

Chemical Analysis Report

NE-DIST-2022-06-02-01

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

Event Description: **Nassau North 2**
Request ID: **RQ-2022-06-06-31**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 24-JUN-2022 10:12

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: LITTLE ST. MARYS @ CR 121A

Collection Date/Time: 06/01/2022 11:35

Field ID: 19010046

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2331295	DEP SOP: NU-094-1	Color (true)**	210		PCU	P415023	
	EPA 180.1 Rev. 2.0	Turbidity	3.4	A	NTU	P414667	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P414984	
		Sulfate	25		mg SO4/L	P414988	
	SM 2320 B-2011	Total Alkalinity	21		mg CaCO3/L	P415108	
	SM 2540 C-2011	TDS	143		mg/L	P414803	
	SM 2540 D-2011	TSS	2	U	mg/L	P414769	
	SM 4500-F- C-2011	Fluoride	0.040	I	mg F/L	P415112	
2331296	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P415380	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P414740	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P415307	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P414752	MS
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P414757	
2331300	EPA 200.7 Rev. 4.4	Calcium	14.9		mg/L	P414696	
		Iron	680		ug/L	P414696	
		Magnesium	3.81		mg/L	P414696	
		Potassium	1.3		mg/L	P414696	
		Sodium	10		mg/L	P414696	
		Strontium	64.3		ug/L	P414696	
		Tin	3.0	U	ug/L	P414696	
		Titanium	1.0	I	ug/L	P414696	
		Vanadium	2.0	U	ug/L	P414696	
		Zinc	5.7	I	ug/L	P414696	
	EPA 200.8 Rev. 5.4	Aluminum	214		ug/L	P414696	
		Antimony	0.085	I	ug/L	P414696	
		Arsenic	0.94		ug/L	P414696	
		Barium	42.2		ug/L	P414696	
		Beryllium	0.032	I	ug/L	P414696	
		Boron**	34.1		ug/L	P414696	
		Cadmium	0.020	U	ug/L	P414696	
		Chromium	0.56	I	ug/L	P414696	
		Cobalt	0.257		ug/L	P414696	
		Copper	0.40	U	ug/L	P414696	
		Lead	0.34	I	ug/L	P414696	
		Manganese	44.7		ug/L	P414696	
		Molybdenum	0.21	I	ug/L	P414696	
		Nickel	0.56	I	ug/L	P414696	
		Selenium	0.20	U	ug/L	P414696	
		Silver	0.010	U	ug/L	P414696	
		Thallium	0.10	U	ug/L	P414696	
	SM 2340 B-2011	Hardness	52.8		mg/L	P414696	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Little St Marys River @ SR 115A

Collection Date/Time: 06/01/2022 11:05

Field ID: 19010032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2331301	EPA 200.7 Rev. 4.4	Calcium	7.19		mg/L	P414696	
		Iron	950		ug/L	P414696	
		Magnesium	1.84		mg/L	P414696	
		Potassium	1.1	I	mg/L	P414696	
		Sodium	6.9		mg/L	P414696	
		Strontium	28.8		ug/L	P414696	
		Tin	3.0	U	ug/L	P414696	
		Titanium	1.1	I	ug/L	P414696	
		Vanadium	2.0	U	ug/L	P414696	
		Zinc	5.0	U	ug/L	P414696	
	EPA 200.8 Rev. 5.4	Aluminum	330		ug/L	P414696	
		Antimony	0.054	I	ug/L	P414696	
		Arsenic	0.78		ug/L	P414696	
		Barium	24.2		ug/L	P414696	
		Beryllium	0.030	I	ug/L	P414696	
		Boron**	23.1		ug/L	P414696	
		Cadmium	0.020	U	ug/L	P414696	
		Chromium	0.58	I	ug/L	P414696	
		Cobalt	0.229		ug/L	P414696	
		Copper	0.40	U	ug/L	P414696	
		Lead	0.46		ug/L	P414696	
		Manganese	30.8		ug/L	P414696	
		Molybdenum	0.15	U	ug/L	P414696	
		Nickel	0.50	U	ug/L	P414696	
		Selenium	0.20	U	ug/L	P414696	
		Silver	0.010	U	ug/L	P414696	
		Thallium	0.10	U	ug/L	P414696	
	SM 2340 B-2011	Hardness	25.5		mg/L	P414696	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P415023

