

Chemical Analysis Report

NE-DIST-2021-03-11-02

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

Event Description: **Nassau West 1 2021**

Request ID: **RQ-2021-01-11-29**

Customer: **NE-DIST**

Project ID: **SMP**

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Date Certified: 31-MAR-2021 10:39



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: Deep CR @ Hamp Hicks Rd

Collection Date/Time: 03/10/2021 10:00

Field ID: 19010084

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2230756	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P394840	
	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P394953	
		Sulfate	0.42	I	mg SO4/L	P394957	
	SM 2120 B-2011	Color (true)	280		PCU	P394851	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P395080	
	SM 2540 C-2011	TDS	57		mg/L	P395367	
	SM 2540 D-2011	TSS	2	U	mg/L	P395373	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P395083	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P394999	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P395142	
2230757	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P394966	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P394990	
	SM 5310 B-2011	Organic Carbon	28		mg C/L	P395275	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.005	I	mg P/L	P394810	
	dissolved						

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.

SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Unnamed Stream @ CR 121

Collection Date/Time: 03/10/2021 10:20

Field ID: 19010127

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2230750	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P394840	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P394953	
		Sulfate	1.0		mg SO4/L	P394957	
	SM 2120 B-2011	Color (true)	190		PCU	P394851	
	SM 2320 B-2011	Total Alkalinity	1.3	I	mg CaCO3/L	P395080	
	SM 2540 C-2011	TDS	57		mg/L	P395367	
	SM 2540 D-2011	TSS	3	I	mg/L	P395373	
2230752	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P395083	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P394935	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P395142	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P394966	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P394990	
2230754	SM 5310 B-2011	Organic Carbon	20		mg C/L	P395275	
2230754	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P394810	
2230772	EPA 200.7 Rev. 4.4	Barium	10.4		ug/L	P395033	
		Calcium	3.46		mg/L	P395033	
		Iron	820		ug/L	P395033	
		Magnesium	0.77		mg/L	P395033	
		Potassium	0.30	U	mg/L	P395033	
		Sodium	5.7		mg/L	P395033	
		Zinc	5.0	U	ug/L	P395033	
	EPA 200.8 Rev. 5.4	Aluminum	317		ug/L	P395033	
		Antimony	0.050	U	ug/L	P395033	
		Arsenic	0.28		ug/L	P395033	
		Beryllium	0.030	I	ug/L	P395033	
		Boron**	15.8		ug/L	P395033	
		Cadmium	0.020	U	ug/L	P395033	
		Chromium	0.58	I	ug/L	P395033	
		Copper	0.40	U	ug/L	P395033	
		Lead	0.31	I	ug/L	P395033	
		Nickel	0.51	I	ug/L	P395033	
		Selenium	0.20	U	ug/L	P395033	
		Silver	0.010	U	ug/L	P395033	
		Thallium	0.10	U	ug/L	P395033	
	SM 2340B	Hardness	11.8		mg/L	P395033	

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.

SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: St Marys R SR 2 East

Collection Date/Time: 03/10/2021 10:45

Field ID: 19010027

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2230774	EPA 200.7 Rev. 4.4	Barium	14.6		ug/L	P395033	
		Calcium	3.29		mg/L	P395033	
		Iron	940		ug/L	P395033	
		Magnesium	1.17		mg/L	P395033	
		Potassium	0.41	I	mg/L	P395033	
		Sodium	5.4		mg/L	P395033	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P395033	
		Aluminum	547		ug/L	P395033	
		Antimony	0.050	U	ug/L	P395033	
		Arsenic	0.41		ug/L	P395033	
		Beryllium	0.044		ug/L	P395033	
		Boron**	15.1		ug/L	P395033	
		Cadmium	0.020	U	ug/L	P395033	
		Chromium	0.78	I	ug/L	P395033	
		Copper	0.46	I	ug/L	P395033	
		Lead	0.69		ug/L	P395033	
		Nickel	0.62	I	ug/L	P395033	
		Selenium	0.20	U	ug/L	P395033	
		Silver	0.010	U	ug/L	P395033	
		Thallium	0.10	U	ug/L	P395033	
	SM 2340B	Hardness	13.0		mg/L	P395033	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 03/24/2021.

