Chemical Analysis Report

SO-DIST-2022-03-04-01

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

Event Description: **2022 SMP : Charlotte Cricks**
Request ID: **RQ-2022-02-28-32**
Customer: **SO-DIST**
Project ID: **SMP**

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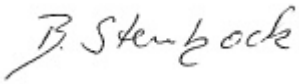
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 28-MAR-2022 17:57



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: Myrtle Slough @ Bermont **Collection Date/Time: 03/03/2022 08:45**

Field ID: G3SD0181 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2310211	EPA 200.7 Rev. 4.4	Calcium	99.5		mg/L	P410707	
		Iron	3.63E+03		ug/L	P410707	
		Magnesium	3.05		mg/L	P410707	
		Potassium	0.67	I	mg/L	P410707	
		Sodium	13.6		mg/L	P410707	
		Strontium	604		ug/L	P410707	
		Tin	3.0	U	ug/L	P410707	
		Titanium	1.4	I	ug/L	P410707	
		Vanadium	3.6	I	ug/L	P410707	
		Zinc	5.0	U	ug/L	P410707	
	EPA 200.8 Rev. 5.4	Aluminum	66		ug/L	P410707	
		Antimony	0.082	I	ug/L	P410707	
		Arsenic	1.11		ug/L	P410707	
		Barium	24.1		ug/L	P410707	
		Beryllium	0.053		ug/L	P410707	
		Boron**	38.8		ug/L	P410707	
		Cadmium	0.020	U	ug/L	P410707	
		Chromium	1.4	I	ug/L	P410707	
		Cobalt	0.095		ug/L	P410707	
		Copper	0.40	U	ug/L	P410707	
		Lead	0.20	U	ug/L	P410707	
		Manganese	12.6		ug/L	P410707	
		Molybdenum	2.03		ug/L	P410707	
		Nickel	0.50	U	ug/L	P410707	
		Selenium	0.20	U	ug/L	P410707	
		Silver	0.010	U	ug/L	P410707	
		Thallium	0.10	U	ug/L	P410707	
	SM 2340B	Hardness	261		mg/L	P410707	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for molybdenum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: FB **Collection Date/Time: 03/03/2022 08:50**

Field ID: FB_03032022 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2310212	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P410707	
		Iron	30	U	ug/L	P410707	
		Magnesium	0.040	U	mg/L	P410707	
		Potassium	0.30	U	mg/L	P410707	
		Sodium	0.50	U	mg/L	P410707	
		Strontium	2.0	U	ug/L	P410707	
		Tin	3.0	U	ug/L	P410707	
		Titanium	0.75	U	ug/L	P410707	
		Vanadium	2.0	U	ug/L	P410707	
		Zinc	5.0	U	ug/L	P410707	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P410707	
		Antimony	0.050	U	ug/L	P410707	
		Arsenic	0.050	U	ug/L	P410707	
		Barium	0.20	U	ug/L	P410707	
		Beryllium	0.010	U	ug/L	P410707	
		Boron**	2.0	U	ug/L	P410707	
		Cadmium	0.020	U	ug/L	P410707	
		Chromium	0.40	U	ug/L	P410707	
		Cobalt	0.020	U	ug/L	P410707	
		Copper	0.40	U	ug/L	P410707	
		Lead	0.20	U	ug/L	P410707	
		Manganese	0.10	U	ug/L	P410707	
		Molybdenum	0.15	U	ug/L	P410707	
		Nickel	0.50	U	ug/L	P410707	
		Selenium	0.20	U	ug/L	P410707	
		Silver	0.010	U	ug/L	P410707	
		Thallium	0.10	U	ug/L	P410707	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for molybdenum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: LeeBranchAtRailroad **Collection Date/Time: 03/03/2022 09:30**

