

Chemical Analysis Report

CEN-DIST-2023-07-12-03

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

Event Description: **Run 4**
Request ID: **RQ-2023-07-10-15**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 26-JUL-2023 08:37



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: FOX LAKE AT CENTER OF WEST LOBE

Collection Date/Time: 07/11/2023 11:39

Field ID: G3CE0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2423317	DEP SOP: NU-094-1	Color (true)	250		PCU	P432371	
	EPA 180.1 Rev. 2.0	Turbidity	5.7	A	NTU	P432381	
	EPA 300.0 Rev. 2.1	Chloride	170		mg Cl/L	P432487	
		Sulfate	25		mg SO4/L	P432490	
	SM 2320 B-2011	Total Alkalinity	26		mg CaCO3/L	P432714	
	SM 2540 C-2015	TDS	388		mg/L	P432926	
	SM 2540 D-2015	TSS	4	I	mg/L	P432927	
	SM 4500-F- C-2011	Fluoride	0.046	I	mg F/L	P432496	
2423318	EPA 350.1 Rev. 2.0	Ammonia-N	0.19		mg N/L	P432569	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P432658	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P432503	
	EPA 365.1 Rev. 2.0	Total-P	0.094		mg P/L	P432509	
	SM 5310 B-2011	Organic Carbon	22		mg C/L	P432536	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

Sample Location: ROBERTS BRANCH AT FORT CHRISTMAS RD N **Collection Date/Time: 07/11/2023 12:41**

Field ID: G3CE0065

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2423336	EPA 200.7 Rev. 4.4	Calcium	13.1		mg/L	P432417	
		Iron	760		ug/L	P432417	
		Magnesium	1.37		mg/L	P432417	
		Potassium	0.93	I	mg/L	P432417	
		Sodium	9.5		mg/L	P432417	
		Strontium	43.3		ug/L	P432417	
		Tin	4.2	I	ug/L	P432417	
		Titanium	2.4	I	ug/L	P432417	
		Vanadium	2.0	U	ug/L	P432417	
		Zinc	5.0	U	ug/L	P432417	
	EPA 200.8 Rev. 5.4	Aluminum	351		ug/L	P432417	
		Antimony	0.082	I	ug/L	P432417	
		Arsenic	1.11		ug/L	P432417	
		Barium	11.6		ug/L	P432417	
		Beryllium	0.033	I	ug/L	P432417	
		Boron	26.0		ug/L	P432417	
		Cadmium	0.020	U	ug/L	P432417	
		Chromium	0.75	I	ug/L	P432417	
		Cobalt	0.097		ug/L	P432417	
		Copper	0.87		ug/L	P432417	
		Lead	0.50		ug/L	P432417	
		Manganese	5.91		ug/L	P432417	
		Molybdenum	0.21	I	ug/L	P432417	
		Nickel	0.50	U	ug/L	P432417	
		Selenium	0.20	U	ug/L	P432417	
		Silver	0.010	U	ug/L	P432512	
		Thallium	0.10	U	ug/L	P432417	
	SM 2340 B-2011	Hardness	38.4		mg/L	P432417	

Sample Location: CORNER LAKE AT CENTER

Collection Date/Time: 07/11/2023 13:31

Field ID: G2CE0284

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2423337	EPA 200.7 Rev. 4.4	Calcium	4.03		mg/L	P432417	
		Iron	96	I	ug/L	P432417	
		Magnesium	1.57		mg/L	P432417	
		Potassium	1.7		mg/L	P432417	
		Sodium	9.6		mg/L	P432417	
		Strontium	22.9		ug/L	P432417	
		Tin	3.0	U	ug/L	P432417	
		Titanium	0.75	U	ug/L	P432417	
		Vanadium	2.0	U	ug/L	P432417	
		Zinc	5.0	U	ug/L	P432417	
	EPA 200.8 Rev. 5.4	Aluminum	77		ug/L	P432417	
		Antimony	0.059	I	ug/L	P432417	
		Arsenic	0.53		ug/L	P432417	
		Barium	10.5		ug/L	P432417	
		Beryllium	0.010	U	ug/L	P432417	
		Boron	24.3		ug/L	P432417	
		Cadmium	0.020	U	ug/L	P432417	
		Chromium	0.40	U	ug/L	P432417	
		Cobalt	0.028	I	ug/L	P432417	
		Copper	1.22		ug/L	P432417	
		Lead	0.20	U	ug/L	P432417	
		Manganese	6.80		ug/L	P432417	
		Molybdenum	0.15	U	ug/L	P432417	
		Nickel	0.50	U	ug/L	P432417	
		Selenium	0.20	U	ug/L	P432417	
		Silver	0.010	U	ug/L	P432512	
		Thallium	0.10	U	ug/L	P432417	
	SM 2340 B-2011	Hardness	16.5		mg/L	P432417	

