Chemical Analysis Report

NE-DIST-2022-11-17-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

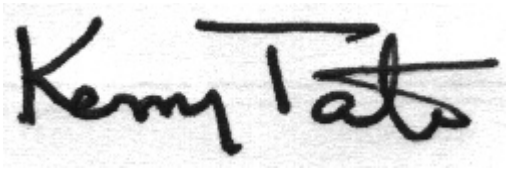
Event Description: **Nassau North Boat 2022**
Request ID: **RQ-2022-11-14-23**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
Attn: Jeremy Parrish

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

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

Date Certified: 08-DEC-2022 08:44



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: 11/16/2022 12:20**

Field ID: 19010131 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2370281	DEP SOP: NU-094-1	Color (true)	260		PCU	P422524	
	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P422519	
	EPA 300.0 Rev. 2.1	Chloride	13	A	mg Cl/L	P423093	
		Sulfate	4.8	A	mg SO4/L	P423096	
	SM 2320 B-2011	Total Alkalinity	15		mg CaCO3/L	P422780	
	SM 2540 C-2015	TDS	89		mg/L	P422852	
	SM 2540 D-2015	TSS	2	I	mg/L	P422705	
	SM 4500-F- C-2011	Fluoride	0.063	I	mg F/L	P422784	
2370282	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P423042	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P422892	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P422669	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P422683	
	SM 5310 B-2011	Organic Carbon	21		mg C/L	P422796	
2370286	EPA 200.7 Rev. 4.4	Calcium	7.11		mg/L	P422537	
		Iron	690		ug/L	P422537	
		Magnesium	2.98		mg/L	P422537	
		Potassium	1.3		mg/L	P422537	
		Sodium	7.3		mg/L	P422537	
		Strontium	36.3		ug/L	P422537	
		Tin	3.0	U	ug/L	P422537	
		Titanium	4.6		ug/L	P422537	
		Vanadium	2.0	U	ug/L	P422537	
		Zinc	5.0	U	ug/L	P422537	
	EPA 200.8 Rev. 5.4	Aluminum	301		ug/L	P422537	
		Antimony	0.068	I	ug/L	P422537	
		Arsenic	0.44		ug/L	P422537	
		Barium	22.1		ug/L	P422537	
		Beryllium	0.035	I	ug/L	P422537	
		Boron	22.0		ug/L	P422537	
		Cadmium	0.020	U	ug/L	P422537	
		Chromium	0.54	I	ug/L	P422537	
		Cobalt	0.155		ug/L	P422537	
		Copper	0.40	U	ug/L	P422537	
		Lead	0.41		ug/L	P422537	
		Manganese	7.96		ug/L	P422537	
		Molybdenum	0.55	I	ug/L	P422537	
		Nickel	0.56	I	ug/L	P422537	
		Selenium	0.20	U	ug/L	P422537	
		Silver	0.010	U	ug/L	P422537	
		Thallium	0.10	U	ug/L	P422537	
	SM 2340 B-2011	Hardness	30		mg/L	P422537	

Ref. Method and Comment:
DEP SOP: NU-094-1: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P422524

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422519

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422537

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: P422537

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: P423093

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: P423096

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423042

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422892

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422669

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422683

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

Reference Method: SM 2320 B-2011
Batch ID: P422780

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

Reference Method: SM 2540 C-2015
Batch ID: P422852

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P422705

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P422784

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P422796

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: P422524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422519

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	98.3		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	99.9		P	85 - 115
Iron	102		P	85 - 115
Magnesium	98.3		P	85 - 115
Potassium	98.2		P	85 - 115
Sodium	98.1		P	85 - 115
Strontium	102		P	85 - 115
Tin	101		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.6		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	105		P	85 - 115
Barium	107		P	85 - 115
Beryllium	99.3		P	85 - 115
Boron	100		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	104		P	85 - 115
Cobalt	103		P	85 - 115
Copper	103		P	85 - 115
Lead	95.6		P	85 - 115
Manganese	102		P	85 - 115
Molybdenum	99.5		P	85 - 115
Nickel	104		P	85 - 115
Selenium	103		P	85 - 115
Silver	100		P	85 - 115
Thallium	98.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423093

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423096

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423042

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422892

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422669

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422683

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

Reference Method: SM 2320 B-2011
Batch ID: P422780

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.1		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P422852

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	99.3		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P422705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	91.5		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P422784