Sample Location: St Marys R @ Stokes Rd

Collection Date/Time: 03/10/2021 11:10

Field ID: 19010093

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2230751	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P394840	
	EPA 300.0 Rev. 2.1	Chloride	9.4		mg Cl/L	P394953	
		Sulfate	1.0		mg SO4/L	P394957	
	SM 2120 B-2011	Color (true)	360		PCU	P394851	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P395080	
	SM 2540 C-2011	TDS	79		mg/L	P395367	
	SM 2540 D-2011	TSS	2	I	mg/L	P395373	
2230753	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P395083	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P394999	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P395142	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P394966	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P394990	
2230755	SM 5310 B-2011	Organic Carbon	35		mg C/L	P395275	
2230755	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P394810	
2230773	EPA 200.7 Rev. 4.4	Barium	14.4		ug/L	P395033	
		Calcium	3.24		mg/L	P395033	
		Iron	940		ug/L	P395033	
		Magnesium	1.18		mg/L	P395033	
		Potassium	0.40	I	mg/L	P395033	
		Sodium	5.5		mg/L	P395033	
		Zinc	5.0	U	ug/L	P395033	
	EPA 200.8 Rev. 5.4	Aluminum	540		ug/L	P395033	
		Antimony	0.050	U	ug/L	P395033	
		Arsenic	0.41		ug/L	P395033	
		Beryllium	0.039	I	ug/L	P395033	
		Boron**	15.2		ug/L	P395033	
		Cadmium	0.020	U	ug/L	P395033	
		Chromium	0.72	I	ug/L	P395033	
		Copper	0.42	I	ug/L	P395033	
		Lead	0.66		ug/L	P395033	
		Nickel	0.65	I	ug/L	P395033	
		Selenium	0.20	U	ug/L	P395033	
		Silver	0.010	U	ug/L	P395033	
		Thallium	0.10	U	ug/L	P395033	
	SM 2340B	Hardness	12.9		mg/L	P395033	

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.
SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 03/24/2021.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P394840

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395033

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: P395033

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: P394953

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394957

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394935

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: P394999

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395142

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394966

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394990

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394810

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

Reference Method: SM 2120 B-2011
Batch ID: P394851

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P395080

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

Reference Method: SM 2540 C-2011
Batch ID: P395367

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P395373

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P395083

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P395275

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: P395033

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	107		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	105		P	85 - 115
Sodium	108		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395033

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.5		P	85 - 115
Antimony	96.7		P	85 - 115
Arsenic	92.9		P	85 - 115
Beryllium	89.2		P	85 - 115
Boron	92.4		P	85 - 115
Cadmium	95.0		P	85 - 115
Chromium	94.1		P	85 - 115
Copper	96.2		P	85 - 115
Lead	100		P	85 - 115
Nickel	94.6		P	85 - 115
Selenium	89.6		P	85 - 115
Silver	101		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394953

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	105		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394935

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394999

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395142

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394966

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: P394990

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394810

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.2		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P394851

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P395080

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P395083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P395275

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P395033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231307	Barium	101	102	P/P	80 - 120
2231307	Calcium	104	106	P/P	80 - 120
2231307	Iron	105	107	P/P	80 - 120
2231307	Magnesium	105	106	P/P	80 - 120
2231307	Potassium	105	106	P/P	80 - 120
2231307	Sodium	105	106	P/P	80 - 120
2231307	Zinc	98.9	99.7	P/P	80 - 120
2231368	Barium	102		P	80 - 120
2231368	Calcium	106		P	80 - 120
2231368	Iron	107		P	80 - 120
2231368	Magnesium	108		P	80 - 120
2231368	Potassium	104		P	80 - 120
2231368	Sodium	104		P	80 - 120
2231368	Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231307	Aluminum	92.7	93.3	P/P	80 - 120
2231307	Antimony	95.6	96.4	P/P	80 - 120
2231307	Arsenic	93.6	93.1	P/P	80 - 120
2231307	Beryllium	88.6	88.8	P/P	80 - 120
2231307	Boron	90.1	90.9	P/P	80 - 120
2231307	Cadmium	95.6	97.1	P/P	80 - 120
2231307	Chromium	93.4	94.4	P/P	80 - 120
2231307	Copper	95.3	95.7	P/P	80 - 120
2231307	Lead	99.5	99.1	P/P	80 - 120
2231307	Nickel	93.7	94.1	P/P	80 - 120
2231307	Selenium	94.2	94.1	P/P	80 - 120
2231307	Silver	101	101	P/P	80 - 120
2231307	Thallium	98.9	98.5	P/P	80 - 120
2231368	Aluminum	93.1		P	80 - 120
2231368	Antimony	99.9		P	80 - 120
2231368	Arsenic	93.3		P	80 - 120
2231368	Beryllium	90.6		P	80 - 120
2231368	Boron	94.3		P	80 - 120
2231368	Cadmium	97.0		P	80 - 120
2231368	Chromium	94.9		P	80 - 120
2231368	Copper	95.3		P	80 - 120
2231368	Lead	103		P	80 - 120
2231368	Nickel	93.6		P	80 - 120
2231368	Selenium	92.1		P	80 - 120
2231368	Silver	101		P	80 - 120
2231368	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230750	Chloride	104	105	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394957