Sample Location: UNNAMED BRANCH AT BRIDGEWAY RD

Collection Date/Time: 07/11/2023 14:22

Field ID: G2CE0245

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2423319	DEP SOP: NU-094-1	Color (true)	62		PCU	P432371	
	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P432381	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P432487	
		Sulfate	4.6		mg SO4/L	P432490	
	SM 2320 B-2011	Total Alkalinity	48		mg CaCO3/L	P432714	
	SM 2540 C-2015	TDS	113		mg/L	P432926	
	SM 2540 D-2015	TSS	4	I	mg/L	P432927	
	SM 4500-F- C-2011	Fluoride	0.063	I	mg F/L	P432496	
2423320	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P432569	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P432658	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.047		mg N/L	P432503	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P432509	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P432536	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P432371

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P432381

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P432417

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: P432417

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
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432512

Component	Result	Code	Units
Silver	0.010	U	ug/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P432487

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P432490

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432569

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432658

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432503

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432509

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

Reference Method: SM 2320 B-2011
Batch ID: P432714

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

Reference Method: SM 2540 C-2015
Batch ID: P432926

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P432927

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P432496

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P432536

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: P432371

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: P432381

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P432417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	106		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Strontium	99.5		P	85 - 115
Tin	101		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.8		P	85 - 115
Zinc	98.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.1		P	85 - 115
Antimony	98.2		P	85 - 115
Arsenic	99.6		P	85 - 115
Barium	99.9		P	85 - 115
Beryllium	98.0		P	85 - 115
Boron	98.8		P	85 - 115
Cadmium	96.9		P	85 - 115
Chromium	95.0		P	85 - 115
Cobalt	97.1		P	85 - 115
Copper	97.9		P	85 - 115
Lead	90.5		P	85 - 115
Manganese	96.1		P	85 - 115
Molybdenum	96.4		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	99.3		P	85 - 115
Thallium	96.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432512

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P432487

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P432490

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432569

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432658

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432503

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: P432509

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

Reference Method: SM 2320 B-2011
Batch ID: P432714

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.0		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P432926

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

Reference Method: SM 2540 D-2015
Batch ID: P432927

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	93.3		P	85 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P432496

