Chemical Analysis Report

NE-DIST-2022-11-17-02

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

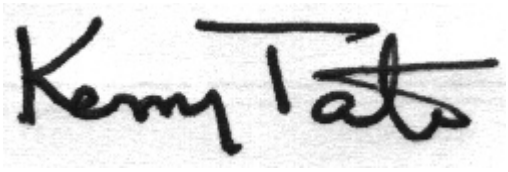
Event Description: **Nassau North 2**
Request ID: **RQ-2022-10-10-11**
Customer: **NE-DIST**
Project ID: **SMP**

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 09:02



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: MILLS CREEK AT US 301/US1 **Collection Date/Time: 11/16/2022 09:50**

Field ID: 19020048 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2370316	EPA 200.7 Rev. 4.4	Calcium	6.62		mg/L	P422595	
		Iron	2.69E+03		ug/L	P422595	
		Magnesium	2.35		mg/L	P422595	
		Potassium	4.1		mg/L	P422595	
		Sodium	11.3		mg/L	P422595	
		Strontium	32.6		ug/L	P422595	
		Tin	3.0	U	ug/L	P422595	
		Titanium	0.89	I	ug/L	P422595	
		Vanadium	2.0	U	ug/L	P422595	
		Zinc	14	I	ug/L	P422595	
	EPA 200.8 Rev. 5.4	Aluminum	371		ug/L	P422595	
		Antimony	0.12	I	ug/L	P422595	
		Arsenic	0.69		ug/L	P422595	
		Barium	24.3		ug/L	P422595	
		Beryllium	0.035	I	ug/L	P422595	
		Boron	34.1		ug/L	P422595	
		Cadmium	0.020	U	ug/L	P422595	
		Chromium	0.84	I	ug/L	P422595	
		Cobalt	0.539		ug/L	P422595	
		Copper	2.54		ug/L	P422920	
		Lead	0.59		ug/L	P422920	
		Manganese	48.0		ug/L	P422595	
		Molybdenum	0.17	I	ug/L	P422595	
		Nickel	1.5	I	ug/L	P422595	
		Selenium	0.20	U	ug/L	P422595	
		Silver	0.010	U	ug/L	P422595	
		Thallium	0.10	U	ug/L	P422595	
	SM 2340 B-2011	Hardness	26.2		mg/L	P422595	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 11/22/2022.

Sample Location: UNNAMED TRIB TO MILLS CR @ CR 108 W OF MINOR LN **Collection Date/Time: 11/16/2022 10:20**

Field ID: 19010159 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2370300	DEP SOP: NU-094-1	Color (true)	180		PCU	P422524	
	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P422519	
	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P423093	
		Sulfate	6.3		mg SO4/L	P423096	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P422780	
	SM 2540 C-2015	TDS	62		mg/L	P422852	
	SM 2540 D-2015	TSS	11		mg/L	P422705	
	SM 4500-F- C-2011	Fluoride	0.027	I	mg F/L	P422784	
2370301	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P423042	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P422892	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.37		mg N/L	P422664	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P422683	
	SM 5310 B-2011	Organic Carbon	20		mg C/L	P422796	
2370315	EPA 200.7 Rev. 4.4	Calcium	2.69		mg/L	P422595	
		Iron	5.80E+03		ug/L	P422595	
		Magnesium	1.33		mg/L	P422595	
		Potassium	0.56	I	mg/L	P422595	
		Sodium	10		mg/L	P422595	
		Strontium	16.6		ug/L	P422595	
		Tin	3.0	U	ug/L	P422595	
		Titanium	0.75	U	ug/L	P422595	
		Vanadium	2.0	U	ug/L	P422595	
		Zinc	5.0	U	ug/L	P422595	
	EPA 200.8 Rev. 5.4	Aluminum	531		ug/L	P422595	
		Antimony	0.091	I	ug/L	P422595	
		Arsenic	0.49		ug/L	P422595	
		Barium	22.6		ug/L	P422595	
		Beryllium	0.048		ug/L	P422595	
		Boron	15.4		ug/L	P422595	
		Cadmium	0.020	U	ug/L	P422595	
		Chromium	0.80	I	ug/L	P422595	
		Cobalt	0.592		ug/L	P422595	
		Copper	1.28		ug/L	P422595	
		Lead	0.67		ug/L	P422920	
		Manganese	21.4		ug/L	P422595	
		Molybdenum	0.15	U	ug/L	P422595	
		Nickel	1.6	I	ug/L	P422595	
		Selenium	0.20	U	ug/L	P422595	
		Silver	0.010	U	ug/L	P422595	
		Thallium	0.10	U	ug/L	P422595	
	SM 2340 B-2011	Hardness	12.2		mg/L	P422595	

Field ID: 19010159 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 11/22/2022.

