

Chemical Analysis Report

CEN-DIST-2023-05-10-02

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

Event Description: **Run 4**
Request ID: **RQ-2023-05-08-25**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 30-MAY-2023 14:01



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: UNNAMED BRANCH AT BRIDGEWAY RD

Collection Date/Time: 05/09/2023 10:04

Field ID: G2CE0245

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2408663	DEP SOP: NU-094-1	Color (true)	34		PCU	P429682	
	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P429689	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P430017	
		Sulfate	6.7		mg SO4/L	P430020	
	SM 2320 B-2011	Total Alkalinity	64		mg CaCO3/L	P430117	
	SM 2540 C-2015	TDS	121		mg/L	P430183	
	SM 2540 D-2015	TSS	2	U	mg/L	P430027	
	SM 4500-F- C-2011	Fluoride	0.067	I	mg F/L	P430285	
2408664	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P430074	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P429954	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.066		mg N/L	P429985	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P429803	
	SM 5310 B-2011	Organic Carbon	9.3		mg C/L	P429896	

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: CORNER LAKE AT CENTER

Collection Date/Time: 05/09/2023 13:04

Field ID: G2CE0284

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2408675	EPA 200.7 Rev. 4.4	Calcium	3.92		mg/L	P429734	
		Iron	110	I	ug/L	P429734	
		Magnesium	1.41		mg/L	P429734	
		Potassium	1.7		mg/L	P429734	
		Sodium	9.6		mg/L	P429734	
		Strontium	22.9		ug/L	P429734	
		Tin	3.0	U	ug/L	P429734	
		Titanium	0.75	U	ug/L	P429734	
		Vanadium	2.0	U	ug/L	P429734	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P429734	
		Aluminum	116		ug/L	P429734	
		Antimony	0.065	I	ug/L	P429734	
		Arsenic	0.52		ug/L	P429734	
		Barium	12.1		ug/L	P429734	
		Beryllium	0.012	I	ug/L	P429734	
		Boron	24.2		ug/L	P429734	
		Cadmium	0.020	U	ug/L	P429734	
		Chromium	0.40	U	ug/L	P429734	
		Cobalt	0.033	I	ug/L	P429734	
		Copper	1.18		ug/L	P429734	
		Lead	0.22	I	ug/L	P429734	
		Manganese	6.23		ug/L	P429734	
		Molybdenum	0.15	U	ug/L	P429734	
		Nickel	0.50	U	ug/L	P429734	
		Selenium	0.20	U	ug/L	P429734	
		Silver	0.010	U	ug/L	P429734	
		Thallium	0.10	U	ug/L	P429734	
		Hardness	15.6		mg/L	P429734	

SM 2340 B-2011

Sample Location: FOX LAKE AT CENTER OF WEST LOBE

Collection Date/Time: 05/09/2023 11:16

Field ID: G3CE0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2408661	DEP SOP: NU-094-1	Color (true)	210		PCU	P429682	
	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P429689	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P430017	
		Sulfate	31		mg SO4/L	P430020	
	SM 2320 B-2011	Total Alkalinity	17		mg CaCO3/L	P430117	
	SM 2540 C-2015	TDS	349		mg/L	P430183	
	SM 2540 D-2015	TSS	2	I	mg/L	P430027	
	SM 4500-F- C-2011	Fluoride	0.035	I	mg F/L	P429887	
2408662	EPA 350.1 Rev. 2.0	Ammonia-N	0.032		mg N/L	P430074	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P429954	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.070		mg N/L	P429985	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P429803	
	SM 5310 B-2011	Organic Carbon	21		mg C/L	P429896	