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

Reference Method: SM 5310 B-2011
Batch ID: P432536

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P432417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422230	Calcium	100		P	80 - 120
2422230	Iron	106	106	P/P	80 - 120
2422230	Magnesium	103	103	P/P	80 - 120
2422230	Potassium	101	100	P/P	80 - 120
2422230	Sodium	101	99.2	P/P	80 - 120
2422230	Strontium	99.2	98.7	P/P	80 - 120
2422230	Tin	99.2	102	P/P	80 - 120
2422230	Titanium	102	104	P/P	80 - 120
2422230	Vanadium	101	103	P/P	80 - 120
2422230	Zinc	95.3	96.2	P/P	80 - 120
2423337	Calcium	104		P	80 - 120
2423337	Iron	106		P	80 - 120
2423337	Magnesium	104		P	80 - 120
2423337	Potassium	102		P	80 - 120
2423337	Sodium	99.8		P	80 - 120
2423337	Strontium	99.8		P	80 - 120
2423337	Tin	100		P	80 - 120
2423337	Titanium	101		P	80 - 120
2423337	Vanadium	100		P	80 - 120
2423337	Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P432417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422230	Aluminum	99.8	99.8	P/P	80 - 120
2422230	Antimony	101	102	P/P	80 - 120
2422230	Arsenic	101	100	P/P	80 - 120
2422230	Barium	103	103	P/P	80 - 120
2422230	Beryllium	96.4	95.8	P/P	80 - 120
2422230	Boron	101	102	P/P	80 - 120
2422230	Cadmium	100	102	P/P	80 - 120
2422230	Chromium	97.1	97.3	P/P	80 - 120
2422230	Cobalt	95.4	95.4	P/P	80 - 120
2422230	Copper	94.8	95.3	P/P	80 - 120
2422230	Lead	92.0	92.3	P/P	80 - 120
2422230	Manganese	97.9	98.1	P/P	80 - 120
2422230	Molybdenum	99.9	99.6	P/P	80 - 120
2422230	Nickel	97.3	97.1	P/P	80 - 120
2422230	Selenium	102	99.0	P/P	80 - 120
2422230	Thallium	100	101	P/P	80 - 120
2423337	Aluminum	99.7		P	80 - 120
2423337	Antimony	99.9		P	80 - 120
2423337	Arsenic	98.8		P	80 - 120
2423337	Barium	101		P	80 - 120
2423337	Beryllium	94.1		P	80 - 120
2423337	Boron	102		P	80 - 120
2423337	Cadmium	102		P	80 - 120
2423337	Chromium	98.4		P	80 - 120
2423337	Cobalt	95.7		P	80 - 120
2423337	Copper	98.0		P	80 - 120
2423337	Lead	92.6		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423337	Manganese	98.7		P	80 - 120
2423337	Molybdenum	99.9		P	80 - 120
2423337	Nickel	97.9		P	80 - 120
2423337	Selenium	98.3		P	80 - 120
2423337	Thallium	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421707	Silver	99.3	106	P/P	80 - 120
2423336	Silver	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P432487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422818	Chloride	101		P	90 - 110
2423168	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P432490

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422818	Sulfate	99.8		P	90 - 110
2423168	Sulfate	94.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423307	Ammonia-N	96.2	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432658

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423308	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432503

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423308	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432509

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423320	Total-P	103	103	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P432496

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422819	Fluoride	104	104	P/P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P432536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423320	Organic Carbon	95.2	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P432371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423306	Color (true)	2.22	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P432381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423317	Turbidity	3.15	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P432417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422230	Calcium	0.620	Spike	P	0 - 20
2422230	Iron	0.337	Spike	P	0 - 20
2422230	Magnesium	0.163	Spike	P	0 - 20
2422230	Potassium	0.992	Spike	P	0 - 20
2422230	Sodium	0.886	Spike	P	0 - 20
2422230	Strontium	0.479	Spike	P	0 - 20
2422230	Tin	2.37	Spike	P	0 - 20
2422230	Titanium	1.56	Spike	P	0 - 20
2422230	Vanadium	1.38	Spike	P	0 - 20
2422230	Zinc	0.939	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422230	Aluminum	0.0107	Spike	P	0 - 20
2422230	Antimony	0.687	Spike	P	0 - 20
2422230	Arsenic	0.464	Spike	P	0 - 20
2422230	Barium	0.375	Spike	P	0 - 20
2422230	Beryllium	0.565	Spike	P	0 - 20
2422230	Boron	0.247	Spike	P	0 - 20
2422230	Cadmium	1.58	Spike	P	0 - 20
2422230	Chromium	0.227	Spike	P	0 - 20
2422230	Cobalt	0.0555	Spike	P	0 - 20
2422230	Copper	0.430	Spike	P	0 - 20
2422230	Lead	0.362	Spike	P	0 - 20
2422230	Manganese	0.167	Spike	P	0 - 20
2422230	Molybdenum	0.247	Spike	P	0 - 20
2422230	Nickel	0.262	Spike	P	0 - 20
2422230	Selenium	2.76	Spike	P	0 - 20
2422230	Thallium	0.512	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P432512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421707	Silver	6.34	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P432487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422818	Chloride	0.0903	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423307	Ammonia-N	0.979	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432658

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423308	Kjeldahl Nitrogen	0.615	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432503

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423308	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432509

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423320	Total-P	0.299	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P432714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422819	Total Alkalinity	0.0853	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P432926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422814	TDS	6.38	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P432496

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422819	Fluoride	0.0	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P432536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423320	Organic Carbon	0.790	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A120300

Included Lab Sample IDs: 2423317, 2423319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A120325

Included Lab Sample IDs: 2423317, 2423319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 110
Color (true)	103	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A120327

