Chemical Analysis Report

CEN-DIST-2022-03-22-02

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

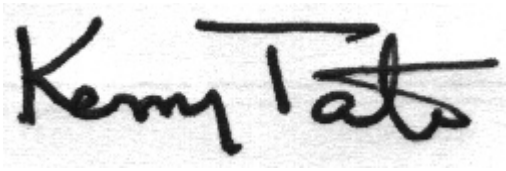
Event Description: **Run 11**
Request ID: **RQ-2022-03-21-19**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matthew Bearden

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 06-APR-2022 08:58



Case Narrative

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

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

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

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

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

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: Roberts Branch @ Curryville Rd **Collection Date/Time: 03/21/2022 09:46**

Field ID: G3CE0011 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2313658	DEP SOP: NU-094-1	Color (true)**	430		PCU	P411451	
	EPA 180.1 Rev. 2.0	Turbidity	1.6	A	NTU	P411422	
	EPA 300.0 Rev. 2.1	Chloride	13	A	mg Cl/L	P411618	
		Sulfate	0.67	A	mg SO4/L	P411620	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P411603	
	SM 2540 C-2011	TDS	83		mg/L	P411623	
	SM 2540 D-2011	TSS	2	I	mg/L	P411585	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P411606	
2313659	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P411495	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P411530	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P411483	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P411513	
	SM 5310 B-2011	Organic Carbon	39		mg C/L	P411595	
2313664	EPA 200.7 Rev. 4.4	Calcium	3.17		mg/L	P411510	
		Iron	460		ug/L	P411510	
		Magnesium	1.16		mg/L	P411510	
		Potassium	0.74	I	mg/L	P411510	
		Sodium	7.4		mg/L	P411510	
		Strontium	17.0		ug/L	P411510	
		Tin	3.0	U	ug/L	P411510	
		Titanium	3.1		ug/L	P411510	
		Vanadium	2.0	U	ug/L	P411510	
		Zinc	5.0	U	ug/L	P411510	
	EPA 200.8 Rev. 5.4	Aluminum	500		ug/L	P411510	
		Antimony	0.051	I	ug/L	P411510	
		Arsenic	0.56		ug/L	P411510	
		Barium	7.92		ug/L	P411510	
		Beryllium	0.032	I	ug/L	P411510	
		Boron**	20.0		ug/L	P411510	
		Cadmium	0.020	U	ug/L	P411510	
		Chromium	0.58	I	ug/L	P411680	
		Cobalt	0.140		ug/L	P411510	
		Copper	0.57	I	ug/L	P411510	
		Lead	0.42		ug/L	P411510	
		Manganese	6.81		ug/L	P411510	
		Molybdenum	0.15	U	ug/L	P411680	
		Nickel	1.2	I	ug/L	P411680	
		Selenium	0.20	U	ug/L	P411510	
		Silver	0.010	U	ug/L	P411510	
		Thallium	0.10	U	ug/L	P411510	
	SM 2340B	Hardness	12.7		mg/L	P411510	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P411451

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411422

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411510

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: P411510

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
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: P411680

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411618

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411620

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411495

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411530

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411483

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411513

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

Reference Method: SM 2320 B-2011
Batch ID: P411603

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

Reference Method: SM 2540 C-2011
Batch ID: P411623

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P411585

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P411606

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P411595

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: P411451

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.7		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411422

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.6		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	107		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	106		P	85 - 115
Sodium	107		P	85 - 115
Strontium	105		P	85 - 115
Tin	104		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	96.6		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	100		P	85 - 115
Barium	102		P	85 - 115
Beryllium	100		P	85 - 115
Boron	106		P	85 - 115
Cadmium	100		P	85 - 115
Cobalt	101		P	85 - 115
Copper	99.7		P	85 - 115
Lead	97.9		P	85 - 115
Manganese	98.0		P	85 - 115
Selenium	101		P	85 - 115
Silver	99.8		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411680

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	97.9		P	85 - 115
Molybdenum	97.7		P	85 - 115
Nickel	102		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411618

