Chemical Analysis Report

NE-DIST-2022-04-26-01

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

Event Description: **Nassau North Boat 2022**
Request ID: **RQ-2022-04-25-13**
Customer: **NE-DIST**
Project ID: **SMP**

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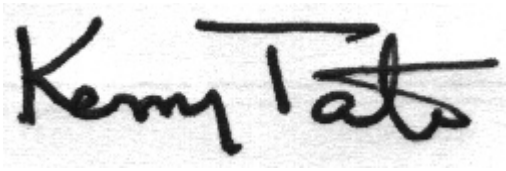
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 19-MAY-2022 10:49



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: St Marys River @ Bend 4.5 miles **Collection Date/Time: 04/25/2022 14:15**

Field ID: 19010131 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2321948	DEP SOP: NU-094-1	Color (true)**	440		PCU	P412920	
	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P412917	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P413252	
		Sulfate	0.64		mg SO4/L	P413255	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P413538	
	SM 2540 C-2011	TDS	84		mg/L	P413421	
	SM 2540 D-2011	TSS	2	I	mg/L	P413469	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P413543	
2321949	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P413111	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P413718	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P413029	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P413052	
	SM 5310 B-2011	Organic Carbon	34		mg C/L	P413244	
2321966	EPA 200.7 Rev. 4.4	Calcium	2.49		mg/L	P412938	
		Iron	990		ug/L	P412938	
		Magnesium	0.91		mg/L	P412938	
		Potassium	0.30	U	mg/L	P412938	
		Sodium	3.4		mg/L	P412938	
		Strontium	11.7		ug/L	P412938	
		Tin	3.0	U	ug/L	P412938	
		Titanium	5.2		ug/L	P412938	
		Vanadium	2.0	U	ug/L	P412938	
		Zinc	5.0	U	ug/L	P412938	
	EPA 200.8 Rev. 5.4	Aluminum	624		ug/L	P412938	
		Antimony	0.050	U	ug/L	P412938	
		Arsenic	0.44		ug/L	P412938	
		Barium	12.2		ug/L	P412938	
		Beryllium	0.033	I	ug/L	P412938	
		Boron**	13.6		ug/L	P412938	
		Cadmium	0.020	U	ug/L	P412938	
		Chromium	0.66	I	ug/L	P412938	
		Cobalt	0.243		ug/L	P412938	
		Copper	0.42	I	ug/L	P412938	
		Lead	0.79		ug/L	P412938	
		Manganese	11.3		ug/L	P412938	
		Molybdenum	0.15	U	ug/L	P412938	
		Nickel	0.66	I	ug/L	P412938	
		Selenium	0.20	U	ug/L	P412938	
		Silver	0.010	U	ug/L	P412938	
		Thallium	0.10	U	ug/L	P412938	
	SM 2340 B-2011	Hardness	9.96		mg/L	P412938	

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 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 05/02/2022.

Sample Location: Plummer Creek @ Second Island **Collection Date/Time: 04/25/2022 11:55**

Field ID: G4NE0301 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2321946	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P412917	
	SM 2320 B-2011	Total Alkalinity	15		mg CaCO3/L	P413538	
	SM 2540 D-2011	TSS	15		mg/L	P413472	
	SM 4500-F- C-2011	Fluoride	0.059	I	mg F/L	P413543	
2321947	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P413111	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P413274	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.033		mg N/L	P413029	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P413052	
	SM 5310 B-2011	Organic Carbon	29		mg C/L	P413244	

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

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P412920

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412917

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412938

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: P412938

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: P413252

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: P413255

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413111

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413274

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413718

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413029

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413052

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

Reference Method: SM 2320 B-2011
Batch ID: P413538

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

Reference Method: SM 2540 C-2011
Batch ID: P413421

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413469

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P413472

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P413543

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P413244

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: P412920

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.3		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412917

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	95.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Iron	106		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	104		P	85 - 115
Sodium	102		P	85 - 115
Strontium	98.0		P	85 - 115
Tin	103		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	97.5		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	99.6		P	85 - 115
Arsenic	101		P	85 - 115
Barium	103		P	85 - 115
Beryllium	95.6		P	85 - 115
Boron	104		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	97.4		P	85 - 115
Cobalt	99.3		P	85 - 115
Copper	97.0		P	85 - 115
Lead	97.0		P	85 - 115
Manganese	98.6		P	85 - 115
Molybdenum	97.7		P	85 - 115
Nickel	98.8		P	85 - 115
Selenium	102		P	85 - 115
Silver	100		P	85 - 115
Thallium	98.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413252

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: P413255

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413111

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413274

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413718

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413052

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

Reference Method: SM 2320 B-2011
Batch ID: P413538

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.3		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P413543