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414667

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P414696

Component	Result	Code	Units
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
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414696

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	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
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	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: P414984

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: P414988

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415380

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414740

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415307

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414752

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

Reference Method: SM 2320 B-2011
Batch ID: P415108

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

Reference Method: SM 2540 C-2011
Batch ID: P414803

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P414769

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P415112

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: P414757

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P415023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414667

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.7		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P414696

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	99.0		P	85 - 115
Magnesium	98.8		P	85 - 115
Potassium	100		P	85 - 115
Sodium	99.1		P	85 - 115
Strontium	98.9		P	85 - 115
Tin	102		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	93.3		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414696

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.3		P	85 - 115
Antimony	99.2		P	85 - 115
Arsenic	101		P	85 - 115
Barium	104		P	85 - 115
Beryllium	98.4		P	85 - 115
Boron	103		P	85 - 115
Cadmium	97.6		P	85 - 115
Chromium	98.0		P	85 - 115
Cobalt	105		P	85 - 115
Copper	98.3		P	85 - 115
Lead	102		P	85 - 115
Manganese	98.6		P	85 - 115
Molybdenum	101		P	85 - 115
Nickel	99.5		P	85 - 115
Selenium	101		P	85 - 115
Silver	106		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414984

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414988

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415380

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: P414740

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415307

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414752

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

Reference Method: SM 2320 B-2011
Batch ID: P415108

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

Reference Method: SM 4500-F- C-2011
Batch ID: P415112

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P414757

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P414696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331424	Calcium	102		P	80 - 120
2331424	Iron	104		P	80 - 120
2331424	Magnesium	102		P	80 - 120
2331424	Potassium	101		P	80 - 120
2331424	Sodium	97.3		P	80 - 120
2331424	Strontium	101		P	80 - 120
2331424	Tin	105		P	80 - 120
2331424	Titanium	102		P	80 - 120
2331424	Vanadium	95.6		P	80 - 120
2331424	Zinc	104		P	80 - 120
2331465	Calcium	99.1	98.9	P/P	80 - 120
2331465	Iron	99.8	101	P/P	80 - 120
2331465	Magnesium	99.2	100	P/P	80 - 120
2331465	Potassium	106	107	P/P	80 - 120
2331465	Sodium	97.0	98.7	P/P	80 - 120
2331465	Strontium	98.2	99.9	P/P	80 - 120
2331465	Tin	101	102	P/P	80 - 120
2331465	Titanium	97.7	102	P/P	80 - 120
2331465	Vanadium	90.1	93.8	P/P	80 - 120
2331465	Zinc	98.1	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P414696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331424	Aluminum	112		P	80 - 120
2331424	Antimony	101		P	80 - 120
2331424	Arsenic	100		P	80 - 120
2331424	Barium	103		P	80 - 120
2331424	Beryllium	99.0		P	80 - 120
2331424	Boron	110		P	80 - 120
2331424	Cadmium	99.1		P	80 - 120
2331424	Chromium	101		P	80 - 120
2331424	Cobalt	105		P	80 - 120
2331424	Copper	97.6		P	80 - 120
2331424	Lead	104		P	80 - 120
2331424	Molybdenum	102		P	80 - 120
2331424	Nickel	100		P	80 - 120
2331424	Selenium	94.6		P	80 - 120
2331424	Silver	107		P	80 - 120
2331424	Thallium	105		P	80 - 120
2331465	Aluminum	101	101	P/P	80 - 120
2331465	Antimony	102	101	P/P	80 - 120
2331465	Arsenic	102	101	P/P	80 - 120
2331465	Barium	105	104	P/P	80 - 120
2331465	Beryllium	97.9	99.8	P/P	80 - 120
2331465	Boron	103	104	P/P	80 - 120
2331465	Cadmium	99.9	99.8	P/P	80 - 120
2331465	Chromium	100	99.2	P/P	80 - 120
2331465	Cobalt	108	106	P/P	80 - 120
2331465	Copper	101	98.1	P/P	80 - 120
2331465	Lead	103	103	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331465	Manganese	102	98.6	P/P	80 - 120
2331465	Molybdenum	104	103	P/P	80 - 120
2331465	Nickel	102	100	P/P	80 - 120
2331465	Selenium	99.8	97.3	P/P	80 - 120
2331465	Silver	108	105	P/P	80 - 120
2331465	Thallium	105	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414984

