

Chemical Analysis Report

NE-DIST-2024-03-27-01

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

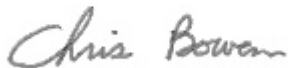
Event Description: **Suwannee Central**
Request ID: **RQ-2024-03-18-06**
Customer: **NE-DIST**
Project ID: **SMP**

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.
Chris Bowen, B.S.
Marek Topolski, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Chris Bowen, Environmental Administrator

Date Certified: 12-APR-2024 11:51



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: SWIFT CREEK POND CENTER

Collection Date/Time: 03/26/2024 10:10

Field ID: 21030066

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2477778	DEP SOP: NU-094-1	Color (true)	250		PCU	P443408	
	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P443392	
	EPA 300.0 Rev. 2.1	Chloride	7.3		mg Cl/L	P443664	
		Sulfate	0.89		mg SO4/L	P443667	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P443496	
	SM 2540 C-2015	TDS	80		mg/L	P443897	
	SM 2540 D-2015	TSS	8	I	mg/L	P443729	
	SM 4500-F- C-2011	Fluoride	0.034	I	mg F/L	P443499	
2477779	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P443448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P443425	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.082		mg N/L	P443467	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P443443	
	SM 5310 B-2014	Organic Carbon	25		mg C/L	P443681	
2477788	EPA 200.7 Rev. 4.4	Calcium	2.98		mg/L	P443435	
		Iron	750		ug/L	P443435	
		Magnesium	1.38		mg/L	P443435	
		Potassium	0.33	I	mg/L	P443435	
		Sodium	4.1		mg/L	P443435	
		Strontium	11.8		ug/L	P443435	
		Tin	3.0	U	ug/L	P443435	
		Titanium	3.2		ug/L	P443435	
		Vanadium	2.0	U	ug/L	P443435	
		Zinc	5.0	U	ug/L	P443435	
	EPA 200.8 Rev. 5.4	Aluminum	424		ug/L	P443435	
		Antimony	0.055	I	ug/L	P443435	
		Arsenic	0.33		ug/L	P443435	
		Barium	10.5		ug/L	P443435	
		Beryllium	0.024	I	ug/L	P443435	
		Boron	14.7		ug/L	P443435	
		Cadmium	0.020	U	ug/L	P443435	
		Chromium	0.67	I	ug/L	P443435	
		Cobalt	0.186		ug/L	P443435	
		Copper	0.40	U	ug/L	P443435	
		Lead	0.71		ug/L	P443435	
		Manganese	21.3		ug/L	P443435	
		Molybdenum	0.15	U	ug/L	P443435	
		Nickel	0.50	U	ug/L	P443435	
		Selenium	0.20	U	ug/L	P443435	
		Silver	0.010	U	ug/L	P443435	
		Thallium	0.10	U	ug/L	P443435	
	SM 2340 B-2011	Hardness	13.1		mg/L	P443435	

Ref. Method and Comment:

DEP SOP: NU-094-1: Batch relative percent difference is unavailable because of analytical difficulties.

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 03/29/2024.

Sample Location: NEW RIVER AT SR 125

Collection Date/Time: 03/26/2024 11:15

Field ID: 21030082

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2477774	DEP SOP: NU-094-1	Color (true)	280		PCU	P443404	
	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P443392	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P443664	
		Sulfate	5.0		mg SO4/L	P443667	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P443496	
	SM 2540 C-2015	TDS	83		mg/L	P443897	
	SM 2540 D-2015	TSS	4	I	mg/L	P443729	
	SM 4500-F- C-2011	Fluoride	0.029	I	mg F/L	P443499	
2477776	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P443448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P443425	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P443467	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P443442	
	SM 5310 B-2014	Organic Carbon	33		mg C/L	P443681	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: ALLIGATOR CREEK AT NW CR225