Field ID: G3SD0212 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2310202	DEP SOP: NU-094-1	Color (true)**	32	A	PCU	P410688	
	EPA 180.1 Rev. 2.0	Turbidity	9.4	A	NTU	P410694	
	EPA 300.0 Rev. 2.1	Chloride	540		mg Cl/L	P411049	
		Sulfate	160		mg SO4/L	P411053	
	SM 2320 B-2011	Total Alkalinity	136		mg CaCO3/L	P410981	
	SM 2540 C-2011	TDS	1.32E+03		mg/L	P411341	
	SM 2540 D-2011	TSS	4	I	mg/L	P411345	
	SM 4500 F-C-2011	Fluoride	0.66		mg F/L	P410984	
2310203	EPA 350.1 Rev. 2.0	Ammonia-N	0.052		mg N/L	P410789	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P410923	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.095		mg N/L	P411044	
	EPA 365.1 Rev. 2.0	Total-P	0.39		mg P/L	P411387	
	SM 5310 B-2011	Organic Carbon	9.3		mg C/L	P410890	
2310204	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.16		mg P/L	P410691	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-2011: 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: P410688

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410694

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410707

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: P410707

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: P411049

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: P411053

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410789

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410923

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411044

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411387

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410691

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

Reference Method: SM 2320 B-2011
Batch ID: P410981

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

Reference Method: SM 2540 C-2011
Batch ID: P411341

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P411345

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P410984

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P410890

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: P410688

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410694

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410707

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	111		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	103		P	85 - 115
Sodium	103		P	85 - 115
Strontium	104		P	85 - 115
Tin	104		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	96.7		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410707

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.2		P	85 - 115
Antimony	98.9		P	85 - 115
Arsenic	97.7		P	85 - 115
Barium	103		P	85 - 115
Beryllium	97.5		P	85 - 115
Boron	98.1		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	98.4		P	85 - 115
Cobalt	97.2		P	85 - 115
Copper	95.8		P	85 - 115
Lead	94.3		P	85 - 115
Manganese	97.8		P	85 - 115
Molybdenum	97.3		P	85 - 115
Nickel	96.7		P	85 - 115
Selenium	99.6		P	85 - 115
Silver	98.1		P	85 - 115
Thallium	96.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411049

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.7		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411053

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410789

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410923

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411044

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411387

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: P410691

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

Reference Method: SM 2320 B-2011
Batch ID: P410981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.8		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P410984

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P410890

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307862	Calcium	103		P	80 - 120
2307862	Iron	108	107	P/P	80 - 120
2307862	Magnesium	102		P	80 - 120
2307862	Potassium	101		P	80 - 120
2307862	Sodium	103		P	80 - 120
2307862	Strontium	103	101	P/P	80 - 120
2307862	Tin	103	102	P/P	80 - 120
2307862	Titanium	102	103	P/P	80 - 120
2307862	Vanadium	96.9	97.7	P/P	80 - 120
2307862	Zinc	100	99.0	P/P	80 - 120
2309728	Calcium	105		P	80 - 120
2309728	Iron	106		P	80 - 120
2309728	Magnesium	103		P	80 - 120
2309728	Potassium	102		P	80 - 120
2309728	Sodium	105		P	80 - 120
2309728	Strontium	102		P	80 - 120
2309728	Tin	104		P	80 - 120
2309728	Titanium	104		P	80 - 120
2309728	Vanadium	95.7		P	80 - 120
2309728	Zinc	96.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307862	Aluminum	97.2	96.7	P/P	80 - 120
2307862	Antimony	101	102	P/P	80 - 120
2307862	Arsenic	99.7	99.7	P/P	80 - 120
2307862	Barium	102	103	P/P	80 - 120
2307862	Beryllium	97.4	97.7	P/P	80 - 120
2307862	Boron	102	103	P/P	80 - 120
2307862	Cadmium	101	103	P/P	80 - 120
2307862	Chromium	100	101	P/P	80 - 120
2307862	Cobalt	97.4	97.4	P/P	80 - 120
2307862	Copper	94.0	94.9	P/P	80 - 120
2307862	Lead	95.5	95.8	P/P	80 - 120
2307862	Manganese	99.0	99.9	P/P	80 - 120
2307862	Nickel	95.6	96.0	P/P	80 - 120
2307862	Selenium	90.4	89.6	P/P	80 - 120
2307862	Silver	97.8	97.5	P/P	80 - 120
2307862	Thallium	99.9	101	P/P	80 - 120
2309728	Aluminum	96.5		P	80 - 120
2309728	Antimony	103		P	80 - 120
2309728	Arsenic	98.2		P	80 - 120
2309728	Barium	103		P	80 - 120
2309728	Beryllium	97.6		P	80 - 120
2309728	Boron	102		P	80 - 120
2309728	Cadmium	101		P	80 - 120
2309728	Chromium	100		P	80 - 120
2309728	Cobalt	94.6		P	80 - 120
2309728	Copper	92.8		P	80 - 120
2309728	Lead	95.7		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2309728	Manganese	100		P	80 - 120
2309728	Molybdenum	101		P	80 - 120
2309728	Nickel	94.3		P	80 - 120
2309728	Selenium	98.6		P	80 - 120
2309728	Silver	97.6		P	80 - 120
2309728	Thallium	99.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411049