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331284	Chloride	101		P	90 - 110
2331295	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414988

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331284	Sulfate	96.3		P	90 - 110
2331295	Sulfate	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331384	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414740

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331255	Kjeldahl Nitrogen	109	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415307

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331388	NO2NO3-N	92.0	93.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331288	Total-P	111	109	F/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P415112

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330820	Fluoride	100	100	P/P	94 - 104

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P414757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331287	Organic Carbon	96.2	97.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P415023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331383	Color (true)	0.644	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331295	Turbidity	1.48	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P414696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331465	Calcium	0.149	Spike	P	0 - 20
2331465	Iron	0.807	Spike	P	0 - 20
2331465	Magnesium	0.998	Spike	P	0 - 20
2331465	Potassium	0.992	Spike	P	0 - 20
2331465	Sodium	1.23	Spike	P	0 - 20
2331465	Strontium	1.75	Spike	P	0 - 20
2331465	Tin	1.50	Spike	P	0 - 20
2331465	Titanium	4.05	Spike	P	0 - 20
2331465	Vanadium	4.13	Spike	P	0 - 20
2331465	Zinc	4.11	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P414696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331465	Aluminum	0.657	Spike	P	0 - 20
2331465	Antimony	1.04	Spike	P	0 - 20
2331465	Arsenic	0.549	Spike	P	0 - 20
2331465	Barium	0.784	Spike	P	0 - 20
2331465	Beryllium	1.89	Spike	P	0 - 20
2331465	Boron	0.253	Spike	P	0 - 20
2331465	Cadmium	0.118	Spike	P	0 - 20
2331465	Chromium	1.19	Spike	P	0 - 20
2331465	Cobalt	1.60	Spike	P	0 - 20
2331465	Copper	2.84	Spike	P	0 - 20
2331465	Lead	0.185	Spike	P	0 - 20
2331465	Manganese	2.72	Spike	P	0 - 20
2331465	Molybdenum	1.43	Spike	P	0 - 20
2331465	Nickel	1.79	Spike	P	0 - 20
2331465	Selenium	2.51	Spike	P	0 - 20
2331465	Silver	2.59	Spike	P	0 - 20
2331465	Thallium	0.970	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331284	Chloride	0.436	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P414988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331284	Sulfate	0.756	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331384	Ammonia-N	0.111	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331255	Kjeldahl Nitrogen	3.46	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415307

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331388	NO2NO3-N	1.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331288	Total-P	1.49	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P415108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330820	Total Alkalinity	0.250	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P414803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331254	TDS	0.0	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 D-2011
Batch ID: P414769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331254	TSS	3.64	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P415112

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330820	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P414757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331287	Organic Carbon	0.543	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A112575

