	99.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386749

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.4		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	99.5		P	85 - 115
Boron	94.3		P	85 - 115
Cadmium	96.1		P	85 - 115
Chromium	103		P	85 - 115
Copper	96.8		P	85 - 115
Lead	98.1		P	85 - 115
Nickel	95.6		P	85 - 115
Selenium	97.6		P	85 - 115
Silver	107		P	85 - 115
Thallium	99.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387061

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387066

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386863

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.1		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386867

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386780

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386757

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386759

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386706

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

Reference Method: SM 2120 B-2011
Batch ID: P386710

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.2		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P386763

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P386902

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P386768

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192874	Barium	104	102	P/P	80 - 120
2192874	Calcium	105	106	P/P	80 - 120
2192874	Iron	108	110	P/P	80 - 120
2192874	Magnesium	109	110	P/P	80 - 120
2192874	Potassium	104	105	P/P	80 - 120
2192874	Sodium	99.9	98.4	P/P	80 - 120
2192874	Zinc	108	106	P/P	80 - 120
2192988	Barium	99.0		P	80 - 120
2192988	Calcium	104		P	80 - 120
2192988	Iron	105		P	80 - 120
2192988	Magnesium	98.9		P	80 - 120
2192988	Potassium	103		P	80 - 120
2192988	Sodium	102		P	80 - 120
2192988	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192874	Aluminum	94.7	93.5	P/P	80 - 120
2192874	Antimony	100	98.9	P/P	80 - 120
2192874	Arsenic	100	97.9	P/P	80 - 120
2192874	Boron	99.0	97.3	P/P	80 - 120
2192874	Cadmium	98.1	97.3	P/P	80 - 120
2192874	Chromium	103	102	P/P	80 - 120
2192874	Copper	97.5	95.7	P/P	80 - 120
2192874	Lead	101	101	P/P	80 - 120
2192874	Nickel	97.2	95.7	P/P	80 - 120
2192874	Selenium	98.0	96.1	P/P	80 - 120
2192874	Silver	106	107	P/P	80 - 120
2192874	Thallium	101	103	P/P	80 - 120
2192988	Aluminum	93.2		P	80 - 120
2192988	Antimony	105		P	80 - 120
2192988	Arsenic	107		P	80 - 120
2192988	Boron	97.8		P	80 - 120
2192988	Cadmium	101		P	80 - 120
2192988	Chromium	105		P	80 - 120
2192988	Copper	99.0		P	80 - 120
2192988	Lead	102		P	80 - 120
2192988	Nickel	99.2		P	80 - 120
2192988	Selenium	104		P	80 - 120
2192988	Silver	106		P	80 - 120
2192988	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387061

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192838	Chloride	99.8		P	90 - 110
2193005	Chloride	99.7		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387066

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192838	Sulfate	98.8		P	90 - 110
2193005	Sulfate	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193006	Ammonia-N	98.0	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386863

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192836	Kjeldahl Nitrogen	95.0	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192998	Kjeldahl Nitrogen	93.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192953	NO2NO3-N	102	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192836	Total-P	108	111	P/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192982	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192954	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P386902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192997	Fluoride	102	102	P/P	94 - 107

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P386768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192839	Organic Carbon	99.0	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192939	Turbidity	0.422	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192874	Barium	1.73	Spike	P	0 - 20
2192874	Calcium	0.712	Spike	P	0 - 20
2192874	Iron	1.61	Spike	P	0 - 20
2192874	Magnesium	0.587	Spike	P	0 - 20
2192874	Potassium	1.16	Spike	P	0 - 20
2192874	Sodium	0.934	Spike	P	0 - 20
2192874	Zinc	1.50	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192874	Aluminum	1.03	Spike	P	0 - 20
2192874	Antimony	1.49	Spike	P	0 - 20
2192874	Arsenic	2.51	Spike	P	0 - 20
2192874	Boron	1.61	Spike	P	0 - 20
2192874	Cadmium	0.872	Spike	P	0 - 20
2192874	Chromium	0.742	Spike	P	0 - 20
2192874	Copper	1.88	Spike	P	0 - 20
2192874	Lead	0.404	Spike	P	0 - 20
2192874	Nickel	1.48	Spike	P	0 - 20
2192874	Selenium	1.97	Spike	P	0 - 20
2192874	Silver	0.701	Spike	P	0 - 20
2192874	Thallium	2.03	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193005	Chloride	0.302	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387066

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193005	Sulfate	0.678	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193006	Ammonia-N	1.58	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386863

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192836	Kjeldahl Nitrogen	3.45	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192998	Kjeldahl Nitrogen	4.01	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192953	NO2NO3-N	2.49	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192836	Total-P	2.36	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192982	Total-P	0.404	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192954	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P386710

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192975	Color (true)	3.46	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
 Batch ID: P386763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192997	Total Alkalinity	0.323	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
 Batch ID: P387159

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192352	TDS	5.83	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
 Batch ID: P387160