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230750	Sulfate	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230408	Ammonia-N	95.4	97.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394999

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230785	Ammonia-N	96.0	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230713	Kjeldahl Nitrogen	109	96.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230705	NO2NO3-N	99.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230668	Total-P	108	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394810

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230958	O-Phosphate-P	96.1	97.4	P/P	90 - 110

Reference Method: SM 5310 B-2011
Batch ID: P395275

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2230760	Organic Carbon	94.7	95.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P394840

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230709	Turbidity	2.83	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P395033

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231307	Barium	0.419	Spike	P	0 - 20
2231307	Calcium	1.78	Spike	P	0 - 20
2231307	Iron	1.63	Spike	P	0 - 20
2231307	Magnesium	1.20	Spike	P	0 - 20
2231307	Potassium	0.903	Spike	P	0 - 20
2231307	Sodium	0.178	Spike	P	0 - 20
2231307	Zinc	0.780	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395033

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231307	Aluminum	0.559	Spike	P	0 - 20
2231307	Antimony	0.838	Spike	P	0 - 20
2231307	Arsenic	0.543	Spike	P	0 - 20
2231307	Beryllium	0.186	Spike	P	0 - 20
2231307	Boron	0.777	Spike	P	0 - 20
2231307	Cadmium	1.52	Spike	P	0 - 20
2231307	Chromium	1.03	Spike	P	0 - 20
2231307	Copper	0.438	Spike	P	0 - 20
2231307	Lead	0.389	Spike	P	0 - 20
2231307	Nickel	0.433	Spike	P	0 - 20
2231307	Selenium	0.116	Spike	P	0 - 20
2231307	Silver	0.734	Spike	P	0 - 20
2231307	Thallium	0.392	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394953

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230750	Chloride	0.760	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394957

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230750	Sulfate	0.992	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P394935

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230408	Ammonia-N	1.89	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P394999

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230785	Ammonia-N	0.765	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P395142

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230713	Kjeldahl Nitrogen	6.41	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P394966

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230705	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P394990

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230668	Total-P	0.921	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P394810

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230958	O-Phosphate-P	0.962	Spike	P	0 - 20

Reference Method: SM 2320 B-2011

Batch ID: P395080

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231046	Total Alkalinity	0.470	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011

Batch ID: P395367

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230712	TDS	4.60	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P395083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231046	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P395275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2230760	Organic Carbon	0.285	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: A104013

Included Lab Sample IDs: 2230754, 2230755, 2230758

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A104019

Included Lab Sample IDs: 2230750, 2230751, 2230756

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	101	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A104022

Included Lab Sample IDs: 2230750, 2230751, 2230756

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	104	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A104048

Included Lab Sample IDs: 2230752

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A104057

Included Lab Sample IDs: 2230750, 2230751, 2230756

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Sulfate	104	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A104062

Included Lab Sample IDs: 2230752, 2230753, 2230757

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A104072

Included Lab Sample IDs: 2230753, 2230757

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	98.8	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A104103

