

Chemical Analysis Report

NE-DIST-2021-05-06-01

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

Event Description: **Nassau North 2021**
Request ID: **RQ-2021-04-19-28**
Customer: **NE-DIST**
Project ID: **SMP**

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Date Certified: 26-MAY-2021 11:52



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: Mills CR @ CR 115

Collection Date/Time: 05/05/2021 13:30

Field ID: 19010097

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2245589	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P397788	
	EPA 300.0 Rev. 2.1	Chloride	10		mg Cl/L	P398560	
		Sulfate	2.3		mg SO4/L	P398563	
		Color (true)	250		PCU	P397805	
	SM 2320 B-2011	Total Alkalinity	3.1		mg CaCO3/L	P398174	
	SM 2540 C-2011	TDS	69		mg/L	P398299	RPD
	SM 2540 D-2011	TSS	4	I	mg/L	P398294	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P398695	
2245590	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P398214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P398107	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P397884	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P398135	
	SM 5310 B-2011	Organic Carbon	22		mg C/L	P397942	
2245591	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P397778	
2245605	EPA 200.7 Rev. 4.4	Barium	20.2		ug/L	P398159	
		Calcium	4.29		mg/L	P398159	
		Iron	1.45E+03		ug/L	P398159	
		Magnesium	1.08		mg/L	P398159	
		Manganese	11.2		ug/L	P398159	
		Potassium	0.75	I	mg/L	P398159	
		Sodium	6.3		mg/L	P398159	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P398159	
		Aluminum	468		ug/L	P398159	
		Antimony	0.050	U	ug/L	P398159	
		Arsenic	0.46		ug/L	P398159	
		Beryllium	0.036	I	ug/L	P398159	
		Boron**	19.2		ug/L	P398159	
		Cadmium	0.020	U	ug/L	P398159	
		Chromium	0.58	I	ug/L	P398159	
		Copper	0.40	U	ug/L	P398159	
		Lead	0.49		ug/L	P398159	
		Nickel	0.59	I	ug/L	P398159	
		Selenium	0.24	I	ug/L	P398159	
		Silver	0.010	U	ug/L	P398159	
		Thallium	0.10	U	ug/L	P398159	
		Hardness	15.2		mg/L	P398159	

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: Little St. Marys @ CR 121A

Collection Date/Time: 05/05/2021 11:20

Field ID: 19010046

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2245586	EPA 180.1 Rev. 2.0	Turbidity	5.4	A	NTU	P397788	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P398560	
		Sulfate	10		mg SO4/L	P398563	
	SM 2120 B-2011	Color (true)	230		PCU	P397805	
	SM 2320 B-2011	Total Alkalinity	26		mg CaCO3/L	P398174	
	SM 2540 C-2011	TDS	115		mg/L	P398299	RPD
	SM 2540 D-2011	TSS	6	I	mg/L	P398294	
	SM 4500 F-C-2011	Fluoride	0.049	I	mg F/L	P398695	
2245587	EPA 350.1 Rev. 2.0	Ammonia-N	0.048		mg N/L	P398214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.97		mg N/L	P398107	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.031		mg N/L	P397884	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P398135	
	SM 5310 B-2011	Organic Carbon	26		mg C/L	P397942	
2245588	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P397778	
2245604	EPA 200.7 Rev. 4.4	Barium	31.3		ug/L	P398159	
		Calcium	13.8		mg/L	P398159	
		Iron	1.06E+03		ug/L	P398159	
		Magnesium	3.97		mg/L	P398159	
		Manganese	72.3		ug/L	P398159	
		Potassium	1.2	I	mg/L	P398159	
		Sodium	11.3		mg/L	P398159	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P398159	
		Aluminum	357		ug/L	P398159	
		Antimony	0.050	U	ug/L	P398159	
		Arsenic	0.65		ug/L	P398159	
		Beryllium	0.037	I	ug/L	P398159	
		Boron**	30.8		ug/L	P398159	
		Cadmium	0.020	U	ug/L	P398159	
		Chromium	0.71	I	ug/L	P398159	
		Copper	0.60	I	ug/L	P398159	
		Lead	0.61		ug/L	P398159	
		Nickel	0.55	I	ug/L	P398159	
		Selenium	0.20	U	ug/L	P398159	
		Silver	0.010	U	ug/L	P398159	
		Thallium	0.10	U	ug/L	P398159	
		Hardness	50.9		mg/L	P398159	

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: Little St. Mary's River at White Oak Rd

