Chemical Analysis Report

CEN-DIST-2023-09-26-02

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

Event Description: **Run 11**
Request ID: **RQ-2023-09-18-33**
Customer: **CEN-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 13-OCT-2023 14:30

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: LAKE WALKER AT CENTER **Collection Date/Time: 09/25/2023 12:12**

Field ID: G4CE0238 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2439865	DEP SOP: NU-094-1	Color (true)	18		PCU	P435524	
	EPA 180.1 Rev. 2.0	Turbidity	7.6		NTU	P435528	
	EPA 300.0 Rev. 2.1	Chloride	6.1		mg Cl/L	P435834	
		Sulfate	0.45	I	mg SO4/L	P435837	
	SM 2320 B-2011	Total Alkalinity	52		mg CaCO3/L	P435733	
	SM 2540 C-2015	TDS	81		mg/L	P436126	
	SM 2540 D-2015	TSS	9	I	mg/L	P435854	
	SM 4500-F- C-2011	Fluoride	0.062	I	mg F/L	P435736	
2439868	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P435695	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P435939	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P436140	
	EPA 365.1 Rev. 2.0	Total-P	0.084		mg P/L	P435689	
	SM 5310 B-2011	Organic Carbon	7.8		mg C/L	P435752	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high 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: LAKE CATHERINE AT CENTER **Collection Date/Time: 09/25/2023 11:23**

Field ID: G4CE0240 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2439877	EPA 200.7 Rev. 4.4	Calcium	28.8		mg/L	P435588	
		Iron	30	U	ug/L	P435588	
		Magnesium	2.69		mg/L	P435588	
		Potassium	1.3		mg/L	P435588	
		Sodium	7.6		mg/L	P435588	
		Strontium	86.0		ug/L	P435588	
		Tin	5.0	I	ug/L	P435588	
		Titanium	0.75	U	ug/L	P435588	
		Vanadium	2.0	U	ug/L	P435588	
		Zinc	5.0	U	ug/L	P435588	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P435588	
		Antimony	0.47		ug/L	P435588	
		Arsenic	0.52		ug/L	P435588	
		Barium	9.29		ug/L	P435588	
		Beryllium	0.010	U	ug/L	P435588	
		Boron	44.0		ug/L	P435588	
		Cadmium	0.020	U	ug/L	P435588	
		Chromium	0.40	U	ug/L	P435588	
		Cobalt	0.020	U	ug/L	P435588	
		Copper	0.56	I	ug/L	P435588	
		Lead	0.20	U	ug/L	P435588	
		Manganese	4.00		ug/L	P435588	
		Molybdenum	0.89		ug/L	P435588	
		Nickel	0.50	U	ug/L	P435588	
		Selenium	0.20	U	ug/L	P435588	
		Silver	0.010	U	ug/L	P435588	
		Thallium	0.10	U	ug/L	P435588	
	SM 2340 B-2011	Hardness	82.9		mg/L	P435588	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: LAKE JANE AT CENTER **Collection Date/Time: 09/25/2023 10:37**

Field ID: G4CE0152 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2439866	DEP SOP: NU-094-1	Color (true)	24		PCU	P435524	
	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P435528	
	EPA 300.0 Rev. 2.1	Chloride	9.8		mg Cl/L	P435834	
		Sulfate	7.6		mg SO4/L	P435837	
	SM 2320 B-2011	Total Alkalinity	68		mg CaCO3/L	P435733	
	SM 2540 C-2015	TDS	107		mg/L	P436126	
	SM 2540 D-2015	TSS	8	I	mg/L	P435854	
	SM 4500-F- C-2011	Fluoride	0.080	I	mg F/L	P435736	
2439869	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P435695	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P435939	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P436378	
	EPA 365.1 Rev. 2.0	Total-P	0.077		mg P/L	P435689	
	SM 5310 B-2011	Organic Carbon	8.6		mg C/L	P435752	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high 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: LAKE LORNA DOONE AT CENTER **Collection Date/Time: 09/25/2023 09:48**

