

Chemical Analysis Report

CEN-DIST-2023-10-27-01

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

Event Description: **Run 4**
Request ID: **RQ-2023-10-30-14**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 15-NOV-2023 13:26



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: 10/26/2023 11:01

Field ID: G3CE0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2447536	DEP SOP: NU-094-1	Color (true)	410		PCU	P437092	
	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P437098	
	EPA 300.0 Rev. 2.1	Chloride	68		mg Cl/L	P437504	
		Sulfate	7.9		mg SO4/L	P437508	
	SM 2320 B-2011	Total Alkalinity	15		mg CaCO3/L	P437159	
	SM 2540 C-2015	TDS	196		mg/L	P437566	
	SM 2540 D-2015	TSS	2	U	mg/L	P437417	
	SM 4500-F- C-2011	Fluoride	0.034	I	mg F/L	P437162	
2447537	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P437196	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P437122	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.048		mg N/L	P437642	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P437172	
	SM 5310 B-2011	Organic Carbon	25		mg C/L	P437267	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: UNNMAED BRANCH AT BRIDGEWAY RD

Collection Date/Time: 10/26/2023 10:01

Field ID: G2CE0245

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2447538	DEP SOP: NU-094-1	Color (true)	47		PCU	P437092	
	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P437098	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P437504	
		Sulfate	5.3		mg SO4/L	P437508	
	SM 2320 B-2011	Total Alkalinity	56		mg CaCO3/L	P437159	
	SM 2540 C-2015	TDS	111		mg/L	P437566	
	SM 2540 D-2015	TSS	2	I	mg/L	P437417	
	SM 4500-F- C-2011	Fluoride	0.066	I	mg F/L	P437162	
2447539	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P437196	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P437122	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P437643	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P437172	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P437267	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ROBERTS BRANCH AT FORT CHRISTMAS RD N **Collection Date/Time: 10/26/2023 12:00**

Field ID: G3CE0065

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2447558	EPA 200.7 Rev. 4.4	Calcium	2.05		mg/L	P437135	
		Iron	970		ug/L	P437135	
		Magnesium	1.27		mg/L	P437135	
		Potassium	0.30	U	mg/L	P437135	
		Sodium	7.7		mg/L	P437135	
		Strontium	15.6		ug/L	P437135	
		Tin	3.0	U	ug/L	P437135	
		Titanium	2.1	I	ug/L	P437135	
		Vanadium	2.0	U	ug/L	P437135	
	EPA 200.8 Rev. 5.4	Aluminum	477		ug/L	P437135	
		Antimony	0.050	U	ug/L	P437135	
		Arsenic	0.31		ug/L	P437135	
		Barium	6.98		ug/L	P437135	
		Beryllium	0.039	I	ug/L	P437135	
		Boron	17.5		ug/L	P437135	
		Cadmium	0.020	U	ug/L	P437135	
		Chromium	0.40	I	ug/L	P437135	
		Cobalt	0.153		ug/L	P437135	
		Copper	0.40	U	ug/L	P437135	
		Lead	0.48		ug/L	P437135	
		Manganese	6.21		ug/L	P437135	
		Molybdenum	0.15	U	ug/L	P437135	MS
		Nickel	0.60	I	ug/L	P437135	
		Selenium	0.20	U	ug/L	P437135	MS
		Silver	0.010	U	ug/L	P437135	
		Thallium	0.10	U	ug/L	P437135	
		Zinc	8.5	I	ug/L	P437135	
	SM 2340 B-2011	Hardness	10.3		mg/L	P437135	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for aluminum, chromium, copper, lead, manganese and zinc are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: CORNER LAKE AT CENTER

