

Chemical Analysis Report

TLH-ROC-2022-04-20-03

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

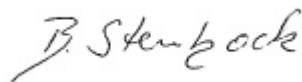
Event Description: **Run 15**
Request ID: **RQ-2022-02-21-76**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 10-MAY-2022 19:01



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: Gully Branch 80m north of Gully Branch Rd

Collection Date/Time: 04/20/2022 10:55

Field ID: G2TLHR0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2320930	DEP SOP: NU-094-1	Color (true)**	320		PCU	P412726	
	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P412723	
	EPA 300.0 Rev. 2.1	Chloride	6.6		mg Cl/L	P413118	
		Sulfate	0.29	I	mg SO4/L	P413121	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P413184	
	SM 2540 C-2011	TDS	60		mg/L	P413195	
	SM 2540 D-2011	TSS	3	I	mg/L	P413198	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P413189	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P413067	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99		mg N/L	P413211	
2320931	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P412911	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P413332	
	SM 5310 B-2011	Organic Carbon	28		mg C/L	P412815	
	EPA 200.7 Rev. 4.4	Calcium	2.15		mg/L	P412801	
		Iron	980		ug/L	P412801	
		Magnesium	0.43		mg/L	P412801	
		Potassium	0.30	U	mg/L	P412801	
		Sodium	3.4		mg/L	P412801	
		Strontium	10.1		ug/L	P412801	
		Tin	3.0	U	ug/L	P412801	
		Titanium	1.6	I	ug/L	P412801	
		Vanadium	2.0	U	ug/L	P412801	
		Zinc	5.0	U	ug/L	P412801	
	EPA 200.8 Rev. 5.4	Aluminum	561		ug/L	P412801	
		Antimony	0.050	U	ug/L	P412801	
		Arsenic	0.20	I	ug/L	P412801	
		Barium	5.18		ug/L	P412801	
		Beryllium	0.021	I	ug/L	P412801	
		Boron**	12.0		ug/L	P412801	
		Cadmium	0.020	U	ug/L	P412801	
		Chromium	0.61	I	ug/L	P412801	
		Cobalt	0.088		ug/L	P412801	
		Copper	0.40	U	ug/L	P412801	
		Lead	0.46		ug/L	P412801	
		Manganese	4.86		ug/L	P412801	
		Molybdenum	0.15	U	ug/L	P412801	
		Nickel	0.50	U	ug/L	P412801	
		Selenium	0.20	U	ug/L	P412801	
		Silver	0.010	U	ug/L	P412801	
		Thallium	0.10	U	ug/L	P412801	
	SM 2340 B-2011	Hardness	7.2		mg/L	P412801	

Ref. Method and Comment:

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

Sample Location: FB

Collection Date/Time: 04/20/2022 10:45

Field ID: FB_04202022

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2320933	DEP SOP: NU-094-1	Color (true)**	2.5	U	PCU	P412726	
	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P412723	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P413118	
		Sulfate	0.20	U	mg SO4/L	P413121	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P413184	
	SM 2540 C-2011	TDS	15	U	mg/L	P413194	
	SM 2540 D-2011	TSS	2	U	mg/L	P413197	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P413189	
2320934	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P413067	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P413211	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P412911	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P413332	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P412815	
2320940	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P412801	
		Iron	30	U	ug/L	P412801	
		Magnesium	0.040	U	mg/L	P412801	
		Potassium	0.30	U	mg/L	P412801	
		Sodium	0.50	U	mg/L	P412801	
		Strontium	2.0	U	ug/L	P412801	
		Tin	3.0	U	ug/L	P412801	
		Titanium	0.75	U	ug/L	P412801	
		Vanadium	2.0	U	ug/L	P412801	
		Zinc	5.0	U	ug/L	P412801	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P412801	
		Antimony	0.050	U	ug/L	P412801	
		Arsenic	0.050	U	ug/L	P412801	
		Barium	0.20	U	ug/L	P412801	
		Beryllium	0.010	U	ug/L	P412801	
		Boron**	2.0	U	ug/L	P412801	
		Cadmium	0.020	U	ug/L	P412801	
		Chromium	0.40	U	ug/L	P412801	
		Cobalt	0.020	U	ug/L	P412801	
		Copper	0.40	U	ug/L	P412801	
		Lead	0.20	U	ug/L	P412801	
		Manganese	0.10	U	ug/L	P412801	
		Molybdenum	0.15	U	ug/L	P412801	
		Nickel	0.50	U	ug/L	P412801	
		Selenium	0.20	U	ug/L	P412801	
		Silver	0.010	U	ug/L	P412801	
		Thallium	0.10	U	ug/L	P412801	
	SM 2340 B-2011	Hardness	0.35	U	mg/L	P412801	

