

Chemical Analysis Report

NE-DIST-2021-07-30-01

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

Event Description: **Nassau North West**
Request ID: **RQ-2021-07-26-18**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 25-AUG-2021 15:26

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Unnamed Branch @ CR125

Collection Date/Time: 07/29/2021 12:00

Field ID: 19010123

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266062	EPA 200.7 Rev. 4.4	Barium	15.0		ug/L	P401881	
		Calcium	4.08		mg/L	P401881	
		Iron	1.13E+03		ug/L	P401881	
		Magnesium	1.00		mg/L	P401881	
		Manganese	20.4		ug/L	P401881	
		Potassium	0.76	I	mg/L	P401881	
		Sodium	2.9		mg/L	P402375	
	EPA 200.8 Rev. 5.4	Zinc	9.6	I	ug/L	P402375	
		Aluminum	666		ug/L	P401881	
		Antimony	0.085	I	ug/L	P401881	
		Arsenic	0.80		ug/L	P401881	
		Beryllium	0.034	I	ug/L	P401881	
		Boron**	17.4		ug/L	P401881	
		Cadmium	0.020	U	ug/L	P401881	
		Chromium	0.95	I	ug/L	P401881	
		Copper	0.83		ug/L	P402262	
		Lead	1.23		ug/L	P401881	
		Nickel	0.82	I	ug/L	P401881	
		Selenium	0.20	U	ug/L	P401881	
		Silver	0.010	U	ug/L	P401881	
		Thallium	0.10	U	ug/L	P401881	
	SM 2340B	Hardness	14.3		mg/L	P401881	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The lead result was confirmed on 08/11/2021.

Sample Location: Daughtery BR @ Crews Rd

Collection Date/Time: 07/29/2021 10:50

Field ID: 19010136

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266055	EPA 180.1 Rev. 2.0	Turbidity	6.8		NTU	P401778	
	EPA 300.0 Rev. 2.1	Chloride	2.9		mg Cl/L	P402078	
		Sulfate	0.23	I	mg SO4/L	P402080	
	SM 2120 B-2011	Color (true)	640		PCU	P401781	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P401937	
	SM 2540 C-2011	TDS	81		mg/L	P402222	
	SM 2540 D-2011	TSS	9	I	mg/L	P402225	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P401939	
2266056	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P402257	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.96		mg N/L	P402635	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.048		mg N/L	P401809	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P401843	
	SM 5310 B-2011	Organic Carbon	44		mg C/L	P402468	
2266057	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P401768	
2266061	EPA 200.7 Rev. 4.4	Barium	16.7		ug/L	P401881	
		Calcium	2.07		mg/L	P402375	
		Iron	2.11E+03		ug/L	P401881	
		Magnesium	0.67		mg/L	P402375	
		Manganese	14.9		ug/L	P401881	
		Potassium	0.34	I	mg/L	P401881	
		Sodium	2.4		mg/L	P402375	
		Zinc	5.1	I	ug/L	P402375	
	EPA 200.8 Rev. 5.4	Aluminum	987		ug/L	P401881	
		Antimony	0.066	I	ug/L	P401881	
		Arsenic	0.59		ug/L	P401881	
		Beryllium	0.098		ug/L	P401881	
		Boron**	13.9		ug/L	P401881	
		Cadmium	0.029	I	ug/L	P401881	
		Chromium	1.1	I	ug/L	P401881	
		Copper	0.41	I	ug/L	P402262	
		Lead	1.60		ug/L	P401881	
		Nickel	1.1	I	ug/L	P401881	
		Selenium	0.25	I	ug/L	P401881	
		Silver	0.010	U	ug/L	P401881	
		Thallium	0.10	U	ug/L	P401881	
	SM 2340B	Hardness	7.9		mg/L	P402375	

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.