Collection Date/Time: 10/26/2023 13:20

Field ID: G2CE0284

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2447559	EPA 200.7 Rev. 4.4	Calcium	4.40		mg/L	P437135	
		Iron	180		ug/L	P437135	
		Magnesium	1.59		mg/L	P437135	
		Potassium	1.8		mg/L	P437135	
		Sodium	10.3		mg/L	P437135	
		Strontium	23.0		ug/L	P437135	
		Tin	3.0	U	ug/L	P437135	
		Titanium	0.75	U	ug/L	P437135	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P437135	
		Aluminum	120		ug/L	P437135	
		Antimony	0.050	U	ug/L	P437135	
		Arsenic	0.64		ug/L	P437135	
		Barium	12.6		ug/L	P437135	
		Beryllium	0.013	I	ug/L	P437135	
		Boron	22.1		ug/L	P437135	
		Cadmium	0.020	U	ug/L	P437135	
		Chromium	0.46	I	ug/L	P437135	
		Cobalt	0.033	I	ug/L	P437135	
		Copper	2.68		ug/L	P437135	
		Lead	0.28	I	ug/L	P437135	
		Manganese	8.44		ug/L	P437135	
		Molybdenum	0.15	U	ug/L	P437135	MS
		Nickel	0.70	I	ug/L	P437135	
		Selenium	0.20	U	ug/L	P437135	MS
		Silver	0.010	U	ug/L	P437135	
		Thallium	0.10	U	ug/L	P437135	
		Zinc	7.0	U	ug/L	P437135	
	SM 2340 B-2011	Hardness	17.5		mg/L	P437135	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for aluminum, chromium, copper, lead, manganese and zinc are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P437092

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P437098

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437135

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437135

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.22	I	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
Zinc	7.0	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437504

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: P437508

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437196

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P437122

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437642

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437643

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437172

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

Reference Method: SM 2320 B-2011
Batch ID: P437159

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

Reference Method: SM 2540 C-2015
Batch ID: P437566

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P437417

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P437162

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P437267

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: P437092

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P437098

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437135

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	113		P	85 - 115
Magnesium	114		P	85 - 115
Potassium	104		P	85 - 115
Sodium	103		P	85 - 115
Strontium	99.6		P	85 - 115
Tin	98.4		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437135

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.3		P	85 - 115
Antimony	95.3		P	85 - 115
Arsenic	98.0		P	85 - 115
Barium	98.9		P	85 - 115
Beryllium	95.0		P	85 - 115
Boron	97.5		P	85 - 115
Cadmium	97.8		P	85 - 115
Chromium	92.2		P	85 - 115
Cobalt	95.2		P	85 - 115
Copper	95.3		P	85 - 115
Lead	101		P	85 - 115
Manganese	95.3		P	85 - 115
Molybdenum	94.9		P	85 - 115
Nickel	95.6		P	85 - 115
Selenium	98.1		P	85 - 115
Silver	105		P	85 - 115
Thallium	104		P	85 - 115
Zinc	95.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437504

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437508

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P437122

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437642

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437643

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: P437172

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

Reference Method: SM 2320 B-2011
Batch ID: P437159

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.8		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P437566

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	98.8		P	85 - 115

Reference Method: SM 2540 D-2015
Batch ID: P437417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	101		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P437162

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

Reference Method: SM 5310 B-2011
Batch ID: P437267

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.3		P	85 - 115

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P437135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447484	Calcium	108		P	80 - 120
2447484	Iron	112	112	P/P	80 - 120
2447484	Magnesium	112	113	P/P	80 - 120
2447484	Potassium	103	103	P/P	80 - 120
2447484	Sodium	104		P	80 - 120
2447484	Strontium	100	99.6	P/P	80 - 120
2447484	Tin	97.9	96.8	P/P	80 - 120
2447484	Titanium	101	96.6	P/P	80 - 120
2447484	Vanadium	101	101	P/P	80 - 120
2447658	Magnesium	105		P	75 - 125
2447658	Potassium	106		P	75 - 125
2447658	Sodium	105		P	75 - 125
2447658	Strontium	100		P	75 - 125
2447658	Tin	84.6		P	75 - 125
2447658	Vanadium	94.8		P	75 - 125

