

Chemical Analysis Report

CEN-DIST-2023-01-04-01

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

Event Description: **Florence/SJR/Second/Faulk**
Request ID: **RQ-2023-01-02-56**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 25-JAN-2023 12:04

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the 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: SECOND CREEK AT S.R. 520

Collection Date/Time: 01/03/2023 11:16

Field ID: G3CE0066

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2377960	DEP SOP: NU-094-1	Color (true)	130		PCU	P424126	
	EPA 180.1 Rev. 2.0	Turbidity	0.85	I	NTU	P424125	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P424401	
		Sulfate	1.5		mg SO4/L	P424404	
	SM 2320 B-2011	Total Alkalinity	86		mg CaCO3/L	P424275	
	SM 2540 C-2015	TDS	176		mg/L	P424662	
	SM 2540 D-2015	TSS	2	U	mg/L	P424518	
	SM 4500-F- C-2011	Fluoride	0.033	I	mg F/L	P424395	MS
2377961	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P424561	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P424385	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P424411	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P424191	
	SM 5310 B-2011	Organic Carbon	20		mg C/L	P424268	

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: Florence Lake @ Center

Collection Date/Time: 01/03/2023 12:05

Field ID: G3CE0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2377957	DEP SOP: NU-094-1	Color (true)	180	A	PCU	P424126	
	EPA 180.1 Rev. 2.0	Turbidity	2.3	A	NTU	P424125	
	EPA 300.0 Rev. 2.1	Chloride	270		mg Cl/L	P424401	
		Sulfate	61		mg SO4/L	P424404	
	SM 2320 B-2011	Total Alkalinity	81		mg CaCO3/L	P424275	
	SM 2540 C-2015	TDS	646		mg/L	P424662	
	SM 2540 D-2015	TSS	4	I	mg/L	P424518	
2377958	SM 4500-F- C-2011	Fluoride	0.13		mg F/L	P424395	MS
	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P424561	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P424385	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P424411	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P424191	
2377959	SM 5310 B-2011	Organic Carbon	24		mg C/L	P424268	
2377965	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P424112	
2377965	EPA 200.7 Rev. 4.4	Calcium	59.7		mg/L	P424148	
		Iron	580		ug/L	P424148	
		Magnesium	18.8		mg/L	P424148	
		Potassium	4.4		mg/L	P424148	
		Sodium	132		mg/L	P424148	
		Strontium	2.22E+03		ug/L	P424148	
		Tin	3.0	U	ug/L	P424148	
	EPA 200.8 Rev. 5.4	Titanium	0.91	I	ug/L	P424148	
		Vanadium	2.0	U	ug/L	P424148	
		Zinc	5.0	U	ug/L	P424148	
		Aluminum	38		ug/L	P424148	
		Antimony	0.11	I	ug/L	P424148	
		Arsenic	1.06		ug/L	P424148	
		Barium	35.6		ug/L	P424148	
		Beryllium	0.010	U	ug/L	P424148	
		Boron	35.6		ug/L	P424148	
		Cadmium	0.020	U	ug/L	P424148	
		Chromium	0.40	U	ug/L	P424148	
		Cobalt	0.214		ug/L	P424148	
		Copper	0.40	U	ug/L	P424148	
		Lead	0.33	I	ug/L	P424148	
		Manganese	7.69		ug/L	P424148	
		Molybdenum	1.98		ug/L	P424148	
		Nickel	0.50	U	ug/L	P424148	
		Selenium	0.20	U	ug/L	P424148	
		Silver	0.010	U	ug/L	P424148	
		Thallium	0.10	U	ug/L	P424148	
	SM 2340 B-2011	Hardness	226		mg/L	P424148	

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: P424126

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424125

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424148

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: P424148

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424401

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424404

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424561

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424411

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424191

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424112

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2320 B-2011
Batch ID: P424275

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

Reference Method: SM 2540 C-2015
Batch ID: P424662

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P424518

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P424395

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P424268

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: P424126

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424125

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424148

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	98.4		P	85 - 115
Iron	102		P	85 - 115
Magnesium	99.2		P	85 - 115
Potassium	101		P	85 - 115
Sodium	103		P	85 - 115
Strontium	103		P	85 - 115
Tin	97.4		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	92.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424148

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	103		P	85 - 115
Barium	105		P	85 - 115
Beryllium	96.7		P	85 - 115
Boron	101		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	99.5		P	85 - 115
Cobalt	100		P	85 - 115
Copper	101		P	85 - 115
Lead	95.1		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	100		P	85 - 115
Nickel	102		P	85 - 115
Selenium	102		P	85 - 115
Silver	104		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424401

