

Chemical Analysis Report

CEN-DIST-2022-02-23-01

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

Event Description: **Run 3**
Request ID: **RQ-2022-02-21-20**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 18-MAR-2022 14:28

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: Reedy Lake Basin @ Lake Reedy Blvd- Bridge Collection Date/Time: 02/22/2022 12:40

Field ID: G4CE0224

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2307567	DEP SOP: NU-094-1	Color (true)**	11	AJ	PCU	P410299	RPD
	EPA 180.1 Rev. 2.0	Turbidity	6.7		NTU	P410270	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P410362	
		Sulfate	51		mg SO4/L	P410367	
	SM 2320 B-2011	Total Alkalinity	29		mg CaCO3/L	P410563	
	SM 2540 C-2011	TDS	141		mg/L	P410774	
	SM 2540 D-2011	TSS	19		mg/L	P410803	
	SM 4500 F-C-2011	Fluoride	0.094	I	mg F/L	P410568	
2307568	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P410576	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P410337	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.053		mg N/L	P410622	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P410482	
	SM 5310 B-2011	Organic Carbon	7.8		mg C/L	P410541	
2307569	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P410262	

Ref. Method and Comment:

DEP SOP: NU-094-1: Refer to the Lab Analysis Report for an explanation of QC Codes.

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Livingston Creek @ Old Avon Park Rd

Collection Date/Time: 02/22/2022 12:55

Field ID: G4CE0210

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2307564	DEP SOP: NU-094-1	Color (true)**	180		PCU	P410299	RPD
	EPA 180.1 Rev. 2.0	Turbidity	0.70	I	NTU	P410270	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P410362	
		Sulfate	5.5		mg SO4/L	P410367	
	SM 2320 B-2011	Total Alkalinity	15		mg CaCO3/L	P410563	
	SM 2540 C-2011	TDS	108		mg/L	P410774	
	SM 2540 D-2011	TSS	2	U	mg/L	P410803	
	SM 4500 F-C-2011	Fluoride	0.091	I	mg F/L	P410568	
2307565	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P410576	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P410337	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P410622	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P410482	
	SM 5310 B-2011	Organic Carbon	22		mg C/L	P410541	
2307566	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P410262	
2307579	EPA 200.7 Rev. 4.4	Calcium	5.40		mg/L	P410333	
		Iron	110	I	ug/L	P410333	
		Magnesium	4.70		mg/L	P410333	
		Potassium	7.4		mg/L	P410333	
		Sodium	7.9		mg/L	P410333	
		Strontium	110		ug/L	P410333	
		Tin	3.0	U	ug/L	P410333	
		Titanium	0.75	U	ug/L	P410333	
		Vanadium	2.0	U	ug/L	P410333	
		Zinc	5.0	U	ug/L	P410333	
	EPA 200.8 Rev. 5.4	Aluminum	73		ug/L	P410333	
		Antimony	0.050	U	ug/L	P410333	
		Arsenic	0.27		ug/L	P410333	
		Barium	5.88		ug/L	P410333	
		Beryllium	0.010	U	ug/L	P410333	
		Boron**	31.4		ug/L	P410333	
		Cadmium	0.020	U	ug/L	P410333	
		Chromium	0.40	U	ug/L	P410533	
		Cobalt	0.062	I	ug/L	P410333	
		Copper	0.40	U	ug/L	P410333	
		Lead	0.20	U	ug/L	P410333	
		Manganese	7.35		ug/L	P410333	
		Molybdenum	0.15	U	ug/L	P410333	
		Nickel	0.50	U	ug/L	P410333	
		Selenium	0.20	U	ug/L	P410333	
		Silver	0.010	U	ug/L	P410333	
		Thallium	0.10	U	ug/L	P410333	
	SM 2340B	Hardness	32.8		mg/L	P410333	

Ref. Method and Comment:

SM 2540 D-2011: 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: P410299

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410270

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410333

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: P410333

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
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 200.8 Rev. 5.4
Batch ID: P410533

Component	Result	Code	Units
Chromium	0.40	U	ug/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410362

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410367

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410576

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410337

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410622

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410482

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410262

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

Reference Method: SM 2320 B-2011
Batch ID: P410563

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

Reference Method: SM 2540 C-2011
Batch ID: P410774

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P410803

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P410568

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P410541

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: P410299

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.3		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410270

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410333

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Strontium	100		P	85 - 115
Tin	102		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	95.8		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410333

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.1		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	101		P	85 - 115
Barium	101		P	85 - 115
Beryllium	97.3		P	85 - 115
Boron	100		P	85 - 115
Cadmium	99.7		P	85 - 115
Cobalt	100		P	85 - 115
Copper	98.9		P	85 - 115
Lead	94.7		P	85 - 115
Manganese	99.4		P	85 - 115
Molybdenum	99.3		P	85 - 115
Nickel	100		P	85 - 115
Selenium	101		P	85 - 115
Silver	96.2		P	85 - 115
Thallium	97.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410533