EPA 365.1 Rev. 2.0: Total-P: 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 on 08/11/2021.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P401778

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P401881

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.21	I	mg/L
Iron	30	U	ug/L
Magnesium	0.059	I	mg/L
Manganese	1.0	U	ug/L
Potassium	0.30	U	mg/L

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402375

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Magnesium	0.040	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: P401881

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
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 200.8 Rev. 5.4
Batch ID: P402262

Component	Result	Code	Units
Copper	0.40	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402078

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402080

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402257

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402635

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401809

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401843

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401768

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

Reference Method: SM 2120 B-2011
Batch ID: P401781

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P401937

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

Reference Method: SM 2540 C-2011
Batch ID: P402222

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P402225

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P402468

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: P401881

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	101		P	85 - 115
Iron	96.9		P	85 - 115
Magnesium	103		P	85 - 115
Manganese	98.1		P	85 - 115
Potassium	106		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P402375

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Magnesium	111		P	85 - 115
Sodium	103		P	85 - 115
Zinc	108		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P401881

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	107		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	103		P	85 - 115
Boron	104		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	100		P	85 - 115
Lead	105		P	85 - 115
Nickel	103		P	85 - 115
Selenium	99.0		P	85 - 115
Silver	102		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P402262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	93.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P402078

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

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P402080

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.6		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402257

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402635

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401809

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: P401843

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401768

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.1		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P401781

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.1		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P401937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

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

Reference Method: SM 5310 B-2011
Batch ID: P402468

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265970	Barium	111		P	80 - 120
2265970	Calcium	104		P	80 - 120
2265970	Iron	107		P	80 - 120
2265970	Magnesium	109		P	80 - 120
2265970	Manganese	105		P	80 - 120
2265970	Potassium	110		P	80 - 120
2266597	Barium	106	105	P/P	80 - 120
2266597	Calcium	104		P	80 - 120
2266597	Iron	96.1	99.8	P/P	80 - 120
2266597	Magnesium	100	103	P/P	80 - 120
2266597	Manganese	100	99.7	P/P	80 - 120
2266597	Potassium	102	105	P/P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P402375

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265002	Calcium	104		P	80 - 120
2265002	Magnesium	107		P	80 - 120
2265002	Sodium	103		P	80 - 120
2265002	Zinc	108		P	80 - 120
2265969	Calcium	102		P	80 - 120
2265969	Magnesium	108	105	P/P	80 - 120
2265969	Sodium	103		P	80 - 120
2265969	Zinc	105	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265970	Aluminum	118		P	80 - 120
2265970	Antimony	103		P	80 - 120
2265970	Arsenic	97.9		P	80 - 120
2265970	Beryllium	102		P	80 - 120
2265970	Boron	107		P	80 - 120
2265970	Cadmium	103		P	80 - 120
2265970	Chromium	102		P	80 - 120
2265970	Lead	100		P	80 - 120
2265970	Nickel	101		P	80 - 120
2265970	Selenium	95.3		P	80 - 120
2265970	Silver	103		P	80 - 120
2265970	Thallium	110		P	80 - 120
2266597	Aluminum	101	102	P/P	80 - 120
2266597	Antimony	104	106	P/P	80 - 120
2266597	Arsenic	97.3	98.3	P/P	80 - 120
2266597	Beryllium	98.5	98.3	P/P	80 - 120
2266597	Boron	103	105	P/P	80 - 120
2266597	Cadmium	100	102	P/P	80 - 120
2266597	Chromium	98.0	99.8	P/P	80 - 120
2266597	Lead	102	102	P/P	80 - 120
2266597	Nickel	97.8	99.3	P/P	80 - 120
2266597	Selenium	94.5	94.7	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266597	Silver	101	101	P/P	80 - 120
2266597	Thallium	108	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P402262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265003	Copper	91.6		P	80 - 120
2265339	Copper	111	94.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265759	Chloride	98.7		P	90 - 110
2265947	Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402080

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265759	Sulfate	94.5		P	90 - 110
2265947	Sulfate	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266030	Ammonia-N	101	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265948	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265949	O-Phosphate-P	96.0	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266207	Fluoride	99.2	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P402468

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

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P402468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266214	Organic Carbon	98.6	99.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P401778

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266041	Turbidity	6.65	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401881

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266597	Barium	0.563	Spike	P	0 - 20
2266597	Calcium	0.583	Spike	P	0 - 20
2266597	Iron	3.11	Spike	P	0 - 20
2266597	Magnesium	2.06	Spike	P	0 - 20
2266597	Manganese	0.353	Spike	P	0 - 20
2266597	Potassium	3.04	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P402375

