Chemical Analysis Report

CEN-DIST-2022-02-17-01

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

Event Description: **Run 17**
Request ID: **RQ-2022-01-17-22**
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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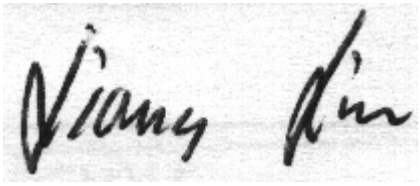
Certified by: Liang Lin, Environmental Administrator

Date Certified: 11-MAR-2022 15:38



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: Little Haw Creek @ 10m Upstream of SR11 **Collection Date/Time: 02/16/2022 12:01**

Field ID: G2CE0066 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306367	DEP SOP: NU-094-1	Color (true)**	220		PCU	P410053	
	EPA 180.1 Rev. 2.0	Turbidity	0.60	I	NTU	P410007	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P410156	
		Sulfate	0.30	I	mg SO4/L	P410153	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P410139	
	SM 2540 C-2011	TDS	91		mg/L	P410340	
	SM 2540 D-2011	TSS	2	U	mg/L	P410255	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P410142	
2306368	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P410525	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P410057	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P410293	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P409996	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P410585	
2306369	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P409998	
2306372	EPA 200.7 Rev. 4.4	Calcium	3.94		mg/L	P410023	
		Iron	340		ug/L	P410023	
		Magnesium	1.16		mg/L	P410023	
		Potassium	0.33	I	mg/L	P410023	
		Sodium	9.5		mg/L	P410023	
		Strontium	19.1		ug/L	P410023	
		Tin	3.0	U	ug/L	P410023	
		Titanium	1.1	I	ug/L	P410023	
		Vanadium	2.0	U	ug/L	P410023	
		Zinc	5.0	U	ug/L	P410023	
	EPA 200.8 Rev. 5.4	Aluminum	266		ug/L	P410023	
		Antimony	0.050	U	ug/L	P410023	
		Arsenic	0.25		ug/L	P410023	
		Barium	5.98		ug/L	P410023	
		Beryllium	0.010	U	ug/L	P410023	
		Boron**	21.4		ug/L	P410023	
		Cadmium	0.020	U	ug/L	P410023	
		Chromium	0.51	I	ug/L	P410023	
		Cobalt	0.145		ug/L	P410023	
		Copper	0.40	U	ug/L	P410023	
		Lead	0.20	U	ug/L	P410023	
		Manganese	6.84		ug/L	P410023	
		Molybdenum	0.15	U	ug/L	P410023	
		Nickel	0.50	U	ug/L	P410023	
		Selenium	0.20	U	ug/L	P410023	
		Silver	0.010	U	ug/L	P410023	
		Thallium	0.10	U	ug/L	P410023	
	SM 2340B	Hardness	14.6		mg/L	P410023	

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: P410053

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410007

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410023

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: P410023

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: P410153

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410156

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410525

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410057

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410293

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409996

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409998

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

Reference Method: SM 2320 B-2011
Batch ID: P410139

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

Reference Method: SM 2540 C-2011
Batch ID: P410340

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P410255

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P410142

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P410585

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: P410053

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.9		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410007

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	104		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	103		P	85 - 115
Sodium	103		P	85 - 115
Strontium	101		P	85 - 115
Tin	104		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	96.4		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.6		P	85 - 115
Antimony	98.1		P	85 - 115
Arsenic	99.6		P	85 - 115
Barium	101		P	85 - 115
Beryllium	98.2		P	85 - 115
Boron	101		P	85 - 115
Cadmium	98.6		P	85 - 115
Chromium	97.3		P	85 - 115
Cobalt	99.1		P	85 - 115
Copper	97.5		P	85 - 115
Lead	94.5		P	85 - 115
Manganese	98.9		P	85 - 115
Molybdenum	97.0		P	85 - 115
Nickel	98.3		P	85 - 115
Selenium	98.1		P	85 - 115
Silver	98.0		P	85 - 115
Thallium	96.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410153

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410156

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410525

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410057

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410293

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409996

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409998

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.2		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P410139

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.8		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P410142

