Chemical Analysis Report

CEN-DIST-2023-01-10-01

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

Event Description: **Run 7**
Request ID: **RQ-2023-01-09-52**
Customer: **CEN-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 01-FEB-2023 09:49

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Hart @ Center **Collection Date/Time: 01/09/2023 11:07**

Field ID: G4CE0243 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2379267	EPA 200.7 Rev. 4.4	Calcium	5.89		mg/L	P424418	
		Cobalt	1.0	U	ug/L	P424418	
		Iron	700		ug/L	P424418	
		Magnesium	1.65		mg/L	P424418	
		Manganese	6.2		ug/L	P424418	
		Potassium	1.6		mg/L	P424418	
		Sodium	10.8		mg/L	P424418	
		Strontium	43.5		ug/L	P424418	
		Tin	3.0	U	ug/L	P424418	
		Titanium	1.3	I	ug/L	P424418	
		Vanadium	2.0	U	ug/L	P424418	
		Zinc	5.0	U	ug/L	P424418	
	EPA 200.8 Rev. 5.4	Aluminum	351		ug/L	P424418	
		Antimony	0.074	I	ug/L	P424418	
		Arsenic	0.77		ug/L	P424418	
		Barium	12.1		ug/L	P424418	
		Beryllium	0.016	I	ug/L	P424418	
		Boron	24.6		ug/L	P424418	MS
		Cadmium	0.020	U	ug/L	P424418	
		Chromium	0.60	I	ug/L	P424418	
		Copper	1.07		ug/L	P424418	
		Lead	0.44		ug/L	P424418	
		Molybdenum	0.15	U	ug/L	P424418	
		Nickel	0.50	U	ug/L	P424418	
		Selenium	0.20	U	ug/L	P424418	
		Silver	0.010	U	ug/L	P424418	
		Thallium	0.10	U	ug/L	P424418	
	SM 2340 B-2011	Hardness	21.5		mg/L	P424418	

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

Sample Location: Alligator Lake @ Center of South lobe **Collection Date/Time: 01/09/2023 12:38**

Field ID: G4CE0170 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2379268	EPA 200.7 Rev. 4.4	Calcium	4.60		mg/L	P424418	
		Cobalt	1.0	U	ug/L	P424418	
		Iron	720		ug/L	P424418	
		Magnesium	2.51		mg/L	P424418	
		Manganese	11.3		ug/L	P424418	
		Potassium	2.9		mg/L	P424418	
		Sodium	14.0		mg/L	P424418	
		Strontium	32.4		ug/L	P424418	
		Tin	3.0	U	ug/L	P424418	
		Titanium	1.3	I	ug/L	P424418	
		Vanadium	2.0	U	ug/L	P424418	
		Zinc	7.7	I	ug/L	P424418	
	EPA 200.8 Rev. 5.4	Aluminum	307		ug/L	P424418	
		Antimony	0.062	I	ug/L	P424418	
		Arsenic	0.81		ug/L	P424418	
		Barium	16.2		ug/L	P424418	
		Beryllium	0.026	I	ug/L	P424418	
		Boron	27.4		ug/L	P424418	MS
		Cadmium	0.020	U	ug/L	P424418	
		Chromium	0.71	I	ug/L	P424418	
		Copper	1.15		ug/L	P424418	
		Lead	0.75		ug/L	P424418	
		Molybdenum	0.15	U	ug/L	P424418	
		Nickel	0.50	U	ug/L	P424418	
		Selenium	0.20	U	ug/L	P424418	
		Silver	0.010	U	ug/L	P424418	
		Thallium	0.10	U	ug/L	P424418	
	SM 2340 B-2011	Hardness	21.8		mg/L	P424418	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 01/24/2023.

Sample Location: L WASHINGTON CENTER **Collection Date/Time: 01/09/2023 14:11**

Field ID: G3CE0025 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2379229	DEP SOP: NU-094-1	Color (true)	240		PCU	P424359	
	EPA 180.1 Rev. 2.0	Turbidity	0.80	I	NTU	P424362	
	EPA 300.0 Rev. 2.1	Chloride	82		mg Cl/L	P424624	
		Sulfate	15		mg SO4/L	P424627	
	SM 2320 B-2011	Total Alkalinity	66		mg CaCO3/L	P424709	
	SM 2540 C-2015	TDS	275		mg/L	P424910	
	SM 2540 D-2015	TSS	2	U	mg/L	P424819	
	SM 4500-F- C-2011	Fluoride	0.16		mg F/L	P425151	
2379230	EPA 350.1 Rev. 2.0	Ammonia-N	0.064		mg N/L	P424565	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P424390	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P424607	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P424435	
	SM 5310 B-2011	Organic Carbon	32		mg C/L	P424546	

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

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P424359

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424362

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424418

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Cobalt	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/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: P424418