Included Lab Sample IDs: 2423317, 2423319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	100	P/P	95 - 105

Reference Method: SM 4500-F- C-2011

Run ID: A120384

Included Lab Sample IDs: 2423317, 2423319

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120388

Included Lab Sample IDs: 2423318, 2423320

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A120407

Included Lab Sample IDs: 2423336, 2423337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	99.7	P/P	90 - 110
Antimony	98.8	97.7	P/P	90 - 110
Arsenic	98.9	97.1	P/P	90 - 110
Barium	99.4	98.9	P/P	90 - 110
Beryllium	96.4	95.3	P/P	90 - 110
Boron	98.9	96.7	P/P	90 - 110
Cadmium	99.1	99.4	P/P	90 - 110
Chromium	99.1	99.0	P/P	90 - 110
Cobalt	96.1	94.6	P/P	90 - 110
Copper	97.8	95.9	P/P	90 - 110
Lead	91.2	90.7	P/P	90 - 110
Manganese	101	100	P/P	90 - 110
Molybdenum	98.5	97.5	P/P	90 - 110
Nickel	97.9	95.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A120407

Included Lab Sample IDs: 2423336, 2423337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	99.6	98.3	P/P	90 - 110
Thallium	98.8	98.5	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A120408

Included Lab Sample IDs: 2423318, 2423320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.9	98.3	P/P	90 - 110
Organic Carbon	98.3	98.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A120414

Included Lab Sample IDs: 2423336, 2423337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	103	P/P	90 - 110
Iron	103	105	P/P	90 - 110
Magnesium	102	104	P/P	90 - 110
Potassium	99.8	102	P/P	90 - 110
Sodium	97.7	101	P/P	90 - 110
Strontium	100	101	P/P	90 - 110
Tin	102	100	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	100	99.7	P/P	90 - 110
Zinc	100	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120423

Included Lab Sample IDs: 2423318

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120426

Included Lab Sample IDs: 2423318, 2423320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120430

Included Lab Sample IDs: 2423320

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A120441

Included Lab Sample IDs: 2423336, 2423337

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	97.8	99.0	P/P	90 - 110
Silver	99.0	99.4	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A120497

Included Lab Sample IDs: 2423317, 2423319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.1	93.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120555

Included Lab Sample IDs: 2423318, 2423320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	110	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				2.22	
EPA 180.1 Rev. 2.0	Turbidity	100				3.15	
EPA 200.7 Rev. 4.4	Calcium	103	100	104			0.620
	Iron	106	106	106	106		0.337
	Magnesium	106	103	103	104		0.163
	Potassium	101	101	100	102		0.992
	Sodium	102	101	99.2	99.8		0.886
	Strontium	99.5	99.2	98.7	99.8		0.479
	Tin	101	99.2	102	100		2.37
	Titanium	101	102	104	101		1.56
	Vanadium	99.8	101	103	100		1.38
	Zinc	98.3	95.3	96.2	100		0.939
EPA 200.8 Rev. 5.4	Aluminum	99.1	99.8	99.8	99.7		0.0107
	Antimony	98.2	101	102	99.9		0.687
	Arsenic	99.6	101	100	98.8		0.464
	Barium	99.9	103	103	101		0.375
	Beryllium	98.0	96.4	95.8	94.1		0.565
	Boron	98.8	101	102	102		0.247
	Cadmium	96.9	100	102	102		1.58
	Chromium	95.0	97.1	97.3	98.4		0.227
	Cobalt	97.1	95.4	95.4	95.7		0.0555
	Copper	97.9	94.8	95.3	98.0		0.430
	Lead	90.5	92.0	92.3	92.6		0.362
	Manganese	96.1	97.9	98.1	98.7		0.167
	Molybdenum	96.4	99.9	99.6	99.9		0.247
	Nickel	98.7	97.3	97.1	97.9		0.262
	Selenium	99.3	102	99.0	98.3		2.76
	Silver	98.3	99.3	106	103		6.34
	Thallium	96.2	100	101	100		0.512
EPA 300.0 Rev. 2.1	Chloride	103	101	102		0.0903	
	Sulfate	98.9	99.8	94.6			
EPA 350.1 Rev. 2.0	Ammonia-N	96.0	96.2	98.0			0.979
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	103	102			0.615
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	101	103	103			0.299
SM 2320 B-2011	Total Alkalinity	97.0				0.0853	
SM 2540 C-2015	TDS	96.0				6.38	
SM 2540 D-2015	TSS	93.3					
SM 4500-F- C-2011	Fluoride	102	104	104			0.0
SM 5310 B-2011	Organic Carbon	96.4	95.2	96.4			0.790