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: 05/09/2023 12:10**

Field ID: G3CE0065

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2408676	EPA 200.7 Rev. 4.4	Calcium	16.1		mg/L	P429734	
		Iron	430		ug/L	P429734	
		Magnesium	2.04		mg/L	P429734	
		Potassium	0.52	I	mg/L	P429734	
		Sodium	11.9		mg/L	P429734	
		Strontium	54.9		ug/L	P429734	
		Tin	3.0	U	ug/L	P429734	
		Titanium	1.7	I	ug/L	P429734	
		Vanadium	2.0	U	ug/L	P429734	
		Zinc	7.0	I	ug/L	P429734	
	EPA 200.8 Rev. 5.4	Aluminum	287		ug/L	P429734	
		Antimony	0.069	I	ug/L	P429734	
		Arsenic	0.74		ug/L	P429734	
		Barium	5.18		ug/L	P429734	
		Beryllium	0.022	I	ug/L	P429734	
		Boron	30.8		ug/L	P429734	
		Cadmium	0.020	U	ug/L	P429734	
		Chromium	0.59	I	ug/L	P429734	
		Cobalt	0.094		ug/L	P429734	
		Copper	0.63	I	ug/L	P429734	
		Lead	0.27	I	ug/L	P429734	
		Manganese	8.34		ug/L	P429734	
		Molybdenum	0.15	U	ug/L	P429734	
		Nickel	0.50	U	ug/L	P429734	
		Selenium	0.20	U	ug/L	P429734	
		Silver	0.010	U	ug/L	P429734	
		Thallium	0.10	U	ug/L	P429734	
	SM 2340 B-2011	Hardness	48.5		mg/L	P429734	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P429682

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P429689

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P429734

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: P429734

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: P430017

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: P430020

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430074

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429954

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429985

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429803

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

Reference Method: SM 2320 B-2011
Batch ID: P430117

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

Reference Method: SM 2540 C-2015
Batch ID: P430183

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P430027

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P429887

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P430285

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P429896

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: P429682

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P429689

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.3		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P429734

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	102		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	100		P	85 - 115
Sodium	105		P	85 - 115
Strontium	104		P	85 - 115
Tin	104		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	103		P	85 - 115
Zinc	108		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429734

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	99.7		P	85 - 115
Barium	102		P	85 - 115
Beryllium	98.1		P	85 - 115
Boron	103		P	85 - 115
Cadmium	99.8		P	85 - 115
Chromium	98.2		P	85 - 115
Cobalt	102		P	85 - 115
Copper	98.1		P	85 - 115
Lead	102		P	85 - 115
Manganese	99.5		P	85 - 115
Molybdenum	99.1		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	99.2		P	85 - 115
Silver	107		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430017

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430020

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430074

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429954

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: P429985

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429803

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

Reference Method: SM 2320 B-2011
Batch ID: P430117

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P430183

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

Reference Method: SM 2540 D-2015
Batch ID: P430027

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	95.9		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P429887

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	94 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P430285

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

Reference Method: SM 5310 B-2011
Batch ID: P429896

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P429734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408260	Calcium	100	103	P/P	80 - 120
2408260	Iron	102	104	P/P	80 - 120
2408260	Magnesium	101	103	P/P	80 - 120
2408260	Potassium	101	102	P/P	80 - 120
2408260	Sodium	106	106	P/P	80 - 120
2408260	Strontium	104	104	P/P	80 - 120
2408260	Tin	102	103	P/P	80 - 120
2408260	Titanium	103	102	P/P	80 - 120
2408260	Vanadium	103	103	P/P	80 - 120
2408260	Zinc	108	107	P/P	80 - 120
2408656	Calcium	102		P	80 - 120
2408656	Iron	105		P	80 - 120
2408656	Magnesium	101		P	80 - 120
2408656	Potassium	103		P	80 - 120
2408656	Sodium	106		P	80 - 120
2408656	Strontium	105		P	80 - 120
2408656	Tin	101		P	80 - 120
2408656	Titanium	102		P	80 - 120
2408656	Vanadium	104		P	80 - 120
2408656	Zinc	109		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P429734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408260	Aluminum	101	101	P/P	80 - 120
2408260	Antimony	103	103	P/P	80 - 120
2408260	Arsenic	100	101	P/P	80 - 120
2408260	Barium	104	104	P/P	80 - 120
2408260	Beryllium	95.5	96.7	P/P	80 - 120
2408260	Boron	103	104	P/P	80 - 120
2408260	Cadmium	102	103	P/P	80 - 120
2408260	Chromium	100	100	P/P	80 - 120
2408260	Cobalt	103	104	P/P	80 - 120
2408260	Copper	100	100	P/P	80 - 120
2408260	Lead	104	105	P/P	80 - 120
2408260	Manganese	102	102	P/P	80 - 120
2408260	Molybdenum	99.5	101	P/P	80 - 120
2408260	Nickel	99.4	99.3	P/P	80 - 120
2408260	Selenium	101	101	P/P	80 - 120
2408260	Silver	104	104	P/P	80 - 120
2408260	Thallium	102	105	P/P	80 - 120
2408656	Aluminum	100		P	80 - 120
2408656	Antimony	104		P	80 - 120
2408656	Arsenic	103		P	80 - 120
2408656	Barium	104		P	80 - 120
2408656	Beryllium	98.2		P	80 - 120
2408656	Boron	102		P	80 - 120
2408656	Cadmium	101		P	80 - 120
2408656	Chromium	97.2		P	80 - 120
2408656	Cobalt	101		P	80 - 120
2408656	Copper	99.1		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408656	Lead	104		P	80 - 120
2408656	Manganese	98.7		P	80 - 120
2408656	Molybdenum	102		P	80 - 120
2408656	Nickel	98.5		P	80 - 120
2408656	Selenium	102		P	80 - 120
2408656	Silver	102		P	80 - 120
2408656	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430017