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
Copper	0.40	U	ug/L
Lead	0.20	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: P424624

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: P424627

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424565

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424390

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424607

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424435

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

Reference Method: SM 2320 B-2011
Batch ID: P424709

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

Reference Method: SM 2540 C-2015
Batch ID: P424910

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P424819

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P425151

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P424546

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: P424359

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424362

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Cobalt	101		P	85 - 115
Iron	105		P	85 - 115
Magnesium	101		P	85 - 115
Manganese	102		P	85 - 115
Potassium	103		P	85 - 115
Sodium	106		P	85 - 115
Strontium	106		P	85 - 115
Tin	103		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	106		P	85 - 115
Arsenic	104		P	85 - 115
Barium	105		P	85 - 115
Beryllium	95.8		P	85 - 115
Boron	102		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	97.5		P	85 - 115
Molybdenum	103		P	85 - 115
Nickel	104		P	85 - 115
Selenium	103		P	85 - 115
Silver	104		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424624

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.7		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424627

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424565

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424390

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424607

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424435

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

Reference Method: SM 2320 B-2011
Batch ID: P424709

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.1		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P424910

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

Reference Method: SM 2540 D-2015
Batch ID: P424819

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	98.1		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P425151

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	96 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P424546

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379193	Calcium	102		P	80 - 120
2379193	Cobalt	102	102	P/P	80 - 120
2379193	Iron	104	108	P/P	80 - 120
2379193	Magnesium	103		P	80 - 120
2379193	Manganese	103	105	P/P	80 - 120
2379193	Potassium	100	107	P/P	80 - 120
2379193	Sodium	107		P	80 - 120
2379193	Strontium	104	107	P/P	80 - 120
2379193	Tin	99.9	100	P/P	80 - 120
2379193	Titanium	103	105	P/P	80 - 120
2379193	Vanadium	105	107	P/P	80 - 120
2379193	Zinc	98.9	102	P/P	80 - 120
2379387	Cobalt	102		P	80 - 120
2379387	Iron	100		P	80 - 120
2379387	Manganese	105		P	80 - 120
2379387	Strontium	103		P	80 - 120
2379387	Tin	102		P	80 - 120
2379387	Titanium	109		P	80 - 120
2379387	Vanadium	112		P	80 - 120
2379387	Zinc	113		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379193	Aluminum	103	101	P/P	80 - 120
2379193	Antimony	108	107	P/P	80 - 120
2379193	Arsenic	107	105	P/P	80 - 120
2379193	Barium	107	103	P/P	80 - 120
2379193	Beryllium	97.3	97.1	P/P	80 - 120
2379193	Boron	102	103	P/P	80 - 120
2379193	Cadmium	106	109	P/P	80 - 120
2379193	Chromium	102	100	P/P	80 - 120
2379193	Copper	100	99.6	P/P	80 - 120
2379193	Lead	98.6	99.1	P/P	80 - 120
2379193	Molybdenum	105	104	P/P	80 - 120
2379193	Nickel	104	104	P/P	80 - 120
2379193	Selenium	101	99.3	P/P	80 - 120
2379193	Silver	103	101	P/P	80 - 120
2379193	Thallium	105	106	P/P	80 - 120
2379387	Aluminum	108		P	80 - 120
2379387	Antimony	113		P	80 - 120
2379387	Arsenic	120		P	80 - 120
2379387	Barium	113		P	80 - 120
2379387	Beryllium	80.1		P	80 - 120
2379387	Boron	60.8		F	80 - 120
2379387	Cadmium	101		P	80 - 120
2379387	Chromium	101		P	80 - 120
2379387	Copper	81.0		P	80 - 120
2379387	Lead	106		P	80 - 120
2379387	Molybdenum	113		P	80 - 120
2379387	Nickel	91.3		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379387	Selenium	116		P	80 - 120
2379387	Silver	88.6		P	80 - 120
2379387	Thallium	105		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424624

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379138	Chloride	95.1		P	90 - 110
2379142	Chloride	95.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424627

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379138	Sulfate	98.2		P	90 - 110
2379142	Sulfate	97.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424565

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379225	Ammonia-N	97.8	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379146	Kjeldahl Nitrogen	95.1	93.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424607

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379345	NO2NO3-N	98.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379304	Total-P	107	107	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P425151

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379229	Fluoride	98.8	99.4	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P424546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P424546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379689	Organic Carbon	100		P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P424359