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424404

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424561

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424411

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424191

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424112

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.9		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P424275

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.8		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P424662

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

Reference Method: SM 2540 D-2015
Batch ID: P424518

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	91.1		P	85 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P424395

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

Reference Method: SM 5310 B-2011
Batch ID: P424268

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P424148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377783	Calcium	92.6		P	80 - 120
2377783	Iron	104		P	80 - 120
2377783	Magnesium	103		P	80 - 120
2377783	Potassium	102		P	80 - 120
2377783	Sodium	104		P	80 - 120
2377783	Strontium	104		P	80 - 120
2377783	Tin	101		P	80 - 120
2377783	Titanium	107		P	80 - 120
2377783	Vanadium	107		P	80 - 120
2377783	Zinc	91.7		P	80 - 120
2378017	Calcium	94.3		P	80 - 120
2378017	Iron	102	102	P/P	80 - 120
2378017	Magnesium	98.4		P	80 - 120
2378017	Potassium	108	107	P/P	80 - 120
2378017	Sodium	103		P	80 - 120
2378017	Strontium	103	102	P/P	80 - 120
2378017	Tin	99.1	99.4	P/P	80 - 120
2378017	Titanium	104	105	P/P	80 - 120
2378017	Vanadium	105	106	P/P	80 - 120
2378017	Zinc	97.1	93.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P424148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377783	Aluminum	98.2		P	80 - 120
2377783	Antimony	105		P	80 - 120
2377783	Arsenic	103		P	80 - 120
2377783	Barium	102		P	80 - 120
2377783	Beryllium	97.6		P	80 - 120
2377783	Boron	97.9		P	80 - 120
2377783	Cadmium	103		P	80 - 120
2377783	Chromium	97.9		P	80 - 120
2377783	Cobalt	98.1		P	80 - 120
2377783	Copper	97.0		P	80 - 120
2377783	Lead	93.5		P	80 - 120
2377783	Manganese	101		P	80 - 120
2377783	Molybdenum	101		P	80 - 120
2377783	Nickel	100		P	80 - 120
2377783	Selenium	101		P	80 - 120
2377783	Silver	103		P	80 - 120
2377783	Thallium	103		P	80 - 120
2378017	Aluminum	98.5	99.8	P/P	80 - 120
2378017	Antimony	106	106	P/P	80 - 120
2378017	Arsenic	105	105	P/P	80 - 120
2378017	Barium	105	104	P/P	80 - 120
2378017	Beryllium	97.7	95.2	P/P	80 - 120
2378017	Boron	98.7	100	P/P	80 - 120
2378017	Cadmium	107	105	P/P	80 - 120
2378017	Chromium	101	102	P/P	80 - 120
2378017	Cobalt	100	101	P/P	80 - 120
2378017	Copper	99.8	101	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378017	Lead	94.8	95.3	P/P	80 - 120
2378017	Manganese	103	103	P/P	80 - 120
2378017	Molybdenum	105	105	P/P	80 - 120
2378017	Nickel	102	103	P/P	80 - 120
2378017	Selenium	103	101	P/P	80 - 120
2378017	Silver	103	103	P/P	80 - 120
2378017	Thallium	104	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377710	Chloride	98.4		P	90 - 110
2377892	Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377710	Sulfate	101		P	90 - 110
2377892	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424561

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377761	Ammonia-N	100	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378607	Kjeldahl Nitrogen	101	110	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377961	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378024	Total-P	109	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424112

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377763	O-Phosphate-P	98.6	99.1	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P424395

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378021	Fluoride	104	105	P/F	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P424268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378023	Organic Carbon	97.8	96.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P424126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377957	Color (true)	0.518	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377957	Turbidity	10.6	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378017	Calcium	0.727	Spike	P	0 - 20
2378017	Iron	0.466	Spike	P	0 - 20
2378017	Magnesium	0.709	Spike	P	0 - 20
2378017	Potassium	1.03	Spike	P	0 - 20
2378017	Sodium	0.413	Spike	P	0 - 20
2378017	Strontium	0.994	Spike	P	0 - 20
2378017	Tin	0.351	Spike	P	0 - 20
2378017	Titanium	1.46	Spike	P	0 - 20
2378017	Vanadium	1.40	Spike	P	0 - 20
2378017	Zinc	4.06	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378017	Aluminum	1.24	Spike	P	0 - 20
2378017	Antimony	0.169	Spike	P	0 - 20
2378017	Arsenic	0.132	Spike	P	0 - 20
2378017	Barium	0.690	Spike	P	0 - 20
2378017	Beryllium	2.52	Spike	P	0 - 20
2378017	Boron	1.13	Spike	P	0 - 20
2378017	Cadmium	2.56	Spike	P	0 - 20
2378017	Chromium	0.258	Spike	P	0 - 20
2378017	Cobalt	0.0588	Spike	P	0 - 20
2378017	Copper	1.38	Spike	P	0 - 20
2378017	Lead	0.556	Spike	P	0 - 20
2378017	Manganese	0.171	Spike	P	0 - 20
2378017	Molybdenum	0.179	Spike	P	0 - 20
2378017	Nickel	0.864	Spike	P	0 - 20
2378017	Selenium	1.35	Spike	P	0 - 20
2378017	Silver	0.348	Spike	P	0 - 20
2378017	Thallium	1.10	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377710	Chloride	0.152	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377710	Sulfate	0.790	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424561

