Chemical Analysis Report

CEN-DIST-2022-10-11-03

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

Event Description: **Roberts Branch x2**
Request ID: **RQ-2022-10-10-12**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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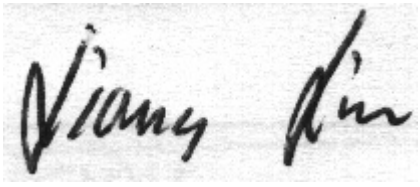
Certified by: Liang Lin, Environmental Administrator

Date Certified: 01-NOV-2022 15:00



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: Roberts Branch @ Fort Christmas Rd. N **Collection Date/Time: 10/10/2022 10:39**

Field ID: G3CE0065 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2361639	EPA 200.7 Rev. 4.4	Calcium	3.17		mg/L	P420837	
		Iron	540		ug/L	P420837	
		Magnesium	0.99		mg/L	P420837	
		Potassium	1.1	I	mg/L	P420837	
		Sodium	5.7		mg/L	P420837	
		Strontium	16.9		ug/L	P420837	
		Tin	3.0	U	ug/L	P420837	
		Titanium	3.0		ug/L	P420837	
		Vanadium	2.0	U	ug/L	P420837	
		Zinc	6.3	I	ug/L	P420837	
	EPA 200.8 Rev. 5.4	Aluminum	493		ug/L	P420837	
		Antimony	0.058	I	ug/L	P420837	
		Arsenic	1.20		ug/L	P420837	
		Barium	7.17		ug/L	P420837	
		Beryllium	0.024	I	ug/L	P420837	
		Boron	16.2		ug/L	P420837	
		Cadmium	0.020	U	ug/L	P420837	
		Chromium	0.58	I	ug/L	P420837	
		Cobalt	0.127		ug/L	P420837	
		Copper	0.64	I	ug/L	P420837	
		Lead	0.48		ug/L	P420837	
		Manganese	6.72		ug/L	P420837	
		Molybdenum	0.15	U	ug/L	P420837	
		Nickel	0.51	I	ug/L	P420837	
		Selenium	0.20	U	ug/L	P420837	
		Silver	0.010	U	ug/L	P420837	
		Thallium	0.10	U	ug/L	P420837	
	SM 2340 B-2011	Hardness	12.0		mg/L	P420837	

Sample Location: Roberts Branch @ Curryville Rd. **Collection Date/Time: 10/10/2022 10:05**

Field ID: G3CE0011 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2361633	DEP SOP: NU-094-1	Color (true)	520		PCU	P420754	
	EPA 180.1 Rev. 2.0	Turbidity	8.5		NTU	P420733	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P421200	
		Sulfate	0.20	U	mg SO4/L	P421203	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P421014	
	SM 2540 C-2015	TDS	75		mg/L	P421281	
	SM 2540 D-2015	TSS	2	U	mg/L	P421277	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P421016	
2361634	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P420980	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P420758	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P420845	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P420814	
	SM 5310 B-2011	Organic Carbon	38		mg C/L	P420966	
2361638	EPA 200.7 Rev. 4.4	Calcium	1.45		mg/L	P420837	
		Iron	700		ug/L	P420837	
		Magnesium	0.71		mg/L	P420837	
		Potassium	0.30	U	mg/L	P420837	
		Sodium	4.1		mg/L	P420837	
		Strontium	9.5		ug/L	P420837	
		Tin	3.0	U	ug/L	P420837	
		Titanium	2.1	I	ug/L	P420837	
		Vanadium	2.0	U	ug/L	P420837	
		Zinc	5.2	I	ug/L	P420837	
	EPA 200.8 Rev. 5.4	Aluminum	362		ug/L	P420837	
		Antimony	0.050	U	ug/L	P420837	
		Arsenic	0.36		ug/L	P420837	
		Barium	4.34		ug/L	P420837	
		Beryllium	0.026	I	ug/L	P420837	
		Boron	14.3		ug/L	P420837	
		Cadmium	0.020	U	ug/L	P420837	
		Chromium	0.40	U	ug/L	P420837	
		Cobalt	0.106		ug/L	P420837	
		Copper	0.40	U	ug/L	P420837	
		Lead	0.46		ug/L	P420837	
		Manganese	4.83		ug/L	P420837	
		Molybdenum	0.15	U	ug/L	P420837	
		Nickel	0.50	U	ug/L	P420837	
		Selenium	0.20	U	ug/L	P420837	
		Silver	0.010	U	ug/L	P420837	
		Thallium	0.10	U	ug/L	P420837	
	SM 2340 B-2011	Hardness	6.5		mg/L	P420837	