Included Lab Sample IDs: 2331295

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112612

Included Lab Sample IDs: 2331300, 2331301

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	102	P/P	90 - 110
Aluminum	99.7	100	P/P	90 - 110
Antimony	99.6	99.7	P/P	90 - 110
Antimony	99.7	99.3	P/P	90 - 110
Arsenic	99.4	100	P/P	90 - 110
Arsenic	99.9	99.4	P/P	90 - 110
Barium	101	99.5	P/P	90 - 110
Barium	99.5	99.7	P/P	90 - 110
Boron	104	105	P/P	90 - 110
Boron	98.3	104	P/P	90 - 110
Cadmium	99.4	99.5	P/P	90 - 110
Cadmium	99.5	99.5	P/P	90 - 110
Chromium	99.2	99.3	P/P	90 - 110
Chromium	99.3	97.8	P/P	90 - 110
Cobalt	102	102	P/P	90 - 110
Cobalt	105	102	P/P	90 - 110
Copper	97.2	97.5	P/P	90 - 110
Copper	98.4	97.2	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Lead	101	100	P/P	90 - 110
Manganese	99.0	99.1	P/P	90 - 110
Manganese	99.1	99.0	P/P	90 - 110
Molybdenum	99.4	99.5	P/P	90 - 110
Nickel	101	98.3	P/P	90 - 110
Nickel	98.3	98.2	P/P	90 - 110
Selenium	98.4	98.9	P/P	90 - 110
Selenium	98.9	98.6	P/P	90 - 110
Silver	105	106	P/P	90 - 110
Silver	107	105	P/P	90 - 110
Thallium	98.3	98.1	P/P	90 - 110
Thallium	99.2	98.3	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A112617

Included Lab Sample IDs: 2331296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112634

Included Lab Sample IDs: 2331300, 2331301

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112634

Included Lab Sample IDs: 2331300, 2331301

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	96.8	97.9	P/P	90 - 110
Molybdenum	97.8	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112648

Included Lab Sample IDs: 2331296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	97.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A112677

Included Lab Sample IDs: 2331300, 2331301

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	92.1	96.7	P/P	90 - 110
Iron	92.9	98.0	P/P	90 - 110
Magnesium	92.1	97.4	P/P	90 - 110
Potassium	94.7	99.4	P/P	90 - 110
Sodium	91.5	96.0	P/P	90 - 110
Strontium	97.5	96.8	P/P	90 - 110
Tin	99.6	99.1	P/P	90 - 110
Titanium	96.6	95.7	P/P	90 - 110
Vanadium	97.0	96.8	P/P	90 - 110
Zinc	99.7	99.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A112707

Included Lab Sample IDs: 2331295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A112727

Included Lab Sample IDs: 2331295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	105	P/P	85 - 115

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112749

Included Lab Sample IDs: 2331296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.0	99.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A112774

Included Lab Sample IDs: 2331295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.1	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A112774

Included Lab Sample IDs: 2331295

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112870

Included Lab Sample IDs: 2331296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	94.0	94.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112905

Included Lab Sample IDs: 2331296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	96.9	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
DEP SOP: NU-094-1	Color (true)	102					0.644	
EPA 180.1 Rev. 2.0	Turbidity	96.7					1.48	
EPA 200.7 Rev. 4.4	Calcium	103	102	99.1	98.9			0.149
	Iron	99.0	104	99.8	101			0.807
	Magnesium	98.8	102	99.2	100			0.998
	Potassium	100	101	106	107			0.992
	Sodium	99.1	97.3	97.0	98.7			1.23
	Strontium	98.9	101	98.2	99.9			1.75
	Tin	102	105	101	102			1.50
	Titanium	101	102	97.7	102			4.05
	Vanadium	93.3	95.6	90.1	93.8			4.13
	Zinc	102	104	98.1	102			4.11
EPA 200.8 Rev. 5.4	Aluminum	99.3	101	101	112			0.657
	Antimony	99.2	102	101	101			1.04
	Arsenic	101	102	101	100			0.549
	Barium	104	105	104	103			0.784
	Beryllium	98.4	97.9	99.8	99.0			1.89
	Boron	103	103	104	110			0.253
	Cadmium	97.6	99.9	99.8	99.1			0.118
	Chromium	98.0	100	99.2	101			1.19
	Cobalt	105	108	106	105			1.60
	Copper	98.3	101	98.1	97.6			2.84
	Lead	102	103	103	104			0.185
	Manganese	98.6	102	98.6				2.72
	Molybdenum	101	104	103	102			1.43
	Nickel	99.5	102	100	100			1.79
	Selenium	101	99.8	97.3	94.6			2.51
	Silver	106	108	105	107			2.59
	Thallium	101	105	104	105			0.970
EPA 300.0 Rev. 2.1	Chloride	100	101	99.5			0.436	
	Sulfate	100	96.3	96.4			0.756	
EPA 350.1 Rev. 2.0	Ammonia-N	100	104	104				0.111
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.1	109	103				3.46
EPA 353.2 Rev. 2.0	NO2NO3-N	96.0	92.0	93.5				1.04
EPA 365.1 Rev. 2.0	Total-P	107	111	109				1.49
SM 2320 B-2011	Total Alkalinity	102					0.250	
SM 2540 C-2011	TDS						0.0	
SM 2540 D-2011	TSS						3.64	
SM 4500-F- C-2011	Fluoride	100	100	100				0.0
SM 5310 B-2011	Organic Carbon	95.6	96.2	97.0				0.543