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	93.2		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410362

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410367

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410576

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410337

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410622

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410482

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	102		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P410563

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.3		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P410568

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	93 - 104

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P410541

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P410333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307370	Calcium	100		P	80 - 120
2307370	Iron	106	105	P/P	80 - 120
2307370	Magnesium	107	106	P/P	80 - 120
2307370	Potassium	102	100	P/P	80 - 120
2307370	Sodium	99.1	98.6	P/P	80 - 120
2307370	Strontium	100	98.9	P/P	80 - 120
2307370	Tin	106	103	P/P	80 - 120
2307370	Titanium	104	104	P/P	80 - 120
2307370	Vanadium	96.9	97.5	P/P	80 - 120
2307370	Zinc	102	102	P/P	80 - 120
2307375	Calcium	99.5		P	80 - 120
2307375	Iron	106		P	80 - 120
2307375	Magnesium	107		P	80 - 120
2307375	Potassium	109		P	80 - 120
2307375	Sodium	103		P	80 - 120
2307375	Strontium	101		P	80 - 120
2307375	Tin	103		P	80 - 120
2307375	Titanium	103		P	80 - 120
2307375	Vanadium	99.5		P	80 - 120
2307375	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P410333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307370	Aluminum	98.9	95.9	P/P	80 - 120
2307370	Antimony	104	102	P/P	80 - 120
2307370	Arsenic	102	100	P/P	80 - 120
2307370	Barium	105	103	P/P	80 - 120
2307370	Beryllium	99.7	98.0	P/P	80 - 120
2307370	Boron	102	102	P/P	80 - 120
2307370	Cadmium	103	100	P/P	80 - 120
2307370	Cobalt	99.0	98.7	P/P	80 - 120
2307370	Copper	98.7	97.7	P/P	80 - 120
2307370	Lead	95.2	94.8	P/P	80 - 120
2307370	Manganese	102	101	P/P	80 - 120
2307370	Molybdenum	102	101	P/P	80 - 120
2307370	Nickel	100	99.8	P/P	80 - 120
2307370	Selenium	100	98.5	P/P	80 - 120
2307370	Silver	97.5	98.1	P/P	80 - 120
2307370	Thallium	98.9	98.8	P/P	80 - 120
2307375	Aluminum	97.2		P	80 - 120
2307375	Antimony	104		P	80 - 120
2307375	Arsenic	100		P	80 - 120
2307375	Barium	103		P	80 - 120
2307375	Beryllium	96.0		P	80 - 120
2307375	Boron	99.6		P	80 - 120
2307375	Cadmium	104		P	80 - 120
2307375	Cobalt	96.2		P	80 - 120
2307375	Copper	95.1		P	80 - 120
2307375	Lead	95.7		P	80 - 120
2307375	Manganese	101		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307375	Molybdenum	103		P	80 - 120
2307375	Nickel	99.7		P	80 - 120
2307375	Selenium	98.6		P	80 - 120
2307375	Silver	96.9		P	80 - 120
2307375	Thallium	97.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307826	Chromium	96.2	95.8	P/P	80 - 120
2307827	Chromium	99.1		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410362

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307330	Chloride	99.9		P	90 - 110
2307391	Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410367

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307330	Sulfate	99.7		P	90 - 110
2307391	Sulfate	99.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410576

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308274	Ammonia-N	98.6	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307336	Kjeldahl Nitrogen	103	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410622

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307392	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307229	Total-P	105	106	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307569	O-Phosphate-P	95.6	95.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P410568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307331	Fluoride	99.2	98.6	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P410541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307667	Organic Carbon	96.2	96.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P410299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307567	Color (true)	43.2	Sample	F	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307585	Turbidity	7.31	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307370	Calcium	0.531	Spike	P	0 - 20
2307370	Iron	1.05	Spike	P	0 - 20
2307370	Magnesium	0.734	Spike	P	0 - 20
2307370	Potassium	1.35	Spike	P	0 - 20
2307370	Sodium	0.314	Spike	P	0 - 20
2307370	Strontium	1.38	Spike	P	0 - 20
2307370	Tin	2.88	Spike	P	0 - 20
2307370	Titanium	0.369	Spike	P	0 - 20
2307370	Vanadium	0.555	Spike	P	0 - 20
2307370	Zinc	0.0486	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307370	Aluminum	1.54	Spike	P	0 - 20
2307370	Antimony	1.00	Spike	P	0 - 20
2307370	Arsenic	1.50	Spike	P	0 - 20
2307370	Barium	1.65	Spike	P	0 - 20
2307370	Beryllium	1.72	Spike	P	0 - 20
2307370	Boron	0.293	Spike	P	0 - 20
2307370	Cadmium	2.16	Spike	P	0 - 20
2307370	Cobalt	0.300	Spike	P	0 - 20
2307370	Copper	1.05	Spike	P	0 - 20
2307370	Lead	0.412	Spike	P	0 - 20
2307370	Manganese	0.825	Spike	P	0 - 20
2307370	Molybdenum	0.923	Spike	P	0 - 20
2307370	Nickel	0.410	Spike	P	0 - 20
2307370	Selenium	1.86	Spike	P	0 - 20
2307370	Silver	0.565	Spike	P	0 - 20
2307370	Thallium	0.166	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307826	Chromium	0.475	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307330	Chloride	2.63	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410367