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P413244

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	87.7		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321305	Calcium	97.1		P	80 - 120
2321305	Iron	107		P	80 - 120
2321305	Magnesium	109		P	80 - 120
2321305	Potassium	102		P	80 - 120
2321305	Sodium	96.7		P	80 - 120
2321305	Strontium	103		P	80 - 120
2321305	Tin	104		P	80 - 120
2321305	Titanium	101		P	80 - 120
2321305	Vanadium	97.5		P	80 - 120
2321305	Zinc	102		P	80 - 120
2321307	Calcium	103	109	P/P	80 - 120
2321307	Iron	104	111	P/P	80 - 120
2321307	Magnesium	105	113	P/P	80 - 120
2321307	Potassium	95.7	101	P/P	80 - 120
2321307	Sodium	98.2	103	P/P	80 - 120
2321307	Strontium	97.3	99.5	P/P	80 - 120
2321307	Tin	97.7	100	P/P	80 - 120
2321307	Titanium	98.9	102	P/P	80 - 120
2321307	Vanadium	92.4	95.0	P/P	80 - 120
2321307	Zinc	98.6	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321305	Aluminum	103		P	80 - 120
2321305	Antimony	100		P	80 - 120
2321305	Arsenic	99.3		P	80 - 120
2321305	Barium	102		P	80 - 120
2321305	Beryllium	92.8		P	80 - 120
2321305	Boron	106		P	80 - 120
2321305	Cadmium	101		P	80 - 120
2321305	Chromium	99.7		P	80 - 120
2321305	Cobalt	97.7		P	80 - 120
2321305	Copper	95.6		P	80 - 120
2321305	Lead	98.5		P	80 - 120
2321305	Manganese	95.9		P	80 - 120
2321305	Molybdenum	97.9		P	80 - 120
2321305	Nickel	98.9		P	80 - 120
2321305	Selenium	113		P	80 - 120
2321305	Silver	100		P	80 - 120
2321305	Thallium	102		P	80 - 120
2321307	Aluminum	101	104	P/P	80 - 120
2321307	Antimony	96.0	96.8	P/P	80 - 120
2321307	Arsenic	97.8	99.1	P/P	80 - 120
2321307	Barium	100	102	P/P	80 - 120
2321307	Beryllium	88.7	90.9	P/P	80 - 120
2321307	Boron	103	104	P/P	80 - 120
2321307	Cadmium	96.9	98.4	P/P	80 - 120
2321307	Chromium	97.0	97.7	P/P	80 - 120
2321307	Cobalt	95.5	97.3	P/P	80 - 120
2321307	Copper	95.1	97.1	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321307	Lead	96.0	95.6	P/P	80 - 120
2321307	Manganese	94.1	96.0	P/P	80 - 120
2321307	Molybdenum	94.5	95.9	P/P	80 - 120
2321307	Nickel	96.9	98.6	P/P	80 - 120
2321307	Selenium	111	113	P/P	80 - 120
2321307	Silver	96.7	99.6	P/P	80 - 120
2321307	Thallium	98.8	99.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321936	Chloride	99.6		P	90 - 110
2322001	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413255

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321936	Sulfate	96.7		P	90 - 110
2322001	Sulfate	93.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321874	Ammonia-N	100	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321889	Kjeldahl Nitrogen	108	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321937	NO2NO3-N	95.0	95.0	P/P	90 - 110
2321937	NO2NO3-N	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321972	Total-P	103	103	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P413543

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321899	Fluoride	98.7	98.0	P/P	92 - 107

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P413244

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321994	Organic Carbon	98.1	99.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P412920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321991	Color (true)	0.154	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412917

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321936	Turbidity	2.82	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321307	Calcium	4.50	Spike	P	0 - 20
2321307	Iron	6.28	Spike	P	0 - 20
2321307	Magnesium	5.65	Spike	P	0 - 20
2321307	Potassium	4.90	Spike	P	0 - 20
2321307	Sodium	3.11	Spike	P	0 - 20
2321307	Strontium	2.21	Spike	P	0 - 20
2321307	Tin	2.35	Spike	P	0 - 20
2321307	Titanium	2.56	Spike	P	0 - 20
2321307	Vanadium	2.76	Spike	P	0 - 20
2321307	Zinc	1.71	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321307	Aluminum	2.67	Spike	P	0 - 20
2321307	Antimony	0.859	Spike	P	0 - 20
2321307	Arsenic	1.34	Spike	P	0 - 20
2321307	Barium	1.34	Spike	P	0 - 20
2321307	Beryllium	1.99	Spike	P	0 - 20
2321307	Boron	0.837	Spike	P	0 - 20
2321307	Cadmium	1.54	Spike	P	0 - 20
2321307	Chromium	0.761	Spike	P	0 - 20
2321307	Cobalt	1.77	Spike	P	0 - 20
2321307	Copper	2.10	Spike	P	0 - 20
2321307	Lead	0.403	Spike	P	0 - 20
2321307	Manganese	1.13	Spike	P	0 - 20
2321307	Molybdenum	1.39	Spike	P	0 - 20
2321307	Nickel	1.67	Spike	P	0 - 20
2321307	Selenium	1.99	Spike	P	0 - 20
2321307	Silver	2.95	Spike	P	0 - 20
2321307	Thallium	1.03	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321936	Chloride	0.952	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413255