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P410585

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305759	Calcium	95.9		P	80 - 120
2305759	Iron	104	103	P/P	80 - 120
2305759	Magnesium	104	104	P/P	80 - 120
2305759	Potassium	102	99.8	P/P	80 - 120
2305759	Sodium	101	100	P/P	80 - 120
2305759	Strontium	101	99.9	P/P	80 - 120
2305759	Tin	102	103	P/P	80 - 120
2305759	Titanium	100	102	P/P	80 - 120
2305759	Vanadium	95.6	97.7	P/P	80 - 120
2305759	Zinc	99.0	101	P/P	80 - 120
2306327	Calcium	96.6		P	80 - 120
2306327	Iron	102		P	80 - 120
2306327	Magnesium	94.6		P	80 - 120
2306327	Potassium	98.5		P	80 - 120
2306327	Sodium	94.5		P	80 - 120
2306327	Strontium	97.8		P	80 - 120
2306327	Tin	101		P	80 - 120
2306327	Titanium	99.8		P	80 - 120
2306327	Vanadium	94.1		P	80 - 120
2306327	Zinc	96.6		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305759	Aluminum	108	99.9	P/P	80 - 120
2305759	Antimony	108	101	P/P	80 - 120
2305759	Arsenic	108	102	P/P	80 - 120
2305759	Barium	111	104	P/P	80 - 120
2305759	Beryllium	106	98.7	P/P	80 - 120
2305759	Boron	112	103	P/P	80 - 120
2305759	Cadmium	107	100	P/P	80 - 120
2305759	Chromium	108	101	P/P	80 - 120
2305759	Cobalt	111	103	P/P	80 - 120
2305759	Copper	108	101	P/P	80 - 120
2305759	Lead	103	98.2	P/P	80 - 120
2305759	Manganese	110	102	P/P	80 - 120
2305759	Molybdenum	108	99.9	P/P	80 - 120
2305759	Nickel	112	103	P/P	80 - 120
2305759	Selenium	109	101	P/P	80 - 120
2305759	Silver	107	101	P/P	80 - 120
2305759	Thallium	106	102	P/P	80 - 120
2306327	Aluminum	99.7		P	80 - 120
2306327	Antimony	102		P	80 - 120
2306327	Arsenic	102		P	80 - 120
2306327	Barium	103		P	80 - 120
2306327	Beryllium	99.0		P	80 - 120
2306327	Boron	105		P	80 - 120
2306327	Cadmium	100		P	80 - 120
2306327	Chromium	99.5		P	80 - 120
2306327	Cobalt	98.6		P	80 - 120
2306327	Copper	95.9		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306327	Lead	96.5		P	80 - 120
2306327	Manganese	100		P	80 - 120
2306327	Molybdenum	102		P	80 - 120
2306327	Nickel	101		P	80 - 120
2306327	Selenium	80.3		P	80 - 120
2306327	Silver	97.3		P	80 - 120
2306327	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410153

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306101	Sulfate	104		P	90 - 110
2306277	Sulfate	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410156

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306101	Chloride	106		P	90 - 110
2306277	Chloride	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410525

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306076	Ammonia-N	96.6	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410057

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306279	Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410293

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306325	NO2NO3-N	98.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409996

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306280	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306389	O-Phosphate-P	97.0	98.0	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P410142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306585	Fluoride	101	100	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P410585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306033	Organic Carbon	95.7	98.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P410053

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306386	Color (true)	1.77	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410007

