

Chemical Analysis Report

SW-DIST-2020-07-16-01

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

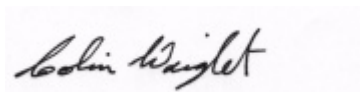
Event Description: **Run 12**
Request ID: **RQ-2020-06-29-03**
Customer: **SW-DIST**
Project ID: **SMP**

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

Date Certified: 31-JUL-2020 10:30



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: Livingston Creek @ Old Avon Park Rd

Collection Date/Time: 07/15/2020 11:40

Field ID: G4SW0104

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2183472	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P385091	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P385199	
	SM 2120 B-2011	Color (true)	310		PCU	P384752	
	SM 2320 B-2011	Total Alkalinity	16		mg CaCO3/L	P385001	
	SM 2540 C-2011	TDS	146		mg/L	P385024	
	SM 2540 D-2011	TSS	2	U	mg/L	P384909	
	SM 4500 F-C-2011	Fluoride	0.11		mg F/L	P385004	
2183473	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P384830	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P384985	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384914	
	EPA 365.1 Rev. 2.0	Total-P	0.30		mg P/L	P384880	
	SM 5310 B-2011	Organic Carbon	28		mg C/L	P384843	
2183474	EPA 300.0 Rev. 2.1 dissolved	Sulfate	2.9		mg SO4/L	P385203	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.25		mg P/L	P384788	
2183487	EPA 200.7 Rev. 4.4	Barium	7.6		ug/L	P384874	
		Calcium	5.51		mg/L	P384874	
		Iron	490		ug/L	P384874	
		Magnesium	4.47		mg/L	P384874	
		Potassium	9.4		mg/L	P384874	
		Sodium	9.5		mg/L	P384874	
		Zinc	5.0	U	ug/L	P384874	
	EPA 200.8 Rev. 5.4	Aluminum	88		ug/L	P384874	
		Antimony	0.050	U	ug/L	P384874	
		Arsenic	0.41		ug/L	P384874	
		Boron**	43.4		ug/L	P384874	
		Cadmium	0.020	U	ug/L	P384874	
		Chromium	0.40	U	ug/L	P384874	
		Copper	0.40	U	ug/L	P384874	
		Lead	0.21	I	ug/L	P384874	
		Nickel	0.50	U	ug/L	P384874	
		Selenium	0.20	U	ug/L	P384874	
		Silver	0.010	U	ug/L	P384874	
		Thallium	0.10	U	ug/L	P384874	
	SM 2340B	Hardness	32.2		mg/L	P384874	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Reclaimed Mine Cut Lake SE

Collection Date/Time: 07/15/2020 10:45

Field ID: G3SW0074

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2183475	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P385091	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P385199	
	SM 2120 B-2011	Color (true)	5.4	IA	PCU	P384857	
	SM 2320 B-2011	Total Alkalinity	62		mg CaCO3/L	P385001	
	SM 2540 C-2011	TDS	116		mg/L	P385024	
	SM 2540 D-2011	TSS	19		mg/L	P384909	
	SM 4500 F-C-2011	Fluoride	1.2		mg F/L	P385004	
2183476	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P384826	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P384985	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384915	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P384880	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P384843	
2183477	EPA 300.0 Rev. 2.1 dissolved	Sulfate	0.20	U	mg SO4/L	P385203	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.047		mg P/L	P384788	

Ref. Method and Comment:

SM 2120 B-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

EPA 351.2 Rev. 2.0: 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: P385091

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384874

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: P384874

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: P385199

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385203

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384826

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384830

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384985

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384914

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384915

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384880

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384788

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

Reference Method: SM 2120 B-2011
Batch ID: P384752

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P384857

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P385001

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P385024

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P384909

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P385004

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P384843

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: P384874

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	100		P	85 - 115
Iron	108		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	105		P	85 - 115
Sodium	101		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384874