Collection Date/Time: 03/26/2024 11:25

Field ID: G1NE0957

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2477772	DEP SOP: NU-094-1	Color (true)	230		PCU	P443404	
	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P443392	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P443664	
		Sulfate	0.99		mg SO4/L	P443667	
	SM 2320 B-2011	Total Alkalinity	8.9		mg CaCO3/L	P443496	
	SM 2540 C-2015	TDS	105		mg/L	P443897	
	SM 2540 D-2015	TSS	4	I	mg/L	P443729	
2477773	SM 4500-F- C-2011	Fluoride	0.041	I	mg F/L	P443499	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P443448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P443425	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P443467	
	EPA 365.1 Rev. 2.0	Total-P	0.041		mg P/L	P443442	
2477787	SM 5310 B-2014	Organic Carbon	25		mg C/L	P443681	
	EPA 200.7 Rev. 4.4	Calcium	7.76		mg/L	P443435	
		Iron	1.04E+03		ug/L	P443435	
		Magnesium	1.46		mg/L	P443435	
		Potassium	0.52	I	mg/L	P443435	
		Sodium	7.5		mg/L	P443435	
		Strontium	16.7		ug/L	P443435	
		Tin	3.0	U	ug/L	P443435	
		Titanium	3.6		ug/L	P443435	
		Vanadium	2.0	U	ug/L	P443435	
		Zinc	5.0	U	ug/L	P443435	
	EPA 200.8 Rev. 5.4	Aluminum	389		ug/L	P443435	
		Antimony	0.050	U	ug/L	P443435	
		Arsenic	0.57		ug/L	P443435	
		Barium	9.11		ug/L	P443435	
		Beryllium	0.023	I	ug/L	P443435	
		Boron	15.1		ug/L	P443435	
		Cadmium	0.020	U	ug/L	P443435	
		Chromium	1.1	I	ug/L	P443435	
		Cobalt	0.281		ug/L	P443435	
		Copper	0.40	U	ug/L	P443435	
		Lead	0.39	I	ug/L	P443435	
		Manganese	10.1		ug/L	P443435	
		Molybdenum	0.15	U	ug/L	P443435	
		Nickel	0.66	I	ug/L	P443435	
		Selenium	0.20	U	ug/L	P443435	
		Silver	0.010	U	ug/L	P443435	
		Thallium	0.10	U	ug/L	P443435	
	SM 2340 B-2011	Hardness	25.4		mg/L	P443435	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: SANTA FE RIVER AT CR325

Collection Date/Time: 03/26/2024 12:15

Field ID: 21030114

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2477775	DEP SOP: NU-094-1	Color (true)	230		PCU	P443404	
	EPA 180.1 Rev. 2.0	Turbidity	0.70	I	NTU	P443392	
	EPA 300.0 Rev. 2.1	Chloride	7.5		mg Cl/L	P443664	
		Sulfate	0.20	U	mg SO4/L	P443667	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P443496	
	SM 2540 C-2015	TDS	80		mg/L	P443897	
	SM 2540 D-2015	TSS	3	I	mg/L	P443729	
	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P443499	
2477777	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P443448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P443425	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P443467	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P443442	
	SM 5310 B-2014	Organic Carbon	28		mg C/L	P443681	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P443404

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P443408

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P443392

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P443435

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: P443435

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443664

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443667

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P443448

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P443425

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P443467

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443442

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443443

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

Reference Method: SM 2320 B-2011
Batch ID: P443496

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

Reference Method: SM 2540 C-2015
Batch ID: P443897

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P443729

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P443499

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2014
Batch ID: P443681

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: P443404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.2		P	90 - 110

Reference Method: DEP SOP: NU-094-1
Batch ID: P443408

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	95.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P443392

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P443435

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	111		P	85 - 115
Magnesium	113		P	85 - 115
Potassium	104		P	85 - 115
Sodium	104		P	85 - 115
Strontium	96.4		P	85 - 115
Tin	101		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	99.0		P	85 - 115
Zinc	96.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443435

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.6		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	98.0		P	85 - 115
Barium	102		P	85 - 115
Beryllium	98.6		P	85 - 115
Boron	99.6		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	104		P	85 - 115
Cobalt	101		P	85 - 115
Copper	96.9		P	85 - 115
Lead	93.7		P	85 - 115
Manganese	103		P	85 - 115
Molybdenum	97.1		P	85 - 115
Nickel	98.6		P	85 - 115
Selenium	98.4		P	85 - 115
Silver	99.9		P	85 - 115
Thallium	94.1		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443664

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443667

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P443448

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: P443425

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P443467

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443442

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443443

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

Reference Method: SM 2320 B-2011
Batch ID: P443496

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P443897

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	95.2		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P443729