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306382	Turbidity	2.26	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305759	Calcium	1.01	Spike	P	0 - 20
2305759	Iron	1.11	Spike	P	0 - 20
2305759	Magnesium	0.150	Spike	P	0 - 20
2305759	Potassium	1.97	Spike	P	0 - 20
2305759	Sodium	0.727	Spike	P	0 - 20
2305759	Strontium	0.863	Spike	P	0 - 20
2305759	Tin	0.972	Spike	P	0 - 20
2305759	Titanium	1.98	Spike	P	0 - 20
2305759	Vanadium	2.23	Spike	P	0 - 20
2305759	Zinc	2.04	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305759	Aluminum	6.95	Spike	P	0 - 20
2305759	Antimony	5.97	Spike	P	0 - 20
2305759	Arsenic	6.30	Spike	P	0 - 20
2305759	Barium	5.69	Spike	P	0 - 20
2305759	Beryllium	7.11	Spike	P	0 - 20
2305759	Boron	7.10	Spike	P	0 - 20
2305759	Cadmium	6.60	Spike	P	0 - 20
2305759	Chromium	6.59	Spike	P	0 - 20
2305759	Cobalt	7.03	Spike	P	0 - 20
2305759	Copper	6.61	Spike	P	0 - 20
2305759	Lead	4.68	Spike	P	0 - 20
2305759	Manganese	7.53	Spike	P	0 - 20
2305759	Molybdenum	7.50	Spike	P	0 - 20
2305759	Nickel	7.90	Spike	P	0 - 20
2305759	Selenium	7.10	Spike	P	0 - 20
2305759	Silver	5.91	Spike	P	0 - 20
2305759	Thallium	3.80	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306101	Sulfate	0.296	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410156

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306101	Chloride	0.423	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306076	Ammonia-N	4.96	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306279	Kjeldahl Nitrogen	1.95	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410293

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306325	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409996

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306280	Total-P	0.132	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306389	O-Phosphate-P	0.869	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P410139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306585	Total Alkalinity	0.543	Sample	P	0 - 5.2

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P410340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306136	TDS	2.25	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P410142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306585	Fluoride	0.473	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P410585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306033	Organic Carbon	2.06	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: A110423
Included Lab Sample IDs: 2306367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	104	P/P	90 - 110
Sulfate	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A110468
Included Lab Sample IDs: 2306369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	99.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A110472
Included Lab Sample IDs: 2306367

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: A110487
Included Lab Sample IDs: 2306367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110524
Included Lab Sample IDs: 2306372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	99.0	P/P	90 - 110
Antimony	95.7	93.9	P/P	90 - 110
Arsenic	99.9	99.0	P/P	90 - 110
Barium	99.2	97.3	P/P	90 - 110
Beryllium	98.0	96.9	P/P	90 - 110
Boron	99.2	97.6	P/P	90 - 110
Cadmium	98.1	97.5	P/P	90 - 110
Chromium	97.9	96.1	P/P	90 - 110
Cobalt	101	100	P/P	90 - 110
Copper	102	99.8	P/P	90 - 110
Lead	94.5	93.7	P/P	90 - 110
Manganese	100	98.7	P/P	90 - 110
Molybdenum	98.1	96.5	P/P	90 - 110
Nickel	102	101	P/P	90 - 110
Selenium	99.5	97.0	P/P	90 - 110
Silver	91.4	91.0	P/P	90 - 110
Thallium	99.4	96.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A110525
Included Lab Sample IDs: 2306367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.0	97.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A110525
Included Lab Sample IDs: 2306367

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110578
Included Lab Sample IDs: 2306372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.7	100	P/P	90 - 110
Iron	100	102	P/P	90 - 110
Magnesium	99.4	101	P/P	90 - 110
Potassium	97.9	98.9	P/P	90 - 110
Sodium	99.0	98.9	P/P	90 - 110
Strontium	97.9	99.6	P/P	90 - 110
Tin	101	102	P/P	90 - 110
Titanium	100	101	P/P	90 - 110
Vanadium	100	101	P/P	90 - 110
Zinc	100	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110588
Included Lab Sample IDs: 2306368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110589
Included Lab Sample IDs: 2306368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.9	93.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110618
Included Lab Sample IDs: 2306368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110696
Included Lab Sample IDs: 2306368