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411620

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411495

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411483

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411513

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

Reference Method: SM 2320 B-2011
Batch ID: P411603

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.9		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P411606

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P411595

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: P411510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314047	Calcium	103		P	80 - 120
2314047	Iron	99.2	103	P/P	80 - 120
2314047	Magnesium	103	108	P/P	80 - 120
2314047	Potassium	96.9	102	P/P	80 - 120
2314047	Sodium	93.3	101	P/P	80 - 120
2314047	Strontium	100	104	P/P	80 - 120
2314047	Tin	101	104	P/P	80 - 120
2314047	Titanium	96.1	99.2	P/P	80 - 120
2314047	Vanadium	94.9	98.6	P/P	80 - 120
2314047	Zinc	100	104	P/P	80 - 120
2314048	Calcium	105		P	80 - 120
2314048	Iron	107		P	80 - 120
2314048	Magnesium	108		P	80 - 120
2314048	Potassium	103		P	80 - 120
2314048	Sodium	102		P	80 - 120
2314048	Strontium	104		P	80 - 120
2314048	Tin	102		P	80 - 120
2314048	Titanium	102		P	80 - 120
2314048	Vanadium	97.5		P	80 - 120
2314048	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314047	Aluminum	103	104	P/P	80 - 120
2314047	Antimony	100	100	P/P	80 - 120
2314047	Arsenic	101	101	P/P	80 - 120
2314047	Barium	101	102	P/P	80 - 120
2314047	Beryllium	97.5	102	P/P	80 - 120
2314047	Boron	104	103	P/P	80 - 120
2314047	Cadmium	99.6	101	P/P	80 - 120
2314047	Cobalt	99.3	100	P/P	80 - 120
2314047	Copper	97.4	97.6	P/P	80 - 120
2314047	Lead	97.7	98.4	P/P	80 - 120
2314047	Manganese	90.9	93.2	P/P	80 - 120
2314047	Selenium	99.3	98.3	P/P	80 - 120
2314047	Silver	97.8	97.5	P/P	80 - 120
2314047	Thallium	103	104	P/P	80 - 120
2314048	Aluminum	107		P	80 - 120
2314048	Antimony	105		P	80 - 120
2314048	Arsenic	102		P	80 - 120
2314048	Barium	108		P	80 - 120
2314048	Beryllium	99.9		P	80 - 120
2314048	Boron	110		P	80 - 120
2314048	Cadmium	102		P	80 - 120
2314048	Cobalt	103		P	80 - 120
2314048	Copper	103		P	80 - 120
2314048	Lead	100		P	80 - 120
2314048	Manganese	104		P	80 - 120
2314048	Selenium	102		P	80 - 120
2314048	Silver	100		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314048	Thallium	105		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314860	Chromium	95.9		P	80 - 120
2314860	Molybdenum	98.5		P	80 - 120
2314860	Nickel	93.3		P	80 - 120
2314863	Chromium	98.3	97.7	P/P	80 - 120
2314863	Molybdenum	102	101	P/P	80 - 120
2314863	Nickel	99.8	99.4	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411618

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313658	Chloride	97.8		P	90 - 110
2313881	Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313658	Sulfate	98.0		P	90 - 110
2313881	Sulfate	98.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411495

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313628	Ammonia-N	98.0	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313421	Kjeldahl Nitrogen	104	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411483

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313625	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P411606

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313609	Fluoride	97.4	96.3	P/P	92 - 107