Collection Date/Time: 05/05/2021 10:40

Field ID: G4NE0289

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2245606	EPA 200.7 Rev. 4.4	Barium	17.7		ug/L	P398159	
		Calcium	7.49		mg/L	P398159	
		Iron	630		ug/L	P398159	
		Magnesium	4.06		mg/L	P398159	
		Manganese	16.6		ug/L	P398159	
		Potassium	0.99	I	mg/L	P398159	
		Sodium	16.8		mg/L	P398159	
	EPA 200.8 Rev. 5.4	Zinc	14	I	ug/L	P398159	
		Aluminum	442		ug/L	P398159	
		Antimony	0.050	U	ug/L	P398159	
		Arsenic	1.06		ug/L	P398159	
		Beryllium	0.042		ug/L	P398159	
		Boron**	30.7		ug/L	P398159	
		Cadmium	0.020	U	ug/L	P398159	
		Chromium	1.5	I	ug/L	P398159	
		Copper	2.81		ug/L	P398159	
		Lead	0.65		ug/L	P398159	
		Nickel	0.69	I	ug/L	P398159	
		Selenium	0.20	U	ug/L	P398159	
		Silver	0.010	U	ug/L	P398159	
		Thallium	0.10	U	ug/L	P398159	
	SM 2340B	Hardness	35.4		mg/L	P398159	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P397788

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398159

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
Manganese	1.0	U	ug/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: P398159

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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: P398560

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398563

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398214

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: P398107

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397884

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398135

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

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

Reference Method: SM 2120 B-2011
Batch ID: P397805

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P398174

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P398299

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P398294

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P397942

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: P398159

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	102		P	85 - 115
Manganese	104		P	85 - 115
Potassium	99.4		P	85 - 115
Sodium	101		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P398159

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.9		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	101		P	85 - 115
Beryllium	95.4		P	85 - 115
Boron	103		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	95.0		P	85 - 115
Copper	103		P	85 - 115
Lead	99.1		P	85 - 115
Nickel	102		P	85 - 115
Selenium	101		P	85 - 115
Silver	102		P	85 - 115
Thallium	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398560

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398563

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P398214

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P398107

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397884

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: P398135

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

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

Reference Method: SM 2120 B-2011
Batch ID: P397805

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.8		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P398174

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.7		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P397942

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P398159

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244973	Barium	101		P	80 - 120
2244973	Calcium	105		P	80 - 120
2244973	Iron	106		P	80 - 120
2244973	Magnesium	107		P	80 - 120
2244973	Manganese	104		P	80 - 120
2244973	Potassium	100		P	80 - 120
2244973	Sodium	101		P	80 - 120
2244973	Zinc	107		P	80 - 120
2245713	Barium	99.6	101	P/P	80 - 120
2245713	Calcium	102		P	80 - 120
2245713	Iron	107	105	P/P	80 - 120
2245713	Magnesium	100		P	80 - 120
2245713	Manganese	102	104	P/P	80 - 120
2245713	Potassium	99.8	101	P/P	80 - 120
2245713	Sodium	100		P	80 - 120
2245713	Zinc	106	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P398159

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244973	Aluminum	93.1		P	80 - 120
2244973	Antimony	102		P	80 - 120
2244973	Arsenic	102		P	80 - 120
2244973	Beryllium	93.9		P	80 - 120
2244973	Boron	110		P	80 - 120
2244973	Cadmium	105		P	80 - 120
2244973	Chromium	94.4		P	80 - 120
2244973	Copper	100		P	80 - 120
2244973	Lead	101		P	80 - 120
2244973	Nickel	98.4		P	80 - 120
2244973	Selenium	100		P	80 - 120
2244973	Silver	109		P	80 - 120
2244973	Thallium	108		P	80 - 120
2245713	Aluminum	95.6	96.1	P/P	80 - 120
2245713	Antimony	103	104	P/P	80 - 120
2245713	Arsenic	103	103	P/P	80 - 120
2245713	Beryllium	98.2	97.9	P/P	80 - 120
2245713	Boron	102	104	P/P	80 - 120
2245713	Cadmium	106	106	P/P	80 - 120
2245713	Chromium	98.2	100	P/P	80 - 120
2245713	Copper	98.7	99.1	P/P	80 - 120
2245713	Lead	101	102	P/P	80 - 120
2245713	Nickel	100	101	P/P	80 - 120
2245713	Selenium	103	104	P/P	80 - 120
2245713	Silver	103	103	P/P	80 - 120
2245713	Thallium	109	111	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398560

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244979	Chloride	100		P	90 - 110
2245380	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398563

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244979	Sulfate	100		P	90 - 110
2245380	Sulfate	98.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245590	Ammonia-N	96.0	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245619	Kjeldahl Nitrogen	102	95.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245593	NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245461	Total-P	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245583	O-Phosphate-P	95.6	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245618	Fluoride	94.5	98.7	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P397942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245373	Organic Carbon	95.5	94.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P397788