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P437135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447484	Aluminum	93.4	93.2	P/P	80 - 120
2447484	Antimony	96.4	96.9	P/P	80 - 120
2447484	Arsenic	97.0	97.1	P/P	80 - 120
2447484	Barium	98.3	99.2	P/P	80 - 120
2447484	Beryllium	90.5	92.8	P/P	80 - 120
2447484	Boron	100	100	P/P	80 - 120
2447484	Cadmium	99.3	99.5	P/P	80 - 120
2447484	Chromium	92.3	93.1	P/P	80 - 120
2447484	Cobalt	94.3	94.9	P/P	80 - 120
2447484	Copper	95.2	95.8	P/P	80 - 120
2447484	Lead	102	103	P/P	80 - 120
2447484	Manganese	96.5	97.3	P/P	80 - 120
2447484	Molybdenum	95.3	95.8	P/P	80 - 120
2447484	Nickel	94.8	95.3	P/P	80 - 120
2447484	Selenium	97.6	97.1	P/P	80 - 120
2447484	Silver	105	104	P/P	80 - 120
2447484	Thallium	105	107	P/P	80 - 120
2447484	Zinc	97.0	103	P/P	80 - 120
2447658	Antimony	82.2		P	75 - 125
2447658	Arsenic	84.6		P	75 - 125
2447658	Barium	97.5		P	75 - 125
2447658	Beryllium	85.5		P	75 - 125
2447658	Boron	95.8		P	75 - 125
2447658	Cadmium	96.9		P	75 - 125
2447658	Cobalt	91.4		P	75 - 125
2447658	Molybdenum	73.3		F	75 - 125
2447658	Nickel	82.3		P	75 - 125
2447658	Selenium	66.1		F	75 - 125
2447658	Silver	97.5		P	75 - 125
2447658	Thallium	104		P	75 - 125

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437504

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447474	Chloride	105		P	90 - 110
2447605	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447474	Sulfate	105		P	90 - 110
2447605	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447606	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447537	NO2NO3-N	95.8	95.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447539	NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447570	Total-P	106	109	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P437162

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447414	Fluoride	103	102	P/P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P437267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2447539	Organic Carbon	94.8	97.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P437092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447568	Color (true)	12.5	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P437098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447616	Turbidity	0.851	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447484	Calcium	0.0903	Spike	P	0 - 20
2447484	Iron	0.216	Spike	P	0 - 20
2447484	Magnesium	0.246	Spike	P	0 - 20
2447484	Potassium	0.114	Spike	P	0 - 20
2447484	Sodium	0.395	Spike	P	0 - 20
2447484	Strontium	0.425	Spike	P	0 - 20
2447484	Tin	1.13	Spike	P	0 - 20
2447484	Titanium	3.12	Spike	P	0 - 20
2447484	Vanadium	0.816	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447484	Aluminum	0.121	Spike	P	0 - 20
2447484	Antimony	0.490	Spike	P	0 - 20
2447484	Arsenic	0.116	Spike	P	0 - 20
2447484	Barium	0.865	Spike	P	0 - 20
2447484	Beryllium	2.39	Spike	P	0 - 20
2447484	Boron	0.0105	Spike	P	0 - 20
2447484	Cadmium	0.233	Spike	P	0 - 20
2447484	Chromium	0.838	Spike	P	0 - 20
2447484	Cobalt	0.598	Spike	P	0 - 20
2447484	Copper	0.677	Spike	P	0 - 20
2447484	Lead	1.12	Spike	P	0 - 20
2447484	Manganese	0.713	Spike	P	0 - 20
2447484	Molybdenum	0.469	Spike	P	0 - 20
2447484	Nickel	0.494	Spike	P	0 - 20
2447484	Selenium	0.546	Spike	P	0 - 20
2447484	Silver	0.992	Spike	P	0 - 20
2447484	Thallium	1.54	Spike	P	0 - 20
2447484	Zinc	6.38	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437504

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447474	Chloride	0.107	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P437508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447474	Sulfate	0.377	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P437196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447606	Ammonia-N	0.392	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P437122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447642	Kjeldahl Nitrogen	5.39	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447537	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P437643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447539	NO2NO3-N	0.264	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P437172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447570	Total-P	2.98	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P437159

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447414	Total Alkalinity	2.91	Sample	P	0 - 3.9