Field ID: G4CE0239 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2439867	DEP SOP: NU-094-1	Color (true)	10		PCU	P435524	
	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P435528	
	EPA 300.0 Rev. 2.1	Chloride	7.7		mg Cl/L	P435834	
		Sulfate	3.9		mg SO4/L	P435837	
	SM 2320 B-2011	Total Alkalinity	53		mg CaCO3/L	P435733	
	SM 2540 C-2015	TDS	72		mg/L	P436126	
	SM 2540 D-2015	TSS	4	I	mg/L	P435854	
	SM 4500-F- C-2011	Fluoride	0.051	I	mg F/L	P435736	
2439870	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P435695	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P435939	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P436378	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P435690	
	SM 5310 B-2011	Organic Carbon	5.5		mg C/L	P435752	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high 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: P435524

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P435528

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435588

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: P435588

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: P435834

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: P435837

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435695

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435939

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436140

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436378

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435689

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435690

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

Reference Method: SM 2320 B-2011
Batch ID: P435733

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

Reference Method: SM 2540 C-2015
Batch ID: P436126

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P435854

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P435736

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P435752

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: P435524

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: P435528

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435588

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	101		P	85 - 115
Sodium	104		P	85 - 115
Strontium	103		P	85 - 115
Tin	103		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	103		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435588

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	99.3		P	85 - 115
Barium	104		P	85 - 115
Beryllium	102		P	85 - 115
Boron	104		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	104		P	85 - 115
Cobalt	102		P	85 - 115
Copper	99.2		P	85 - 115
Lead	97.1		P	85 - 115
Manganese	103		P	85 - 115
Molybdenum	100		P	85 - 115
Nickel	100		P	85 - 115
Selenium	99.0		P	85 - 115
Silver	112		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435834

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: P435837

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435695

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435939

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436140

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435689

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435690

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

Reference Method: SM 2320 B-2011
Batch ID: P435733

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.3		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P436126

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P435854

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	93.9		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P435736

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

Reference Method: SM 5310 B-2011
Batch ID: P435752

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439344	Iron	103		P	75 - 125
2439344	Magnesium	103		P	75 - 125
2439344	Potassium	102		P	75 - 125
2439344	Sodium	103		P	75 - 125
2439344	Strontium	100		P	75 - 125
2439344	Tin	101		P	75 - 125
2439344	Titanium	102		P	75 - 125
2439344	Vanadium	102		P	75 - 125
2439344	Zinc	100		P	75 - 125
2439877	Calcium	99.9		P	80 - 120
2439877	Iron	104	104	P/P	80 - 120
2439877	Magnesium	105	104	P/P	80 - 120
2439877	Potassium	98.7	97.5	P/P	80 - 120
2439877	Sodium	99.8		P	80 - 120
2439877	Strontium	100	99.5	P/P	80 - 120
2439877	Tin	101	99.2	P/P	80 - 120
2439877	Titanium	101	102	P/P	80 - 120
2439877	Vanadium	101	103	P/P	80 - 120
2439877	Zinc	101	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439344	Aluminum	94.1		P	75 - 125
2439344	Antimony	100		P	75 - 125
2439344	Arsenic	103		P	75 - 125
2439344	Barium	104		P	75 - 125
2439344	Beryllium	97.7		P	75 - 125
2439344	Boron	102		P	75 - 125
2439344	Cadmium	105		P	75 - 125
2439344	Chromium	104		P	75 - 125
2439344	Cobalt	100		P	75 - 125
2439344	Copper	93.2		P	75 - 125
2439344	Lead	98.4		P	75 - 125
2439344	Manganese	99.2		P	75 - 125
2439344	Molybdenum	105		P	75 - 125
2439344	Nickel	95.8		P	75 - 125
2439344	Selenium	99.3		P	75 - 125
2439344	Silver	109		P	75 - 125
2439344	Thallium	107		P	75 - 125
2439877	Aluminum	98.9	99.0	P/P	80 - 120
2439877	Antimony	102	101	P/P	80 - 120
2439877	Arsenic	102	100	P/P	80 - 120
2439877	Barium	104	103	P/P	80 - 120
2439877	Beryllium	103	103	P/P	80 - 120
2439877	Boron	103	102	P/P	80 - 120
2439877	Cadmium	102	103	P/P	80 - 120
2439877	Chromium	105	103	P/P	80 - 120
2439877	Cobalt	101	101	P/P	80 - 120
2439877	Copper	98.3	97.4	P/P	80 - 120
2439877	Lead	96.6	97.0	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439877	Manganese	102	102	P/P	80 - 120
2439877	Molybdenum	102	101	P/P	80 - 120
2439877	Nickel	99.1	98.2	P/P	80 - 120
2439877	Selenium	100	98.1	P/P	80 - 120
2439877	Silver	112	110	P/P	80 - 120
2439877	Thallium	107	106	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435834