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P411595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313461	Organic Carbon	99.0	99.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P411451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313608	Color (true)	0.582	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P411422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313658	Turbidity	16.7	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P411510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314047	Calcium	5.21	Spike	P	0 - 20
2314047	Iron	3.46	Spike	P	0 - 20
2314047	Magnesium	3.79	Spike	P	0 - 20
2314047	Potassium	3.74	Spike	P	0 - 20
2314047	Sodium	4.07	Spike	P	0 - 20
2314047	Strontium	3.77	Spike	P	0 - 20
2314047	Tin	3.59	Spike	P	0 - 20
2314047	Titanium	2.96	Spike	P	0 - 20
2314047	Vanadium	3.82	Spike	P	0 - 20
2314047	Zinc	3.58	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314047	Aluminum	0.788	Spike	P	0 - 20
2314047	Antimony	0.0934	Spike	P	0 - 20
2314047	Arsenic	0.0465	Spike	P	0 - 20
2314047	Barium	0.856	Spike	P	0 - 20
2314047	Beryllium	4.02	Spike	P	0 - 20
2314047	Boron	0.719	Spike	P	0 - 20
2314047	Cadmium	1.61	Spike	P	0 - 20
2314047	Cobalt	1.19	Spike	P	0 - 20
2314047	Copper	0.235	Spike	P	0 - 20
2314047	Lead	0.724	Spike	P	0 - 20
2314047	Manganese	1.81	Spike	P	0 - 20
2314047	Selenium	1.07	Spike	P	0 - 20
2314047	Silver	0.320	Spike	P	0 - 20
2314047	Thallium	0.695	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314863	Chromium	0.609	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P411680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314863	Molybdenum	0.817	Spike	P	0 - 20
2314863	Nickel	0.372	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411618

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313658	Chloride	0.519	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313658	Sulfate	0.120	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411495

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313628	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313421	Kjeldahl Nitrogen	3.49	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313625	NO2NO3-N	0.985	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313670	Total-P	3.62	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P411603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313609	Total Alkalinity	1.25	Sample	P	0 - 5.2

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P411623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313610	TDS	9.78	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P411606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313609	Fluoride	0.968	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P411595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313461	Organic Carbon	0.350	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: A111070
Included Lab Sample IDs: 2313658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	99.6	P/P	90 - 110
Sulfate	99.0	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A111088
Included Lab Sample IDs: 2313658

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: A111099
Included Lab Sample IDs: 2313658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.1	101	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111105
Included Lab Sample IDs: 2313659

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111115
Included Lab Sample IDs: 2313659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	98.7	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A111155
Included Lab Sample IDs: 2313659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.9	97.2	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A111156
Included Lab Sample IDs: 2313658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.3	98.3	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A111156
Included Lab Sample IDs: 2313658

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111171
Included Lab Sample IDs: 2313664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	103	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	103	105	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Strontium	97.6	97.7	P/P	90 - 110
Tin	97.7	98.0	P/P	90 - 110
Titanium	97.1	97.4	P/P	90 - 110
Vanadium	97.3	97.3	P/P	90 - 110
Zinc	99.4	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111172
Included Lab Sample IDs: 2313664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	101	P/P	90 - 110
Antimony	97.2	99.3	P/P	90 - 110
Arsenic	98.0	98.5	P/P	90 - 110
Barium	99.3	100	P/P	90 - 110
Beryllium	97.6	97.4	P/P	90 - 110
Boron	100	101	P/P	90 - 110
Cadmium	98.4	99.8	P/P	90 - 110
Cobalt	97.9	97.8	P/P	90 - 110
Copper	98.2	98.3	P/P	90 - 110
Lead	94.4	95.2	P/P	90 - 110
Manganese	98.5	99.2	P/P	90 - 110
Selenium	98.8	98.8	P/P	90 - 110
Silver	95.0	95.8	P/P	90 - 110
Thallium	98.0	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111193
Included Lab Sample IDs: 2313659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111196
Included Lab Sample IDs: 2313659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.8	95.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111218
Included Lab Sample IDs: 2313664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.1	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111218
Included Lab Sample IDs: 2313664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Molybdenum	99.6	101	P/P	90 - 110
Nickel	98.5	99.2	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)	98.7					0.582	
EPA 180.1 Rev. 2.0	Turbidity	97.6					16.7	
EPA 200.7 Rev. 4.4	Calcium	105	103	105				5.21
	Iron	107	99.2	103	107			3.46
	Magnesium	108	103	108	108			3.79
	Potassium	106	96.9	102	103			3.74
	Sodium	107	93.3	101	102			4.07
	Strontium	105	100	104	104			3.77
	Tin	104	101	104	102			3.59
	Titanium	103	96.1	99.2	102			2.96
	Vanadium	96.6	94.9	98.6	97.5			3.82
	Zinc	105	100	104	102			3.58
EPA 200.8 Rev. 5.4	Aluminum	103	103	104	107			0.788
	Antimony	101	100	100	105			0.0934
	Arsenic	100	101	101	102			0.0465
	Barium	102	101	102	108			0.856
	Beryllium	100	97.5	102	99.9			4.02
	Boron	106	104	103	110			0.719
	Cadmium	100	99.6	101	102			1.61
	Chromium	97.9	98.3	97.7	95.9			0.609
	Cobalt	101	99.3	100	103			1.19
	Copper	99.7	97.4	97.6	103			0.235
	Lead	97.9	97.7	98.4	100			0.724
	Manganese	98.0	90.9	93.2	104			1.81
	Molybdenum	97.7	102	101	98.5			0.817
	Nickel	102	99.8	99.4	93.3			0.372
	Selenium	101	99.3	98.3	102			1.07
	Silver	99.8	97.8	97.5	100			0.320
	Thallium	100	103	104	105			0.695
EPA 300.0 Rev. 2.1	Chloride	98.7	97.8	98.3			0.519	
	Sulfate	99.4	98.0	98.2			0.120	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	98.0	98.0				0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.9	104	99.2				3.49
EPA 353.2 Rev. 2.0	NO2NO3-N	103	101	102				0.985
EPA 365.1 Rev. 2.0	Total-P	96.8						3.62
SM 2320 B-2011	Total Alkalinity	98.9					1.25	
SM 2540 C-2011	TDS						9.78	
SM 4500 F-C-2011	Fluoride	98.2	97.4	96.3				0.968
SM 5310 B-2011	Organic Carbon	95.6	99.0	99.6				0.350