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: P412726

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412723

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412801

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: P412801

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: P413118

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: P413121

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413211

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412911

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413332

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

Reference Method: SM 2320 B-2011
Batch ID: P413184

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

Reference Method: SM 2540 C-2011
Batch ID: P413194

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P413195

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413197

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P413198

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P412815

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: P412726

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.4		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412723

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	95.5		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412801

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	106		P	85 - 115
Sodium	101		P	85 - 115
Strontium	103		P	85 - 115
Tin	103		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	94.8		P	85 - 115
Zinc	99.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412801

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.7		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	97.5		P	85 - 115
Barium	101		P	85 - 115
Beryllium	96.4		P	85 - 115
Boron	103		P	85 - 115
Cadmium	98.4		P	85 - 115
Chromium	97.5		P	85 - 115
Cobalt	98.0		P	85 - 115
Copper	96.8		P	85 - 115
Lead	98.4		P	85 - 115
Manganese	98.1		P	85 - 115
Molybdenum	98.2		P	85 - 115
Nickel	99.2		P	85 - 115
Selenium	97.6		P	85 - 115
Silver	97.4		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413118

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413121

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413211

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: P412911

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413332

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

Reference Method: SM 2320 B-2011
Batch ID: P413184

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

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

Reference Method: SM 5310 B-2011
Batch ID: P412815

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P412801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320382	Calcium	99.4		P	80 - 120
2320382	Iron	110	105	P/P	80 - 120
2320382	Magnesium	107	104	P/P	80 - 120
2320382	Potassium	105	101	P/P	80 - 120
2320382	Sodium	97.4		P	80 - 120
2320382	Strontium	103	102	P/P	80 - 120
2320382	Tin	104	101	P/P	80 - 120
2320382	Titanium	107	103	P/P	80 - 120
2320382	Vanadium	98.6	97.0	P/P	80 - 120
2320382	Zinc	102	100	P/P	80 - 120
2320383	Calcium	104		P	80 - 120
2320383	Iron	108		P	80 - 120
2320383	Magnesium	107		P	80 - 120
2320383	Potassium	104		P	80 - 120
2320383	Sodium	103		P	80 - 120
2320383	Strontium	104		P	80 - 120
2320383	Tin	103		P	80 - 120
2320383	Titanium	103		P	80 - 120
2320383	Vanadium	98.4		P	80 - 120
2320383	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P412801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320382	Aluminum	103	110	P/P	80 - 120
2320382	Antimony	104	104	P/P	80 - 120
2320382	Arsenic	96.7	96.7	P/P	80 - 120
2320382	Barium	103	102	P/P	80 - 120
2320382	Beryllium	95.9	99.4	P/P	80 - 120
2320382	Boron	110	110	P/P	80 - 120
2320382	Cadmium	102	103	P/P	80 - 120
2320382	Chromium	101	103	P/P	80 - 120
2320382	Cobalt	97.3	97.4	P/P	80 - 120
2320382	Copper	95.6	96.3	P/P	80 - 120
2320382	Lead	100	101	P/P	80 - 120
2320382	Manganese	111	113	P/P	80 - 120
2320382	Molybdenum	101	101	P/P	80 - 120
2320382	Nickel	98.7	99.2	P/P	80 - 120
2320382	Selenium	96.0	95.2	P/P	80 - 120
2320382	Silver	98.8	97.8	P/P	80 - 120
2320382	Thallium	103	104	P/P	80 - 120
2320383	Aluminum	102		P	80 - 120
2320383	Antimony	102		P	80 - 120
2320383	Arsenic	97.7		P	80 - 120
2320383	Barium	101		P	80 - 120
2320383	Beryllium	94.1		P	80 - 120
2320383	Boron	106		P	80 - 120
2320383	Cadmium	102		P	80 - 120
2320383	Chromium	99.1		P	80 - 120
2320383	Cobalt	98.7		P	80 - 120
2320383	Copper	96.6		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320383	Lead	100		P	80 - 120
2320383	Manganese	97.5		P	80 - 120
2320383	Molybdenum	98.0		P	80 - 120
2320383	Nickel	98.2		P	80 - 120
2320383	Selenium	96.5		P	80 - 120
2320383	Silver	97.0		P	80 - 120
2320383	Thallium	104		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413118