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192975	TDS	3.94	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P386902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192997	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
 Batch ID: P386768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192839	Organic Carbon	1.61	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: A100711

Included Lab Sample IDs: 2192975, 2192976, 2192981

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100712

Included Lab Sample IDs: 2192979, 2192980, 2192983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	99.6	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A100713

Included Lab Sample IDs: 2192975, 2192976, 2192981

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.9	98.0	P/P	90 - 115

Reference Method: SM 2320 B-2011

Run ID: A100734

Included Lab Sample IDs: 2192975, 2192976, 2192981

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.8	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A100736

Included Lab Sample IDs: 2192977, 2192978, 2192982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100742

Included Lab Sample IDs: 2192977, 2192978, 2192982

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100757

Included Lab Sample IDs: 2192982

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100778

Included Lab Sample IDs: 2192977, 2192978

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A100789

Included Lab Sample IDs: 2192988, 2192989

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	98.0	P/P	90 - 110
Barium	97.9	101	P/P	90 - 110
Calcium	101	101	P/P	90 - 110
Calcium	102	101	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Iron	105	105	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Potassium	100	100	P/P	90 - 110
Potassium	101	102	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Sodium	100	99.6	P/P	90 - 110
Zinc	102	99.2	P/P	90 - 110
Zinc	99.4	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A100801

Included Lab Sample IDs: 2192975, 2192976, 2192981

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100807

Included Lab Sample IDs: 2192978, 2192982

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100809

Included Lab Sample IDs: 2192977

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.0	94.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100833

Included Lab Sample IDs: 2192977, 2192978, 2192982

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A100843

Included Lab Sample IDs: 2192975, 2192976, 2192981

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1 dissolved

Run ID: A100843

Included Lab Sample IDs: 2192979, 2192980, 2192983

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100913

Included Lab Sample IDs: 2192988, 2192989

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.8	96.0	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Arsenic	96.1	98.2	P/P	90 - 110
Boron	93.5	96.0	P/P	90 - 110
Cadmium	94.5	95.4	P/P	90 - 110
Chromium	98.2	99.8	P/P	90 - 110
Copper	96.7	94.5	P/P	90 - 110
Lead	96.7	95.6	P/P	90 - 110
Nickel	95.9	95.6	P/P	90 - 110
Selenium	94.0	99.6	P/P	90 - 110
Thallium	95.4	94.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100945

Included Lab Sample IDs: 2192988, 2192989

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	106	105	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					0.422	
EPA 200.7 Rev. 4.4	Barium	97.9	104	102	99.0		1.73
	Calcium	103	105	106	104		0.712
	Iron	104	108	110	105		1.61
	Magnesium	104	109	110	98.9		0.587
	Potassium	101	104	105	103		1.16
	Sodium	100	99.9	98.4	102		0.934
	Zinc	99.8	108	106	103		1.50
EPA 200.8 Rev. 5.4	Aluminum	93.4	93.2	94.7	93.5		1.03
	Antimony	100	105	100	98.9		1.49
	Arsenic	99.5	107	100	97.9		2.51
	Boron	94.3	97.8	99.0	97.3		1.61
	Cadmium	96.1	101	98.1	97.3		0.872
	Chromium	103	105	103	102		0.742
	Copper	96.8	99.0	97.5	95.7		1.88
	Lead	98.1	101	102	101		0.404
	Nickel	95.6	99.2	97.2	95.7		1.48
	Selenium	97.6	104	98.0	96.1		1.97
	Silver	107	106	106	107		0.701
	Thallium	99.4	107	101	103		2.03
EPA 300.0 Rev. 2.1	Chloride	99.6	99.7	99.8		0.302	
EPA 300.0 Rev. 2.1 dissolved	Sulfate	98.0	96.4	98.8		0.678	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	98.0	101			1.58
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.1	95.0	99.5			3.45
	Kjeldahl Nitrogen	93.2	93.0	100			4.01
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102	99.0			2.49
EPA 365.1 Rev. 2.0	Total-P	107	108	111			2.36
	Total-P	106	106	107			0.404
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	100	100			0.0
SM 2120 B-2011	Color (true)	96.2				3.46	
SM 2320 B-2011	Total Alkalinity	100				0.323	
SM 2540 C-2011	TDS					5.83	
	TDS					3.94	
SM 4500 F-C-2011	Fluoride	102	102	102			0.0
SM 5310 B-2011	Organic Carbon	99.6	99.0	101			1.61

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2192975, 2192976, 2192981
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2192988, 2192989
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2192988, 2192989
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2192975, 2192976, 2192981
EPA 300.0 Rev. 2.1 dissolved	Sulfate, dissolved, in filtered, aqueous matrices	2192979, 2192980, 2192983
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2192977, 2192978, 2192982
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2192977, 2192978, 2192982
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2192977, 2192978, 2192982
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2192977, 2192978, 2192982
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2192979, 2192980, 2192983
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2192975, 2192976, 2192981

