

Chemical Analysis Report

CEN-DIST-2022-02-08-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Run 11**
Request ID: **RQ-2022-01-31-19**
Customer: **CEN-DIST**
Project ID: **SMP**

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

Date Certified: 02-MAR-2022 09:21



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 @ Curryville Rd.

Collection Date/Time: 02/07/2022 10:35

Field ID: G3CE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2304318	DEP SOP: NU-094-1	Color (true)**	180		PCU	P409596	
	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P409582	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P409775	
		Sulfate	3.8		mg SO4/L	P409782	
	SM 2320 B-2011	Total Alkalinity	2.5	I	mg CaCO3/L	P409649	
	SM 2540 C-2011	TDS	71		mg/L	P409978	
	SM 2540 D-2011	TSS	3	I	mg/L	P409970	
2304319	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P409651	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P409955	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P409670	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P409705	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P409770	
2304320	SM 5310 B-2011	Organic Carbon	20		mg C/L	P410066	
2304326	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.027		mg P/L	P409566	
	EPA 200.7 Rev. 4.4	Calcium	5.07		mg/L	P409595	
		Iron	330		ug/L	P409595	
		Magnesium	1.30		mg/L	P409595	
		Potassium	1.6		mg/L	P409595	
		Sodium	9.5		mg/L	P409595	
		Strontium	29.6		ug/L	P409595	
		Tin	3.0	U	ug/L	P409595	
		Titanium	1.7	I	ug/L	P409595	
		Vanadium	2.0	U	ug/L	P409595	
		Zinc	5.0	U	ug/L	P409595	
		Aluminum	393		ug/L	P409595	
		Antimony	0.050	U	ug/L	P409595	
		Arsenic	0.27		ug/L	P409595	
		Barium	10.9		ug/L	P409595	
	EPA 200.8 Rev. 5.4	Beryllium	0.024	I	ug/L	P409595	
		Boron**	18.4		ug/L	P409595	
		Cadmium	0.020	U	ug/L	P409595	
		Chromium	0.44	I	ug/L	P409595	
		Cobalt	0.085		ug/L	P409595	
		Copper	0.40	U	ug/L	P409595	
		Lead	0.36	I	ug/L	P409595	
		Manganese	4.91		ug/L	P409595	
		Molybdenum	0.15	U	ug/L	P409595	
		Nickel	0.50	U	ug/L	P409595	
		Selenium	0.20	U	ug/L	P409595	
		Silver	0.010	U	ug/L	P409595	
		Thallium	0.10	U	ug/L	P409595	
	SM 2340B	Hardness	18.0		mg/L	P409595	

Field ID: G3CE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for 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 and beryllium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Roberts Branch @ Fort Christmas Rd. N

Collection Date/Time: 02/07/2022 11:17

Field ID: G3CE0065

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2304327	EPA 200.7 Rev. 4.4	Calcium	1.93		mg/L	P409595	
		Iron	390		ug/L	P409595	
		Magnesium	1.29		mg/L	P409595	
		Potassium	0.30	U	mg/L	P409595	
		Sodium	9.4		mg/L	P409595	
		Strontium	16.2		ug/L	P409595	
		Tin	3.0	U	ug/L	P409595	
		Titanium	1.3	I	ug/L	P409595	
		Vanadium	2.0	U	ug/L	P409595	
		Zinc	5.9	I	ug/L	P409595	
	EPA 200.8 Rev. 5.4	Aluminum	313		ug/L	P409595	
		Antimony	0.050	U	ug/L	P409595	
		Arsenic	0.19	I	ug/L	P409595	
		Barium	6.70		ug/L	P409595	
		Beryllium	0.035	I	ug/L	P409595	
		Boron**	16.4		ug/L	P409595	
		Cadmium	0.020	U	ug/L	P409595	
		Chromium	0.40	U	ug/L	P409595	
		Cobalt	0.117		ug/L	P409595	
		Copper	0.40	U	ug/L	P409595	
		Lead	0.22	I	ug/L	P409595	
		Manganese	4.22		ug/L	P409595	
		Molybdenum	0.15	U	ug/L	P409595	
		Nickel	0.50	U	ug/L	P409595	
		Selenium	0.20	U	ug/L	P409595	
		Silver	0.010	U	ug/L	P409595	
		Thallium	0.10	U	ug/L	P409595	
	SM 2340B	Hardness	10.1		mg/L	P409595	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for 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 and beryllium 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: P409596

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409582

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409595

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: P409595

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: P409775

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: P409782

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409955

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409670

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409705

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409770

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409566

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2320 B-2011
Batch ID: P409649