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.6		P	85 - 115
Antimony	99.1		P	85 - 115
Arsenic	103		P	85 - 115
Boron	99.9		P	85 - 115
Cadmium	99.2		P	85 - 115
Chromium	101		P	85 - 115
Copper	99.4		P	85 - 115
Lead	97.3		P	85 - 115
Nickel	101		P	85 - 115
Selenium	102		P	85 - 115
Silver	99.1		P	85 - 115
Thallium	99.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385199

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385203

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384826

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384830

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384985

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384914

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384915

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384880

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384788

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

Reference Method: SM 2120 B-2011
Batch ID: P384752

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.0		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P384857

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	92.2		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P385001

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

Reference Method: SM 4500 F-C-2011
Batch ID: P385004

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P384843

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384874

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183868	Barium	103	104	P/P	80 - 120
2183868	Calcium	103		P	80 - 120
2183868	Iron	108	106	P/P	80 - 120
2183868	Magnesium	106	104	P/P	80 - 120
2183868	Potassium	103	101	P/P	80 - 120
2183868	Sodium	101		P	80 - 120
2183868	Zinc	105	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384874

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183868	Aluminum	108	105	P/P	80 - 120
2183868	Antimony	101	99.8	P/P	80 - 120
2183868	Arsenic	103	102	P/P	80 - 120
2183868	Boron	104	103	P/P	80 - 120
2183868	Cadmium	106	102	P/P	80 - 120
2183868	Chromium	104	102	P/P	80 - 120
2183868	Copper	99.7	97.9	P/P	80 - 120
2183868	Lead	98.0	99.0	P/P	80 - 120
2183868	Nickel	99.0	98.7	P/P	80 - 120
2183868	Selenium	100	97.3	P/P	80 - 120
2183868	Silver	101	102	P/P	80 - 120
2183868	Thallium	102	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385199

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183497	Chloride	96.1		P	90 - 110
2183528	Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183497	Sulfate	94.5		P	90 - 110
2183528	Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384826

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183476	Ammonia-N	97.1	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384830

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183529	Ammonia-N	99.7	99.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183348	NO2NO3-N	96.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183513	NO2NO3-N	98.2	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384880

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183466	Total-P	110	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384788

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183470	O-Phosphate-P	96.2	96.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P385004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2184058	Fluoride	99.6	99.6	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P384843

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183529	Organic Carbon	99.4	99.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183465	Turbidity	1.41	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384874

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183868	Barium	1.31	Spike	P	0 - 20
2183868	Calcium	0.414	Spike	P	0 - 20
2183868	Iron	1.02	Spike	P	0 - 20
2183868	Magnesium	1.02	Spike	P	0 - 20
2183868	Potassium	1.41	Spike	P	0 - 20
2183868	Sodium	0.0714	Spike	P	0 - 20
2183868	Zinc	0.219	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384874

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183868	Aluminum	2.30	Spike	P	0 - 20
2183868	Antimony	1.39	Spike	P	0 - 20
2183868	Arsenic	0.848	Spike	P	0 - 20
2183868	Boron	0.441	Spike	P	0 - 20
2183868	Cadmium	3.78	Spike	P	0 - 20
2183868	Chromium	1.50	Spike	P	0 - 20
2183868	Copper	1.72	Spike	P	0 - 20
2183868	Lead	0.990	Spike	P	0 - 20
2183868	Nickel	0.256	Spike	P	0 - 20
2183868	Selenium	3.17	Spike	P	0 - 20
2183868	Silver	0.884	Spike	P	0 - 20
2183868	Thallium	2.34	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385199

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183497	Chloride	0.144	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183497	Sulfate	0.0679	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384826

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183476	Ammonia-N	1.34	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183529	Ammonia-N	0.145	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183529	Kjeldahl Nitrogen	0.948	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183348	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183513	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384880

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183466	Total-P	2.60	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183470	O-Phosphate-P	0.291	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P384752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183566	Color (true)	1.49	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P385001

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2184058	Total Alkalinity	1.86	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P385024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183339	TDS	1.82	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P385004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2184058	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P384843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183529	Organic Carbon	0.296	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A100004