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408605	Chloride	102		P	90 - 110
2408888	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430020

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408605	Sulfate	100		P	90 - 110
2408888	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430074

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408662	Ammonia-N	96.0	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408374	Kjeldahl Nitrogen	106	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408652	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408652	Total-P	104	104	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P429887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408651	Fluoride	103	103	P/P	94 - 106

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P430285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408903	Fluoride	102	103	P/P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P429896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408608	Organic Carbon	97.6	97.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P429682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408605	Color (true)	1.14	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P429689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408371	Turbidity	1.06	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P429734

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408260	Calcium	1.53	Spike	P	0 - 20
2408260	Iron	1.69	Spike	P	0 - 20
2408260	Magnesium	1.53	Spike	P	0 - 20
2408260	Potassium	0.862	Spike	P	0 - 20
2408260	Sodium	0.0486	Spike	P	0 - 20
2408260	Strontium	0.373	Spike	P	0 - 20
2408260	Tin	0.887	Spike	P	0 - 20
2408260	Titanium	1.30	Spike	P	0 - 20
2408260	Vanadium	0.396	Spike	P	0 - 20
2408260	Zinc	0.980	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429734

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408260	Aluminum	0.515	Spike	P	0 - 20
2408260	Antimony	0.416	Spike	P	0 - 20
2408260	Arsenic	0.531	Spike	P	0 - 20
2408260	Barium	0.346	Spike	P	0 - 20
2408260	Beryllium	1.06	Spike	P	0 - 20
2408260	Boron	1.40	Spike	P	0 - 20
2408260	Cadmium	1.62	Spike	P	0 - 20
2408260	Chromium	0.179	Spike	P	0 - 20
2408260	Cobalt	0.349	Spike	P	0 - 20
2408260	Copper	0.138	Spike	P	0 - 20
2408260	Lead	0.962	Spike	P	0 - 20
2408260	Manganese	0.309	Spike	P	0 - 20
2408260	Molybdenum	1.42	Spike	P	0 - 20
2408260	Nickel	0.0693	Spike	P	0 - 20
2408260	Selenium	0.488	Spike	P	0 - 20
2408260	Silver	0.0980	Spike	P	0 - 20
2408260	Thallium	3.07	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P430017

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408605	Chloride	0.662	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430074

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408662	Ammonia-N	0.876	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408374	Kjeldahl Nitrogen	0.773	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408652	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408652	Total-P	0.468	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P430117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408651	Total Alkalinity	1.29	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P430183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408073	TDS	7.07	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P429887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408651	Fluoride	0.0	Spike	P	0 - 1.9

Quality Assurance Report Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P430285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408903	Fluoride	1.04	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P429896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408608	Organic Carbon	0.412	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A119072