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307330	Sulfate	0.134	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308274	Ammonia-N	0.367	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307336	Kjeldahl Nitrogen	6.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410622

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307392	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307229	Total-P	0.746	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307569	O-Phosphate-P	0.313	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P410563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307331	Total Alkalinity	0.0344	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P410774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307666	TDS	5.66	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P410568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307331	Fluoride	0.498	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P410541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307667	Organic Carbon	0.0602	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A110543

Included Lab Sample IDs: 2307564, 2307567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	102	P/P	90 - 110
Sulfate	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A110574

Included Lab Sample IDs: 2307566, 2307569

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	98.4	P/P	90 - 110
O-Phosphate-P	99.1	99.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A110576

Included Lab Sample IDs: 2307564, 2307567

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: A110593

Included Lab Sample IDs: 2307564, 2307567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115
Color (true)	99.9	100	P/P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A110646

Included Lab Sample IDs: 2307579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.5	96.8	P/P	90 - 110
Antimony	98.1	97.0	P/P	90 - 110
Arsenic	97.9	97.5	P/P	90 - 110
Beryllium	97.5	98.9	P/P	90 - 110
Boron	94.7	93.0	P/P	90 - 110
Cadmium	99.1	98.2	P/P	90 - 110
Cobalt	94.2	94.1	P/P	90 - 110
Copper	95.0	94.7	P/P	90 - 110
Lead	92.9	92.5	P/P	90 - 110
Manganese	99.0	98.8	P/P	90 - 110
Molybdenum	98.6	96.8	P/P	90 - 110
Nickel	95.0	94.3	P/P	90 - 110
Selenium	98.0	97.6	P/P	90 - 110
Thallium	98.4	96.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A110663

Included Lab Sample IDs: 2307579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A110663

Included Lab Sample IDs: 2307579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	99.8	P/P	90 - 110
Silver	91.6	90.8	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A110701

Included Lab Sample IDs: 2307565, 2307568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.7	97.1	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A110710

Included Lab Sample IDs: 2307564, 2307567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.3	97.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A110710

Included Lab Sample IDs: 2307564, 2307567

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110711

Included Lab Sample IDs: 2307565, 2307568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110721

Included Lab Sample IDs: 2307565, 2307568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110729

Included Lab Sample IDs: 2307565

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A110732

Included Lab Sample IDs: 2307565, 2307568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A110746

Included Lab Sample IDs: 2307579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	93.9	95.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A110759

Included Lab Sample IDs: 2307579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	100	P/P	90 - 110
Iron	104	101	P/P	90 - 110
Magnesium	103	101	P/P	90 - 110
Potassium	100	99.0	P/P	90 - 110
Sodium	99.0	98.1	P/P	90 - 110
Strontium	97.2	97.0	P/P	90 - 110
Tin	100	99.4	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	101	99.9	P/P	90 - 110
Zinc	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110768

Included Lab Sample IDs: 2307568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	102	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)	99.3				43.2	
EPA 180.1 Rev. 2.0	Turbidity	97.8				7.31	
EPA 200.7 Rev. 4.4	Calcium	103	100	99.5			0.531
	Iron	105	106	105	106		1.05
	Magnesium	106	107	106	107		0.734
	Potassium	102	102	100	109		1.35
	Sodium	102	99.1	98.6	103		0.314
	Strontium	100	100	98.9	101		1.38
	Tin	102	106	103	103		2.88
	Titanium	102	104	104	103		0.369
	Vanadium	95.8	96.9	97.5	99.5		0.555
	Zinc	103	102	102	102		0.0486
EPA 200.8 Rev. 5.4	Aluminum	99.1	98.9	95.9	97.2		1.54
	Antimony	101	104	102	104		1.00
	Arsenic	101	102	100	100		1.50
	Barium	101	105	103	103		1.65
	Beryllium	97.3	96.0	99.7	98.0		1.72
	Boron	100	102	102	99.6		0.293
	Cadmium	99.7	103	100	104		2.16
	Chromium	93.2	96.2	95.8	99.1		0.475
	Cobalt	100	99.0	98.7	96.2		0.300
	Copper	98.9	98.7	97.7	95.1		1.05
	Lead	94.7	95.2	94.8	95.7		0.412
	Manganese	99.4	102	101	101		0.825
	Molybdenum	99.3	102	101	103		0.923
	Nickel	100	100	99.8	99.7		0.410
	Selenium	101	100	98.5	98.6		1.86
	Silver	96.2	97.5	98.1	96.9		0.565
	Thallium	97.2	98.9	98.8	97.9		0.166
EPA 300.0 Rev. 2.1	Chloride	99.5	99.9	99.3		2.63	
	Sulfate	100	99.7	99.5		0.134	
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	98.6	98.2			0.367
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	103	110			6.09
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.5	99.0	99.0			0.0
EPA 365.1 Rev. 2.0	Total-P	103	105	106			0.746
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	95.6	95.9			0.313
SM 2320 B-2011	Total Alkalinity	96.3				0.0344	
SM 2540 C-2011	TDS					5.66	
SM 4500 F-C-2011	Fluoride	100	99.2	98.6			0.498
SM 5310 B-2011	Organic Carbon	96.0	96.2	96.0			0.0602