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P422796

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.3		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370235	Iron	103	102	P/P	80 - 120
2370235	Magnesium	98.7		P	80 - 120
2370235	Potassium	99.6	98.4	P/P	80 - 120
2370235	Sodium	99.7		P	80 - 120
2370235	Strontium	103	103	P/P	80 - 120
2370235	Tin	100	99.8	P/P	80 - 120
2370235	Titanium	101	102	P/P	80 - 120
2370235	Vanadium	103	103	P/P	80 - 120
2370235	Zinc	100	99.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370235	Aluminum	99.4	97.4	P/P	80 - 120
2370235	Antimony	107	104	P/P	80 - 120
2370235	Arsenic	105	104	P/P	80 - 120
2370235	Barium	108	104	P/P	80 - 120
2370235	Beryllium	99.3	96.1	P/P	80 - 120
2370235	Boron	103	102	P/P	80 - 120
2370235	Cadmium	104	101	P/P	80 - 120
2370235	Chromium	106	103	P/P	80 - 120
2370235	Cobalt	103	99.8	P/P	80 - 120
2370235	Copper	103	99.7	P/P	80 - 120
2370235	Lead	97.8	95.1	P/P	80 - 120
2370235	Manganese	106	103	P/P	80 - 120
2370235	Molybdenum	104	103	P/P	80 - 120
2370235	Nickel	103	99.9	P/P	80 - 120
2370235	Selenium	103	101	P/P	80 - 120
2370235	Silver	102	99.2	P/P	80 - 120
2370235	Thallium	104	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423093

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370281	Chloride	103		P	90 - 110
2370668	Chloride	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370281	Sulfate	102		P	90 - 110
2370668	Sulfate	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423042

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370199	Ammonia-N	99.4	102	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422892

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370228	Kjeldahl Nitrogen	95.2	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370225	NO2NO3-N	96.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370494	Total-P	105	107	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P422784

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370361	Fluoride	99.9	101	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P422796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370222	Organic Carbon	100	96.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370589	Turbidity	16.1	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370235	Calcium	0.123	Spike	P	0 - 20
2370235	Iron	0.470	Spike	P	0 - 20
2370235	Magnesium	0.988	Spike	P	0 - 20
2370235	Potassium	0.736	Spike	P	0 - 20
2370235	Sodium	0.120	Spike	P	0 - 20
2370235	Strontium	0.108	Spike	P	0 - 20
2370235	Tin	0.663	Spike	P	0 - 20
2370235	Titanium	0.387	Spike	P	0 - 20
2370235	Vanadium	0.275	Spike	P	0 - 20
2370235	Zinc	0.585	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370235	Aluminum	1.99	Spike	P	0 - 20
2370235	Antimony	2.62	Spike	P	0 - 20
2370235	Arsenic	0.923	Spike	P	0 - 20
2370235	Barium	2.83	Spike	P	0 - 20
2370235	Beryllium	3.33	Spike	P	0 - 20
2370235	Boron	0.0992	Spike	P	0 - 20
2370235	Cadmium	2.83	Spike	P	0 - 20
2370235	Chromium	2.70	Spike	P	0 - 20
2370235	Cobalt	3.39	Spike	P	0 - 20
2370235	Copper	3.16	Spike	P	0 - 20
2370235	Lead	2.74	Spike	P	0 - 20
2370235	Manganese	2.60	Spike	P	0 - 20
2370235	Molybdenum	1.20	Spike	P	0 - 20
2370235	Nickel	2.94	Spike	P	0 - 20
2370235	Selenium	2.09	Spike	P	0 - 20
2370235	Silver	3.20	Spike	P	0 - 20
2370235	Thallium	1.96	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423093

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370281	Chloride	0.130	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370281	Sulfate	0.0943	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370199	Ammonia-N	1.88	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422892

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370228	Kjeldahl Nitrogen	1.88	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370225	NO2NO3-N	0.176	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370494	Total-P	1.61	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P422780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370361	Total Alkalinity	1.05	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P422852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2369236	TDS	6.84	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P422784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370361	Fluoride	0.516	Spike	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P422796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370222	Organic Carbon	3.63	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: A116002
Included Lab Sample IDs: 2370281

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	97.5	98.5	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1
Run ID: A116005
Included Lab Sample IDs: 2370281

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116043
Included Lab Sample IDs: 2370286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.8	98.5	P/P	90 - 110
Antimony	97.9	101	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Barium	99.5	103	P/P	90 - 110
Beryllium	99.6	100	P/P	90 - 110
Boron	96.0	99.9	P/P	90 - 110
Cadmium	99.6	102	P/P	90 - 110
Chromium	98.9	101	P/P	90 - 110
Cobalt	98.5	99.0	P/P	90 - 110
Copper	99.1	99.8	P/P	90 - 110
Lead	93.2	95.1	P/P	90 - 110
Manganese	96.9	102	P/P	90 - 110
Molybdenum	97.9	99.1	P/P	90 - 110
Nickel	99.2	99.5	P/P	90 - 110
Selenium	98.7	102	P/P	90 - 110
Silver	96.3	98.4	P/P	90 - 110
Thallium	98.7	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116065
Included Lab Sample IDs: 2370282

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116090
Included Lab Sample IDs: 2370282

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A116116
Included Lab Sample IDs: 2370286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A116116
Included Lab Sample IDs: 2370286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.5	98.6	P/P	90 - 110
Iron	99.5	98.5	P/P	90 - 110
Magnesium	99.1	98.3	P/P	90 - 110
Potassium	97.5	96.9	P/P	90 - 110
Sodium	99.0	97.9	P/P	90 - 110
Strontium	101	99.9	P/P	90 - 110
Tin	101	100	P/P	90 - 110
Titanium	101	99.3	P/P	90 - 110
Vanadium	101	99.4	P/P	90 - 110
Zinc	100	99.4	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A116138
Included Lab Sample IDs: 2370281

