

Chemical Analysis Report

NE-DIST-2022-07-27-02

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

Event Description: **Butcher Pen SMP**

Request ID: **RQ-2022-07-25-58**

Customer: **NE-DIST**

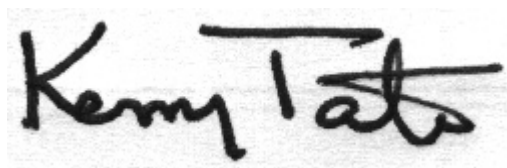
Project ID: **SMP**

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: 16-AUG-2022 09:00

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Butcher Pen CR at Wesconnett

Collection Date/Time: 07/26/2022 15:30

Field ID: 20030760

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2344075	EPA 200.7 Rev. 4.4	Calcium	42.7		mg/L	P417348	
		Iron	1.00E+03		ug/L	P417348	
		Magnesium	6.34		mg/L	P417348	
		Potassium	1.8		mg/L	P417348	
		Sodium	13.5		mg/L	P417348	
		Strontium	640		ug/L	P417348	
		Tin	3.0	U	ug/L	P417348	
		Titanium	1.6	I	ug/L	P417348	
		Vanadium	2.0	U	ug/L	P417348	
		Zinc	9.3	I	ug/L	P417348	
	EPA 200.8 Rev. 5.4	Aluminum	118		ug/L	P417674	
		Antimony	0.17	I	ug/L	P417348	
		Arsenic	1.19		ug/L	P417348	
		Barium	36.5		ug/L	P417348	
		Beryllium	0.016	I	ug/L	P417348	
		Boron	36.2		ug/L	P417348	
		Cadmium	0.020	U	ug/L	P417348	
		Chromium	0.73	I	ug/L	P417348	
		Cobalt	0.118		ug/L	P417348	
		Copper	1.03		ug/L	P417348	
		Lead	0.60		ug/L	P417348	
		Manganese	15.6		ug/L	P417348	
		Molybdenum	0.65		ug/L	P417348	
		Nickel	0.93	I	ug/L	P417348	
		Selenium	0.20	U	ug/L	P417348	
		Silver	0.010	U	ug/L	P417348	
		Thallium	0.10	U	ug/L	P417348	
	SM 2340 B-2011	Hardness	133		mg/L	P417348	

Sample Location: Butcher Pen CR @ Confederate PT Road

Collection Date/Time: 07/26/2022 15:40

Field ID: 20030082

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2344023	DEP SOP: NU-094-1	Color (true)	82		PCU	P417253	
	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P417268	
	EPA 300.0 Rev. 2.1	Chloride	45		mg Cl/L	P417635	
		Sulfate	28		mg SO4/L	P417640	
	SM 2320 B-2011	Total Alkalinity	108		mg CaCO3/L	P417437	
	SM 2540 C-2011	TDS	282	A	mg/L	P417661	
	SM 2540 D-2011	TSS	10	A	mg/L	P417664	
	SM 4500-F- C-2011	Fluoride	0.20		mg F/L	P417442	
2344024	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P417388	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.97		mg N/L	P417282	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P417403	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P417377	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P417392	

Sample Location: Butcher Pen CR at Blanding Blvd.

Collection Date/Time: 07/26/2022 15:20

Field ID: 20030580

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2344076	EPA 200.7 Rev. 4.4	Calcium	45.0		mg/L	P417348	
		Iron	1.06E+03		ug/L	P417348	
		Magnesium	8.70		mg/L	P417348	
		Potassium	1.7		mg/L	P417348	
		Sodium	15.2		mg/L	P417348	
		Strontium	965		ug/L	P417348	
		Tin	3.0	U	ug/L	P417348	
		Titanium	1.4	I	ug/L	P417348	
		Vanadium	2.0	U	ug/L	P417348	
		Zinc	8.0	I	ug/L	P417348	
	EPA 200.8 Rev. 5.4	Aluminum	71		ug/L	P417674	
		Antimony	0.17	I	ug/L	P417348	
		Arsenic	1.35		ug/L	P417348	
		Barium	37.5		ug/L	P417348	
		Beryllium	0.020	I	ug/L	P417348	
		Boron	34.3		ug/L	P417348	
		Cadmium	0.020	U	ug/L	P417348	
		Chromium	0.66	I	ug/L	P417348	
		Cobalt	0.108		ug/L	P417348	
		Copper	1.02		ug/L	P417348	
	SM 2340 B-2011	Lead	0.49		ug/L	P417348	
		Manganese	11.3		ug/L	P417348	
		Molybdenum	0.73		ug/L	P417348	
		Nickel	0.82	I	ug/L	P417348	
		Selenium	0.20	U	ug/L	P417348	
		Silver	0.010	U	ug/L	P417348	
		Thallium	0.10	U	ug/L	P417348	
		Hardness	148		mg/L	P417348	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P417253