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	96.8		P	85 - 115

Reference Method: SM 4500-F- C-2011
Batch ID: P443499

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	94 - 106

Reference Method: SM 5310 B-2014
Batch ID: P443681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P443435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477640	Calcium	99.5		P	80 - 120
2477640	Iron	108	106	P/P	80 - 120
2477640	Magnesium	107	104	P/P	80 - 120
2477640	Potassium	103	101	P/P	80 - 120
2477640	Sodium	102	98.4	P/P	80 - 120
2477640	Strontium	95.9	94.1	P/P	80 - 120
2477640	Tin	98.1	98.4	P/P	80 - 120
2477640	Titanium	102	101	P/P	80 - 120
2477640	Vanadium	98.0	98.1	P/P	80 - 120
2477640	Zinc	93.8	93.2	P/P	80 - 120
2477657	Calcium	114		P	80 - 120
2477657	Iron	112		P	80 - 120
2477657	Magnesium	114		P	80 - 120
2477657	Potassium	108		P	80 - 120
2477657	Sodium	103		P	80 - 120
2477657	Strontium	99.9		P	80 - 120
2477657	Tin	101		P	80 - 120
2477657	Titanium	94.2		P	80 - 120
2477657	Vanadium	99.9		P	80 - 120
2477657	Zinc	96.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477640	Aluminum	96.9	97.8	P/P	80 - 120
2477640	Antimony	103	104	P/P	80 - 120
2477640	Arsenic	98.5	99.2	P/P	80 - 120
2477640	Barium	101	102	P/P	80 - 120
2477640	Beryllium	99.1	100	P/P	80 - 120
2477640	Boron	101	101	P/P	80 - 120
2477640	Cadmium	103	104	P/P	80 - 120
2477640	Chromium	106	107	P/P	80 - 120
2477640	Cobalt	101	101	P/P	80 - 120
2477640	Copper	93.5	93.8	P/P	80 - 120
2477640	Lead	93.8	94.5	P/P	80 - 120
2477640	Manganese	104	105	P/P	80 - 120
2477640	Molybdenum	98.7	101	P/P	80 - 120
2477640	Nickel	98.4	97.8	P/P	80 - 120
2477640	Selenium	99.2	99.8	P/P	80 - 120
2477640	Silver	100	101	P/P	80 - 120
2477640	Thallium	95.6	97.0	P/P	80 - 120
2477657	Aluminum	94.4		P	80 - 120
2477657	Antimony	102		P	80 - 120
2477657	Arsenic	98.6		P	80 - 120
2477657	Barium	103		P	80 - 120
2477657	Beryllium	100		P	80 - 120
2477657	Boron	97.8		P	80 - 120
2477657	Cadmium	100		P	80 - 120
2477657	Chromium	104		P	80 - 120
2477657	Cobalt	100		P	80 - 120
2477657	Copper	96.1		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477657	Lead	94.6		P	80 - 120
2477657	Manganese	104		P	80 - 120
2477657	Molybdenum	98.4		P	80 - 120
2477657	Nickel	97.8		P	80 - 120
2477657	Selenium	98.5		P	80 - 120
2477657	Silver	99.7		P	80 - 120
2477657	Thallium	95.9		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477794	Chloride	101		P	90 - 110
2477797	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443667

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477794	Sulfate	102		P	90 - 110
2477797	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P443448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477795	Ammonia-N	96.6	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P443425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477777	Kjeldahl Nitrogen	93.3	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P443467

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477773	NO2NO3-N	92.3	94.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443442

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477766	Total-P	100	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477857	Total-P	105	110	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P443499

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477856	Fluoride	102	102	P/P	94 - 106

Reference Method: SM 5310 B-2014
Batch ID: P443681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2477773	Organic Carbon	101	102	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P443404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477910	Color (true)	1.67	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P443392