Quality Assurance Report Precision

Reference Method: SM 2540 C-2015
Batch ID: P437566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447605	TDS	6.00	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P437162

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447414	Fluoride	0.467	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P437267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2447539	Organic Carbon	1.67	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: A122416

Included Lab Sample IDs: 2447536, 2447538

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.6	99.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A122419

Included Lab Sample IDs: 2447536, 2447538

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

Reference Method: SM 2320 B-2011

Run ID: A122444

Included Lab Sample IDs: 2447536, 2447538

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.8	96.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A122444

Included Lab Sample IDs: 2447536, 2447538

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A122464

Included Lab Sample IDs: 2447537, 2447539

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A122475

Included Lab Sample IDs: 2447558, 2447559

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.9	96.0	P/P	90 - 110
Antimony	95.1	94.9	P/P	90 - 110
Arsenic	96.7	96.8	P/P	90 - 110
Barium	96.4	96.5	P/P	90 - 110
Beryllium	92.4	94.2	P/P	90 - 110
Boron	91.6	95.7	P/P	90 - 110
Cadmium	97.3	97.6	P/P	90 - 110
Chromium	93.0	93.4	P/P	90 - 110
Cobalt	95.1	94.3	P/P	90 - 110
Copper	94.0	93.8	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Manganese	97.3	97.7	P/P	90 - 110
Molybdenum	95.6	94.7	P/P	90 - 110
Nickel	95.1	95.2	P/P	90 - 110
Selenium	97.2	97.4	P/P	90 - 110
Silver	98.3	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A122475

Included Lab Sample IDs: 2447558, 2447559

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	101	100	P/P	90 - 110
Zinc	96.1	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A122491

Included Lab Sample IDs: 2447537, 2447539

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A122501

Included Lab Sample IDs: 2447558, 2447559

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	105	P/P	90 - 110
Iron	103	104	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Strontium	99.2	99.4	P/P	90 - 110
Tin	100	100	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A122507

Included Lab Sample IDs: 2447537, 2447539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.3	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A122585

Included Lab Sample IDs: 2447537, 2447539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.6	91.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A122610

Included Lab Sample IDs: 2447536, 2447538

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

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A122667

Included Lab Sample IDs: 2447537, 2447539

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	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)	100				12.5	
EPA 180.1 Rev. 2.0	Turbidity	104				0.851	
EPA 200.7 Rev. 4.4	Calcium	107		108			0.0903
	Iron	113		112	112		0.216
	Magnesium	114		112	113	105	0.246
	Potassium	104		103	103	106	0.114
	Sodium	103		104	105		0.395
	Strontium	99.6		100	99.6	100	0.425
	Tin	98.4		97.9	96.8	84.6	1.13
	Titanium	102		101	96.6		3.12
	Vanadium	100		101	101	94.8	0.816
EPA 200.8 Rev. 5.4	Aluminum	96.3		93.4	93.2		0.121
	Antimony	95.3		82.2	96.4	96.9	0.490
	Arsenic	98.0		97.0	97.1	84.6	0.116
	Barium	98.9		98.3	99.2	97.5	0.865
	Beryllium	95.0		90.5	92.8	85.5	2.39
	Boron	97.5		100	100	95.8	0.0105
	Cadmium	97.8		99.3	99.5	96.9	0.233
	Chromium	92.2		92.3	93.1		0.838
	Cobalt	95.2		94.3	94.9	91.4	0.598
	Copper	95.3		95.2	95.8		0.677
	Lead	101		102	103		1.12
	Manganese	95.3		96.5	97.3		0.713
	Molybdenum	94.9		95.3	95.8	73.3	0.469
	Nickel	95.6		94.8	95.3	82.3	0.494
	Selenium	98.1		97.6	97.1	66.1	0.546
	Silver	105		105	104	97.5	0.992
	Thallium	104		105	107	104	1.54
	Zinc	95.5		97.0	103		6.38
EPA 300.0 Rev. 2.1	Chloride	104		105	104	0.107	
	Sulfate	105		105	104	0.377	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8		102	102		0.392
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4					5.39
EPA 353.2 Rev. 2.0	NO2NO3-N	101		95.8	95.8		0.0
	NO2NO3-N	100		99.0	99.5		0.264
EPA 365.1 Rev. 2.0	Total-P	108		106	109		2.98
SM 2320 B-2011	Total Alkalinity	97.8				2.91	
SM 2540 C-2015	TDS	98.8				6.00	
SM 2540 D-2015	TSS	101					
SM 4500-F- C-2011	Fluoride	103		103	102		0.467
SM 5310 B-2011	Organic Carbon	95.3		94.8	97.3		1.67