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417268

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417348

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: P417348

Component	Result	Code	Units
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: P417674

Component	Result	Code	Units
Aluminum	5.0	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417635

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417640

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417388

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417403

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417377

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

Reference Method: SM 2320 B-2011
Batch ID: P417437

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

Reference Method: SM 2540 C-2011
Batch ID: P417661

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P417664

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P417392

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: P417253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417268

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417348

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	80 - 120
Iron	109		P	80 - 120
Magnesium	104		P	80 - 120
Potassium	104		P	80 - 120
Sodium	102		P	80 - 120
Strontium	100		P	80 - 120
Tin	102		P	80 - 120
Titanium	103		P	80 - 120
Vanadium	102		P	80 - 120
Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417348

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	105		P	85 - 115
Arsenic	96.8		P	85 - 115
Barium	107		P	85 - 115
Beryllium	94.3		P	85 - 115
Boron	97.4		P	85 - 115
Cadmium	98.2		P	85 - 115
Chromium	100		P	85 - 115
Cobalt	99.3		P	85 - 115
Copper	97.1		P	85 - 115
Lead	93.5		P	85 - 115
Manganese	105		P	85 - 115
Molybdenum	95.8		P	85 - 115
Nickel	98.9		P	85 - 115
Selenium	101		P	85 - 115
Silver	98.0		P	85 - 115
Thallium	97.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417635

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417640

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417403

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417377

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

Reference Method: SM 2320 B-2011
Batch ID: P417437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.7		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

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

Reference Method: SM 5310 B-2011
Batch ID: P417392

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P417348

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344298	Calcium	102		P	80 - 120
2344298	Iron	116		P	80 - 120
2344298	Magnesium	111		P	80 - 120
2344298	Potassium	99.1		P	80 - 120
2344298	Sodium	100		P	80 - 120
2344298	Strontium	101		P	80 - 120
2344298	Tin	97.7		P	80 - 120
2344298	Titanium	106		P	80 - 120
2344298	Vanadium	102		P	80 - 120
2344298	Zinc	99.6		P	80 - 120
2344442	Calcium	102		P	80 - 120
2344442	Iron	109	106	P/P	80 - 120
2344442	Magnesium	102		P	80 - 120
2344442	Potassium	101	97.5	P/P	80 - 120
2344442	Sodium	103	100	P/P	80 - 120
2344442	Strontium	101	99.0	P/P	80 - 120
2344442	Tin	102	100	P/P	80 - 120
2344442	Titanium	103	101	P/P	80 - 120
2344442	Vanadium	102	100	P/P	80 - 120
2344442	Zinc	99.0	96.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P417348