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2192975, 2192976, 2192981
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2192988, 2192989
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2192975, 2192976, 2192981
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2192975, 2192976, 2192981
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2192975, 2192976, 2192981
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2192977, 2192978, 2192982

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	08/28/2020			08/28/2020 14:51	Yen Ta	2192975, 2192976, 2192981
EPA 200.7 Rev. 4.4	08/28/2020	08/31/2020 13:30	Elliott D. Healy	09/02/2020 15:34	Betina Topolski	2192989
	08/28/2020	08/31/2020 13:30	Elliott D. Healy	09/02/2020 19:41	Betina Topolski	2192988
EPA 200.8 Rev. 5.4	08/28/2020	08/31/2020 13:30	Elliott D. Healy	09/10/2020 18:03	Alexander Thompson	2192989
	08/28/2020	08/31/2020 13:30	Elliott D. Healy	09/10/2020 18:41	Alexander Thompson	2192988
	08/28/2020	08/31/2020 13:30	Elliott D. Healy	09/11/2020 12:58	Alexander Thompson	2192989
	08/28/2020	08/31/2020 13:30	Elliott D. Healy	09/11/2020 13:35	Alexander Thompson	2192988
EPA 300.0 Rev. 2.1	08/28/2020			09/05/2020 08:05	Julia Storbeck	2192975
	08/28/2020			09/05/2020 08:17	Julia Storbeck	2192976
	08/28/2020			09/05/2020 08:29	Julia Storbeck	2192981
EPA 300.0 Rev. 2.1 dissolved	08/28/2020			09/05/2020 08:42	Julia Storbeck	2192979
	08/28/2020			09/05/2020 08:54	Julia Storbeck	2192980
	08/28/2020			09/05/2020 09:06	Julia Storbeck	2192983
EPA 350.1 Rev. 2.0	08/28/2020			09/05/2020 16:49	Ping Hua	2192982
	08/28/2020			09/05/2020 17:00	Ping Hua	2192978
	08/28/2020			09/05/2020 17:25	Ping Hua	2192977
EPA 351.2 Rev. 2.0	08/28/2020	09/02/2020 12:20	David Boose	09/03/2020 13:41	Virginia P. Brown	2192978
	08/28/2020	09/02/2020 12:20	David Boose	09/03/2020 13:43	Virginia P. Brown	2192982
	08/28/2020	09/02/2020 12:20	David Boose	09/03/2020 15:53	Virginia P. Brown	2192977
EPA 353.2 Rev. 2.0	08/28/2020			09/01/2020 11:15	Beverly Y. Sanders	2192977
	08/28/2020			09/01/2020 11:17	Beverly Y. Sanders	2192978
	08/28/2020			09/01/2020 11:18	Beverly Y. Sanders	2192982
EPA 365.1 Rev. 2.0	08/28/2020	08/31/2020 15:00	Yen Ta	09/01/2020 13:28	Benjamin T. Nordmann	2192982
	08/28/2020	08/31/2020 15:00	Yen Ta	09/02/2020 12:13	Lipi Saha	2192977
	08/28/2020	08/31/2020 15:00	Yen Ta	09/02/2020 12:15	Lipi Saha	2192978
EPA 365.1 Rev. 2.0 dissolved	08/28/2020			08/28/2020 15:21	Samantha Davila	2192979, 2192980
	08/28/2020			08/28/2020 15:22	Samantha Davila	2192983
SM 2120 B-2011	08/28/2020			08/28/2020 15:46	Benjamin T. Nordmann	2192975
	08/28/2020			08/28/2020 15:49	Benjamin T. Nordmann	2192976
	08/28/2020			08/28/2020 15:50	Benjamin T. Nordmann	2192981
SM 2320 B-2011	08/28/2020			08/31/2020 18:33	Dale L. Simmons	2192975
	08/28/2020			08/31/2020 18:41	Dale L. Simmons	2192976
	08/28/2020			08/31/2020 18:54	Dale L. Simmons	2192981
SM 2340B	08/28/2020			09/02/2020 15:34	Betina Topolski	2192989
	08/28/2020			09/02/2020 19:41	Betina Topolski	2192988
SM 2540 C-2011	08/28/2020			08/31/2020 14:51	Yijie Li	2192975, 2192976, 2192981
SM 2540 D-2011	08/28/2020			08/31/2020 14:39	Yijie Li	2192975, 2192976, 2192981
SM 4500 F-C-2011	08/28/2020			09/03/2020 04:06	Dale L. Simmons	2192975
	08/28/2020			09/03/2020 04:11	Dale L. Simmons	2192976
	08/28/2020			09/03/2020 04:16	Dale L. Simmons	2192981

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	08/28/2020			08/31/2020 17:22	David Boose	2192977
	08/28/2020			08/31/2020 17:36	David Boose	2192978
	08/28/2020			08/31/2020 17:48	David Boose	2192982