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

Reference Method: SM 2540 C-2011
Batch ID: P409978

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P409970

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P409651

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P410066

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: P409596

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P409582

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.5		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P409595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	103		P	85 - 115
Sodium	105		P	85 - 115
Strontium	104		P	85 - 115
Tin	108		P	85 - 115
Titanium	105		P	85 - 115
Vanadium	98.6		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P409595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.9		P	85 - 115
Antimony	99.7		P	85 - 115
Arsenic	102		P	85 - 115
Barium	103		P	85 - 115
Beryllium	94.8		P	85 - 115
Boron	100		P	85 - 115
Cadmium	97.8		P	85 - 115
Chromium	96.9		P	85 - 115
Cobalt	100		P	85 - 115
Copper	98.6		P	85 - 115
Lead	97.4		P	85 - 115
Manganese	98.0		P	85 - 115
Molybdenum	100		P	85 - 115
Nickel	100		P	85 - 115
Selenium	98.4		P	85 - 115
Silver	105		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P409775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	106		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	106		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409955

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409670

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: P409705

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: P409770

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409566

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P409649

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.3		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P409651

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.2		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P410066

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P409595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2303248	Calcium	103		P	80 - 120
2303248	Iron	101		P	80 - 120
2303248	Magnesium	100		P	80 - 120
2303248	Potassium	105		P	80 - 120
2303248	Sodium	101		P	80 - 120
2303248	Strontium	106		P	80 - 120
2303248	Tin	102		P	80 - 120
2303248	Vanadium	98.8		P	80 - 120
2303248	Zinc	111		P	80 - 120
2303749	Calcium	108	109	P/P	80 - 120
2303749	Iron	108	109	P/P	80 - 120
2303749	Magnesium	109	110	P/P	80 - 120
2303749	Potassium	110	110	P/P	80 - 120
2303749	Sodium	105	104	P/P	80 - 120
2303749	Strontium	106	106	P/P	80 - 120
2303749	Tin	107	110	P/P	80 - 120
2303749	Titanium	104	106	P/P	80 - 120
2303749	Vanadium	97.6	98.7	P/P	80 - 120
2303749	Zinc	106	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P409595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2303248	Antimony	95.4		P	80 - 120
2303248	Arsenic	103		P	80 - 120
2303248	Barium	106		P	80 - 120
2303248	Boron	107		P	80 - 120
2303248	Cadmium	101		P	80 - 120
2303248	Chromium	100		P	80 - 120
2303248	Cobalt	102		P	80 - 120
2303248	Copper	102		P	80 - 120
2303248	Lead	100		P	80 - 120
2303248	Manganese	99.7		P	80 - 120
2303248	Molybdenum	103		P	80 - 120
2303248	Nickel	102		P	80 - 120
2303248	Selenium	100		P	80 - 120
2303248	Silver	105		P	80 - 120
2303248	Thallium	106		P	80 - 120
2303749	Aluminum	98.8	100	P/P	80 - 120
2303749	Antimony	98.5	99.1	P/P	80 - 120
2303749	Arsenic	103	102	P/P	80 - 120
2303749	Barium	103	104	P/P	80 - 120
2303749	Beryllium	102	101	P/P	80 - 120
2303749	Boron	97.2	100	P/P	80 - 120
2303749	Cadmium	98.7	99.5	P/P	80 - 120
2303749	Chromium	97.3	97.1	P/P	80 - 120
2303749	Cobalt	102	102	P/P	80 - 120
2303749	Copper	101	102	P/P	80 - 120
2303749	Lead	97.7	97.6	P/P	80 - 120
2303749	Manganese	96.8	98.1	P/P	80 - 120
2303749	Molybdenum	99.9	99.6	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P409595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2303749	Nickel	103	105	P/P	80 - 120
2303749	Selenium	99.1	101	P/P	80 - 120
2303749	Silver	104	104	P/P	80 - 120
2303749	Thallium	103	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P409775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304253	Chloride	106		P	90 - 110
2304379	Chloride	107		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P409782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304253	Sulfate	101		P	90 - 110
2304379	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P409955

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304223	Ammonia-N	96.8	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P409670

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304254	Kjeldahl Nitrogen	93.5	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P409705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304222	NO2NO3-N	98.6	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P409770

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304284	Total-P	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P409566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304255	O-Phosphate-P	98.1	99.8	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P409651

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2303948	Fluoride	95.2	97.0	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P410066

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304418	Organic Carbon	96.0	94.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P409596

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304253	Color (true)	3.42	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409582