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344298	Antimony	96.2		P	80 - 120
2344298	Arsenic	95.1		P	80 - 120
2344298	Barium	101		P	80 - 120
2344298	Beryllium	92.1		P	80 - 120
2344298	Boron	102		P	80 - 120
2344298	Cadmium	97.3		P	80 - 120
2344298	Chromium	99.4		P	80 - 120
2344298	Cobalt	95.3		P	80 - 120
2344298	Copper	94.4		P	80 - 120
2344298	Lead	92.7		P	80 - 120
2344298	Manganese	110		P	80 - 120
2344298	Molybdenum	93.3		P	80 - 120
2344298	Nickel	96.3		P	80 - 120
2344298	Selenium	92.2		P	80 - 120
2344298	Silver	95.2		P	80 - 120
2344298	Thallium	96.9		P	80 - 120
2344442	Antimony	103	103	P/P	80 - 120
2344442	Arsenic	95.9	96.0	P/P	80 - 120
2344442	Barium	103	104	P/P	80 - 120
2344442	Beryllium	92.0	90.1	P/P	80 - 120
2344442	Boron	97.6	99.9	P/P	80 - 120
2344442	Cadmium	97.7	95.7	P/P	80 - 120
2344442	Chromium	99.3	98.7	P/P	80 - 120
2344442	Cobalt	96.3	95.2	P/P	80 - 120
2344442	Copper	93.6	93.0	P/P	80 - 120
2344442	Lead	92.0	91.9	P/P	80 - 120
2344442	Manganese	102	102	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P417348

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344442	Molybdenum	95.7	95.3	P/P	80 - 120
2344442	Nickel	95.0	93.3	P/P	80 - 120
2344442	Selenium	95.3	95.3	P/P	80 - 120
2344442	Silver	96.3	96.0	P/P	80 - 120
2344442	Thallium	97.6	98.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P417674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344299	Aluminum	98.2	98.5	P/P	80 - 120
2344403	Aluminum	90.2		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P417635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344108	Chloride	93.2		P	90 - 110
2344177	Chloride	92.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P417640

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344108	Sulfate	93.1		P	90 - 110
2344177	Sulfate	94.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P417388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344111	Ammonia-N	98.4	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P417282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344159	Kjeldahl Nitrogen	106	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P417403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344111	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P417377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2343987	Total-P	106	104	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344107	Fluoride	104	103	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P417392

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344199	Organic Carbon	98.0	98.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P417253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344201	Color (true)	7.19	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344198	Turbidity	11.6	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344442	Calcium	1.19	Spike	P	0 - 20
2344442	Iron	2.25	Spike	P	0 - 20
2344442	Magnesium	1.13	Spike	P	0 - 20
2344442	Potassium	3.11	Spike	P	0 - 20
2344442	Sodium	2.07	Spike	P	0 - 20
2344442	Strontium	1.90	Spike	P	0 - 20
2344442	Tin	1.60	Spike	P	0 - 20
2344442	Titanium	1.70	Spike	P	0 - 20
2344442	Vanadium	1.73	Spike	P	0 - 20
2344442	Zinc	2.34	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344442	Antimony	0.0979	Spike	P	0 - 20
2344442	Arsenic	0.0584	Spike	P	0 - 20
2344442	Barium	0.791	Spike	P	0 - 20
2344442	Beryllium	2.11	Spike	P	0 - 20
2344442	Boron	2.12	Spike	P	0 - 20
2344442	Cadmium	2.09	Spike	P	0 - 20
2344442	Chromium	0.545	Spike	P	0 - 20
2344442	Cobalt	1.16	Spike	P	0 - 20
2344442	Copper	0.694	Spike	P	0 - 20
2344442	Lead	0.0868	Spike	P	0 - 20
2344442	Manganese	0.682	Spike	P	0 - 20
2344442	Molybdenum	0.363	Spike	P	0 - 20
2344442	Nickel	1.84	Spike	P	0 - 20
2344442	Selenium	0.00129	Spike	P	0 - 20
2344442	Silver	0.336	Spike	P	0 - 20
2344442	Thallium	0.552	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344299	Aluminum	0.278	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344108	Chloride	0.0	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344108	Sulfate	0.275	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344111	Ammonia-N	0.857	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344159	Kjeldahl Nitrogen	2.07	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344111	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2343987	Total-P	1.93	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P417437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344107	Total Alkalinity	0.908	Sample	P	0 - 3.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P417661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344023	TDS	7.43	Sample	P	0 - 10

Reference Method: SM 2540 D-2011
Batch ID: P417664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344023	TSS	3.92	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P417442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344107	Fluoride	1.01	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P417392

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344199	Organic Carbon	0.154	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A113737

Included Lab Sample IDs: 2344023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A113742

Included Lab Sample IDs: 2344023

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A113790

Included Lab Sample IDs: 2344024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	98.9	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A113791