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2310103	Chloride	96.8		P	90 - 110
2310484	Chloride	99.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411053

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2310103	Sulfate	97.4		P	90 - 110
2310484	Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410789

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2310121	Ammonia-N	99.6	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410923

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2310285	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2310203	NO2NO3-N	97.6	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411387

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2310107	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410691

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2310262	O-Phosphate-P	101	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P410890

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2309030	Organic Carbon	97.3	96.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P410688

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310202	Color (true)	0.512	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P410694

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310202	Turbidity	0.425	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307862	Calcium	1.59	Spike	P	0 - 20
2307862	Iron	0.900	Spike	P	0 - 20
2307862	Magnesium	0.805	Spike	P	0 - 20
2307862	Potassium	1.91	Spike	P	0 - 20
2307862	Sodium	2.27	Spike	P	0 - 20
2307862	Strontium	1.69	Spike	P	0 - 20
2307862	Tin	0.139	Spike	P	0 - 20
2307862	Titanium	0.597	Spike	P	0 - 20
2307862	Vanadium	0.884	Spike	P	0 - 20
2307862	Zinc	1.38	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307862	Aluminum	0.476	Spike	P	0 - 20
2307862	Antimony	0.941	Spike	P	0 - 20
2307862	Arsenic	0.00839	Spike	P	0 - 20
2307862	Barium	0.215	Spike	P	0 - 20
2307862	Beryllium	0.386	Spike	P	0 - 20
2307862	Boron	0.706	Spike	P	0 - 20
2307862	Cadmium	2.21	Spike	P	0 - 20
2307862	Chromium	0.505	Spike	P	0 - 20
2307862	Cobalt	0.0609	Spike	P	0 - 20
2307862	Copper	1.00	Spike	P	0 - 20
2307862	Lead	0.357	Spike	P	0 - 20
2307862	Manganese	0.756	Spike	P	0 - 20
2307862	Molybdenum	0.0817	Spike	P	0 - 20
2307862	Nickel	0.390	Spike	P	0 - 20
2307862	Selenium	0.843	Spike	P	0 - 20
2307862	Silver	0.274	Spike	P	0 - 20
2307862	Thallium	1.25	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310103	Chloride	0.0180	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P411053

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310103	Sulfate	0.331	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410789

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310121	Ammonia-N	1.00	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410923

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310285	Kjeldahl Nitrogen	0.533	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310203	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310107	Total-P	0.289	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410691

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310262	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P410981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310485	Total Alkalinity	4.61	Sample	P	0 - 5.2

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P411341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310260	TDS	4.65	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P410984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2310485	Fluoride	0.483	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P410890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2309030	Organic Carbon	0.976	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: DEP SOP: NU-094-1
Run ID: A110762
Included Lab Sample IDs: 2310202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A110765
Included Lab Sample IDs: 2310204

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A110767
Included Lab Sample IDs: 2310202