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245586	Turbidity	2.97	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P398159

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245713	Barium	1.23	Spike	P	0 - 20
2245713	Calcium	1.13	Spike	P	0 - 20
2245713	Iron	1.85	Spike	P	0 - 20
2245713	Magnesium	1.68	Spike	P	0 - 20
2245713	Manganese	1.24	Spike	P	0 - 20
2245713	Potassium	0.796	Spike	P	0 - 20
2245713	Sodium	0.766	Spike	P	0 - 20
2245713	Zinc	0.168	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P398159

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245713	Aluminum	0.567	Spike	P	0 - 20
2245713	Antimony	0.671	Spike	P	0 - 20
2245713	Arsenic	0.714	Spike	P	0 - 20
2245713	Beryllium	0.236	Spike	P	0 - 20
2245713	Boron	2.21	Spike	P	0 - 20
2245713	Cadmium	0.00544	Spike	P	0 - 20
2245713	Chromium	2.14	Spike	P	0 - 20
2245713	Copper	0.407	Spike	P	0 - 20
2245713	Lead	1.10	Spike	P	0 - 20
2245713	Nickel	0.870	Spike	P	0 - 20
2245713	Selenium	0.501	Spike	P	0 - 20
2245713	Silver	0.459	Spike	P	0 - 20
2245713	Thallium	1.48	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398560

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244979	Chloride	0.852	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398563

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244979	Sulfate	0.938	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245590	Ammonia-N	1.79	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245619	Kjeldahl Nitrogen	5.11	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245593	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245461	Total-P	2.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245583	O-Phosphate-P	1.66	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P397805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245630	Color (true)	0.133	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P398174

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245385	Total Alkalinity	1.33	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P398299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245659	TDS	10.8	Sample	F	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245618	Fluoride	0.951	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P397942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245373	Organic Carbon	0.809	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A105228

Included Lab Sample IDs: 2245588, 2245591

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A105230

Included Lab Sample IDs: 2245586, 2245589

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	98.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A105236

Included Lab Sample IDs: 2245586, 2245589

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A105281

Included Lab Sample IDs: 2245587, 2245590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A105310

Included Lab Sample IDs: 2245587, 2245590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.1	96.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A105413

Included Lab Sample IDs: 2245587, 2245590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	97.8	P/P	90 - 110
Kjeldahl Nitrogen	95.6	100	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A105419

Included Lab Sample IDs: 2245586, 2245589

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A105429

Included Lab Sample IDs: 2245587, 2245590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	98.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A105437

Included Lab Sample IDs: 2245587, 2245590

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105445

Included Lab Sample IDs: 2245604, 2245605, 2245606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	103	P/P	90 - 110
Antimony	101	100	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Beryllium	101	99.8	P/P	90 - 110
Boron	106	109	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	95.2	93.4	P/P	90 - 110
Copper	100	101	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	99.8	102	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Thallium	100	99.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105451

Included Lab Sample IDs: 2245604, 2245605, 2245606

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A105478

Included Lab Sample IDs: 2245604, 2245605, 2245606

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	100	P/P	90 - 110
Calcium	99.8	102	P/P	90 - 110
Iron	100	102	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Manganese	101	102	P/P	90 - 110
Potassium	97.7	99.7	P/P	90 - 110
Sodium	97.9	99.2	P/P	90 - 110
Zinc	105	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A105550

Included Lab Sample IDs: 2245586, 2245589

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

Quality Assurance Report

Calibration Verification

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.97	
EPA 200.7 Rev. 4.4	Barium	102	101	99.6	101		1.23
	Calcium	106	105	102			1.13
	Iron	105	106	107	105		1.85
	Magnesium	102	107	100			1.68
	Manganese	104	104	102	104		1.24
	Potassium	99.4	100	99.8	101		0.796
	Sodium	101	101	100			0.766
	Zinc	106	107	106	106		0.168
EPA 200.8 Rev. 5.4	Aluminum	97.9	95.6	96.1	93.1		0.567
	Antimony	100	103	104	102		0.671
	Arsenic	101	103	103	102		0.714
	Beryllium	95.4	98.2	97.9	93.9		0.236
	Boron	103	102	104	110		2.21
	Cadmium	101	106	106	105		0.0054
	Chromium	95.0	98.2	100	94.4		2.14
	Copper	103	98.7	99.1	100		0.407
	Lead	99.1	101	102	101		1.10
	Nickel	102	100	101	98.4		0.870
	Selenium	101	103	104	100		0.501
	Silver	102	103	103	109		0.459
	Thallium	106	109	111	108		1.48
EPA 300.0 Rev. 2.1	Chloride	101	100	97.9		0.852	
	Sulfate	100	100	98.3		0.938	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	96.0	98.2			1.79
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	102	95.7			5.11
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.5	99.0			0.506
EPA 365.1 Rev. 2.0	Total-P	103	102	104			2.16
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	95.6	97.2			1.66
SM 2120 B-2011	Color (true)	97.8				0.133	
SM 2320 B-2011	Total Alkalinity	98.7				1.33	
SM 2540 C-2011	TDS					10.8	
SM 4500 F-C-2011	Fluoride	94.7	94.5	98.7			0.951
SM 5310 B-2011	Organic Carbon	96.0	95.5	94.2			0.809