Ref. Method and Comment:
SM 4500-F- C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P420754

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P420733

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420837

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: P420837

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: P421200

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: P421203

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420980

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420758

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420845

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420814

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

Reference Method: SM 2320 B-2011
Batch ID: P421014

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

Reference Method: SM 2540 C-2015
Batch ID: P421281

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P421277

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P421016

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P420966

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: P420754

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: P420733

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	99.8		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420837

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.3		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	101		P	85 - 115
Barium	105		P	85 - 115
Beryllium	92.2		P	85 - 115
Boron	102		P	85 - 115
Cadmium	99.1		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	101		P	85 - 115
Copper	100		P	85 - 115
Lead	94.7		P	85 - 115
Manganese	103		P	85 - 115
Molybdenum	99.0		P	85 - 115
Nickel	101		P	85 - 115
Selenium	100		P	85 - 115
Silver	101		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421200

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.4		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421203

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420980

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420758

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420845

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: P420814

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

Reference Method: SM 2320 B-2011
Batch ID: P421014

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

Reference Method: SM 2540 C-2015
Batch ID: P421281

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

Reference Method: SM 2540 D-2015
Batch ID: P421277

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	99.8		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P421016

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	96 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P420966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361766	Calcium	111		P	80 - 120
2361766	Iron	109		P	80 - 120
2361766	Magnesium	109		P	80 - 120
2361766	Potassium	105		P	80 - 120
2361766	Sodium	103		P	80 - 120
2361766	Strontium	107		P	80 - 120
2361766	Tin	106		P	80 - 120
2361766	Titanium	107		P	80 - 120
2361766	Vanadium	105		P	80 - 120
2361766	Zinc	106		P	80 - 120
2361889	Calcium	105	106	P/P	80 - 120
2361889	Iron	103	104	P/P	80 - 120
2361889	Magnesium	106	107	P/P	80 - 120
2361889	Potassium	102	103	P/P	80 - 120
2361889	Sodium	101	102	P/P	80 - 120
2361889	Strontium	103	104	P/P	80 - 120
2361889	Tin	105	101	P/P	80 - 120
2361889	Titanium	101	99.6	P/P	80 - 120
2361889	Vanadium	102	102	P/P	80 - 120
2361889	Zinc	103	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361766	Aluminum	98.9		P	80 - 120
2361766	Antimony	103		P	80 - 120
2361766	Arsenic	102		P	80 - 120
2361766	Barium	105		P	80 - 120
2361766	Beryllium	93.1		P	80 - 120
2361766	Boron	104		P	80 - 120
2361766	Cadmium	102		P	80 - 120
2361766	Chromium	103		P	80 - 120
2361766	Cobalt	102		P	80 - 120
2361766	Copper	101		P	80 - 120
2361766	Lead	96.1		P	80 - 120
2361766	Manganese	104		P	80 - 120
2361766	Molybdenum	99.9		P	80 - 120
2361766	Nickel	102		P	80 - 120
2361766	Selenium	102		P	80 - 120
2361766	Silver	101		P	80 - 120
2361766	Thallium	102		P	80 - 120
2361889	Aluminum	99.4	98.0	P/P	80 - 120
2361889	Antimony	101	100	P/P	80 - 120
2361889	Arsenic	102	101	P/P	80 - 120
2361889	Barium	105	104	P/P	80 - 120
2361889	Beryllium	87.6	89.7	P/P	80 - 120
2361889	Boron	106	105	P/P	80 - 120
2361889	Cadmium	99.3	100	P/P	80 - 120
2361889	Chromium	102	101	P/P	80 - 120
2361889	Cobalt	100	99.6	P/P	80 - 120
2361889	Copper	101	101	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361889	Lead	95.8	95.6	P/P	80 - 120
2361889	Manganese	100	99.6	P/P	80 - 120
2361889	Molybdenum	98.8	98.6	P/P	80 - 120
2361889	Nickel	101	99.5	P/P	80 - 120
2361889	Selenium	99.1	99.4	P/P	80 - 120
2361889	Silver	100	99.8	P/P	80 - 120
2361889	Thallium	101	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421200

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361682	Chloride	95.5		P	90 - 110
2361753	Chloride	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361682	Sulfate	96.9		P	90 - 110
2361753	Sulfate	97.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420980

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361568	Ammonia-N	97.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420758