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2331295
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2331295
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2331300, 2331301
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2331300, 2331301
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2331295
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2331295
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2331296

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2331296
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2331296
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2331296
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2331295
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2331300, 2331301
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2331295
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2331295
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2331295
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2331296

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	06/02/2022			06/02/2022 14:41	Blanca Fach	2331295
EPA 180.1 Rev. 2.0	06/02/2022			06/02/2022 14:16	Anna M. Plaviak	2331295
EPA 200.7 Rev. 4.4	06/02/2022	06/03/2022 09:45	Megan Whitefoot	06/08/2022 01:50	McKinley C Carter	2331300
	06/02/2022	06/03/2022 09:45	Megan Whitefoot	06/08/2022 01:58	McKinley C Carter	2331301
EPA 200.8 Rev. 5.4	06/02/2022	06/03/2022 09:45	Megan Whitefoot	06/03/2022 21:06	Emily M Philpot	2331300
	06/02/2022	06/03/2022 09:45	Megan Whitefoot	06/03/2022 22:01	Emily M Philpot	2331301
	06/02/2022	06/03/2022 09:45	Megan Whitefoot	06/06/2022 16:09	Alexander Thompson	2331300
	06/02/2022	06/03/2022 09:45	Megan Whitefoot	06/06/2022 16:15	Alexander Thompson	2331301
EPA 300.0 Rev. 2.1	06/02/2022			06/08/2022 23:44	Anna M. Plaviak	2331295
EPA 350.1 Rev. 2.0	06/02/2022			06/17/2022 15:27	Ping Hua	2331296
EPA 351.2 Rev. 2.0	06/02/2022	06/08/2022 09:10	Samantha L Bates	06/10/2022 14:42	Alexandra J Mattheus	2331296
EPA 353.2 Rev. 2.0	06/02/2022			06/14/2022 18:15	Touraj Touran	2331296
EPA 365.1 Rev. 2.0	06/02/2022	06/06/2022 15:34	Adam P Silver	06/07/2022 14:26	James L Waggeberby	2331296
SM 2320 B-2011	06/02/2022			06/13/2022 00:32	Dale L. Simmons	2331295
SM 2340 B-2011	06/02/2022			06/08/2022 01:50	McKinley C Carter	2331300
	06/02/2022			06/08/2022 01:58	McKinley C Carter	2331301
SM 2540 C-2011	06/02/2022			06/03/2022 14:44	Ping Hua	2331295
SM 2540 D-2011	06/02/2022			06/03/2022 14:44	Ping Hua	2331295
SM 4500-F- C-2011	06/02/2022			06/13/2022 00:32	Dale L. Simmons	2331295
SM 5310 B-2011	06/02/2022			06/04/2022 01:12	Khloe J Berg	2331296