Included Lab Sample IDs: 2230750, 2230751, 2230756

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-2011

Run ID: A104103

Included Lab Sample IDs: 2230750, 2230751, 2230756

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104108

Included Lab Sample IDs: 2230752, 2230753, 2230757

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104152

Included Lab Sample IDs: 2230772, 2230773, 2230774

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.7	100	P/P	90 - 110
Antimony	97.9	99.5	P/P	90 - 110
Arsenic	98.8	97.1	P/P	90 - 110
Beryllium	99.0	97.8	P/P	90 - 110
Boron	96.0	101	P/P	90 - 110
Cadmium	98.7	101	P/P	90 - 110
Chromium	98.7	98.9	P/P	90 - 110
Copper	99.7	98.5	P/P	90 - 110
Lead	106	107	P/P	90 - 110
Nickel	100	98.0	P/P	90 - 110
Selenium	100	99.3	P/P	90 - 110
Silver	100	101	P/P	90 - 110
Thallium	103	104	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A104189

Included Lab Sample IDs: 2230752, 2230753, 2230757

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.2	94.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104201

Included Lab Sample IDs: 2230752, 2230753, 2230757

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.7	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A104251

Included Lab Sample IDs: 2230772, 2230773, 2230774

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.6	99.3	P/P	90 - 110
Calcium	102	102	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	100	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A104251

Included Lab Sample IDs: 2230772, 2230773, 2230774

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Potassium	103	103	P/P	90 - 110
Sodium	100	100	P/P	90 - 110
Zinc	102	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.83	
EPA 200.7 Rev. 4.4	Barium	102	101	102	102		0.419
	Calcium	107	104	106	106		1.78
	Iron	105	105	107	107		1.63
	Magnesium	105	105	106	108		1.20
	Potassium	105	105	106	104		0.903
	Sodium	108	105	106	104		0.178
	Zinc	100	98.9	99.7	100		0.780
EPA 200.8 Rev. 5.4	Aluminum	94.5	92.7	93.3	93.1		0.559
	Antimony	96.7	95.6	96.4	99.9		0.838
	Arsenic	92.9	93.6	93.1	93.3		0.543
	Beryllium	89.2	88.6	88.8	90.6		0.186
	Boron	92.4	90.1	90.9	94.3		0.777
	Cadmium	95.0	95.6	97.1	97.0		1.52
	Chromium	94.1	93.4	94.4	94.9		1.03
	Copper	96.2	95.3	95.7	95.3		0.438
	Lead	100	99.5	99.1	103		0.389
	Nickel	94.6	93.7	94.1	93.6		0.433
	Selenium	89.6	94.2	94.1	92.1		0.116
	Silver	101	101	101	101		0.734
	Thallium	102	98.9	98.5	103		0.392
EPA 300.0 Rev. 2.1	Chloride	105	104	105			0.760
	Sulfate	105	102	103			0.992
EPA 350.1 Rev. 2.0	Ammonia-N	101	95.4	97.4			1.89
	Ammonia-N	99.0	96.0	96.8			0.765
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	109	96.6			6.41
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	99.0	98.5			0.506
EPA 365.1 Rev. 2.0	Total-P	108	108	109			0.921
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	96.1	97.4			0.962
SM 2120 B-2011	Color (true)	101					
SM 2320 B-2011	Total Alkalinity	101				0.470	
SM 2540 C-2011	TDS					4.60	
SM 4500 F-C-2011	Fluoride	98.2					0.0
SM 5310 B-2011	Organic Carbon	94.2	94.7	95.1			0.285

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2230750, 2230751, 2230756
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2230772, 2230773, 2230774
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2230772, 2230773, 2230774
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2230750, 2230751, 2230756
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2230750, 2230751, 2230756
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2230752, 2230753, 2230757
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2230752, 2230753, 2230757
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2230752, 2230753, 2230757
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2230752, 2230753, 2230757
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2230754, 2230755, 2230758
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2230750, 2230751, 2230756
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2230750, 2230751, 2230756

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2230772, 2230773, 2230774
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2230750, 2230751, 2230756
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2230750, 2230751, 2230756
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2230750, 2230751, 2230756
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2230752, 2230753, 2230757