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477618	Turbidity	4.77	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P443435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477640	Calcium	2.03	Spike	P	0 - 20
2477640	Iron	1.83	Spike	P	0 - 20
2477640	Magnesium	2.15	Spike	P	0 - 20
2477640	Potassium	1.76	Spike	P	0 - 20
2477640	Sodium	2.06	Spike	P	0 - 20
2477640	Strontium	1.84	Spike	P	0 - 20
2477640	Tin	0.232	Spike	P	0 - 20
2477640	Titanium	0.603	Spike	P	0 - 20
2477640	Vanadium	0.0606	Spike	P	0 - 20
2477640	Zinc	0.446	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P443435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477640	Aluminum	0.869	Spike	P	0 - 20
2477640	Antimony	1.45	Spike	P	0 - 20
2477640	Arsenic	0.703	Spike	P	0 - 20
2477640	Barium	1.53	Spike	P	0 - 20
2477640	Beryllium	1.02	Spike	P	0 - 20
2477640	Boron	0.319	Spike	P	0 - 20
2477640	Cadmium	0.438	Spike	P	0 - 20
2477640	Chromium	0.488	Spike	P	0 - 20
2477640	Cobalt	0.0672	Spike	P	0 - 20
2477640	Copper	0.267	Spike	P	0 - 20
2477640	Lead	0.785	Spike	P	0 - 20
2477640	Manganese	1.14	Spike	P	0 - 20
2477640	Molybdenum	1.63	Spike	P	0 - 20
2477640	Nickel	0.683	Spike	P	0 - 20
2477640	Selenium	0.600	Spike	P	0 - 20
2477640	Silver	0.615	Spike	P	0 - 20
2477640	Thallium	1.38	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477794	Chloride	0.478	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P443667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477794	Sulfate	0.720	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P443448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477795	Ammonia-N	2.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P443425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477777	Kjeldahl Nitrogen	8.11	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P443467

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477773	NO2NO3-N	2.57	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477766	Total-P	2.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P443443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477857	Total-P	3.42	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P443496

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477856	Total Alkalinity	1.33	Sample	P	0 - 3.9

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2015
Batch ID: P443897

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477569	TDS	7.46	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P443499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477856	Fluoride	0.0	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2014
Batch ID: P443681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2477773	Organic Carbon	0.652	Spike	P	0 - 15

* 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: A125024

Included Lab Sample IDs: 2477772, 2477774, 2477775, 2477778

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105
Turbidity	99.5	100	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1

Run ID: A125031

Included Lab Sample IDs: 2477772, 2477774, 2477775, 2477778

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A125052

Included Lab Sample IDs: 2477773, 2477776, 2477777, 2477779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A125058

Included Lab Sample IDs: 2477787, 2477788

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.8	97.6	P/P	90 - 110
Antimony	98.3	99.1	P/P	90 - 110
Arsenic	95.2	94.8	P/P	90 - 110
Barium	98.0	98.2	P/P	90 - 110
Beryllium	98.0	97.1	P/P	90 - 110
Boron	96.9	92.9	P/P	90 - 110
Cadmium	98.1	98.7	P/P	90 - 110
Chromium	98.3	99.0	P/P	90 - 110
Cobalt	96.3	96.9	P/P	90 - 110
Copper	93.5	93.0	P/P	90 - 110
Lead	91.9	92.5	P/P	90 - 110
Manganese	98.5	100	P/P	90 - 110
Molybdenum	96.3	96.4	P/P	90 - 110
Nickel	93.5	94.0	P/P	90 - 110
Selenium	97.9	97.3	P/P	90 - 110
Silver	96.1	95.9	P/P	90 - 110
Thallium	96.8	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A125059

Included Lab Sample IDs: 2477779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	101	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A125060

Included Lab Sample IDs: 2477787, 2477788

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	101	P/P	90 - 110
Iron	102	100	P/P	90 - 110
Magnesium	103	101	P/P	90 - 110
Potassium	103	102	P/P	90 - 110
Sodium	97.9	97.2	P/P	90 - 110
Strontium	97.3	98.0	P/P	90 - 110
Tin	103	103	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	99.0	98.7	P/P	90 - 110
Zinc	98.1	98.3	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A125062

Included Lab Sample IDs: 2477772, 2477774, 2477775, 2477778

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	96.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A125062

Included Lab Sample IDs: 2477772, 2477774, 2477775, 2477778

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	103	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A125065

Included Lab Sample IDs: 2477773, 2477776, 2477777

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A125089

Included Lab Sample IDs: 2477773, 2477776, 2477777, 2477779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A125129