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379221	Color (true)	1.61	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P424362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379173	Turbidity	4.65	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P424418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379193	Calcium	2.95	Spike	P	0 - 20
2379193	Cobalt	0.701	Spike	P	0 - 20
2379193	Iron	3.31	Spike	P	0 - 20
2379193	Magnesium	3.53	Spike	P	0 - 20
2379193	Manganese	1.65	Spike	P	0 - 20
2379193	Potassium	3.72	Spike	P	0 - 20
2379193	Sodium	2.03	Spike	P	0 - 20
2379193	Strontium	2.11	Spike	P	0 - 20
2379193	Tin	0.595	Spike	P	0 - 20
2379193	Titanium	2.03	Spike	P	0 - 20
2379193	Vanadium	1.74	Spike	P	0 - 20
2379193	Zinc	3.21	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P424418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379193	Aluminum	1.37	Spike	P	0 - 20
2379193	Antimony	0.631	Spike	P	0 - 20
2379193	Arsenic	1.69	Spike	P	0 - 20
2379193	Barium	2.72	Spike	P	0 - 20
2379193	Beryllium	0.150	Spike	P	0 - 20
2379193	Boron	1.05	Spike	P	0 - 20
2379193	Cadmium	2.58	Spike	P	0 - 20
2379193	Chromium	1.66	Spike	P	0 - 20
2379193	Copper	0.865	Spike	P	0 - 20
2379193	Lead	0.519	Spike	P	0 - 20
2379193	Molybdenum	0.584	Spike	P	0 - 20
2379193	Nickel	0.367	Spike	P	0 - 20
2379193	Selenium	1.88	Spike	P	0 - 20
2379193	Silver	1.05	Spike	P	0 - 20
2379193	Thallium	0.842	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424624

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379138	Chloride	0.271	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P424627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379138	Sulfate	1.34	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379225	Ammonia-N	0.186	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379146	Kjeldahl Nitrogen	1.00	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424607

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379345	NO2NO3-N	0.478	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379304	Total-P	0.0218	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P424709

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379739	Total Alkalinity	1.55	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P424910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378760	TDS	0.342	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P425151

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379229	Fluoride	0.487	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P424546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379689	Organic Carbon	0.385	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: A116828
Included Lab Sample IDs: 2379229

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

Reference Method: DEP SOP: NU-094-1
Run ID: A116829
Included Lab Sample IDs: 2379229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A116833
Included Lab Sample IDs: 2379229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.8	99.0	P/P	90 - 110
Sulfate	98.9	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116891
Included Lab Sample IDs: 2379230

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

Reference Method: SM 5310 B-2011
Run ID: A116895
Included Lab Sample IDs: 2379230

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116902
Included Lab Sample IDs: 2379230

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116920
Included Lab Sample IDs: 2379230

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	93.5	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116926
Included Lab Sample IDs: 2379230

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A116966
Included Lab Sample IDs: 2379229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.5	97.3	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A116990
Included Lab Sample IDs: 2379267, 2379268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Cobalt	96.4	96.0	P/P	90 - 110
Iron	105	105	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Manganese	98.8	99.6	P/P	90 - 110
Potassium	106	104	P/P	90 - 110
Sodium	108	108	P/P	90 - 110
Strontium	100	102	P/P	90 - 110
Tin	95.9	94.8	P/P	90 - 110
Titanium	97.0	97.6	P/P	90 - 110
Vanadium	97.6	97.2	P/P	90 - 110
Zinc	94.7	92.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117050
Included Lab Sample IDs: 2379267, 2379268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	104	P/P	90 - 110
Aluminum	104	99.9	P/P	90 - 110
Antimony	102	106	P/P	90 - 110
Antimony	106	107	P/P	90 - 110
Arsenic	100	101	P/P	90 - 110
Arsenic	101	103	P/P	90 - 110
Barium	101	106	P/P	90 - 110
Barium	106	102	P/P	90 - 110
Boron	93.7	97.1	P/P	90 - 110
Boron	99.5	93.7	P/P	90 - 110
Cadmium	102	104	P/P	90 - 110
Cadmium	104	106	P/P	90 - 110
Chromium	97.4	98.7	P/P	90 - 110
Chromium	98.7	92.9	P/P	90 - 110
Copper	98.9	98.9	P/P	90 - 110
Copper	98.9	94.8	P/P	90 - 110
Lead	94.2	95.5	P/P	90 - 110
Lead	94.6	94.2	P/P	90 - 110
Molybdenum	97.9	101	P/P	90 - 110
Molybdenum	99.4	97.9	P/P	90 - 110
Nickel	100	92.0	P/P	90 - 110
Nickel	92.0	92.6	P/P	90 - 110
Selenium	100	106	P/P	90 - 110
Selenium	106	103	P/P	90 - 110
Silver	101	99.3	P/P	90 - 110
Silver	99.3	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117050
Included Lab Sample IDs: 2379267, 2379268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	101	101	P/P	90 - 110
Thallium	99.5	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117079
Included Lab Sample IDs: 2379267, 2379268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	100	94.1	P/P	90 - 110
Beryllium	98.9	100	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A117157
Included Lab Sample IDs: 2379229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	101	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)	101					1.61	
EPA 180.1 Rev. 2.0	Turbidity	101					4.65	
EPA 200.7 Rev. 4.4	Calcium	101	102					2.95
	Cobalt	101	102	102	102			0.701
	Iron	105	104	108	100			3.31
	Magnesium	101	103					3.53
	Manganese	102	103	105	105			1.65
	Potassium	103	100	107				3.72
	Sodium	106	107					2.03
	Strontium	106	104	107	103			2.11
	Tin	103	99.9	100	102			0.595
	Titanium	101	103	105	109			2.03
	Vanadium	101	105	107	112			1.74
	Zinc	99.7	98.9	102	113			3.21
EPA 200.8 Rev. 5.4	Aluminum	103	103	101	108			1.37
	Antimony	106	113	108	107			0.631
	Arsenic	104	120	107	105			1.69
	Barium	105	113	107	103			2.72
	Beryllium	95.8	80.1	97.3	97.1			0.150
	Boron	102	102	103	60.8			1.05
	Cadmium	105	101	106	109			2.58
	Chromium	101	102	100	101			1.66
	Copper	102	81.0	100	99.6			0.865
	Lead	97.5	98.6	99.1	106			0.519
	Molybdenum	103	105	104	113			0.584
	Nickel	104	104	104	91.3			0.367
	Selenium	103	116	101	99.3			1.88
	Silver	104	88.6	103	101			1.05
	Thallium	102	105	106	105			0.842
EPA 300.0 Rev. 2.1	Chloride	98.7	95.1	95.2			0.271	
	Sulfate	99.0	98.2	97.6			1.34	
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	97.8	98.0				0.186
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	95.1	93.5				1.00
EPA 353.2 Rev. 2.0	NO2NO3-N	104	98.2					0.478
EPA 365.1 Rev. 2.0	Total-P	105	107	107				0.0218
SM 2320 B-2011	Total Alkalinity	96.1					1.55	
SM 2540 C-2015	TDS	105					0.342	
SM 2540 D-2015	TSS	98.1						
SM 4500-F- C-2011	Fluoride	99.8	98.8	99.4				0.487
SM 5310 B-2011	Organic Carbon	97.8	100					0.385