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	98.1	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A116138
Included Lab Sample IDs: 2370281

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

Reference Method: SM 5310 B-2011
Run ID: A116144
Included Lab Sample IDs: 2370282

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116198
Included Lab Sample IDs: 2370282

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116231
Included Lab Sample IDs: 2370282

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A116259
Included Lab Sample IDs: 2370281

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A116259
Included Lab Sample IDs: 2370281

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	106	P/P	90 - 110
Sulfate	103	105	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)	99.6					
EPA 180.1 Rev. 2.0	Turbidity	98.3				16.1	
EPA 200.7 Rev. 4.4	Calcium	99.9					0.123
	Iron	102	103	102			0.470
	Magnesium	98.3	98.7				0.988
	Potassium	98.2	99.6	98.4			0.736
	Sodium	98.1	99.7				0.120
	Strontium	102	103	103			0.108
	Tin	101	100	99.8			0.663
	Titanium	101	101	102			0.387
	Vanadium	101	103	103			0.275
	Zinc	100	100	99.4			0.585
EPA 200.8 Rev. 5.4	Aluminum	98.6	99.4	97.4			1.99
	Antimony	104	107	104			2.62
	Arsenic	105	105	104			0.923
	Barium	107	108	104			2.83
	Beryllium	99.3	99.3	96.1			3.33
	Boron	100	103	102			0.0992
	Cadmium	101	104	101			2.83
	Chromium	104	106	103			2.70
	Cobalt	103	103	99.8			3.39
	Copper	103	103	99.7			3.16
	Lead	95.6	97.8	95.1			2.74
	Manganese	102	106	103			2.60
	Molybdenum	99.5	104	103			1.20
	Nickel	104	103	99.9			2.94
	Selenium	103	103	101			2.09
	Silver	100	102	99.2			3.20
	Thallium	98.9	104	102			1.96
EPA 300.0 Rev. 2.1	Chloride	103	103	108		0.130	
	Sulfate	109	102	107		0.0943	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	99.4	102			1.88
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.0	95.2	97.2			1.88
EPA 353.2 Rev. 2.0	NO2NO3-N	104	96.8				0.176
EPA 365.1 Rev. 2.0	Total-P	103	105	107			1.61
SM 2320 B-2011	Total Alkalinity	99.1				1.05	
SM 2540 C-2015	TDS	99.3				6.84	
SM 2540 D-2015	TSS	91.5					
SM 4500-F- C-2011	Fluoride	100	99.9	101			0.516
SM 5310 B-2011	Organic Carbon	98.3	100	96.0			3.63

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2370281
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2370281
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2370286
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2370286
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2370281
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2370281
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2370282

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2370282
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2370282
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2370282
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2370281
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2370286
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2370281
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2370281
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2370281
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2370282

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	11/17/2022			11/17/2022 16:12	Chandler E Cox	2370281
EPA 180.1 Rev. 2.0	11/17/2022			11/17/2022 14:12	Anna M. Plaviak	2370281
EPA 200.7 Rev. 4.4	11/17/2022	11/18/2022 08:30	Megan Whitefoot	11/22/2022 15:33	McKinley C Carter	2370286
EPA 200.8 Rev. 5.4	11/17/2022	11/18/2022 08:30	Megan Whitefoot	11/18/2022 15:12	Megan Whitefoot	2370286
EPA 300.0 Rev. 2.1	11/17/2022			12/02/2022 10:07	James L Waggerby	2370281
EPA 350.1 Rev. 2.0	11/17/2022			12/02/2022 11:42	Ping Hua	2370282
EPA 351.2 Rev. 2.0	11/17/2022	11/21/2022 13:35	Alexandra J Mattheus	11/30/2022 15:47	Judith K. Clark	2370282
EPA 353.2 Rev. 2.0	11/17/2022			11/21/2022 12:14	Beverly Y. Sanders	2370282
EPA 365.1 Rev. 2.0	11/17/2022	11/21/2022 15:27	Adam P Silver	11/22/2022 10:12	James L Waggerby	2370282
SM 2320 B-2011	11/17/2022			11/23/2022 05:22	Dale L. Simmons	2370281
SM 2340 B-2011	11/17/2022			11/22/2022 15:33	McKinley C Carter	2370286
SM 2540 C-2015	11/17/2022			11/18/2022 16:39	Yijie Li	2370281
SM 2540 D-2015	11/17/2022			11/18/2022 16:39	Yijie Li	2370281
SM 4500-F- C-2011	11/17/2022			11/23/2022 05:22	Dale L. Simmons	2370281
SM 5310 B-2011	11/17/2022			11/24/2022 02:32	Touraj Touran	2370282