Included Lab Sample IDs: 2477772, 2477774, 2477775, 2477778

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2014
Run ID: A125132
Included Lab Sample IDs: 2477773, 2477776, 2477777, 2477779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	116	P/P	85 - 115

* 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	MS
			LCS	SMP	MS		
DEP SOP: NU-094-1	Color (true)	98.2				1.67	
	Color (true)	95.9					
EPA 180.1 Rev. 2.0	Turbidity	104				4.77	
EPA 200.7 Rev. 4.4	Calcium	102	99.5	114			2.03
	Iron	111	108	106	112		1.83
	Magnesium	113	107	104	114		2.15
	Potassium	104	103	101	108		1.76
	Sodium	104	102	98.4	103		2.06
	Strontium	96.4	95.9	94.1	99.9		1.84
	Tin	101	98.1	98.4	101		0.232
	Titanium	102	102	101	94.2		0.603
	Vanadium	99.0	98.0	98.1	99.9		0.0606
	Zinc	96.5	93.8	93.2	96.5		0.446
	Aluminum	98.6	96.9	97.8	94.4		0.869
	Antimony	102	103	104	102		1.45
	Arsenic	98.0	98.5	99.2	98.6		0.703
	Barium	102	101	102	103		1.53
EPA 200.8 Rev. 5.4	Beryllium	98.6	99.1	100	100		1.02
	Boron	99.6	101	101	97.8		0.319
	Cadmium	99.6	103	104	100		0.438
	Chromium	104	106	107	104		0.488
	Cobalt	101	101	101	100		0.0672
	Copper	96.9	93.5	93.8	96.1		0.267
	Lead	93.7	93.8	94.5	94.6		0.785
	Manganese	103	104	105	104		1.14
	Molybdenum	97.1	98.7	101	98.4		1.63
	Nickel	98.6	98.4	97.8	97.8		0.683
	Selenium	98.4	99.2	99.8	98.5		0.600
	Silver	99.9	100	101	99.7		0.615
	Thallium	94.1	95.6	97.0	95.9		1.38
	Chloride	104	101	99.5		0.478	
EPA 300.0 Rev. 2.1	Sulfate	106	102	101		0.720	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	96.6	99.0			2.32
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.2	93.3	104			8.11
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	92.3	94.8			2.57
EPA 365.1 Rev. 2.0	Total-P	105	100	104			2.24
	Total-P	105	105	110			3.42
SM 2320 B-2011	Total Alkalinity	103				1.33	
SM 2540 C-2015	TDS	95.2				7.46	
SM 2540 D-2015	TSS	96.8					
SM 4500-F- C-2011	Fluoride	101	102	102			0.0
SM 5310 B-2014	Organic Carbon	99.3	101	102			0.652

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2477772, 2477774, 2477775, 2477778
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2477772, 2477774, 2477775, 2477778
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2477787, 2477788
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2477787, 2477788
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2477772, 2477774, 2477775, 2477778

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2477772, 2477774, 2477775, 2477778
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2477773, 2477776, 2477777, 2477779
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2477773, 2477776, 2477777, 2477779
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2477773, 2477776, 2477777, 2477779
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2477773, 2477776, 2477777, 2477779
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2477772, 2477774, 2477775, 2477778
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2477787, 2477788
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2477772, 2477774, 2477775, 2477778
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2477772, 2477774, 2477775, 2477778
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2477772, 2477774, 2477775, 2477778
SM 5310 B-2014	Nonpurgeable Organic Carbon in aqueous matrices	2477773, 2477776, 2477777, 2477779