Included Lab Sample IDs: 2183487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	102	P/P	90 - 110
Calcium	102	104	P/P	90 - 110
Iron	105	106	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	104	103	P/P	90 - 110
Zinc	98.0	99.5	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A100019

Included Lab Sample IDs: 2183472, 2183475

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	105	100	P/P	90 - 110
Total Alkalinity	97.5	105	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A100019

Included Lab Sample IDs: 2183472, 2183475

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	103	P/P	90 - 110
Fluoride	103	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100028

Included Lab Sample IDs: 2183487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.6	99.6	P/P	90 - 110
Antimony	98.3	97.5	P/P	90 - 110
Arsenic	99.1	97.9	P/P	90 - 110
Boron	99.3	101	P/P	90 - 110
Cadmium	98.9	99.1	P/P	90 - 110
Chromium	95.4	96.1	P/P	90 - 110
Copper	94.0	94.0	P/P	90 - 110
Lead	96.3	95.7	P/P	90 - 110
Nickel	94.2	94.4	P/P	90 - 110
Selenium	99.6	98.7	P/P	90 - 110
Silver	96.1	96.4	P/P	90 - 110
Thallium	95.7	94.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100044

Included Lab Sample IDs: 2183473, 2183476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	98.8	P/P	90 - 110
Kjeldahl Nitrogen	98.8	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A100047
Included Lab Sample IDs: 2183472, 2183475

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100104
Included Lab Sample IDs: 2183472, 2183475

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Run ID: A100104
Included Lab Sample IDs: 2183474, 2183477

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

Reference Method: SM 2120 B-2011
Run ID: A99921
Included Lab Sample IDs: 2183472

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A99941
Included Lab Sample IDs: 2183474, 2183477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.5	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99955
Included Lab Sample IDs: 2183476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	98.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99956
Included Lab Sample IDs: 2183473

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.2	98.7	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A99964
Included Lab Sample IDs: 2183473, 2183476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.3	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B-2011

Run ID: A99967

Included Lab Sample IDs: 2183475

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.8	99.7	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A99985

Included Lab Sample IDs: 2183473, 2183476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A99998

Included Lab Sample IDs: 2183473, 2183476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	101	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	MS
EPA 180.1 Rev. 2.0	Turbidity					1.41	
EPA 200.7 Rev. 4.4	Barium	103		103	104		1.31
	Calcium	100		103			0.414
	Iron	108		108	106		1.02
	Magnesium	107		106	104		1.02
	Potassium	105		103	101		1.41
	Sodium	101		101			0.0714
	Zinc	101		105	104		0.219
EPA 200.8 Rev. 5.4	Aluminum	97.6		108	105		2.30
	Antimony	99.1		101	99.8		1.39
	Arsenic	103		103	102		0.848
	Boron	99.9		104	103		0.441
	Cadmium	99.2		106	102		3.78
	Chromium	101		104	102		1.50
	Copper	99.4		99.7	97.9		1.72
	Lead	97.3		98.0	99.0		0.990
	Nickel	101		99.0	98.7		0.256
	Selenium	102		100	97.3		3.17
	Silver	99.1		101	102		0.884
	Thallium	99.7		102	104		2.34
EPA 300.0 Rev. 2.1	Chloride	98.9		96.1	99.6	0.144	
EPA 300.0 Rev. 2.1 dissolved	Sulfate	97.5		94.5	96.2	0.0679	
EPA 350.1 Rev. 2.0	Ammonia-N	99.0		97.1	98.6		1.34
	Ammonia-N	98.3		99.7	99.5		0.145
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.6					0.948
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100		96.2			0.506
	NO ₂ NO ₃ -N	99.0		98.2	98.2		0.0
EPA 365.1 Rev. 2.0	Total-P	107		110	104		2.60
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.8		96.2	96.7		0.291
SM 2120 B-2011	Color (true)	99.0				1.49	
	Color (true)	92.2					
SM 2320 B-2011	Total Alkalinity	104				1.86	
SM 2540 C-2011	TDS					1.82	
SM 4500 F-C-2011	Fluoride	102		99.6	99.6		0.0
SM 5310 B-2011	Organic Carbon	98.7		99.4	99.8		0.296