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2423317, 2423319
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2423317, 2423319
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2423336, 2423337
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2423336, 2423337
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2423317, 2423319
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2423317, 2423319
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2423318, 2423320

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2423318, 2423320
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2423318, 2423320
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2423318, 2423320
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2423317, 2423319
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2423336, 2423337
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2423317, 2423319
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2423317, 2423319
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2423317, 2423319
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2423318, 2423320

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	07/12/2023			07/12/2023 15:21	Alexis Price	2423319
	07/12/2023			07/12/2023 15:38	Alexis Price	2423317
EPA 180.1 Rev. 2.0	07/12/2023			07/12/2023 13:34	Alexis Price	2423317
	07/12/2023			07/12/2023 13:35	Alexis Price	2423319
EPA 200.7 Rev. 4.4	07/12/2023	07/13/2023 12:25	George D Taylor	07/14/2023 17:08	Samatha Luckman	2423336
	07/12/2023	07/13/2023 12:25	George D Taylor	07/14/2023 17:16	Samatha Luckman	2423337
EPA 200.8 Rev. 5.4	07/12/2023	07/13/2023 12:25	George D Taylor	07/14/2023 20:38	Emily M Philpot	2423336
	07/12/2023	07/13/2023 12:25	George D Taylor	07/14/2023 20:48	Emily M Philpot	2423337
	07/12/2023	07/14/2023 12:55	George D Taylor	07/17/2023 15:06	Conrad Hartmann	2423336
	07/12/2023	07/14/2023 12:55	George D Taylor	07/17/2023 16:12	Conrad Hartmann	2423337
EPA 300.0 Rev. 2.1	07/12/2023			07/14/2023 08:13	James L Waggeberby	2423317
	07/12/2023			07/14/2023 08:28	James L Waggeberby	2423319
EPA 350.1 Rev. 2.0	07/12/2023			07/17/2023 12:52	Khloe J Berg	2423318
	07/12/2023			07/17/2023 12:53	Khloe J Berg	2423320
EPA 351.2 Rev. 2.0	07/12/2023	07/19/2023 08:44	Samantha L Bates	07/21/2023 13:39	Samantha L Bates	2423318
	07/12/2023	07/19/2023 08:44	Samantha L Bates	07/21/2023 13:41	Samantha L Bates	2423320
EPA 353.2 Rev. 2.0	07/12/2023			07/14/2023 11:25	Beverly Y. Sanders	2423318
	07/12/2023			07/14/2023 11:26	Beverly Y. Sanders	2423320
EPA 365.1 Rev. 2.0	07/12/2023	07/14/2023 14:05	Adam P Silver	07/17/2023 12:45	Chandler E Cox	2423318
	07/12/2023	07/14/2023 14:05	Adam P Silver	07/17/2023 13:44	Chandler E Cox	2423320
SM 2320 B-2011	07/12/2023			07/18/2023 17:27	Dale L. Simmons	2423317
	07/12/2023			07/18/2023 17:37	Dale L. Simmons	2423319
SM 2340 B-2011	07/12/2023			07/14/2023 17:08	Samatha Luckman	2423336
	07/12/2023			07/14/2023 17:16	Samatha Luckman	2423337
SM 2540 C-2015	07/12/2023			07/17/2023 15:46	Yijie Li	2423317, 2423319
SM 2540 D-2015	07/12/2023			07/17/2023 15:46	Yijie Li	2423317, 2423319
SM 4500-F- C-2011	07/12/2023			07/14/2023 09:06	Dale L. Simmons	2423317
	07/12/2023			07/14/2023 09:20	Dale L. Simmons	2423319
SM 5310 B-2011	07/12/2023			07/15/2023 02:55	Elise M. Gillis	2423320
	07/12/2023			07/15/2023 07:32	Elise M. Gillis	2423318