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321936	Sulfate	0.846	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321874	Ammonia-N	0.379	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321889	Kjeldahl Nitrogen	3.16	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323722	Kjeldahl Nitrogen	0.243	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321937	NO2NO3-N	0.907	Spike	P	0 - 15

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321972	Total-P	0.683	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P413538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321899	Total Alkalinity	3.13	Sample	P	0 - 5.2

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P413421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321969	TDS	3.66	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P413543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321899	Fluoride	0.492	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P413244

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321994	Organic Carbon	0.955	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: A111700
Included Lab Sample IDs: 2321946, 2321948

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	98.5	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1
Run ID: A111702
Included Lab Sample IDs: 2321948

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	102	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A111715
Included Lab Sample IDs: 2321948

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	101	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111756
Included Lab Sample IDs: 2321947, 2321949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	96.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111801
Included Lab Sample IDs: 2321947, 2321949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	97.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111832
Included Lab Sample IDs: 2321966

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	101	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Barium	99.6	99.2	P/P	90 - 110
Beryllium	95.2	94.9	P/P	90 - 110
Boron	103	105	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Cobalt	98.4	98.8	P/P	90 - 110
Copper	97.1	96.8	P/P	90 - 110
Lead	99.5	100	P/P	90 - 110
Manganese	99.4	100	P/P	90 - 110
Molybdenum	97.2	96.9	P/P	90 - 110
Selenium	98.8	101	P/P	90 - 110
Silver	102	103	P/P	90 - 110
Thallium	95.5	96.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A111856
Included Lab Sample IDs: 2321947, 2321949

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111879
Included Lab Sample IDs: 2321947, 2321949

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111898
Included Lab Sample IDs: 2321966

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	98.8	98.1	P/P	90 - 110
Nickel	98.7	97.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111908
Included Lab Sample IDs: 2321966

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.7	101	P/P	95 - 105
Iron	99.3	102	P/P	95 - 105
Magnesium	99.1	102	P/P	95 - 105
Potassium	97.5	100	P/P	95 - 105
Sodium	96.5	97.9	P/P	95 - 105
Strontium	95.1	94.9	P/P	95 - 105
Tin	97.0	96.0	P/P	95 - 105
Titanium	98.4	99.1	P/P	95 - 105
Vanadium	98.2	98.9	P/P	95 - 105
Zinc	98.5	99.2	P/P	95 - 105

Reference Method: SM 2320 B-2011
Run ID: A111984
Included Lab Sample IDs: 2321946, 2321948

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.9	95.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A111984
Included Lab Sample IDs: 2321946, 2321948