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377761	Ammonia-N	1.41	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378607	Kjeldahl Nitrogen	5.70	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377961	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378024	Total-P	0.784	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424112

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377763	O-Phosphate-P	0.506	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P424275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378370	Total Alkalinity	0.0946	Sample	P	0 - 3.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-2015
Batch ID: P424662

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378463	TDS	4.76	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P424395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378021	Fluoride	1.54	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P424268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378023	Organic Carbon	1.29	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A116725

Included Lab Sample IDs: 2377959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	98.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A116731

Included Lab Sample IDs: 2377957, 2377960

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

Reference Method: DEP SOP: NU-094-1

Run ID: A116732

Included Lab Sample IDs: 2377957, 2377960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	102	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A116794

Included Lab Sample IDs: 2377958, 2377961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.7	98.0	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A116795

Included Lab Sample IDs: 2377957, 2377960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.9	98.7	P/P	90 - 110
Total Alkalinity	98.7	94.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A116808

Included Lab Sample IDs: 2377958, 2377961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A116833

Included Lab Sample IDs: 2377957, 2377960

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

Reference Method: SM 4500-F- C-2011

Run ID: A116836

Included Lab Sample IDs: 2377957, 2377960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 4500-F- C-2011

Run ID: A116836

Included Lab Sample IDs: 2377957, 2377960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A116841

Included Lab Sample IDs: 2377958, 2377961

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116902

Included Lab Sample IDs: 2377958, 2377961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A116926

Included Lab Sample IDs: 2377958, 2377961

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A116978

Included Lab Sample IDs: 2377965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.3	96.8	P/P	90 - 110
Iron	103	99.7	P/P	90 - 110
Magnesium	102	99.4	P/P	90 - 110
Potassium	105	103	P/P	90 - 110
Sodium	105	103	P/P	90 - 110
Strontium	106	102	P/P	90 - 110
Tin	98.4	95.4	P/P	90 - 110
Titanium	106	103	P/P	90 - 110
Vanadium	107	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A116990

Included Lab Sample IDs: 2377965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	92.6	95.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116999

Included Lab Sample IDs: 2377965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.3	97.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116999

Included Lab Sample IDs: 2377965

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	103	103	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Barium	101	99.8	P/P	90 - 110
Beryllium	98.6	98.5	P/P	90 - 110
Boron	95.8	95.4	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Chromium	98.0	97.5	P/P	90 - 110
Cobalt	98.0	95.2	P/P	90 - 110
Copper	99.5	97.1	P/P	90 - 110
Lead	93.4	92.6	P/P	90 - 110
Manganese	100	99.3	P/P	90 - 110
Molybdenum	98.6	98.0	P/P	90 - 110
Nickel	100	97.5	P/P	90 - 110
Selenium	102	101	P/P	90 - 110
Silver	102	101	P/P	90 - 110
Thallium	101	101	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision	
						LCS	SMP MS
DEP SOP: NU-094-1	Color (true)	98.9					0.518
EPA 180.1 Rev. 2.0	Turbidity	100					10.6
EPA 200.7 Rev. 4.4	Calcium	98.4	92.6	94.3			0.727
	Iron	102	104	102	102		0.466
	Magnesium	99.2	103	98.4			0.709
	Potassium	101	102	108	107		1.03
	Sodium	103	104	103			0.413
	Strontium	103	104	103	102		0.994
	Tin	97.4	101	99.1	99.4		0.351
	Titanium	103	107	104	105		1.46
	Vanadium	102	107	105	106		1.40
	Zinc	92.3	91.7	97.1	93.2		4.06
EPA 200.8 Rev. 5.4	Aluminum	101	98.5	99.8	98.2		1.24
	Antimony	105	106	106	105		0.169
	Arsenic	103	105	105	103		0.132
	Barium	105	105	104	102		0.690
	Beryllium	96.7	97.7	95.2	97.6		2.52
	Boron	101	98.7	100	97.9		1.13
	Cadmium	104	107	105	103		2.56
	Chromium	99.5	101	102	97.9		0.258
	Cobalt	100	100	101	98.1		0.0588
	Copper	101	99.8	101	97.0		1.38
	Lead	95.1	94.8	95.3	93.5		0.556
	Manganese	101	103	103	101		0.171
	Molybdenum	100	105	105	101		0.179
	Nickel	102	102	103	100		0.864
	Selenium	102	103	101	101		1.35
	Silver	104	103	103	103		0.348
	Thallium	103	104	105	103		1.10
EPA 300.0 Rev. 2.1	Chloride	102	98.4	98.2			0.152
	Sulfate	103	101	101			0.790
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	98.6			1.41
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.0	101	110			5.70
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	108	109	108			0.784
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	98.6	99.1			0.506
SM 2320 B-2011	Total Alkalinity	96.8					0.0946
SM 2540 C-2015	TDS	102					4.76
SM 2540 D-2015	TSS	91.1					
SM 4500-F- C-2011	Fluoride	100	104	105			1.54
SM 5310 B-2011	Organic Carbon	95.2	97.8	96.6			1.29