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265969	Calcium	2.53	Spike	P	0 - 20
2265969	Magnesium	2.13	Spike	P	0 - 20
2265969	Sodium	2.21	Spike	P	0 - 20
2265969	Zinc	2.48	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401881

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266597	Aluminum	1.19	Spike	P	0 - 20
2266597	Antimony	1.21	Spike	P	0 - 20
2266597	Arsenic	1.03	Spike	P	0 - 20
2266597	Beryllium	0.121	Spike	P	0 - 20
2266597	Boron	0.996	Spike	P	0 - 20
2266597	Cadmium	1.63	Spike	P	0 - 20
2266597	Chromium	1.78	Spike	P	0 - 20
2266597	Lead	0.0791	Spike	P	0 - 20
2266597	Nickel	1.56	Spike	P	0 - 20
2266597	Selenium	0.304	Spike	P	0 - 20
2266597	Silver	0.635	Spike	P	0 - 20
2266597	Thallium	0.523	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402262

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265339	Copper	16.8	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265759	Chloride	0.114	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265759	Sulfate	0.795	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266030	Ammonia-N	2.21	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265865	Kjeldahl Nitrogen	2.99	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265948	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266066	Total-P	2.96	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265949	O-Phosphate-P	1.24	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P401781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266078	Color (true)	7.26	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P401937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266207	Total Alkalinity	0.690	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P402222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266078	TDS	6.64	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266207	Fluoride	0.897	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P402468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266214	Organic Carbon	0.218	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: A106947

Included Lab Sample IDs: 2266057

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	96.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A106950

Included Lab Sample IDs: 2266055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A106951

Included Lab Sample IDs: 2266055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	100	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A106974

Included Lab Sample IDs: 2266056

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107005

Included Lab Sample IDs: 2266056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	97.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107025

Included Lab Sample IDs: 2266055

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

Reference Method: SM 2320 B-2011

Run ID: A107027

Included Lab Sample IDs: 2266055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107027

Included Lab Sample IDs: 2266055

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107048

Included Lab Sample IDs: 2266061, 2266062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	104	104	P/P	90 - 110
Antimony	105	106	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Beryllium	99.0	101	P/P	90 - 110
Boron	104	102	P/P	90 - 110
Cadmium	104	104	P/P	90 - 110
Chromium	100	100	P/P	90 - 110
Nickel	101	100	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	96.8	97.0	P/P	90 - 110
Thallium	109	108	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107070

Included Lab Sample IDs: 2266061, 2266062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	99.8	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107127

Included Lab Sample IDs: 2266061, 2266062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	105	107	P/P	90 - 110
Calcium	98.9	100	P/P	90 - 110
Iron	94.5	95.9	P/P	90 - 110
Magnesium	95.9	97.1	P/P	90 - 110
Manganese	100	103	P/P	90 - 110
Potassium	105	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107151

Included Lab Sample IDs: 2266056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107192

Included Lab Sample IDs: 2266061, 2266062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	92.8	93.2	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A107246

Included Lab Sample IDs: 2266056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107254

Included Lab Sample IDs: 2266061, 2266062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	99.4	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107354

Included Lab Sample IDs: 2266056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						6.65	
EPA 200.7 Rev. 4.4	Barium	104	111	106	105			0.563
	Calcium	101	104	104				0.583
	Calcium	104	104	102				2.53
	Iron	96.9	107	96.1	99.8			3.11
	Magnesium	103	109	100	103			2.06
	Magnesium	111	107	108	105			2.13
	Manganese	98.1	105	100	99.7			0.353
	Potassium	106	110	102	105			3.04
	Sodium	103	103	103				2.21
	Zinc	108	108	105	102			2.48
EPA 200.8 Rev. 5.4	Aluminum	103	101	102	118			1.19
	Antimony	107	104	106	103			1.21
	Arsenic	102	97.3	98.3	97.9			1.03
	Beryllium	103	98.5	98.3	102			0.121
	Boron	104	103	105	107			0.996
	Cadmium	103	100	102	103			1.63
	Chromium	100	98.0	99.8	102			1.78
	Copper	93.0	111	94.2	91.6			16.8
	Lead	105	102	102	100			0.0791
	Nickel	103	97.8	99.3	101			1.56
	Selenium	99.0	94.5	94.7	95.3			0.304
	Silver	102	101	101	103			0.635
	Thallium	107	108	108	110			0.523
EPA 300.0 Rev. 2.1	Chloride	98.2	98.7	99.4			0.114	
	Sulfate	96.6	94.5	99.2			0.795	
EPA 350.1 Rev. 2.0	Ammonia-N	100	101	105				2.21
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106						2.99
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	100	100				0.0
EPA 365.1 Rev. 2.0	Total-P	109						2.96
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	96.0	97.2				1.24
SM 2120 B-2011	Color (true)	99.1					7.26	
SM 2320 B-2011	Total Alkalinity	102					0.690	
SM 2540 C-2011	TDS						6.64	
SM 4500 F-C-2011	Fluoride	101	99.2	101				0.897
SM 5310 B-2011	Organic Carbon	97.6	98.6	99.0				0.218