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320921	Chloride	98.4		P	90 - 110
2320955	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320921	Sulfate	97.3		P	90 - 110
2320955	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320891	Ammonia-N	98.4	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320960	Kjeldahl Nitrogen	99.7	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320891	NO2NO3-N	96.5	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413332

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320889	Total-P	101	103	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320888	Fluoride	102	102	P/P	92 - 107

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P412815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320851	Organic Carbon	98.4	97.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P412726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320955	Color (true)	2.07	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321046	Turbidity	2.04	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320382	Calcium	0.295	Spike	P	0 - 20
2320382	Iron	3.97	Spike	P	0 - 20
2320382	Magnesium	2.02	Spike	P	0 - 20
2320382	Potassium	2.38	Spike	P	0 - 20
2320382	Sodium	1.59	Spike	P	0 - 20
2320382	Strontium	1.29	Spike	P	0 - 20
2320382	Tin	3.05	Spike	P	0 - 20
2320382	Titanium	3.74	Spike	P	0 - 20
2320382	Vanadium	1.63	Spike	P	0 - 20
2320382	Zinc	1.84	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320382	Aluminum	6.00	Spike	P	0 - 20
2320382	Antimony	0.469	Spike	P	0 - 20
2320382	Arsenic	0.0187	Spike	P	0 - 20
2320382	Barium	0.301	Spike	P	0 - 20
2320382	Beryllium	3.27	Spike	P	0 - 20
2320382	Boron	0.278	Spike	P	0 - 20
2320382	Cadmium	0.865	Spike	P	0 - 20
2320382	Chromium	1.45	Spike	P	0 - 20
2320382	Cobalt	0.0741	Spike	P	0 - 20
2320382	Copper	0.667	Spike	P	0 - 20
2320382	Lead	0.285	Spike	P	0 - 20
2320382	Manganese	0.462	Spike	P	0 - 20
2320382	Molybdenum	0.0205	Spike	P	0 - 20
2320382	Nickel	0.464	Spike	P	0 - 20
2320382	Selenium	0.828	Spike	P	0 - 20
2320382	Silver	1.05	Spike	P	0 - 20
2320382	Thallium	0.908	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320921	Chloride	0.378	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320921	Sulfate	0.527	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320891	Ammonia-N	0.704	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320960	Kjeldahl Nitrogen	3.18	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320891	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413332

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320889	Total-P	1.13	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P413184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320888	Total Alkalinity	0.974	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P413194

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320637	TDS	3.20	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P413195

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320886	TDS	6.71	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320888	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P412815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320851	Organic Carbon	0.333	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A111613

Included Lab Sample IDs: 2320930, 2320933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	98.5	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1

Run ID: A111614

Included Lab Sample IDs: 2320930, 2320933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	85 - 115
Color (true)	99.5	101	P/P	85 - 115

Reference Method: SM 5310 B-2011

Run ID: A111659

Included Lab Sample IDs: 2320931, 2320934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A111697

Included Lab Sample IDs: 2320931, 2320934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	97.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A111706

Included Lab Sample IDs: 2320939, 2320940

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	103	P/P	90 - 110
Aluminum	103	105	P/P	90 - 110
Antimony	105	104	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	98.5	97.9	P/P	90 - 110
Arsenic	99.0	100	P/P	90 - 110
Beryllium	97.9	96.7	P/P	90 - 110
Beryllium	98.5	98.6	P/P	90 - 110
Boron	101	105	P/P	90 - 110
Boron	105	106	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Chromium	99.7	101	P/P	90 - 110
Cobalt	98.3	99.2	P/P	90 - 110
Cobalt	99.8	99.0	P/P	90 - 110
Copper	101	99.8	P/P	90 - 110
Copper	97.8	98.6	P/P	90 - 110
Lead	99.0	99.6	P/P	90 - 110
Lead	99.1	99.1	P/P	90 - 110
Manganese	102	102	P/P	90 - 110
Manganese	99.6	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A111706