Sample Location: Mills CR @ CR 108 **Collection Date/Time: 11/16/2022 10:35**

Field ID: 19010096 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2370317	EPA 200.7 Rev. 4.4	Calcium	3.61		mg/L	P422595	
		Iron	1.33E+03		ug/L	P422595	
		Magnesium	1.22		mg/L	P422595	
		Potassium	1.3		mg/L	P422595	
		Sodium	9.8		mg/L	P422595	
		Strontium	19.1		ug/L	P422595	
		Tin	3.0	U	ug/L	P422595	
		Titanium	0.78	I	ug/L	P422595	
		Vanadium	2.0	U	ug/L	P422595	
		Zinc	5.0	U	ug/L	P422595	
	EPA 200.8 Rev. 5.4	Aluminum	320		ug/L	P422595	
		Antimony	0.050	U	ug/L	P422595	
		Arsenic	0.41		ug/L	P422595	
		Barium	23.9		ug/L	P422595	
		Beryllium	0.032	I	ug/L	P422595	
		Boron	19.0		ug/L	P422595	
		Cadmium	0.020	U	ug/L	P422595	
		Chromium	0.45	I	ug/L	P422595	
		Cobalt	0.329		ug/L	P422595	
		Copper	0.40	U	ug/L	P422595	
		Lead	0.35	I	ug/L	P422595	
		Manganese	17.6		ug/L	P422595	
		Molybdenum	0.15	U	ug/L	P422595	
		Nickel	0.54	I	ug/L	P422595	
		Selenium	0.20	U	ug/L	P422595	
		Silver	0.010	U	ug/L	P422595	
		Thallium	0.10	U	ug/L	P422595	
	SM 2340 B-2011	Hardness	14.0		mg/L	P422595	

Sample Location: Little St Marys River @ SR 115A **Collection Date/Time: 11/16/2022 11:15**

Field ID: 19010032 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2370318	EPA 200.7 Rev. 4.4	Calcium	12.5		mg/L	P422595	
		Iron	890		ug/L	P422595	
		Magnesium	3.48		mg/L	P422595	
		Potassium	2.9		mg/L	P422595	
		Sodium	13.2		mg/L	P422595	
		Strontium	51.6		ug/L	P422595	
		Tin	3.0	U	ug/L	P422595	
		Titanium	0.99	I	ug/L	P422595	
		Vanadium	2.0	U	ug/L	P422595	
		Zinc	5.0	U	ug/L	P422595	
	EPA 200.8 Rev. 5.4	Aluminum	257		ug/L	P422595	
		Antimony	0.050	U	ug/L	P422595	
		Arsenic	0.57		ug/L	P422595	
		Barium	29.4		ug/L	P422595	
		Beryllium	0.024	I	ug/L	P422595	
		Boron	34.6		ug/L	P422595	
		Cadmium	0.020	U	ug/L	P422595	
		Chromium	0.58	I	ug/L	P422595	
		Cobalt	0.200		ug/L	P422595	
		Copper	0.47	I	ug/L	P422595	
		Lead	0.35	I	ug/L	P422595	
		Manganese	25.4		ug/L	P422595	
		Molybdenum	0.15	U	ug/L	P422595	
		Nickel	0.50	U	ug/L	P422595	
		Selenium	0.20	U	ug/L	P422595	
		Silver	0.010	U	ug/L	P422595	
		Thallium	0.10	U	ug/L	P422595	
	SM 2340 B-2011	Hardness	45.7		mg/L	P422595	

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: P422595

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: P422595

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 200.8 Rev. 5.4
Batch ID: P422920

Component	Result	Code	Units
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L