Included Lab Sample IDs: 2344024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A113795

Included Lab Sample IDs: 2344024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A113807

Included Lab Sample IDs: 2344024

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

Reference Method: SM 2320 B-2011

Run ID: A113811

Included Lab Sample IDs: 2344023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.6	99.4	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A113811

Included Lab Sample IDs: 2344023

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A113825

Included Lab Sample IDs: 2344024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A113842

Included Lab Sample IDs: 2344075, 2344076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	101	98.2	P/P	90 - 110
Antimony	102	101	P/P	90 - 110
Arsenic	96.6	96.5	P/P	90 - 110
Arsenic	98.6	96.6	P/P	90 - 110
Barium	100	97.5	P/P	90 - 110
Barium	102	100	P/P	90 - 110
Beryllium	94.1	91.8	P/P	90 - 110
Beryllium	96.1	94.1	P/P	90 - 110
Boron	92.4	94.5	P/P	90 - 110
Boron	94.5	97.8	P/P	90 - 110
Cadmium	101	99.9	P/P	90 - 110
Cadmium	99.9	99.0	P/P	90 - 110
Chromium	101	99.3	P/P	90 - 110
Chromium	99.3	97.9	P/P	90 - 110
Cobalt	97.8	96.7	P/P	90 - 110
Cobalt	99.9	97.8	P/P	90 - 110
Copper	96.6	97.2	P/P	90 - 110
Copper	98.7	96.6	P/P	90 - 110
Lead	92.0	92.2	P/P	90 - 110
Lead	92.4	92.0	P/P	90 - 110
Manganese	103	100	P/P	90 - 110
Manganese	105	103	P/P	90 - 110
Molybdenum	95.7	95.4	P/P	90 - 110
Molybdenum	96.8	95.7	P/P	90 - 110
Nickel	96.5	96.4	P/P	90 - 110
Nickel	98.7	96.5	P/P	90 - 110
Selenium	100	99.0	P/P	90 - 110
Selenium	99.0	96.5	P/P	90 - 110
Silver	97.3	97.6	P/P	90 - 110
Silver	99.0	97.3	P/P	90 - 110
Thallium	95.8	96.5	P/P	90 - 110
Thallium	96.5	95.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A113889

Included Lab Sample IDs: 2344075, 2344076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	95 - 105
Iron	102	102	P/P	95 - 105
Magnesium	102	102	P/P	95 - 105
Potassium	101	101	P/P	95 - 105
Sodium	98.9	99.1	P/P	95 - 105
Strontium	102	96.9	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A113889

Included Lab Sample IDs: 2344075, 2344076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Tin	99.8	92.2	P/P	95 - 105
Titanium	101	95.4	P/P	95 - 105
Vanadium	100	94.8	P/P	95 - 105
Zinc	98.6	93.1	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A113902

Included Lab Sample IDs: 2344023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	94.7	95.5	P/P	90 - 110
Sulfate	93.6	94.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A113975

Included Lab Sample IDs: 2344076

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	90.5	97.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A114000