Included Lab Sample IDs: 2408661, 2408663

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A119076

Included Lab Sample IDs: 2408661, 2408663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.0	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119153

Included Lab Sample IDs: 2408675, 2408676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	99.1	P/P	90 - 110
Antimony	101	101	P/P	90 - 110
Arsenic	99.4	99.3	P/P	90 - 110
Barium	100	100	P/P	90 - 110
Beryllium	98.4	98.7	P/P	90 - 110
Boron	101	97.6	P/P	90 - 110
Cadmium	99.7	101	P/P	90 - 110
Chromium	98.8	99.4	P/P	90 - 110
Cobalt	102	102	P/P	90 - 110
Copper	96.4	97.3	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Manganese	100	101	P/P	90 - 110
Molybdenum	98.4	99.3	P/P	90 - 110
Nickel	98.7	98.2	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Thallium	102	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119172

Included Lab Sample IDs: 2408662, 2408664

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A119177

Included Lab Sample IDs: 2408675, 2408676

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

Reference Method: SM 4500-F- C-2011

Run ID: A119179

Included Lab Sample IDs: 2408661

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: A119179

Included Lab Sample IDs: 2408661

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

Reference Method: SM 5310 B-2011

Run ID: A119185

Included Lab Sample IDs: 2408662, 2408664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.4	96.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A119207

Included Lab Sample IDs: 2408675, 2408676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	104	P/P	90 - 110
Iron	103	105	P/P	90 - 110
Magnesium	102	104	P/P	90 - 110
Potassium	102	103	P/P	90 - 110
Sodium	106	107	P/P	90 - 110
Strontium	103	103	P/P	90 - 110
Tin	101	102	P/P	90 - 110
Titanium	99.7	99.9	P/P	90 - 110
Vanadium	99.9	100	P/P	90 - 110
Zinc	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A119211

Included Lab Sample IDs: 2408661, 2408663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.2	99.9	P/P	90 - 110
Sulfate	99.2	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A119221

Included Lab Sample IDs: 2408662, 2408664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A119245

Included Lab Sample IDs: 2408662, 2408664

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A119259

Included Lab Sample IDs: 2408662, 2408664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	96.4	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A119276

Included Lab Sample IDs: 2408661, 2408663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.1	93.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A119359

Included Lab Sample IDs: 2408663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	102	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)	101				1.14	
EPA 180.1 Rev. 2.0	Turbidity	97.3				1.06	
EPA 200.7 Rev. 4.4	Calcium	101	100	103	102		1.53
	Iron	102	102	104	105		1.69
	Magnesium	101	101	103	101		1.53
	Potassium	100	101	102	103		0.862
	Sodium	105	106	106	106		0.0486
	Strontium	104	104	104	105		0.373
	Tin	104	102	103	101		0.887
	Titanium	101	103	102	102		1.30
	Vanadium	103	103	103	104		0.396
	Zinc	108	108	107	109		0.980
EPA 200.8 Rev. 5.4	Aluminum	101	101	101	100		0.515
	Antimony	103	103	103	104		0.416
	Arsenic	99.7	100	101	103		0.531
	Barium	102	104	104	104		0.346
	Beryllium	98.1	95.5	96.7	98.2		1.06
	Boron	103	103	104	102		1.40
	Cadmium	99.8	102	103	101		1.62
	Chromium	98.2	100	100	97.2		0.179
	Cobalt	102	103	104	101		0.349
	Copper	98.1	100	100	99.1		0.138
	Lead	102	104	105	104		0.962
	Manganese	99.5	102	102	98.7		0.309
	Molybdenum	99.1	99.5	101	102		1.42
	Nickel	98.7	99.4	99.3	98.5		0.0693
	Selenium	99.2	101	101	102		0.488
	Silver	107	104	104	102		0.0980
	Thallium	100	102	105	103		3.07
EPA 300.0 Rev. 2.1	Chloride	101	102	102		0.662	
	Sulfate	100	100	101			
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	96.0	97.4			0.876
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.0	106	105			0.773
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102			0.489
EPA 365.1 Rev. 2.0	Total-P	104	104	104			0.468
SM 2320 B-2011	Total Alkalinity	100				1.29	
SM 2540 C-2015	TDS	105				7.07	
SM 2540 D-2015	TSS	95.9					
SM 4500-F- C-2011	Fluoride	100	103	103			0.0
	Fluoride	102	102	103			1.04
SM 5310 B-2011	Organic Carbon	96.7	97.6	97.0			0.412