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2440108	Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439916	Sulfate	103		P	90 - 110
2440108	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435695

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439799	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439930	Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436140

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437931	NO2NO3-N	98.5	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439869	NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439868	Total-P	106	108	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439919	Total-P	104	104	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P435736

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439796	Fluoride	101	101	P/P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P435752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438977	Organic Carbon	94.5	94.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P435524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439820	Color (true)	1.74	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P435528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439750	Turbidity	8.58	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439877	Calcium	1.27	Spike	P	0 - 20
2439877	Iron	0.463	Spike	P	0 - 20
2439877	Magnesium	0.342	Spike	P	0 - 20
2439877	Potassium	0.943	Spike	P	0 - 20
2439877	Sodium	0.521	Spike	P	0 - 20
2439877	Strontium	0.552	Spike	P	0 - 20
2439877	Tin	1.67	Spike	P	0 - 20
2439877	Titanium	0.525	Spike	P	0 - 20
2439877	Vanadium	1.25	Spike	P	0 - 20
2439877	Zinc	0.436	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439877	Aluminum	0.157	Spike	P	0 - 20
2439877	Antimony	0.529	Spike	P	0 - 20
2439877	Arsenic	1.92	Spike	P	0 - 20
2439877	Barium	0.913	Spike	P	0 - 20
2439877	Beryllium	0.0568	Spike	P	0 - 20
2439877	Boron	0.854	Spike	P	0 - 20
2439877	Cadmium	1.16	Spike	P	0 - 20
2439877	Chromium	1.44	Spike	P	0 - 20
2439877	Cobalt	0.305	Spike	P	0 - 20
2439877	Copper	0.825	Spike	P	0 - 20
2439877	Lead	0.361	Spike	P	0 - 20
2439877	Manganese	0.534	Spike	P	0 - 20
2439877	Molybdenum	1.11	Spike	P	0 - 20
2439877	Nickel	0.901	Spike	P	0 - 20
2439877	Selenium	2.01	Spike	P	0 - 20
2439877	Silver	1.10	Spike	P	0 - 20
2439877	Thallium	0.243	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435834

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439916	Chloride	0.00286	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439916	Sulfate	0.503	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435695

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439799	Ammonia-N	0.393	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439930	Kjeldahl Nitrogen	0.675	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437931	NO2NO3-N	1.51	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439869	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439868	Total-P	1.67	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439919	Total-P	0.0691	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P435733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439796	Total Alkalinity	1.06	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P436126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439771	TDS	7.66	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P435736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439796	Fluoride	0.0	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P435752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438977	Organic Carbon	0.226	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: A121771
Included Lab Sample IDs: 2439865, 2439866, 2439867

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.1	98.6	P/P	90 - 110
Sulfate	99.9	100	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1
Run ID: A121773
Included Lab Sample IDs: 2439865, 2439866, 2439867

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A121774
Included Lab Sample IDs: 2439865, 2439866, 2439867