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2245586, 2245589
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2245604, 2245605, 2245606
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2245604, 2245605, 2245606
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2245586, 2245589
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2245586, 2245589
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2245587, 2245590
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2245587, 2245590
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2245587, 2245590
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2245587, 2245590
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2245588, 2245591
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2245586, 2245589
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2245586, 2245589

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2245604, 2245605, 2245606
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2245586, 2245589
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2245586, 2245589
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2245586, 2245589
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2245587, 2245590

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	05/06/2021			05/06/2021 15:01	Sarah A Nixon	2245586, 2245589
EPA 200.7 Rev. 4.4	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/14/2021 18:31	Betina Topolski	2245604
	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/14/2021 18:39	Betina Topolski	2245605
	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/14/2021 18:47	Betina Topolski	2245606
EPA 200.8 Rev. 5.4	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/15/2021 00:32	Alexander Thompson	2245604
	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/15/2021 00:41	Alexander Thompson	2245605
	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/15/2021 00:51	Alexander Thompson	2245606
	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/16/2021 18:20	Alexander Thompson	2245604
	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/16/2021 18:27	Alexander Thompson	2245605
	05/06/2021	05/13/2021 17:25	Elliott D. Healy	05/16/2021 18:33	Alexander Thompson	2245606
EPA 300.0 Rev. 2.1	05/06/2021			05/21/2021 00:37	Lipi Saha	2245586
	05/06/2021			05/21/2021 00:49	Lipi Saha	2245589
EPA 350.1 Rev. 2.0	05/06/2021			05/14/2021 12:13	Roberta Tatti	2245587
	05/06/2021			05/14/2021 12:15	Roberta Tatti	2245590
EPA 351.2 Rev. 2.0	05/06/2021	05/12/2021 13:47	Benjamin T. Nordmann	05/13/2021 13:44	Virginia P. Brown	2245587
	05/06/2021	05/12/2021 13:47	Benjamin T. Nordmann	05/13/2021 13:49	Virginia P. Brown	2245590
EPA 353.2 Rev. 2.0	05/06/2021			05/10/2021 09:42	Beverly Y. Sanders	2245587
	05/06/2021			05/10/2021 09:44	Beverly Y. Sanders	2245590
EPA 365.1 Rev. 2.0	05/06/2021	05/13/2021 14:14	Yen Ta	05/14/2021 14:02	Shengyu Ding	2245587
	05/06/2021	05/13/2021 14:14	Yen Ta	05/14/2021 14:09	Shengyu Ding	2245590
EPA 365.1 Rev. 2.0 dissolved	05/06/2021			05/06/2021 14:09	Blanca Fach	2245588
	05/06/2021			05/06/2021 14:10	Blanca Fach	2245591
SM 2120 B-2011	05/06/2021			05/06/2021 16:45	Madeline Gruver	2245586, 2245589
SM 2320 B-2011	05/06/2021			05/13/2021 05:03	Dale L. Simmons	2245586
	05/06/2021			05/13/2021 05:10	Dale L. Simmons	2245589
SM 2340B	05/06/2021			05/14/2021 18:31	Betina Topolski	2245604
	05/06/2021			05/14/2021 18:39	Betina Topolski	2245605
	05/06/2021			05/14/2021 18:47	Betina Topolski	2245606
SM 2540 C-2011	05/06/2021			05/11/2021 15:02	Yijie Li	2245586, 2245589
SM 2540 D-2011	05/06/2021			05/11/2021 15:02	Yijie Li	2245586, 2245589
SM 4500 F-C-2011	05/06/2021			05/24/2021 14:33	Dale L. Simmons	2245586
	05/06/2021			05/24/2021 14:38	Dale L. Simmons	2245589
SM 5310 B-2011	05/06/2021			05/10/2021 22:30	Madeline Gruver	2245587
	05/06/2021			05/10/2021 22:44	Madeline Gruver	2245590