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110803
Included Lab Sample IDs: 2310203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	98.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110823
Included Lab Sample IDs: 2310211, 2310212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.1	97.2	P/P	90 - 110
Aluminum	99.0	98.3	P/P	90 - 110
Antimony	95.2	95.3	P/P	90 - 110
Antimony	97.4	97.2	P/P	90 - 110
Arsenic	96.9	96.2	P/P	90 - 110
Arsenic	97.4	95.8	P/P	90 - 110
Barium	99.6	98.5	P/P	90 - 110
Barium	99.8	99.9	P/P	90 - 110
Beryllium	96.8	96.5	P/P	90 - 110
Beryllium	97.8	96.1	P/P	90 - 110
Boron	100	101	P/P	90 - 110
Boron	94.1	100	P/P	90 - 110
Cadmium	100	99.4	P/P	90 - 110
Cadmium	97.6	98.1	P/P	90 - 110
Chromium	98.4	98.0	P/P	90 - 110
Chromium	99.7	99.4	P/P	90 - 110
Cobalt	94.5	93.9	P/P	90 - 110
Cobalt	97.7	94.3	P/P	90 - 110
Copper	95.0	94.5	P/P	90 - 110
Copper	97.9	94.6	P/P	90 - 110
Lead	93.5	93.0	P/P	90 - 110
Lead	94.2	93.7	P/P	90 - 110
Manganese	97.9	97.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110823
Included Lab Sample IDs: 2310211, 2310212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Manganese	99.5	99.2	P/P	90 - 110
Molybdenum	98.5	98.0	P/P	90 - 110
Molybdenum	99.2	98.5	P/P	90 - 110
Nickel	94.8	94.8	P/P	90 - 110
Nickel	98.8	94.8	P/P	90 - 110
Selenium	98.0	96.7	P/P	90 - 110
Selenium	99.2	98.7	P/P	90 - 110
Silver	95.8	94.7	P/P	90 - 110
Silver	96.6	95.9	P/P	90 - 110
Thallium	98.0	98.2	P/P	90 - 110
Thallium	99.2	96.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110831
Included Lab Sample IDs: 2310202

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

Reference Method: SM 5310 B-2011
Run ID: A110845
Included Lab Sample IDs: 2310203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.2	95.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110846
Included Lab Sample IDs: 2310211, 2310212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	104	104	P/P	90 - 110
Potassium	104	103	P/P	90 - 110
Sodium	102	102	P/P	90 - 110
Sodium	102	101	P/P	90 - 110
Strontium	96.0	96.2	P/P	90 - 110
Strontium	96.2	95.9	P/P	90 - 110
Tin	96.2	95.5	P/P	90 - 110
Tin	96.2	95.9	P/P	90 - 110
Titanium	96.4	96.1	P/P	90 - 110
Titanium	96.8	96.3	P/P	90 - 110
Vanadium	95.9	95.5	P/P	90 - 110
Vanadium	96.2	95.8	P/P	90 - 110
Zinc	95.2	95.3	P/P	90 - 110
Zinc	97.2	96.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A110877
Included Lab Sample IDs: 2310202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.0	95.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A110877
Included Lab Sample IDs: 2310202