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304417	Turbidity	2.13	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2303749	Calcium	0.829	Spike	P	0 - 20
2303749	Iron	0.821	Spike	P	0 - 20
2303749	Magnesium	0.561	Spike	P	0 - 20
2303749	Potassium	0.246	Spike	P	0 - 20
2303749	Sodium	0.324	Spike	P	0 - 20
2303749	Strontium	0.00528	Spike	P	0 - 20
2303749	Tin	3.09	Spike	P	0 - 20
2303749	Titanium	1.14	Spike	P	0 - 20
2303749	Vanadium	1.15	Spike	P	0 - 20
2303749	Zinc	1.17	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2303749	Aluminum	1.38	Spike	P	0 - 20
2303749	Antimony	0.604	Spike	P	0 - 20
2303749	Arsenic	0.0250	Spike	P	0 - 20
2303749	Barium	0.811	Spike	P	0 - 20
2303749	Beryllium	0.975	Spike	P	0 - 20
2303749	Boron	2.83	Spike	P	0 - 20
2303749	Cadmium	0.888	Spike	P	0 - 20
2303749	Chromium	0.203	Spike	P	0 - 20
2303749	Cobalt	0.690	Spike	P	0 - 20
2303749	Copper	0.111	Spike	P	0 - 20
2303749	Lead	0.0895	Spike	P	0 - 20
2303749	Manganese	1.23	Spike	P	0 - 20
2303749	Molybdenum	0.370	Spike	P	0 - 20
2303749	Nickel	1.57	Spike	P	0 - 20
2303749	Selenium	1.39	Spike	P	0 - 20
2303749	Silver	0.132	Spike	P	0 - 20
2303749	Thallium	1.70	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304253	Chloride	0.448	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304253	Sulfate	0.537	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304223	Ammonia-N	2.10	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304254	Kjeldahl Nitrogen	6.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304222	NO2NO3-N	1.30	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304284	Total-P	0.676	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304255	O-Phosphate-P	1.48	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P409649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2303948	Total Alkalinity	0.0205	Sample	P	0 - 5.2

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P409978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304253	TDS	6.70	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P409651

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2303948	Fluoride	1.53	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P410066

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304418	Organic Carbon	0.604	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A110286

Included Lab Sample IDs: 2304320

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A110291

Included Lab Sample IDs: 2304318

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

Reference Method: DEP SOP: NU-094-1

Run ID: A110296

Included Lab Sample IDs: 2304318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A110318

Included Lab Sample IDs: 2304326, 2304327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.2	97.0	P/P	90 - 110
Antimony	93.7	93.5	P/P	90 - 110
Arsenic	98.1	97.8	P/P	90 - 110
Barium	96.2	96.1	P/P	90 - 110
Beryllium	91.8	91.2	P/P	90 - 110
Boron	98.0	101	P/P	90 - 110
Cadmium	97.6	97.5	P/P	90 - 110
Chromium	95.4	95.6	P/P	90 - 110
Cobalt	96.7	96.4	P/P	90 - 110
Copper	96.6	96.3	P/P	90 - 110
Lead	94.4	94.4	P/P	90 - 110
Manganese	95.3	95.4	P/P	90 - 110
Molybdenum	97.7	97.6	P/P	90 - 110
Nickel	96.8	96.8	P/P	90 - 110
Selenium	95.1	94.9	P/P	90 - 110
Thallium	102	101	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A110321

Included Lab Sample IDs: 2304318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.8	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A110321

Included Lab Sample IDs: 2304318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	96.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A110340

Included Lab Sample IDs: 2304319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	92.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A110344

Included Lab Sample IDs: 2304326, 2304327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	94.7	94.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A110370

Included Lab Sample IDs: 2304318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	105	108	P/P	90 - 110
Sulfate	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110395

Included Lab Sample IDs: 2304319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.8	98.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A110426

Included Lab Sample IDs: 2304326, 2304327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	99.3	99.5	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Strontium	103	104	P/P	90 - 110
Tin	104	105	P/P	90 - 110
Titanium	101	102	P/P	90 - 110
Vanadium	103	103	P/P	90 - 110
Zinc	105	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110454

Included Lab Sample IDs: 2304319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110484