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	03/11/2021			03/11/2021 16:33	Yen Ta	2230750, 2230751, 2230756
EPA 200.7 Rev. 4.4	03/11/2021	03/16/2021 15:50	Elliott D. Healy	03/22/2021 15:28	Josef B Mick	2230772
	03/11/2021	03/16/2021 15:50	Elliott D. Healy	03/22/2021 15:36	Josef B Mick	2230773
	03/11/2021	03/16/2021 15:50	Elliott D. Healy	03/22/2021 15:44	Josef B Mick	2230774
EPA 200.8 Rev. 5.4	03/11/2021	03/16/2021 15:50	Elliott D. Healy	03/18/2021 16:07	McKinley C Carter	2230772
	03/11/2021	03/16/2021 15:50	Elliott D. Healy	03/18/2021 16:14	McKinley C Carter	2230773
	03/11/2021	03/16/2021 15:50	Elliott D. Healy	03/18/2021 16:22	McKinley C Carter	2230774
EPA 300.0 Rev. 2.1	03/11/2021			03/13/2021 08:56	Lipi Saha	2230750
	03/11/2021			03/13/2021 09:32	Lipi Saha	2230751
	03/11/2021			03/13/2021 09:44	Lipi Saha	2230756
EPA 350.1 Rev. 2.0	03/11/2021			03/14/2021 12:01	Ping Hua	2230752
	03/11/2021			03/15/2021 18:05	Ping Hua	2230753
	03/11/2021			03/15/2021 18:06	Ping Hua	2230757
EPA 351.2 Rev. 2.0	03/11/2021	03/18/2021 12:47	Benjamin T. Nordmann	03/22/2021 15:22	Julia Storbeck	2230752
	03/11/2021	03/18/2021 12:47	Benjamin T. Nordmann	03/22/2021 15:24	Julia Storbeck	2230753
	03/11/2021	03/18/2021 12:47	Benjamin T. Nordmann	03/22/2021 15:25	Julia Storbeck	2230757
EPA 353.2 Rev. 2.0	03/11/2021			03/15/2021 10:05	Beverly Y. Sanders	2230752
	03/11/2021			03/15/2021 10:06	Beverly Y. Sanders	2230753
	03/11/2021			03/15/2021 10:07	Beverly Y. Sanders	2230757
EPA 365.1 Rev. 2.0	03/11/2021	03/15/2021 13:12	Yen Ta	03/17/2021 14:18	Shengyu Ding	2230752
	03/11/2021	03/15/2021 13:12	Yen Ta	03/17/2021 14:19	Shengyu Ding	2230753
	03/11/2021	03/15/2021 13:12	Yen Ta	03/17/2021 14:20	Shengyu Ding	2230757
EPA 365.1 Rev. 2.0 dissolved	03/11/2021			03/11/2021 13:51	Patrick M. Roche	2230754
	03/11/2021			03/11/2021 13:52	Patrick M. Roche	2230755
	03/11/2021			03/11/2021 13:53	Patrick M. Roche	2230758
SM 2120 B-2011	03/11/2021			03/11/2021 16:23	Benjamin T. Nordmann	2230750
	03/11/2021			03/11/2021 16:24	Benjamin T. Nordmann	2230751, 2230756
SM 2320 B-2011	03/11/2021			03/17/2021 00:25	Dale L. Simmons	2230750
	03/11/2021			03/17/2021 00:34	Dale L. Simmons	2230751
	03/11/2021			03/17/2021 00:40	Dale L. Simmons	2230756
SM 2340B	03/11/2021			03/22/2021 15:28	Josef B Mick	2230772
	03/11/2021			03/22/2021 15:36	Josef B Mick	2230773
	03/11/2021			03/22/2021 15:44	Josef B Mick	2230774
SM 2540 C-2011	03/11/2021			03/15/2021 15:01	Yijie Li	2230750, 2230751, 2230756
SM 2540 D-2011	03/11/2021			03/15/2021 15:01	Yijie Li	2230750, 2230751, 2230756
SM 4500 F-C-2011	03/11/2021			03/17/2021 00:25	Dale L. Simmons	2230750
	03/11/2021			03/17/2021 00:34	Dale L. Simmons	2230751
	03/11/2021			03/17/2021 00:40	Dale L. Simmons	2230756
SM 5310 B-2011	03/11/2021			03/20/2021 04:12	Madeline Gruver	2230752
	03/11/2021			03/20/2021 04:22	Madeline Gruver	2230753

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	03/11/2021			03/20/2021 04:33	Madeline Gruver	2230757