Quality Assurance Report
Method Blank Results

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

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

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: P422664

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

Quality Assurance Report
Method Blank Results

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

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

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: P422595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	109		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	106		P	85 - 115
Sodium	103		P	85 - 115
Strontium	111		P	85 - 115
Tin	108		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	106		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.9		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	103		P	85 - 115
Barium	106		P	85 - 115
Beryllium	99.0		P	85 - 115
Boron	99.2		P	85 - 115
Cadmium	98.8		P	85 - 115
Chromium	101		P	85 - 115
Cobalt	100		P	85 - 115
Copper	102		P	85 - 115
Lead	93.7		P	85 - 115
Manganese	102		P	85 - 115
Molybdenum	98.3		P	85 - 115
Nickel	101		P	85 - 115
Selenium	101		P	85 - 115
Silver	98.7		P	85 - 115
Thallium	98.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422920

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	101		P	85 - 115
Lead	96.0		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

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

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: P422664

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		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

Quality Assurance Report
Laboratory Control Sample Accuracy

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

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

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: P422595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370981	Calcium	107		P	80 - 120
2370981	Iron	103	109	P/P	80 - 120
2370981	Magnesium	103	109	P/P	80 - 120
2370981	Potassium	99.0	105	P/P	80 - 120
2370981	Sodium	105		P	80 - 120
2370981	Strontium	104	108	P/P	80 - 120
2370981	Tin	107	106	P/P	80 - 120
2370981	Titanium	104	105	P/P	80 - 120
2370981	Vanadium	106	107	P/P	80 - 120
2370981	Zinc	103	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370981	Aluminum	103	104	P/P	80 - 120
2370981	Antimony	102	102	P/P	80 - 120
2370981	Arsenic	102	103	P/P	80 - 120
2370981	Barium	105	106	P/P	80 - 120
2370981	Beryllium	99.6	95.9	P/P	80 - 120
2370981	Boron	105	105	P/P	80 - 120
2370981	Cadmium	101	101	P/P	80 - 120
2370981	Chromium	101	101	P/P	80 - 120
2370981	Cobalt	100	99.9	P/P	80 - 120
2370981	Copper	102	102	P/P	80 - 120
2370981	Lead	94.8	95.0	P/P	80 - 120
2370981	Manganese	105	104	P/P	80 - 120
2370981	Molybdenum	100	101	P/P	80 - 120
2370981	Nickel	99.8	102	P/P	80 - 120
2370981	Selenium	101	101	P/P	80 - 120
2370981	Silver	98.9	98.9	P/P	80 - 120
2370981	Thallium	101	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422920

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371116	Copper	104	98.1	P/P	80 - 120
2371116	Lead	101	96.1	P/P	80 - 120
2371151	Copper	97.2		P	80 - 120
2371151	Lead	97.6		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

Quality Assurance Report
Matrix Spike Accuracy

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

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: P422664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370804	NO2NO3-N	103	102	P/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: P422595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370981	Calcium	2.75	Spike	P	0 - 20
2370981	Iron	4.68	Spike	P	0 - 20
2370981	Magnesium	4.56	Spike	P	0 - 20
2370981	Potassium	4.67	Spike	P	0 - 20
2370981	Sodium	2.74	Spike	P	0 - 20
2370981	Strontium	3.70	Spike	P	0 - 20
2370981	Tin	1.16	Spike	P	0 - 20
2370981	Titanium	0.896	Spike	P	0 - 20
2370981	Vanadium	1.07	Spike	P	0 - 20
2370981	Zinc	1.25	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370981	Aluminum	0.0935	Spike	P	0 - 20
2370981	Antimony	0.575	Spike	P	0 - 20
2370981	Arsenic	0.678	Spike	P	0 - 20
2370981	Barium	0.875	Spike	P	0 - 20
2370981	Beryllium	3.31	Spike	P	0 - 20
2370981	Boron	0.159	Spike	P	0 - 20
2370981	Cadmium	0.911	Spike	P	0 - 20
2370981	Chromium	0.201	Spike	P	0 - 20
2370981	Cobalt	0.208	Spike	P	0 - 20
2370981	Copper	0.130	Spike	P	0 - 20
2370981	Lead	0.262	Spike	P	0 - 20
2370981	Manganese	0.415	Spike	P	0 - 20
2370981	Molybdenum	1.08	Spike	P	0 - 20
2370981	Nickel	1.82	Spike	P	0 - 20
2370981	Selenium	0.132	Spike	P	0 - 20
2370981	Silver	0.0395	Spike	P	0 - 20
2370981	Thallium	1.56	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371116	Copper	5.57	Spike	P	0 - 20
2371116	Lead	4.72	Spike	P	0 - 20