Included Lab Sample IDs: 2320939, 2320940

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Molybdenum	99.1	98.2	P/P	90 - 110
Molybdenum	99.6	99.8	P/P	90 - 110
Nickel	102	100	P/P	90 - 110
Nickel	99.7	100	P/P	90 - 110
Selenium	103	101	P/P	90 - 110
Selenium	99.7	103	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Thallium	100	99.1	P/P	90 - 110
Thallium	98.7	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A111715

Included Lab Sample IDs: 2320930, 2320933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.1	99.7	P/P	90 - 110
Sulfate	100	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A111746

Included Lab Sample IDs: 2320939, 2320940

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.0	98.9	P/P	90 - 110
Barium	99.9	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A111765

Included Lab Sample IDs: 2320931, 2320934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	98.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A111792

Included Lab Sample IDs: 2320939, 2320940

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	107	P/P	90 - 110
Calcium	104	103	P/P	90 - 110
Iron	104	107	P/P	90 - 110
Iron	105	104	P/P	90 - 110
Magnesium	103	107	P/P	90 - 110
Magnesium	105	104	P/P	90 - 110
Potassium	104	106	P/P	90 - 110
Potassium	104	104	P/P	90 - 110
Sodium	103	105	P/P	90 - 110
Sodium	103	102	P/P	90 - 110
Strontium	102	103	P/P	90 - 110
Strontium	102	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A111792

Included Lab Sample IDs: 2320939, 2320940

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Tin	101	101	P/P	90 - 110
Tin	102	100	P/P	90 - 110
Titanium	102	100	P/P	90 - 110
Titanium	99.9	102	P/P	90 - 110
Vanadium	101	103	P/P	90 - 110
Vanadium	102	101	P/P	90 - 110
Zinc	101	102	P/P	90 - 110
Zinc	105	101	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A111826

Included Lab Sample IDs: 2320930, 2320933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.5	96.4	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A111826

Included Lab Sample IDs: 2320930, 2320933

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A111960

Included Lab Sample IDs: 2320931, 2320934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	105	P/P	90 - 110
Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A111973

Included Lab Sample IDs: 2320931, 2320934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.5	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)	99.4				2.07	
EPA 180.1 Rev. 2.0	Turbidity	95.5				2.04	
EPA 200.7 Rev. 4.4	Calcium	103	99.4	104			0.295
	Iron	106	110	105	108		3.97
	Magnesium	107	107	104	107		2.02
	Potassium	106	105	101	104		2.38
	Sodium	101	97.4	103			1.59
	Strontium	103	103	102	104		1.29
	Tin	103	104	101	103		3.05
	Titanium	101	107	103	103		3.74
	Vanadium	94.8	98.6	97.0	98.4		1.63
	Zinc	99.5	102	100	101		1.84
EPA 200.8 Rev. 5.4	Aluminum	99.7	102	103	110		6.00
	Antimony	101	102	104	104		0.469
	Arsenic	97.5	97.7	96.7	96.7		0.0187
	Barium	101	103	102	101		0.301
	Beryllium	96.4	94.1	95.9	99.4		3.27
	Boron	103	106	110	110		0.278
	Cadmium	98.4	102	102	103		0.865
	Chromium	97.5	99.1	101	103		1.45
	Cobalt	98.0	98.7	97.3	97.4		0.0741
	Copper	96.8	96.6	95.6	96.3		0.667
	Lead	98.4	100	100	101		0.285
	Manganese	98.1	97.5	111	113		0.462
	Molybdenum	98.2	98.0	101	101		0.0205
	Nickel	99.2	98.2	98.7	99.2		0.464
	Selenium	97.6	96.5	96.0	95.2		0.828
	Silver	97.4	97.0	98.8	97.8		1.05
	Thallium	102	104	103	104		0.908
EPA 300.0 Rev. 2.1	Chloride	99.6	98.4	100		0.378	
	Sulfate	98.4	97.3	98.4		0.527	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	98.4	97.6			0.704
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	99.7	104			3.18
EPA 353.2 Rev. 2.0	NO2NO3-N	97.0	96.5	96.5			0.0
EPA 365.1 Rev. 2.0	Total-P	102	101	103			1.13
SM 2320 B-2011	Total Alkalinity	101				0.974	
SM 2540 C-2011	TDS					3.20	
	TDS					6.71	
SM 4500-F- C-2011	Fluoride	101	102	102			0.0
SM 5310 B-2011	Organic Carbon	95.1	98.4	97.8			0.333