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2377957, 2377960
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2377957, 2377960
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2377965
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2377965
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2377957, 2377960
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2377957, 2377960

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2377958, 2377961
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2377958, 2377961
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2377958, 2377961
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2377958, 2377961
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2377959
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2377957, 2377960
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2377965
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2377957, 2377960
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2377957, 2377960
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2377957, 2377960
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2377958, 2377961

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	01/04/2023			01/04/2023 15:39	Alexis Price	2377957, 2377960
EPA 180.1 Rev. 2.0	01/04/2023			01/04/2023 14:23	Chandler E Cox	2377957
	01/04/2023			01/04/2023 14:26	Chandler E Cox	2377960
EPA 200.7 Rev. 4.4	01/04/2023	01/05/2023 11:50	George D Taylor	01/19/2023 01:07	McKinley C Carter	2377965
	01/04/2023	01/05/2023 11:50	George D Taylor	01/20/2023 01:52	McKinley C Carter	2377965
EPA 200.8 Rev. 5.4	01/04/2023	01/05/2023 11:50	George D Taylor	01/19/2023 20:05	Emily M Philpot	2377965
EPA 300.0 Rev. 2.1	01/04/2023			01/11/2023 02:19	Anna M. Plaviak	2377957
	01/04/2023			01/11/2023 02:34	Anna M. Plaviak	2377960
EPA 350.1 Rev. 2.0	01/04/2023			01/13/2023 11:58	Ping Hua	2377958
	01/04/2023			01/13/2023 11:59	Ping Hua	2377961
EPA 351.2 Rev. 2.0	01/04/2023	01/12/2023 12:15	Samantha L Bates	01/17/2023 10:46	Samantha L Bates	2377958
	01/04/2023	01/12/2023 12:15	Samantha L Bates	01/17/2023 10:48	Samantha L Bates	2377961
EPA 353.2 Rev. 2.0	01/04/2023			01/11/2023 10:18	Beverly Y. Sanders	2377961
	01/04/2023			01/11/2023 10:24	Beverly Y. Sanders	2377958
EPA 365.1 Rev. 2.0	01/04/2023	01/06/2023 13:35	Adam P Silver	01/09/2023 14:38	James L Waggeberby	2377958
	01/04/2023	01/06/2023 13:35	Adam P Silver	01/09/2023 14:39	James L Waggeberby	2377961
EPA 365.1 Rev. 2.0 dissolved	01/04/2023			01/04/2023 14:22	Elise M. Gillis	2377959
SM 2320 B-2011	01/04/2023			01/07/2023 07:47	Dale L. Simmons	2377960
	01/04/2023			01/07/2023 10:12	Dale L. Simmons	2377957
SM 2340 B-2011	01/04/2023			01/19/2023 01:07	McKinley C Carter	2377965
SM 2540 C-2015	01/04/2023			01/09/2023 16:29	Yijie Li	2377957, 2377960
SM 2540 D-2015	01/04/2023			01/09/2023 16:29	Yijie Li	2377957, 2377960
SM 4500-F- C-2011	01/04/2023			01/10/2023 22:03	Dale L. Simmons	2377960
	01/04/2023			01/10/2023 22:24	Dale L. Simmons	2377957
SM 5310 B-2011	01/04/2023			01/06/2023 17:22	Elise M. Gillis	2377958
	01/04/2023			01/06/2023 17:36	Elise M. Gillis	2377961