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110916
Included Lab Sample IDs: 2310203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110976
Included Lab Sample IDs: 2310203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111110
Included Lab Sample IDs: 2310203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	104	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)	102					0.512	
EPA 180.1 Rev. 2.0	Turbidity	96.9					0.425	
EPA 200.7 Rev. 4.4	Calcium	105	103	105				1.59
	Iron	111	108	107	106			0.900
	Magnesium	104	102	103				0.805
	Potassium	103	101	102				1.91
	Sodium	103	103	105				2.27
	Strontium	104	103	101	102			1.69
	Tin	104	103	102	104			0.139
	Titanium	103	102	103	104			0.597
	Vanadium	96.7	96.9	97.7	95.7			0.884
	Zinc	103	100	99.0	96.5			1.38
EPA 200.8 Rev. 5.4	Aluminum	97.2	97.2	96.7	96.5			0.476
	Antimony	98.9	101	102	103			0.941
	Arsenic	97.7	99.7	99.7	98.2			0.0083
	Barium	103	102	103	103			0.215
	Beryllium	97.5	97.4	97.7	97.6			0.386
	Boron	98.1	102	103	102			0.706
	Cadmium	97.0	101	103	101			2.21
	Chromium	98.4	100	101	100			0.505
	Cobalt	97.2	97.4	97.4	94.6			0.0609
	Copper	95.8	92.8	94.0	94.9			1.00
	Lead	94.3	95.5	95.8	95.7			0.357
	Manganese	97.8	99.0	99.9	100			0.756
	Molybdenum	97.3	101					0.0817
	Nickel	96.7	95.6	96.0	94.3			0.390
	Selenium	99.6	90.4	89.6	98.6			0.843
	Silver	98.1	97.8	97.5	97.6			0.274
	Thallium	96.9	99.9	101	99.5			1.25
EPA 300.0 Rev. 2.1	Chloride	99.7	96.8	99.2			0.0180	
	Sulfate	99.6	97.4	97.1			0.331	
EPA 350.1 Rev. 2.0	Ammonia-N	99.8	99.6	102				1.00
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	103	104				0.533
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	97.6	97.6				0.0
EPA 365.1 Rev. 2.0	Total-P	103	106	107				0.289
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	101	101				0.0
SM 2320 B-2011	Total Alkalinity	98.8					4.61	
SM 2540 C-2011	TDS						4.65	
SM 4500 F-C-2011	Fluoride	99.2						0.483
SM 5310 B-2011	Organic Carbon	97.2	97.3	96.0				0.976

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2310202
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2310202
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2310211, 2310212
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2310211, 2310212
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2310202
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2310202
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2310203

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2310203
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2310203
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2310203
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2310204
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2310202
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2310211
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2310202
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2310202
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2310202
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2310203

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	03/04/2022			03/04/2022 15:13	Samantha L Bates	2310202
EPA 180.1 Rev. 2.0	03/04/2022			03/04/2022 14:19	Anna M. Plaviak	2310202
EPA 200.7 Rev. 4.4	03/04/2022	03/07/2022 10:17	Emily M Philpot	03/09/2022 18:34	Josef B Mick	2310212
	03/04/2022	03/07/2022 10:17	Emily M Philpot	03/09/2022 23:15	Josef B Mick	2310211
	03/04/2022	03/07/2022 10:17	Emily M Philpot	03/10/2022 17:58	Josef B Mick	2310212
EPA 200.8 Rev. 5.4	03/04/2022	03/07/2022 10:17	Emily M Philpot	03/08/2022 16:07	Alexander Thompson	2310212
	03/04/2022	03/07/2022 10:17	Emily M Philpot	03/08/2022 20:05	Alexander Thompson	2310211
EPA 300.0 Rev. 2.1	03/04/2022			03/11/2022 18:48	Anna M. Plaviak	2310202
EPA 350.1 Rev. 2.0	03/04/2022			03/08/2022 12:26	Ping Hua	2310203
EPA 351.2 Rev. 2.0	03/04/2022	03/11/2022 11:10	Alexandra J Mattheus	03/16/2022 12:17	Alexandra J Mattheus	2310203
EPA 353.2 Rev. 2.0	03/04/2022			03/14/2022 09:53	Beverly Y. Sanders	2310203
EPA 365.1 Rev. 2.0	03/04/2022	03/22/2022 17:15	Simonne.V. Calhoun	03/23/2022 11:46	Sarah A Nixon	2310203
EPA 365.1 Rev. 2.0 dissolved	03/04/2022			03/04/2022 15:12	Blanca Fach	2310204
SM 2320 B-2011	03/04/2022			03/10/2022 05:17	Dale L. Simmons	2310202
SM 2340B	03/04/2022			03/09/2022 23:15	Josef B Mick	2310211
SM 2540 C-2011	03/04/2022			03/09/2022 14:26	Yijie Li	2310202
SM 2540 D-2011	03/04/2022			03/09/2022 14:26	Yijie Li	2310202
SM 4500 F-C-2011	03/04/2022			03/10/2022 05:17	Dale L. Simmons	2310202
SM 5310 B-2011	03/04/2022			03/09/2022 04:09	Touraj Touran	2310203