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361198	Kjeldahl Nitrogen	95.2	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361569	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420814

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361642	Total-P	105	105	P/P	90 - 110

Reference Method: SM 5310 B-2011
Batch ID: P420966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361686	Organic Carbon	102	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P420754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361415	Color (true)	2.68	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P420733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361354	Turbidity	1.33	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361889	Calcium	0.738	Spike	P	0 - 20
2361889	Iron	0.370	Spike	P	0 - 20
2361889	Magnesium	0.671	Spike	P	0 - 20
2361889	Potassium	0.204	Spike	P	0 - 20
2361889	Sodium	0.632	Spike	P	0 - 20
2361889	Strontium	0.632	Spike	P	0 - 20
2361889	Tin	3.71	Spike	P	0 - 20
2361889	Titanium	1.04	Spike	P	0 - 20
2361889	Vanadium	0.680	Spike	P	0 - 20
2361889	Zinc	0.778	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361889	Aluminum	1.39	Spike	P	0 - 20
2361889	Antimony	1.07	Spike	P	0 - 20
2361889	Arsenic	0.774	Spike	P	0 - 20
2361889	Barium	1.03	Spike	P	0 - 20
2361889	Beryllium	2.07	Spike	P	0 - 20
2361889	Boron	0.862	Spike	P	0 - 20
2361889	Cadmium	0.943	Spike	P	0 - 20
2361889	Chromium	1.28	Spike	P	0 - 20
2361889	Cobalt	0.761	Spike	P	0 - 20
2361889	Copper	0.125	Spike	P	0 - 20
2361889	Lead	0.195	Spike	P	0 - 20
2361889	Manganese	0.346	Spike	P	0 - 20
2361889	Molybdenum	0.172	Spike	P	0 - 20
2361889	Nickel	1.52	Spike	P	0 - 20
2361889	Selenium	0.248	Spike	P	0 - 20
2361889	Silver	0.598	Spike	P	0 - 20
2361889	Thallium	0.495	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421200

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361682	Chloride	0.0543	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361682	Sulfate	0.222	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420980

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361568	Ammonia-N	2.65	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420758

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361198	Kjeldahl Nitrogen	3.48	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361569	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420814

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361642	Total-P	0.507	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P421014

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361910	Total Alkalinity	0.403	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P421281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361335	TDS	6.28	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 D-2015
Batch ID: P421277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361335	TSS	5.83	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P421016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361910	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P420966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361686	Organic Carbon	0.327	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A115227
Included Lab Sample IDs: 2361633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1
Run ID: A115238
Included Lab Sample IDs: 2361633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115269
Included Lab Sample IDs: 2361634

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115281
Included Lab Sample IDs: 2361634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.7	97.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115327
Included Lab Sample IDs: 2361638, 2361639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	103	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	100	101	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Strontium	104	105	P/P	90 - 110
Tin	100	103	P/P	90 - 110
Titanium	101	103	P/P	90 - 110
Vanadium	100	102	P/P	90 - 110
Zinc	99.5	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A115336
Included Lab Sample IDs: 2361634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.7	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115344
Included Lab Sample IDs: 2361634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115344
Included Lab Sample IDs: 2361634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.0	96.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115352
Included Lab Sample IDs: 2361638, 2361639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	103	P/P	90 - 110
Antimony	99.0	100	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Barium	100	101	P/P	90 - 110
Beryllium	95.5	97.1	P/P	90 - 110
Boron	100	99.8	P/P	90 - 110
Cadmium	99.2	100	P/P	90 - 110
Chromium	98.6	99.7	P/P	90 - 110
Cobalt	99.1	99.3	P/P	90 - 110
Copper	98.6	98.5	P/P	90 - 110
Lead	93.1	93.7	P/P	90 - 110
Manganese	100	101	P/P	90 - 110
Molybdenum	99.3	99.8	P/P	90 - 110
Nickel	99.5	99.6	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	98.4	98.8	P/P	90 - 110
Thallium	98.0	99.1	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A115358
Included Lab Sample IDs: 2361633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.3	99.9	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A115358
Included Lab Sample IDs: 2361633