Quality Assurance Report
Precision

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

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: P422664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370804	NO2NO3-N	0.487	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

Quality Assurance Report
Precision

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

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: 2370300

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: 2370300

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116065
Included Lab Sample IDs: 2370301

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116084
Included Lab Sample IDs: 2370315, 2370316, 2370317, 2370318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.7	98.3	P/P	90 - 110
Aluminum	97.2	96.7	P/P	90 - 110
Antimony	96.6	97.6	P/P	90 - 110
Antimony	98.2	96.6	P/P	90 - 110
Arsenic	101	99.8	P/P	90 - 110
Arsenic	99.8	99.5	P/P	90 - 110
Barium	101	102	P/P	90 - 110
Barium	103	101	P/P	90 - 110
Beryllium	101	100	P/P	90 - 110
Beryllium	103	101	P/P	90 - 110
Boron	95.6	99.3	P/P	90 - 110
Boron	99.3	98.7	P/P	90 - 110
Cadmium	100	98.1	P/P	90 - 110
Cadmium	98.1	100	P/P	90 - 110
Chromium	100	98.0	P/P	90 - 110
Chromium	98.0	99.9	P/P	90 - 110
Cobalt	97.5	97.7	P/P	90 - 110
Cobalt	99.9	97.5	P/P	90 - 110
Copper	101	98.4	P/P	90 - 110
Copper	98.4	98.5	P/P	90 - 110
Lead	92.7	93.6	P/P	90 - 110
Manganese	101	99.0	P/P	90 - 110
Manganese	99.0	100	P/P	90 - 110
Molybdenum	96.5	97.3	P/P	90 - 110
Molybdenum	97.6	96.5	P/P	90 - 110
Nickel	101	98.3	P/P	90 - 110
Nickel	98.3	98.4	P/P	90 - 110
Selenium	100	99.5	P/P	90 - 110
Selenium	99.5	100	P/P	90 - 110
Silver	95.9	96.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116084
Included Lab Sample IDs: 2370315, 2370316, 2370317, 2370318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	96.9	95.9	P/P	90 - 110
Thallium	97.9	99.5	P/P	90 - 110
Thallium	99.3	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116101
Included Lab Sample IDs: 2370301

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A116138
Included Lab Sample IDs: 2370300

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: 2370300

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: 2370301

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: 2370301

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A116199
Included Lab Sample IDs: 2370315, 2370316, 2370317, 2370318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	110	104	P/P	90 - 110
Iron	108	105	P/P	90 - 110
Magnesium	108	105	P/P	90 - 110
Potassium	105	103	P/P	90 - 110
Sodium	108	103	P/P	90 - 110
Strontium	105	109	P/P	90 - 110
Tin	104	106	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A116199
Included Lab Sample IDs: 2370315, 2370316, 2370317, 2370318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Titanium	103	105	P/P	90 - 110
Vanadium	103	104	P/P	90 - 110
Zinc	104	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116231
Included Lab Sample IDs: 2370301

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116248
Included Lab Sample IDs: 2370315, 2370316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	93.8	93.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A116259
Included Lab Sample IDs: 2370300