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2183472, 2183475
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2183487
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2183487
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2183472, 2183475
EPA 300.0 Rev. 2.1 dissolved	Sulfate, dissolved, in filtered, aqueous matrices	2183474, 2183477
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2183473, 2183476
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2183473, 2183476
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2183473, 2183476
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2183473, 2183476
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2183474, 2183477
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2183472, 2183475

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2183472, 2183475
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2183487
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2183472, 2183475
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2183472, 2183475
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2183472, 2183475
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2183473, 2183476

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	07/16/2020			07/16/2020 16:02	Samantha Davila	2183472, 2183475
EPA 200.7 Rev. 4.4	07/16/2020	07/20/2020 13:35	Elliott D. Healy	07/21/2020 16:01	Betina Topolski	2183487
EPA 200.8 Rev. 5.4	07/16/2020	07/20/2020 13:35	Elliott D. Healy	07/22/2020 15:38	Alexander Thompson	2183487
EPA 300.0 Rev. 2.1	07/16/2020			07/22/2020 05:16	Julia Storbeck	2183472
	07/16/2020			07/22/2020 05:28	Julia Storbeck	2183475
EPA 300.0 Rev. 2.1 dissolved	07/16/2020			07/22/2020 08:05	Julia Storbeck	2183474
	07/16/2020			07/22/2020 08:17	Julia Storbeck	2183477
EPA 350.1 Rev. 2.0	07/16/2020			07/19/2020 11:17	Ping Hua	2183476
	07/16/2020			07/19/2020 14:28	Ping Hua	2183473
EPA 351.2 Rev. 2.0	07/16/2020	07/22/2020 10:10	Jhamieka S. Greenwood	07/23/2020 14:27	Jhamieka S. Greenwood	2183473
	07/16/2020	07/22/2020 10:10	Jhamieka S. Greenwood	07/23/2020 14:32	Jhamieka S. Greenwood	2183476
EPA 353.2 Rev. 2.0	07/16/2020			07/21/2020 09:01	Beverly Y. Sanders	2183473
	07/16/2020			07/21/2020 09:14	Beverly Y. Sanders	2183476
EPA 365.1 Rev. 2.0	07/16/2020	07/20/2020 13:21	Yen Ta	07/21/2020 11:13	Lipi Saha	2183473
	07/16/2020	07/20/2020 13:21	Yen Ta	07/21/2020 11:14	Lipi Saha	2183476
EPA 365.1 Rev. 2.0 dissolved	07/16/2020			07/16/2020 16:05	Carlos Miranda	2183474
	07/16/2020			07/16/2020 16:06	Carlos Miranda	2183477
SM 2120 B-2011	07/16/2020			07/16/2020 16:47	Madeline Gruver	2183472
	07/16/2020			07/17/2020 09:16	Madeline Gruver	2183475
SM 2320 B-2011	07/16/2020			07/21/2020 22:46	Dale L. Simmons	2183472
	07/16/2020			07/21/2020 23:25	Dale L. Simmons	2183475
SM 2340B	07/16/2020			07/21/2020 16:01	Betina Topolski	2183487
SM 2540 C-2011	07/16/2020			07/17/2020 18:41	Madeline Gruver	2183472, 2183475
SM 2540 D-2011	07/16/2020			07/17/2020 19:29	Madeline Gruver	2183472, 2183475
SM 4500 F-C-2011	07/16/2020			07/21/2020 22:46	Dale L. Simmons	2183472
	07/16/2020			07/21/2020 23:25	Dale L. Simmons	2183475
SM 5310 B-2011	07/16/2020			07/17/2020 23:21	David Boose	2183473
	07/16/2020			07/17/2020 23:33	David Boose	2183476