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115391
Included Lab Sample IDs: 2361634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.5	98.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115395
Included Lab Sample IDs: 2361633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115395
Included Lab Sample IDs: 2361633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.4	97.8	P/P	90 - 110
Sulfate	98.2	99.3	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)	100					2.68	
EPA 180.1 Rev. 2.0	Turbidity	99.8					1.33	
EPA 200.7 Rev. 4.4	Calcium	106	111	105	106			0.738
	Iron	104	109	103	104			0.370
	Magnesium	106	109	106	107			0.671
	Potassium	103	105	102	103			0.204
	Sodium	106	103	101	102			0.632
	Strontium	104	107	103	104			0.632
	Tin	102	106	105	101			3.71
	Titanium	103	107	101	99.6			1.04
	Vanadium	102	105	102	102			0.680
	Zinc	102	106	103	102			0.778
EPA 200.8 Rev. 5.4	Aluminum	98.3	99.4	98.0	98.9			1.39
	Antimony	103	101	100	103			1.07
	Arsenic	101	102	101	102			0.774
	Barium	105	105	104	105			1.03
	Beryllium	92.2	87.6	89.7	93.1			2.07
	Boron	102	106	105	104			0.862
	Cadmium	99.1	99.3	100	102			0.943
	Chromium	102	102	101	103			1.28
	Cobalt	101	100	99.6	102			0.761
	Copper	100	101	101	101			0.125
	Lead	94.7	95.8	95.6	96.1			0.195
	Manganese	103	100	99.6	104			0.346
	Molybdenum	99.0	98.8	98.6	99.9			0.172
	Nickel	101	101	99.5	102			1.52
	Selenium	100	99.1	99.4	102			0.248
	Silver	101	100	99.8	101			0.598
	Thallium	100	101	101	102			0.495
EPA 300.0 Rev. 2.1	Chloride	95.4	95.5	96.6			0.0543	
	Sulfate	98.1	96.9	97.9			0.222	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	97.8	101				2.65
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.0	95.2	99.4				3.48
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102				0.0
EPA 365.1 Rev. 2.0	Total-P	105	105	105				0.507
SM 2320 B-2011	Total Alkalinity	101					0.403	
SM 2540 C-2015	TDS	101					6.28	
SM 2540 D-2015	TSS	99.8					5.83	
SM 4500-F- C-2011	Fluoride	102						0.0
SM 5310 B-2011	Organic Carbon	99.1	102	103				0.327

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2361633
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2361633
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2361638, 2361639
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2361638, 2361639
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2361633
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2361633
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2361634

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2361634
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2361634
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2361634
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2361633
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2361638, 2361639
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2361633
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2361633
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2361633
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2361634

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	10/11/2022			10/11/2022 16:10	Anna M. Plaviak	2361633
EPA 180.1 Rev. 2.0	10/11/2022			10/11/2022 13:48	Chandler E Cox	2361633
EPA 200.7 Rev. 4.4	10/11/2022	10/13/2022 11:20	George D Taylor	10/14/2022 19:41	McKinley C Carter	2361638
	10/11/2022	10/13/2022 11:20	George D Taylor	10/14/2022 19:48	McKinley C Carter	2361639
EPA 200.8 Rev. 5.4	10/11/2022	10/13/2022 11:20	George D Taylor	10/17/2022 15:52	Megan Whitefoot	2361638
	10/11/2022	10/13/2022 11:20	George D Taylor	10/17/2022 16:01	Megan Whitefoot	2361639
EPA 300.0 Rev. 2.1	10/11/2022			10/19/2022 17:33	Anna M. Plaviak	2361633
EPA 350.1 Rev. 2.0	10/11/2022			10/17/2022 11:49	Judith K. Clark	2361634
EPA 351.2 Rev. 2.0	10/11/2022	10/12/2022 12:56	Samantha L Bates	10/13/2022 10:55	Samantha L Bates	2361634
EPA 353.2 Rev. 2.0	10/11/2022			10/13/2022 09:38	Beverly Y. Sanders	2361634
EPA 365.1 Rev. 2.0	10/11/2022	10/13/2022 15:28	Adam P Silver	10/19/2022 12:56	Simonne.V. Calhoun	2361634
SM 2320 B-2011	10/11/2022			10/13/2022 23:14	Dale L. Simmons	2361633
SM 2340 B-2011	10/11/2022			10/14/2022 19:41	McKinley C Carter	2361638
	10/11/2022			10/14/2022 19:48	McKinley C Carter	2361639
SM 2540 C-2015	10/11/2022			10/13/2022 16:08	Yijie Li	2361633
SM 2540 D-2015	10/11/2022			10/13/2022 16:08	Yijie Li	2361633
SM 4500-F- C-2011	10/11/2022			10/13/2022 23:14	Dale L. Simmons	2361633
SM 5310 B-2011	10/11/2022			10/14/2022 10:53	Khloe J Berg	2361634