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2320930, 2320933
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2320930, 2320933
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2320939, 2320940
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2320939, 2320940
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2320930, 2320933
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2320930, 2320933
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2320931, 2320934

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2320931, 2320934
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2320931, 2320934
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2320931, 2320934
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2320930, 2320933
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2320939, 2320940
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2320930, 2320933
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2320930, 2320933
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2320930, 2320933
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2320931, 2320934

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	04/20/2022			04/21/2022 16:18	Samantha L Bates	2320933
	04/20/2022			04/21/2022 17:24	Samantha L Bates	2320930
EPA 180.1 Rev. 2.0	04/20/2022			04/21/2022 14:35	Khloe J Berg	2320930
	04/20/2022			04/21/2022 14:36	Khloe J Berg	2320933
EPA 200.7 Rev. 4.4	04/20/2022	04/25/2022 10:30	Megan Whitefoot	04/28/2022 22:55	Josef B Mick	2320940
	04/20/2022	04/25/2022 10:30	Megan Whitefoot	04/29/2022 02:38	Josef B Mick	2320939
EPA 200.8 Rev. 5.4	04/20/2022	04/25/2022 10:30	Megan Whitefoot	04/26/2022 13:07	Alexander Thompson	2320940
	04/20/2022	04/25/2022 10:30	Megan Whitefoot	04/26/2022 17:46	Alexander Thompson	2320939
	04/20/2022	04/25/2022 10:30	Megan Whitefoot	04/27/2022 14:15	Emily M Philpot	2320940
	04/20/2022	04/25/2022 10:30	Megan Whitefoot	04/27/2022 15:57	Emily M Philpot	2320939
EPA 300.0 Rev. 2.1	04/20/2022			04/27/2022 19:36	James L Waggeberby	2320930
	04/20/2022			04/27/2022 19:48	James L Waggeberby	2320933
EPA 350.1 Rev. 2.0	04/20/2022			04/28/2022 14:05	Judith K. Clark	2320931
	04/20/2022			04/28/2022 14:06	Judith K. Clark	2320934
EPA 351.2 Rev. 2.0	04/20/2022	05/03/2022 16:44	Samantha L Bates	05/05/2022 11:48	Samantha L Bates	2320931
	04/20/2022	05/03/2022 16:44	Samantha L Bates	05/05/2022 11:53	Samantha L Bates	2320934
EPA 353.2 Rev. 2.0	04/20/2022			04/26/2022 14:11	Nathaniel J Jones	2320931
	04/20/2022			04/26/2022 14:13	Nathaniel J Jones	2320934
EPA 365.1 Rev. 2.0	04/20/2022	05/04/2022 17:30	Simonne.V. Calhoun	05/06/2022 14:39	James L Waggeberby	2320934
	04/20/2022	05/04/2022 17:30	Simonne.V. Calhoun	05/06/2022 14:42	James L Waggeberby	2320931
SM 2320 B-2011	04/20/2022			04/30/2022 18:49	Dale L. Simmons	2320930
	04/20/2022			04/30/2022 18:57	Dale L. Simmons	2320933
SM 2340 B-2011	04/20/2022			04/28/2022 22:55	Josef B Mick	2320940
	04/20/2022			04/29/2022 02:38	Josef B Mick	2320939
SM 2540 C-2011	04/20/2022			04/22/2022 15:36	Yijie Li	2320930, 2320933
SM 2540 D-2011	04/20/2022			04/22/2022 15:36	Yijie Li	2320930, 2320933
SM 4500-F- C-2011	04/20/2022			04/30/2022 18:49	Dale L. Simmons	2320930
	04/20/2022			04/30/2022 18:57	Dale L. Simmons	2320933
SM 5310 B-2011	04/20/2022			04/23/2022 05:29	Khloe J Berg	2320931
	04/20/2022			04/23/2022 05:43	Khloe J Berg	2320934