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	03/27/2024			03/27/2024 15:32	Jessica K Wilks	2477772, 2477774
	03/27/2024			03/27/2024 15:33	Jessica K Wilks	2477775
	03/27/2024			03/27/2024 15:34	Jessica K Wilks	2477778
EPA 180.1 Rev. 2.0	03/27/2024			03/27/2024 13:13	Chandler E Cox	2477772, 2477774
	03/27/2024			03/27/2024 13:14	Chandler E Cox	2477775
	03/27/2024			03/27/2024 13:16	Chandler E Cox	2477778
EPA 200.7 Rev. 4.4	03/27/2024	03/28/2024 11:25	George D Taylor	03/28/2024 20:34	Conrad Hartmann	2477787
	03/27/2024	03/28/2024 11:25	George D Taylor	03/28/2024 20:40	Conrad Hartmann	2477788
EPA 200.8 Rev. 5.4	03/27/2024	03/28/2024 11:25	George D Taylor	03/28/2024 22:17	Emily M Philpot	2477787
	03/27/2024	03/28/2024 11:25	George D Taylor	03/28/2024 22:27	Emily M Philpot	2477788
EPA 300.0 Rev. 2.1	03/27/2024			04/01/2024 19:46	Samantha L Bates	2477772
	03/27/2024			04/01/2024 20:02	Samantha L Bates	2477774
	03/27/2024			04/01/2024 20:17	Samantha L Bates	2477775
EPA 350.1 Rev. 2.0	03/27/2024			04/01/2024 20:32	Samantha L Bates	2477778
	03/27/2024			03/28/2024 13:54	Ping Hua	2477773
	03/27/2024			03/28/2024 13:55	Ping Hua	2477776
	03/27/2024			03/28/2024 13:56	Ping Hua	2477777
	03/27/2024			03/28/2024 13:58	Ping Hua	2477779
EPA 351.2 Rev. 2.0	03/27/2024	03/29/2024 12:42	Simonne.V. Calhoun	04/01/2024 11:30	Robyn Blevins	2477773
	03/27/2024	03/29/2024 12:42	Simonne.V. Calhoun	04/01/2024 11:31	Robyn Blevins	2477776
	03/27/2024	03/29/2024 12:42	Simonne.V. Calhoun	04/01/2024 11:33	Robyn Blevins	2477777
	03/27/2024	03/29/2024 12:42	Simonne.V. Calhoun	04/01/2024 11:38	Robyn Blevins	2477779
EPA 353.2 Rev. 2.0	03/27/2024			03/28/2024 13:02	Fadila Guebre	2477773
	03/27/2024			03/28/2024 13:08	Fadila Guebre	2477776
	03/27/2024			03/28/2024 13:09	Fadila Guebre	2477777
	03/27/2024			03/28/2024 13:10	Fadila Guebre	2477779
EPA 365.1 Rev. 2.0	03/27/2024	03/28/2024 13:40	Josephine W Gitau	03/29/2024 09:15	Elise M. Gillis	2477779
	03/27/2024	03/28/2024 13:40	Josephine W Gitau	03/29/2024 10:46	Elise M. Gillis	2477773
	03/27/2024	03/28/2024 13:40	Josephine W Gitau	03/29/2024 10:47	Elise M. Gillis	2477776
	03/27/2024	03/28/2024 13:40	Josephine W Gitau	03/29/2024 10:48	Elise M. Gillis	2477777
SM 2320 B-2011	03/27/2024			03/29/2024 05:49	Dale L. Simmons	2477772
	03/27/2024			03/29/2024 05:56	Dale L. Simmons	2477774
	03/27/2024			03/29/2024 06:04	Dale L. Simmons	2477775
	03/27/2024			03/29/2024 06:13	Dale L. Simmons	2477778
SM 2340 B-2011	03/27/2024			03/28/2024 20:34	Conrad Hartmann	2477787
	03/27/2024			03/28/2024 20:40	Conrad Hartmann	2477788
SM 2540 C-2015	03/27/2024			03/29/2024 15:27	Yijie Li	2477772, 2477774, 2477775, 2477778
SM 2540 D-2015	03/27/2024			03/29/2024 15:27	Yijie Li	2477772, 2477774, 2477775, 2477778
SM 4500-F- C-2011	03/27/2024			03/29/2024 05:49	Dale L. Simmons	2477772
	03/27/2024			03/29/2024 05:56	Dale L. Simmons	2477774

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500-F- C-2011	03/27/2024			03/29/2024 06:04	Dale L. Simmons	2477775
	03/27/2024			03/29/2024 06:13	Dale L. Simmons	2477778
SM 5310 B-2014	03/27/2024			04/02/2024 06:47	Jessica K Wilks	2477773
	03/27/2024			04/02/2024 07:52	Jessica K Wilks	2477776
	03/27/2024			04/02/2024 08:06	Jessica K Wilks	2477777
	03/27/2024			04/02/2024 08:21	Jessica K Wilks	2477779