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2379229
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2379229
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2379267, 2379268
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2379267, 2379268
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2379229
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2379229
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2379230

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2379230
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2379230
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2379230
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2379229
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2379267, 2379268
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2379229
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2379229
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2379229
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2379230

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	01/10/2023			01/10/2023 16:16	Samantha L Bates	2379229
EPA 180.1 Rev. 2.0	01/10/2023			01/10/2023 14:24	Khloe J Berg	2379229
EPA 200.7 Rev. 4.4	01/10/2023	01/11/2023 11:40	George D Taylor	01/19/2023 17:17	McKinley C Carter	2379267
	01/10/2023	01/11/2023 11:40	George D Taylor	01/19/2023 17:25	McKinley C Carter	2379268
EPA 200.8 Rev. 5.4	01/10/2023	01/11/2023 11:40	George D Taylor	01/23/2023 17:50	Megan Whitefoot	2379267
	01/10/2023	01/11/2023 11:40	George D Taylor	01/23/2023 18:44	Megan Whitefoot	2379268
	01/10/2023	01/11/2023 11:40	George D Taylor	01/24/2023 21:44	Megan Whitefoot	2379267
	01/10/2023	01/11/2023 11:40	George D Taylor	01/24/2023 22:38	Megan Whitefoot	2379268
EPA 300.0 Rev. 2.1	01/10/2023			01/13/2023 18:10	Anna M. Plaviak	2379229
EPA 350.1 Rev. 2.0	01/10/2023			01/13/2023 15:19	Ping Hua	2379230
EPA 351.2 Rev. 2.0	01/10/2023	01/11/2023 13:19	Samantha L Bates	01/17/2023 12:57	Samantha L Bates	2379230
EPA 353.2 Rev. 2.0	01/10/2023			01/17/2023 11:07	Beverly Y. Sanders	2379230
EPA 365.1 Rev. 2.0	01/10/2023	01/12/2023 15:28	Adam P Silver	01/13/2023 09:22	James L Waggerby	2379230
SM 2320 B-2011	01/10/2023			01/19/2023 07:08	Adam P Silver	2379229
SM 2340 B-2011	01/10/2023			01/19/2023 17:17	McKinley C Carter	2379267
	01/10/2023			01/19/2023 17:25	McKinley C Carter	2379268
SM 2540 C-2015	01/10/2023			01/13/2023 16:42	Yijie Li	2379229
SM 2540 D-2015	01/10/2023			01/13/2023 16:42	Yijie Li	2379229
SM 4500-F- C-2011	01/10/2023			01/28/2023 07:52	Dale L. Simmons	2379229
SM 5310 B-2011	01/10/2023			01/13/2023 01:27	Khloe J Berg	2379230