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A112015
Included Lab Sample IDs: 2321947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.1	96.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A112136
Included Lab Sample IDs: 2321949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.5	97.0	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision			
						LCS	SMP	MS	
DEP SOP: NU-094-1	Color (true)	98.3					0.154		
EPA 180.1 Rev. 2.0	Turbidity	95.9					2.82		
EPA 200.7 Rev. 4.4	Calcium	109	97.1	103	109			4.50	
	Iron	106	107	104	111			6.28	
	Magnesium	109	109	105	113			5.65	
	Potassium	104	102	95.7	101			4.90	
	Sodium	102	96.7	98.2	103			3.11	
	Strontium	98.0	103	97.3	99.5			2.21	
	Tin	103	104	97.7	100			2.35	
	Titanium	103	101	98.9	102			2.56	
	Vanadium	97.5	97.5	92.4	95.0			2.76	
	Zinc	102	102	98.6	100			1.71	
EPA 200.8 Rev. 5.4	Aluminum	101	101	104	103			2.67	
	Antimony	99.6	96.0	96.8	100			0.859	
	Arsenic	101	97.8	99.1	99.3			1.34	
	Barium	103	100	102	102			1.34	
	Beryllium	95.6	88.7	90.9	92.8			1.99	
	Boron	104	103	104	106			0.837	
	Cadmium	101	96.9	98.4	101			1.54	
	Chromium	97.4	97.0	97.7	99.7			0.761	
	Cobalt	99.3	95.5	97.3	97.7			1.77	
	Copper	97.0	95.1	97.1	95.6			2.10	
	Lead	97.0	96.0	95.6	98.5			0.403	
	Manganese	98.6	94.1	96.0	95.9			1.13	
	Molybdenum	97.7	94.5	95.9	97.9			1.39	
	Nickel	98.8	96.9	98.6	98.9			1.67	
	Selenium	102	111	113	113			1.99	
	Silver	100	96.7	99.6	100			2.95	
	Thallium	98.0	98.8	99.8	102			1.03	
EPA 300.0 Rev. 2.1	Chloride	100	99.6	97.9			0.952		
	Sulfate	99.7	96.7	93.0			0.846		
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	100	99.6				0.379	
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	108	102				3.16	
	Kjeldahl Nitrogen	92.5						0.243	
EPA 353.2 Rev. 2.0	NO2NO3-N	97.0	95.0	96.5	95.0			0.907	RSD
EPA 365.1 Rev. 2.0	Total-P	104	103	103				0.683	
SM 2320 B-2011	Total Alkalinity	98.3					3.13		
SM 2540 C-2011	TDS						3.66		
SM 4500-F- C-2011	Fluoride	99.8	98.7	98.0				0.492	
SM 5310 B-2011	Organic Carbon	87.7	98.1	99.6				0.955	

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2321948
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2321946, 2321948
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2321966
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2321966
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2321948
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2321948
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2321947, 2321949

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2321947, 2321949
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2321947, 2321949
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2321947, 2321949
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2321946, 2321948
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2321966
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2321948
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2321946, 2321948
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2321946, 2321948
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2321947, 2321949

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	04/26/2022			04/26/2022 16:51	Anna M. Plaviak	2321948
EPA 180.1 Rev. 2.0	04/26/2022			04/26/2022 14:36	Khloe J Berg	2321946
	04/26/2022			04/26/2022 14:37	Khloe J Berg	2321948
EPA 200.7 Rev. 4.4	04/26/2022	04/27/2022 11:05	Megan Whitefoot	05/03/2022 13:41	McKinley C Carter	2321966
EPA 200.8 Rev. 5.4	04/26/2022	04/27/2022 11:05	Megan Whitefoot	04/29/2022 22:40	Emily M Philpot	2321966
	04/26/2022	04/27/2022 11:05	Megan Whitefoot	05/03/2022 16:44	Emily M Philpot	2321966
EPA 300.0 Rev. 2.1	04/26/2022			04/29/2022 23:32	James L Waggerby	2321948
EPA 350.1 Rev. 2.0	04/26/2022			04/29/2022 09:54	Judith K. Clark	2321947
	04/26/2022			04/29/2022 09:55	Judith K. Clark	2321949
EPA 351.2 Rev. 2.0	04/26/2022	05/04/2022 15:46	Alexandra J Mattheus	05/09/2022 18:11	Samantha L Bates	2321947
	04/26/2022	05/12/2022 10:44	Samantha L Bates	05/13/2022 11:43	Alexandra J Mattheus	2321949
EPA 353.2 Rev. 2.0	04/26/2022			04/28/2022 10:53	Beverly Y. Sanders	2321947
	04/26/2022			04/28/2022 10:54	Beverly Y. Sanders	2321949
EPA 365.1 Rev. 2.0	04/26/2022	04/29/2022 13:00	Simonne.V. Calhoun	05/03/2022 12:20	Sarah A Nixon	2321947
	04/26/2022	04/29/2022 13:00	Simonne.V. Calhoun	05/03/2022 12:21	Sarah A Nixon	2321949
SM 2320 B-2011	04/26/2022			05/03/2022 03:14	Dale L. Simmons	2321946
	04/26/2022			05/03/2022 03:21	Dale L. Simmons	2321948
SM 2340 B-2011	04/26/2022			05/03/2022 13:36	McKinley C Carter	2321966
SM 2540 C-2011	04/26/2022			04/29/2022 15:42	Yijie Li	2321948
SM 2540 D-2011	04/26/2022			04/29/2022 15:42	Yijie Li	2321946, 2321948
SM 4500-F- C-2011	04/26/2022			05/03/2022 03:14	Dale L. Simmons	2321946
	04/26/2022			05/03/2022 03:21	Dale L. Simmons	2321948
SM 5310 B-2011	04/26/2022			05/02/2022 18:06	Khloe J Berg	2321947
	04/26/2022			05/02/2022 18:21	Khloe J Berg	2321949