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110696
Included Lab Sample IDs: 2306368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.5	96.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A110715
Included Lab Sample IDs: 2306368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.1	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)	97.9					1.77	
EPA 180.1 Rev. 2.0	Turbidity	97.9					2.26	
EPA 200.7 Rev. 4.4	Calcium	103	95.9	96.6				1.01
	Iron	104	104	103	102			1.11
	Magnesium	105	104	104	94.6			0.150
	Potassium	103	102	99.8	98.5			1.97
	Sodium	103	101	100	94.5			0.727
	Strontium	101	101	99.9	97.8			0.863
	Tin	104	102	103	101			0.972
	Titanium	103	100	102	99.8			1.98
	Vanadium	96.4	95.6	97.7	94.1			2.23
	Zinc	102	99.0	101	96.6			2.04
EPA 200.8 Rev. 5.4	Aluminum	98.6	108	99.9	99.7			6.95
	Antimony	98.1	108	101	102			5.97
	Arsenic	99.6	108	102	102			6.30
	Barium	101	111	104	103			5.69
	Beryllium	98.2	106	98.7	99.0			7.11
	Boron	101	112	103	105			7.10
	Cadmium	98.6	107	100	100			6.60
	Chromium	97.3	108	101	99.5			6.59
	Cobalt	99.1	111	103	98.6			7.03
	Copper	97.5	108	101	95.9			6.61
	Lead	94.5	103	98.2	96.5			4.68
	Manganese	98.9	110	102	100			7.53
	Molybdenum	97.0	108	99.9	102			7.50
	Nickel	98.3	101	112	103			7.90
	Selenium	98.1	109	101	80.3			7.10
	Silver	98.0	107	101	97.3			5.91
	Thallium	96.8	106	102	103			3.80
EPA 300.0 Rev. 2.1	Chloride	104	106	103			0.423	
	Sulfate	102	104	102			0.296	
EPA 350.1 Rev. 2.0	Ammonia-N	96.2	96.6	102				4.96
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	100	103				1.95
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	98.5	98.5				0.0
EPA 365.1 Rev. 2.0	Total-P	105	104	105				0.132
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	97.0	98.0				0.869
SM 2320 B-2011	Total Alkalinity	99.8					0.543	
SM 2540 C-2011	TDS						2.25	
SM 4500 F-C-2011	Fluoride	101	101	100				0.473
SM 5310 B-2011	Organic Carbon	95.6	95.7	98.6				2.06

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2306367
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2306367
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2306372
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2306372
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2306367
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2306367
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2306368

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2306368
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2306368
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2306368
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2306369
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2306367
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2306372
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2306367
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2306367
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2306367
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2306368

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	02/17/2022			02/17/2022 16:51	Anna M. Plaviak	2306367
EPA 180.1 Rev. 2.0	02/17/2022			02/17/2022 14:27	Khloe J Berg	2306367
EPA 200.7 Rev. 4.4	02/17/2022	02/18/2022 10:26	Megan Whitefoot	02/23/2022 22:00	Josef B Mick	2306372
EPA 200.8 Rev. 5.4	02/17/2022	02/18/2022 10:26	Megan Whitefoot	02/21/2022 19:16	Alexander Thompson	2306372
EPA 300.0 Rev. 2.1	02/17/2022			02/18/2022 23:39	Roberta Tatti	2306367
EPA 350.1 Rev. 2.0	02/17/2022			03/01/2022 11:27	Ping Hua	2306368
EPA 351.2 Rev. 2.0	02/17/2022	02/22/2022 09:14	Samantha L Bates	02/23/2022 15:52	Alexandra J Mattheus	2306368
EPA 353.2 Rev. 2.0	02/17/2022			02/24/2022 10:53	Beverly Y. Sanders	2306368
EPA 365.1 Rev. 2.0	02/17/2022	02/18/2022 15:35	Simonne.V. Calhoun	02/23/2022 13:12	Sarah A Nixon	2306368
EPA 365.1 Rev. 2.0 dissolved	02/17/2022			02/17/2022 14:04	James L Waggerby	2306369
SM 2320 B-2011	02/17/2022			02/22/2022 03:23	Dale L. Simmons	2306367
SM 2340B	02/17/2022			02/23/2022 22:00	Josef B Mick	2306372
SM 2540 C-2011	02/17/2022			02/18/2022 15:06	Yijie Li	2306367
SM 2540 D-2011	02/17/2022			02/18/2022 15:06	Yijie Li	2306367
SM 4500 F-C-2011	02/17/2022			02/22/2022 03:23	Dale L. Simmons	2306367
SM 5310 B-2011	02/17/2022			03/02/2022 02:46	Nathaniel J Jones	2306368