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A121829
Included Lab Sample IDs: 2439868, 2439869, 2439870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	98.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A121837
Included Lab Sample IDs: 2439877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	99.0	98.4	P/P	90 - 110
Sodium	100	99.7	P/P	90 - 110
Strontium	101	101	P/P	90 - 110
Tin	101	103	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	100	101	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A121840
Included Lab Sample IDs: 2439877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	98.8	P/P	90 - 110
Antimony	96.7	98.0	P/P	90 - 110
Arsenic	101	99.6	P/P	90 - 110
Barium	101	100	P/P	90 - 110
Beryllium	104	103	P/P	90 - 110
Boron	97.7	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A121840
Included Lab Sample IDs: 2439877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	101	103	P/P	90 - 110
Chromium	105	106	P/P	90 - 110
Cobalt	103	101	P/P	90 - 110
Copper	98.6	98.6	P/P	90 - 110
Lead	93.8	95.5	P/P	90 - 110
Manganese	103	104	P/P	90 - 110
Molybdenum	98.6	99.4	P/P	90 - 110
Nickel	101	99.4	P/P	90 - 110
Selenium	100	102	P/P	90 - 110
Silver	100	102	P/P	90 - 110
Thallium	98.1	102	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A121844
Included Lab Sample IDs: 2439865, 2439866, 2439867

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.7	95.9	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A121844
Included Lab Sample IDs: 2439865, 2439866, 2439867

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121845
Included Lab Sample IDs: 2439868, 2439869

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121850
Included Lab Sample IDs: 2439870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	94.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A121853
Included Lab Sample IDs: 2439868, 2439869, 2439870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.4	95.1	P/P	90 - 110
Organic Carbon	95.1	94.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A122012
Included Lab Sample IDs: 2439868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A122047
Included Lab Sample IDs: 2439868, 2439869, 2439870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A122094
Included Lab Sample IDs: 2439869, 2439870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	97.5	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)	102					1.74	
EPA 180.1 Rev. 2.0	Turbidity	104					8.58	
EPA 200.7 Rev. 4.4	Calcium	105	99.9					1.27
	Iron	106	104	104	103			0.463
	Magnesium	108	105	104	103			0.342
	Potassium	101	98.7	97.5	102			0.943
	Sodium	104	99.8	103				0.521
	Strontium	103	100	99.5	100			0.552
	Tin	103	101	99.2	101			1.67
	Titanium	102	101	102	102			0.525
	Vanadium	103	101	103	102			1.25
	Zinc	104	101	101	100			0.436
EPA 200.8 Rev. 5.4	Aluminum	101	98.9	99.0	94.1			0.157
	Antimony	101	102	101	100			0.529
	Arsenic	99.3	102	100	103			1.92
	Barium	104	104	103	104			0.913
	Beryllium	102	103	103	97.7			0.0568
	Boron	104	103	102	102			0.854
	Cadmium	102	102	103	105			1.16
	Chromium	104	105	103	104			1.44
	Cobalt	102	101	101	100			0.305
	Copper	99.2	98.3	97.4	93.2			0.825
	Lead	97.1	96.6	97.0	98.4			0.361
	Manganese	103	102	102	99.2			0.534
	Molybdenum	100	102	101	105			1.11
	Nickel	100	99.1	98.2	95.8			0.901
	Selenium	99.0	100	98.1	99.3			2.01
	Silver	112	112	110	109			1.10
	Thallium	100	107	106	107			0.243
EPA 300.0 Rev. 2.1	Chloride	102	105				0.0028	
	Sulfate	104	103	102			0.503	
EPA 350.1 Rev. 2.0	Ammonia-N	96.8	102	102				0.393
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	105	104				0.675
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	98.5	100				1.51
	NO2NO3-N	99.0	99.5	100				1.00
EPA 365.1 Rev. 2.0	Total-P	105	106	108				1.67
	Total-P	99.2	104	104				0.0691
SM 2320 B-2011	Total Alkalinity	97.3					1.06	
SM 2540 C-2015	TDS	101					7.66	
SM 2540 D-2015	TSS	93.9						
SM 4500-F- C-2011	Fluoride	101	101	101				0.0
SM 5310 B-2011	Organic Carbon	94.8	94.5	94.2				0.226

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2439865, 2439866, 2439867
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2439865, 2439866, 2439867
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2439877
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2439877
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2439865, 2439866, 2439867