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2266055
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2266061, 2266062
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2266061, 2266062
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2266055
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2266055
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2266056
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2266056
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2266056
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2266056
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2266057

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2266055
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2266055
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2266061, 2266062
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2266055
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2266055
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2266055
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2266056

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	07/30/2021			07/30/2021 15:49	Sarah A Nixon	2266055
EPA 200.7 Rev. 4.4	07/30/2021	08/03/2021 13:50	Elliott D. Healy	08/09/2021 20:50	Josef B Mick	2266061
	07/30/2021	08/03/2021 13:50	Elliott D. Healy	08/09/2021 20:56	Josef B Mick	2266062
	07/30/2021	08/12/2021 14:40	Elliott D. Healy	08/13/2021 23:30	Josef B Mick	2266061
	07/30/2021	08/12/2021 14:40	Elliott D. Healy	08/13/2021 23:36	Josef B Mick	2266062
EPA 200.8 Rev. 5.4	07/30/2021	08/03/2021 13:50	Elliott D. Healy	08/05/2021 04:18	Alexander Thompson	2266061
	07/30/2021	08/03/2021 13:50	Elliott D. Healy	08/05/2021 04:28	Alexander Thompson	2266062
	07/30/2021	08/03/2021 13:50	Elliott D. Healy	08/05/2021 20:47	Alexander Thompson	2266061
	07/30/2021	08/03/2021 13:50	Elliott D. Healy	08/05/2021 20:54	Alexander Thompson	2266062
	07/30/2021	08/10/2021 16:20	Elliott D. Healy	08/11/2021 17:44	Alexander Thompson	2266061
	07/30/2021	08/10/2021 16:20	Elliott D. Healy	08/11/2021 17:50	Alexander Thompson	2266062
EPA 300.0 Rev. 2.1	07/30/2021			08/06/2021 00:44	Lipi Saha	2266055
EPA 350.1 Rev. 2.0	07/30/2021			08/10/2021 12:16	Roberta Tatti	2266056
EPA 351.2 Rev. 2.0	07/30/2021	08/18/2021 14:21	Benjamin T. Nordmann	08/19/2021 12:08	Virginia P. Brown	2266056
EPA 353.2 Rev. 2.0	07/30/2021			08/02/2021 09:27	Beverly Y. Sanders	2266056
EPA 365.1 Rev. 2.0	07/30/2021	08/02/2021 17:13	Simonne.V. Calhoun	08/03/2021 14:19	Lipi Saha	2266056
EPA 365.1 Rev. 2.0 dissolved	07/30/2021			07/30/2021 15:07	Ping Hua	2266057
SM 2120 B-2011	07/30/2021			07/30/2021 16:49	Sarah A Nixon	2266055
SM 2320 B-2011	07/30/2021			08/03/2021 16:38	Dale L. Simmons	2266055
SM 2340B	07/30/2021			08/09/2021 20:56	Josef B Mick	2266062
	07/30/2021			08/13/2021 23:30	Josef B Mick	2266061
SM 2540 C-2011	07/30/2021			08/03/2021 14:36	Yijie Li	2266055
SM 2540 D-2011	07/30/2021			08/03/2021 14:36	Yijie Li	2266055
SM 4500 F-C-2011	07/30/2021			08/03/2021 16:38	Dale L. Simmons	2266055
SM 5310 B-2011	07/30/2021			08/12/2021 05:27	Madeline Gruver	2266056