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	106	P/P	90 - 110
Sulfate	103	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116269
Included Lab Sample IDs: 2370316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	95.3	91.6	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	105	107				2.75
	Iron	109	103	109			4.68
	Magnesium	110	103	109			4.56
	Potassium	106	99.0	105			4.67
	Sodium	103	105				2.74
	Strontium	111	104	108			3.70
	Tin	108	107	106			1.16
	Titanium	107	104	105			0.896
	Vanadium	106	106	107			1.07
	Zinc	104	103	104			1.25
EPA 200.8 Rev. 5.4	Aluminum	98.9	103	104			0.0935
	Antimony	102	102	102			0.575
	Arsenic	103	102	103			0.678
	Barium	106	105	106			0.875
	Beryllium	99.0	99.6	95.9			3.31
	Boron	99.2	105	105			0.159
	Cadmium	98.8	101	101			0.911
	Chromium	101	101	101			0.201
	Cobalt	100	100	99.9			0.208
	Copper	102	102	102			0.130
	Copper	101	104	98.1	97.2		5.57
	Lead	93.7	94.8	95.0			0.262
	Lead	96.0	101	96.1	97.6		4.72
	Manganese	102	105	104			0.415
	Molybdenum	98.3	100	101			1.08
	Nickel	101	99.8	102			1.82
	Selenium	101	101	101			0.132
	Silver	98.7	98.9	98.9			0.0395
	Thallium	98.6	101	103			1.56
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	103	103	102			0.487
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)	2370300
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2370300
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2370315, 2370316, 2370317, 2370318
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2370315, 2370316, 2370317, 2370318
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2370300

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2370300
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2370301
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2370301
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2370301
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2370301
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2370300
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2370315, 2370316, 2370317, 2370318
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2370300
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2370300
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2370300
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2370301

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	2370300
EPA 180.1 Rev. 2.0	11/17/2022			11/17/2022 14:15	Anna M. Plaviak	2370300
EPA 200.7 Rev. 4.4	11/17/2022	11/18/2022 16:20	George D Taylor	12/01/2022 02:17	McKinley C Carter	2370315
	11/17/2022	11/18/2022 16:20	George D Taylor	12/01/2022 02:25	McKinley C Carter	2370316
	11/17/2022	11/18/2022 16:20	George D Taylor	12/01/2022 02:33	McKinley C Carter	2370317
	11/17/2022	11/18/2022 16:20	George D Taylor	12/01/2022 02:40	McKinley C Carter	2370318
EPA 200.8 Rev. 5.4	11/17/2022	11/18/2022 16:20	George D Taylor	11/21/2022 15:50	Megan Whitefoot	2370315
	11/17/2022	11/18/2022 16:20	George D Taylor	11/21/2022 16:53	Megan Whitefoot	2370316
	11/17/2022	11/18/2022 16:20	George D Taylor	11/21/2022 17:02	Megan Whitefoot	2370317
	11/17/2022	11/18/2022 16:20	George D Taylor	11/21/2022 17:11	Megan Whitefoot	2370318
	11/17/2022	11/30/2022 11:30	Vijayalakshmi Reddy	12/05/2022 01:42	Emily M Philpot	2370315
	11/17/2022	11/30/2022 11:30	Vijayalakshmi Reddy	12/05/2022 01:52	Emily M Philpot	2370316
	11/17/2022	11/30/2022 11:30	Vijayalakshmi Reddy	12/05/2022 17:53	Emily M Philpot	2370316
EPA 300.0 Rev. 2.1	11/17/2022			12/02/2022 12:08	James L Waggerby	2370300
EPA 350.1 Rev. 2.0	11/17/2022			12/02/2022 11:45	Ping Hua	2370301
EPA 351.2 Rev. 2.0	11/17/2022	11/21/2022 13:35	Alexandra J Mattheus	11/30/2022 15:50	Judith K. Clark	2370301
EPA 353.2 Rev. 2.0	11/17/2022			11/21/2022 10:13	Beverly Y. Sanders	2370301
EPA 365.1 Rev. 2.0	11/17/2022	11/21/2022 15:27	Adam P Silver	11/22/2022 12:38	James L Waggerby	2370301
SM 2320 B-2011	11/17/2022			11/23/2022 05:29	Dale L. Simmons	2370300
SM 2340 B-2011	11/17/2022			12/01/2022 02:17	McKinley C Carter	2370315
	11/17/2022			12/01/2022 02:25	McKinley C Carter	2370316
	11/17/2022			12/01/2022 02:33	McKinley C Carter	2370317
	11/17/2022			12/01/2022 02:40	McKinley C Carter	2370318
SM 2540 C-2015	11/17/2022			11/18/2022 16:39	Yijie Li	2370300
SM 2540 D-2015	11/17/2022			11/18/2022 16:39	Yijie Li	2370300
SM 4500-F- C-2011	11/17/2022			11/23/2022 05:29	Dale L. Simmons	2370300
SM 5310 B-2011	11/17/2022			11/24/2022 02:46	Touraj Touran	2370301