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2307564, 2307567
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2307564, 2307567
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2307579
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2307579
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2307564, 2307567
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2307564, 2307567
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2307565, 2307568

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2307565, 2307568
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2307565, 2307568
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2307565, 2307568
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2307566, 2307569
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2307564, 2307567
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2307579
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2307564, 2307567
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2307564, 2307567
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2307564, 2307567
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2307565, 2307568

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	02/23/2022			02/23/2022 16:43	Anna M. Plaviak	2307567
	02/23/2022			02/23/2022 16:55	Anna M. Plaviak	2307564
EPA 180.1 Rev. 2.0	02/23/2022			02/23/2022 15:19	Khloe J Berg	2307564
	02/23/2022			02/23/2022 15:22	Khloe J Berg	2307567
EPA 200.7 Rev. 4.4	02/23/2022	02/25/2022 10:20	Megan Whitefoot	03/03/2022 17:58	Josef B Mick	2307579
EPA 200.8 Rev. 5.4	02/23/2022	02/25/2022 10:20	Megan Whitefoot	02/25/2022 22:05	Alexander Thompson	2307579
	02/23/2022	02/25/2022 10:20	Megan Whitefoot	02/28/2022 13:20	Alexander Thompson	2307579
	02/23/2022	03/02/2022 10:10	Megan Whitefoot	03/03/2022 14:52	Alexander Thompson	2307579
EPA 300.0 Rev. 2.1	02/23/2022			02/25/2022 02:56	Roberta Tatti	2307564
	02/23/2022			02/25/2022 03:08	Roberta Tatti	2307567
EPA 350.1 Rev. 2.0	02/23/2022			03/02/2022 12:05	Ping Hua	2307565
	02/23/2022			03/02/2022 12:06	Ping Hua	2307568
EPA 351.2 Rev. 2.0	02/23/2022	02/28/2022 11:43	Samantha L Bates	03/01/2022 14:46	Alexandra J Mattheus	2307565
	02/23/2022	02/28/2022 11:43	Samantha L Bates	03/01/2022 14:47	Alexandra J Mattheus	2307568
EPA 353.2 Rev. 2.0	02/23/2022			03/03/2022 09:24	Beverly Y. Sanders	2307565
	02/23/2022			03/03/2022 09:25	Beverly Y. Sanders	2307568
EPA 365.1 Rev. 2.0	02/23/2022	03/02/2022 15:00	Simonne.V. Calhoun	03/03/2022 11:18	Shengyu Ding	2307565
	02/23/2022	03/02/2022 15:00	Simonne.V. Calhoun	03/04/2022 14:54	Sarah A Nixon	2307568
EPA 365.1 Rev. 2.0 dissolved	02/23/2022			02/23/2022 16:58	James L Waggeberby	2307569
	02/23/2022			02/23/2022 17:09	James L Waggeberby	2307566
SM 2320 B-2011	02/23/2022			03/01/2022 02:43	Dale L. Simmons	2307564
	02/23/2022			03/01/2022 02:56	Dale L. Simmons	2307567
SM 2340B	02/23/2022			03/03/2022 17:58	Josef B Mick	2307579
SM 2540 C-2011	02/23/2022			02/28/2022 15:12	Yijie Li	2307564, 2307567
SM 2540 D-2011	02/23/2022			02/28/2022 15:12	Yijie Li	2307564, 2307567
SM 4500 F-C-2011	02/23/2022			03/01/2022 02:43	Dale L. Simmons	2307564
	02/23/2022			03/01/2022 02:56	Dale L. Simmons	2307567
SM 5310 B-2011	02/23/2022			03/02/2022 03:55	Khloe J Berg	2307568
	02/23/2022			03/02/2022 04:36	Khloe J Berg	2307565