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2313658
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2313658
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2313664
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2313664
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2313658
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2313658
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2313659
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2313659

Reference Method Descriptions

Method	Description	Associated Samples
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2313659
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2313659
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2313658
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2313664
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2313658
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2313658
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2313658
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2313659

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	03/22/2022			03/22/2022 15:24	Blanca Fach	2313658
EPA 180.1 Rev. 2.0	03/22/2022			03/22/2022 16:03	Anna M. Plaviak	2313658
EPA 200.7 Rev. 4.4	03/22/2022	03/24/2022 10:37	Megan Whitefoot	03/25/2022 18:24	Josef B Mick	2313664
EPA 200.8 Rev. 5.4	03/22/2022	03/24/2022 10:37	Megan Whitefoot	03/25/2022 17:25	Alexander Thompson	2313664
	03/22/2022	03/29/2022 10:33	Megan Whitefoot	03/29/2022 19:31	Emily M Philpot	2313664
EPA 300.0 Rev. 2.1	03/22/2022			03/24/2022 17:29	James L Waggerby	2313658
EPA 350.1 Rev. 2.0	03/22/2022			03/23/2022 13:05	Ping Hua	2313659
EPA 351.2 Rev. 2.0	03/22/2022	03/25/2022 10:06	Samantha L Bates	03/28/2022 14:23	Alexandra J Mattheus	2313659
EPA 353.2 Rev. 2.0	03/22/2022			03/23/2022 11:41	Beverly Y. Sanders	2313659
EPA 365.1 Rev. 2.0	03/22/2022	03/25/2022 16:35	Simonne.V. Calhoun	03/28/2022 13:13	Sarah A Nixon	2313659
SM 2320 B-2011	03/22/2022			03/25/2022 04:19	Dale L. Simmons	2313658
SM 2340B	03/22/2022			03/25/2022 18:24	Josef B Mick	2313664
SM 2540 C-2011	03/22/2022			03/23/2022 14:22	Yijie Li	2313658
SM 2540 D-2011	03/22/2022			03/23/2022 14:22	Yijie Li	2313658
SM 4500 F-C-2011	03/22/2022			03/25/2022 04:19	Dale L. Simmons	2313658
SM 5310 B-2011	03/22/2022			03/24/2022 20:54	Khloe J Berg	2313659