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2408661, 2408663
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2408661, 2408663
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2408675, 2408676
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2408675, 2408676
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2408661, 2408663
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2408661, 2408663

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2408662, 2408664
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2408662, 2408664
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2408662, 2408664
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2408662, 2408664
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2408661, 2408663
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2408675, 2408676
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2408661, 2408663
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2408661, 2408663
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2408661, 2408663
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2408662, 2408664

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	05/10/2023			05/10/2023 15:08	Alexis Price	2408663
	05/10/2023			05/10/2023 15:14	Alexis Price	2408661
EPA 180.1 Rev. 2.0	05/10/2023			05/10/2023 14:34	Anna M. Plaviak	2408661, 2408663
EPA 200.7 Rev. 4.4	05/10/2023	05/11/2023 13:35	George D Taylor	05/17/2023 00:39	McKinley C Carter	2408675
	05/10/2023	05/11/2023 13:35	George D Taylor	05/17/2023 00:47	McKinley C Carter	2408676
EPA 200.8 Rev. 5.4	05/10/2023	05/11/2023 13:35	George D Taylor	05/12/2023 21:00	Conrad Hartmann	2408675
	05/10/2023	05/11/2023 13:35	George D Taylor	05/12/2023 21:09	Conrad Hartmann	2408676
	05/10/2023	05/11/2023 13:35	George D Taylor	05/15/2023 17:15	Conrad Hartmann	2408675
	05/10/2023	05/11/2023 13:35	George D Taylor	05/15/2023 17:20	Conrad Hartmann	2408676
EPA 300.0 Rev. 2.1	05/10/2023			05/17/2023 13:43	James L Waggeberby	2408661
	05/10/2023			05/17/2023 13:58	James L Waggeberby	2408663
EPA 350.1 Rev. 2.0	05/10/2023			05/18/2023 13:55	Ping Hua	2408662
	05/10/2023			05/18/2023 13:59	Ping Hua	2408664
EPA 351.2 Rev. 2.0	05/10/2023	05/17/2023 10:59	Dana G. Hughes	05/18/2023 11:07	Samantha L Bates	2408662
	05/10/2023	05/17/2023 10:59	Dana G. Hughes	05/18/2023 11:09	Samantha L Bates	2408664
EPA 353.2 Rev. 2.0	05/10/2023			05/17/2023 11:43	Beverly Y. Sanders	2408662
	05/10/2023			05/17/2023 11:44	Beverly Y. Sanders	2408664
EPA 365.1 Rev. 2.0	05/10/2023	05/12/2023 12:59	Adam P Silver	05/15/2023 15:30	James L Waggeberby	2408662
	05/10/2023	05/12/2023 12:59	Adam P Silver	05/15/2023 15:31	James L Waggeberby	2408664
SM 2320 B-2011	05/10/2023			05/19/2023 01:38	Dale L. Simmons	2408661
	05/10/2023			05/19/2023 01:49	Dale L. Simmons	2408663
SM 2340 B-2011	05/10/2023			05/17/2023 00:39	McKinley C Carter	2408675
	05/10/2023			05/17/2023 00:47	McKinley C Carter	2408676
SM 2540 C-2015	05/10/2023			05/12/2023 15:01	Yijie Li	2408661, 2408663
SM 2540 D-2015	05/10/2023			05/12/2023 15:01	Yijie Li	2408661, 2408663
SM 4500-F- C-2011	05/10/2023			05/16/2023 00:11	Dale L. Simmons	2408661
	05/10/2023			05/24/2023 01:22	Dale L. Simmons	2408663
SM 5310 B-2011	05/10/2023			05/15/2023 19:05	Elise M. Gillis	2408662
	05/10/2023			05/15/2023 19:20	Elise M. Gillis	2408664