Included Lab Sample IDs: 2344075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.5	98.4	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 SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	102				7.19	
EPA 180.1 Rev. 2.0	Turbidity	96.9				11.6	
EPA 200.7 Rev. 4.4	Calcium	104	102	102			1.19
	Iron	109	116	109	106		2.25
	Magnesium	104	111	102			1.13
	Potassium	104	99.1	101	97.5		3.11
	Sodium	102	100	103	100		2.07
	Strontium	100	101	101	99.0		1.90
	Tin	102	97.7	102	100		1.60
	Titanium	103	106	103	101		1.70
	Vanadium	102	102	102	100		1.73
	Zinc	100	99.6	99.0	96.7		2.34
EPA 200.8 Rev. 5.4	Aluminum	100	98.2	98.5	90.2		0.278
	Antimony	105	103	103	96.2		0.0979
	Arsenic	96.8	95.9	96.0	95.1		0.0584
	Barium	107	103	104	101		0.791
	Beryllium	94.3	92.0	90.1	92.1		2.11
	Boron	97.4	97.6	99.9	102		2.12
	Cadmium	98.2	97.7	95.7	97.3		2.09
	Chromium	100	99.3	98.7	99.4		0.545
	Cobalt	99.3	96.3	95.2	95.3		1.16
	Copper	97.1	93.6	93.0	94.4		0.694
	Lead	93.5	92.0	91.9	92.7		0.0868
	Manganese	105	102	102	110		0.682
	Molybdenum	95.8	95.7	95.3	93.3		0.363
	Nickel	98.9	95.0	93.3	96.3		1.84
	Selenium	101	95.3	95.3	92.2		0.0012
	Silver	98.0	96.3	96.0	95.2		0.336
	Thallium	97.5	97.6	98.2	96.9		0.552
EPA 300.0 Rev. 2.1	Chloride	95.7	93.2	92.8		0.0	
	Sulfate	95.6	93.1	94.4		0.275	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	98.4	99.8			0.857
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	106	102			2.07
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	105	106	104			1.93
SM 2320 B-2011	Total Alkalinity	99.7				0.908	
SM 2540 C-2011	TDS					7.43	
SM 2540 D-2011	TSS					3.92	
SM 4500-F- C-2011	Fluoride	104	104	103			1.01
SM 5310 B-2011	Organic Carbon	96.7	98.0	98.3			0.154

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2344023
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2344023
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2344075, 2344076
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2344075, 2344076
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2344023
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2344023
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2344024

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2344024
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2344024
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2344024
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2344023
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2344075, 2344076
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2344023
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2344023
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2344023
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2344024

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	07/27/2022			07/27/2022 14:41	Anna M. Plaviak	2344023
EPA 180.1 Rev. 2.0	07/27/2022			07/27/2022 13:53	Khloe J Berg	2344023
EPA 200.7 Rev. 4.4	07/27/2022	07/29/2022 07:52	Mackenzie Hunt	08/03/2022 14:03	Alexander Thompson	2344075
	07/27/2022	07/29/2022 07:52	Mackenzie Hunt	08/03/2022 14:09	Alexander Thompson	2344076
EPA 200.8 Rev. 5.4	07/27/2022	07/29/2022 07:52	Mackenzie Hunt	08/01/2022 16:39	Megan Whitefoot	2344075
	07/27/2022	07/29/2022 07:52	Mackenzie Hunt	08/01/2022 17:42	Megan Whitefoot	2344076
	07/27/2022	08/05/2022 08:46	Mackenzie Hunt	08/08/2022 18:54	Megan Whitefoot	2344076
	07/27/2022	08/05/2022 08:46	Mackenzie Hunt	08/09/2022 23:59	Emily M Philpot	2344075
EPA 300.0 Rev. 2.1	07/27/2022			08/03/2022 21:42	Anna M. Plaviak	2344023
EPA 350.1 Rev. 2.0	07/27/2022			07/29/2022 09:44	Ping Hua	2344024
EPA 351.2 Rev. 2.0	07/27/2022	07/28/2022 16:20	Simonne.V. Calhoun	07/29/2022 14:39	Samantha L Bates	2344024
EPA 353.2 Rev. 2.0	07/27/2022			07/29/2022 10:46	Beverly Y. Sanders	2344024
EPA 365.1 Rev. 2.0	07/27/2022	07/29/2022 15:30	Simonne.V. Calhoun	08/01/2022 10:20	James L Waggeberby	2344024
SM 2320 B-2011	07/27/2022			07/30/2022 14:26	Adam P Silver	2344023
SM 2340 B-2011	07/27/2022			08/03/2022 14:03	Alexander Thompson	2344075
	07/27/2022			08/03/2022 14:09	Alexander Thompson	2344076
SM 2540 C-2011	07/27/2022			07/29/2022 15:04	Yijie Li	2344023
SM 2540 D-2011	07/27/2022			07/29/2022 15:04	Yijie Li	2344023
SM 4500-F- C-2011	07/27/2022			07/30/2022 14:26	Adam P Silver	2344023
SM 5310 B-2011	07/27/2022			07/28/2022 18:53	Khloe J Berg	2344024