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2439865, 2439866, 2439867
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2439868, 2439869, 2439870
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2439868, 2439869, 2439870
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2439868, 2439869, 2439870
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2439868, 2439869, 2439870
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2439865, 2439866, 2439867
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2439877
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2439865, 2439866, 2439867
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2439865, 2439866, 2439867
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2439865, 2439866, 2439867
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2439868, 2439869, 2439870

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	09/26/2023			09/26/2023 15:36	Alexis Price	2439865
	09/26/2023			09/26/2023 15:37	Alexis Price	2439866
	09/26/2023			09/26/2023 15:38	Alexis Price	2439867
EPA 180.1 Rev. 2.0	09/26/2023			09/26/2023 14:44	Khloe J Berg	2439865
	09/26/2023			09/26/2023 14:45	Khloe J Berg	2439866
	09/26/2023			09/26/2023 14:46	Khloe J Berg	2439867
EPA 200.7 Rev. 4.4	09/26/2023	09/27/2023 13:05	George D Taylor	09/28/2023 14:46	Samatha Luckman	2439877
EPA 200.8 Rev. 5.4	09/26/2023	09/27/2023 13:05	George D Taylor	09/28/2023 16:54	Emily M Philpot	2439877
EPA 300.0 Rev. 2.1	09/26/2023			09/28/2023 10:47	James L Waggerby	2439865
	09/26/2023			09/28/2023 11:03	James L Waggerby	2439866
	09/26/2023			09/28/2023 11:18	James L Waggerby	2439867
EPA 350.1 Rev. 2.0	09/26/2023			09/28/2023 14:11	Ping Hua	2439868
	09/26/2023			09/28/2023 14:13	Ping Hua	2439869
	09/26/2023			09/28/2023 14:14	Ping Hua	2439870
EPA 351.2 Rev. 2.0	09/26/2023	10/04/2023 14:26	Simonne.V. Calhoun	10/10/2023 13:08	Samantha L Bates	2439868
	09/26/2023	10/04/2023 14:26	Simonne.V. Calhoun	10/10/2023 13:10	Samantha L Bates	2439869
	09/26/2023	10/04/2023 14:26	Simonne.V. Calhoun	10/10/2023 13:11	Samantha L Bates	2439870
EPA 353.2 Rev. 2.0	09/26/2023			10/06/2023 12:22	Fadila Guebre	2439868
	09/26/2023			10/11/2023 13:53	Fadila Guebre	2439869
	09/26/2023			10/11/2023 13:59	Fadila Guebre	2439870
EPA 365.1 Rev. 2.0	09/26/2023	09/28/2023 13:36	Alexis Price	09/29/2023 10:46	Chandler E Cox	2439868
	09/26/2023	09/28/2023 13:36	Alexis Price	09/29/2023 10:57	Chandler E Cox	2439869
	09/26/2023	09/28/2023 13:36	Alexis Price	09/29/2023 12:24	Chandler E Cox	2439870
SM 2320 B-2011	09/26/2023			09/29/2023 05:04	Adam P Silver	2439865
	09/26/2023			09/29/2023 05:18	Adam P Silver	2439866
	09/26/2023			09/29/2023 05:30	Adam P Silver	2439867
SM 2340 B-2011	09/26/2023			09/28/2023 14:46	Samatha Luckman	2439877
SM 2540 C-2015	09/26/2023			09/27/2023 15:41	Yijie Li	2439865, 2439866, 2439867
SM 2540 D-2015	09/26/2023			09/27/2023 15:41	Yijie Li	2439865, 2439866, 2439867
SM 4500-F- C-2011	09/26/2023			09/29/2023 05:04	Adam P Silver	2439865
	09/26/2023			09/29/2023 05:18	Adam P Silver	2439866
	09/26/2023			09/29/2023 05:30	Adam P Silver	2439867
SM 5310 B-2011	09/26/2023			09/28/2023 21:29	Khloe J Berg	2439868
	09/26/2023			09/28/2023 22:10	Khloe J Berg	2439869
	09/26/2023			09/28/2023 22:23	Khloe J Berg	2439870