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2447536, 2447538
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2447536, 2447538
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2447558, 2447559
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2447558, 2447559
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2447536, 2447538
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2447536, 2447538

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2447537, 2447539
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2447537, 2447539
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2447537, 2447539
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2447537, 2447539
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2447536, 2447538
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2447558, 2447559
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2447536, 2447538
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2447536, 2447538
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2447536, 2447538
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2447537, 2447539

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	10/27/2023			10/27/2023 14:44	Chandler E Cox	2447536
	10/27/2023			10/27/2023 14:45	Chandler E Cox	2447538
EPA 180.1 Rev. 2.0	10/27/2023			10/27/2023 13:38	Samantha L Bates	2447536
	10/27/2023			10/27/2023 13:40	Samantha L Bates	2447538
EPA 200.7 Rev. 4.4	10/27/2023	10/30/2023 13:55	George D Taylor	11/01/2023 17:04	Chase Roberts	2447558
	10/27/2023	10/30/2023 13:55	George D Taylor	11/01/2023 17:11	Chase Roberts	2447559
EPA 200.8 Rev. 5.4	10/27/2023	10/30/2023 13:55	George D Taylor	10/31/2023 18:49	Conrad Hartmann	2447558
	10/27/2023	10/30/2023 13:55	George D Taylor	10/31/2023 18:58	Conrad Hartmann	2447559
EPA 300.0 Rev. 2.1	10/27/2023			11/07/2023 15:10	James L Waggeberby	2447536
	10/27/2023			11/07/2023 15:25	James L Waggeberby	2447538
EPA 350.1 Rev. 2.0	10/27/2023			10/31/2023 12:54	Ping Hua	2447537
	10/27/2023			10/31/2023 12:55	Ping Hua	2447539
EPA 351.2 Rev. 2.0	10/27/2023	10/30/2023 13:30	Simonne.V. Calhoun	11/01/2023 15:18	Samantha L Bates	2447537
	10/27/2023	10/30/2023 13:30	Simonne.V. Calhoun	11/01/2023 15:20	Samantha L Bates	2447539
EPA 353.2 Rev. 2.0	10/27/2023			11/09/2023 12:00	Fadila Guebre	2447537
	10/27/2023			11/09/2023 12:22	Fadila Guebre	2447539
EPA 365.1 Rev. 2.0	10/27/2023	10/31/2023 12:07	Adam P Silver	11/01/2023 13:29	Chandler E Cox	2447537
	10/27/2023	10/31/2023 12:07	Adam P Silver	11/01/2023 13:30	Chandler E Cox	2447539
SM 2320 B-2011	10/27/2023			10/31/2023 03:26	Adam P Silver	2447536
	10/27/2023			10/31/2023 03:39	Adam P Silver	2447538
SM 2340 B-2011	10/27/2023			11/01/2023 17:04	Chase Roberts	2447558
	10/27/2023			11/01/2023 17:11	Chase Roberts	2447559
SM 2540 C-2015	10/27/2023			10/31/2023 14:50	Yijie Li	2447536, 2447538
SM 2540 D-2015	10/27/2023			10/31/2023 14:50	Yijie Li	2447536, 2447538
SM 4500-F- C-2011	10/27/2023			10/31/2023 03:26	Adam P Silver	2447536
	10/27/2023			10/31/2023 03:39	Adam P Silver	2447538
SM 5310 B-2011	10/27/2023			11/01/2023 21:05	Elise M. Gillis	2447539
	10/27/2023			11/01/2023 22:14	Elise M. Gillis	2447537