Included Lab Sample IDs: 2304319

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

Reference Method: SM 5310 B-2011

Run ID: A110496

Included Lab Sample IDs: 2304319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	96.0	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				3.42	
EPA 180.1 Rev. 2.0	Turbidity	96.5				2.13	
EPA 200.7 Rev. 4.4	Calcium	106	108	109	103		0.829
	Iron	105	108	109	101		0.821
	Magnesium	106	109	110	100		0.561
	Potassium	103	110	110	105		0.246
	Sodium	105	105	104	101		0.324
	Strontium	104	106	106	106		0.0052
	Tin	108	107	110	102		3.09
	Titanium	105	104	106			1.14
	Vanadium	98.6	97.6	98.7	98.8		1.15
	Zinc	107	106	108	111		1.17
EPA 200.8 Rev. 5.4	Aluminum	99.9	98.8	100			1.38
	Antimony	99.7	98.5	99.1	95.4		0.604
	Arsenic	102	103	102	103		0.0250
	Barium	103	103	104	106		0.811
	Beryllium	94.8	102	101			0.975
	Boron	100	97.2	100	107		2.83
	Cadmium	97.8	98.7	99.5	101		0.888
	Chromium	96.9	97.3	97.1	100		0.203
	Cobalt	100	102	102	102		0.690
	Copper	98.6	101	102	102		0.111
	Lead	97.4	97.7	97.6	100		0.0895
	Manganese	98.0	96.8	98.1	99.7		1.23
	Molybdenum	100	99.9	99.6	103		0.370
	Nickel	100	103	105	102		1.57
	Selenium	98.4	99.1	101	100		1.39
	Silver	105	104	104	105		0.132
	Thallium	103	103	105	106		1.70
EPA 300.0 Rev. 2.1	Chloride	106	106	107		0.448	
	Sulfate	106	101	102		0.537	
EPA 350.1 Rev. 2.0	Ammonia-N	103	96.8	99.4			2.10
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.0	93.5	101			6.35
EPA 353.2 Rev. 2.0	NO2NO3-N	100	98.6	100			1.30
EPA 365.1 Rev. 2.0	Total-P	104	104	104			0.676
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	98.1	99.8			1.48
SM 2320 B-2011	Total Alkalinity	98.3				0.0205	
SM 2540 C-2011	TDS					6.70	
SM 4500 F-C-2011	Fluoride	97.2	95.2	97.0			1.53
SM 5310 B-2011	Organic Carbon	94.5	96.0	94.8			0.604

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2304318
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2304318
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2304326, 2304327
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2304326, 2304327
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2304318
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2304318
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2304319

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2304319
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2304319
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2304319
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2304320
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2304318
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2304326, 2304327
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2304318
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2304318
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2304318
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2304319

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	02/08/2022			02/08/2022 16:38	Anna M. Plaviak	2304318
EPA 180.1 Rev. 2.0	02/08/2022			02/08/2022 15:41	Khloe J Berg	2304318
EPA 200.7 Rev. 4.4	02/08/2022	02/09/2022 10:44	Megan Whitefoot	02/15/2022 20:24	Josef B Mick	2304326
	02/08/2022	02/09/2022 10:44	Megan Whitefoot	02/15/2022 20:32	Josef B Mick	2304327
EPA 200.8 Rev. 5.4	02/08/2022	02/09/2022 10:44	Megan Whitefoot	02/09/2022 21:36	Alexander Thompson	2304326
	02/08/2022	02/09/2022 10:44	Megan Whitefoot	02/09/2022 21:45	Alexander Thompson	2304327
	02/08/2022	02/09/2022 10:44	Megan Whitefoot	02/10/2022 16:21	Alexander Thompson	2304326
	02/08/2022	02/09/2022 10:44	Megan Whitefoot	02/10/2022 16:28	Alexander Thompson	2304327
EPA 300.0 Rev. 2.1	02/08/2022			02/12/2022 03:20	James L Waggeberby	2304318
EPA 350.1 Rev. 2.0	02/08/2022			02/16/2022 15:32	Ping Hua	2304319
EPA 351.2 Rev. 2.0	02/08/2022	02/11/2022 10:44	Alexandra J Mattheus	02/14/2022 12:01	Alexandra J Mattheus	2304319
EPA 353.2 Rev. 2.0	02/08/2022			02/10/2022 15:54	Nathaniel J Jones	2304319
EPA 365.1 Rev. 2.0	02/08/2022	02/15/2022 14:20	Simonne.V. Calhoun	02/16/2022 14:17	Shengyu Ding	2304319
EPA 365.1 Rev. 2.0 dissolved	02/08/2022			02/08/2022 14:19	James L Waggeberby	2304320
SM 2320 B-2011	02/08/2022			02/09/2022 19:13	Dale L. Simmons	2304318
SM 2340B	02/08/2022			02/15/2022 20:24	Josef B Mick	2304326
	02/08/2022			02/15/2022 20:32	Josef B Mick	2304327
SM 2540 C-2011	02/08/2022			02/09/2022 14:36	Yijie Li	2304318
SM 2540 D-2011	02/08/2022			02/09/2022 14:36	Yijie Li	2304318
SM 4500 F-C-2011	02/08/2022			02/09/2022 19:13	Dale L. Simmons	2304318
SM 5310 B-2011	02/08/2022			02/18/2022 08:07	Khloe J Berg	2304319