

Chemical Analysis Report

TLH-ROC-2022-05-04-01

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

Event Description: **Run 16**
Request ID: **RQ-2022-04-25-46**
Customer: **TLH-ROC**
Project ID: **SMP**

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Date Certified: 26-MAY-2022 17:27



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: Marshall Creek @ SR2

Collection Date/Time: 05/04/2022 09:40

Field ID: G2TLHR0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2324445	DEP SOP: NU-094-1	Color (true)**	23	A	PCU	P413372	
	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P413369	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P413635	
		Sulfate	0.93		mg SO4/L	P413637	
	SM 2320 B-2011	Total Alkalinity	83		mg CaCO3/L	P413845	
	SM 2540 C-2011	TDS	110		mg/L	P413686	
	SM 2540 D-2011	TSS	15		mg/L	P413679	
	SM 4500-F- C-2011	Fluoride	0.042	I	mg F/L	P413847	
2324446	EPA 350.1 Rev. 2.0	Ammonia-N	0.054		mg N/L	P413702	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40	J	mg N/L	P413869	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.82		mg N/L	P413632	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P413894	
	SM 5310 B-2011	Organic Carbon	2.7		mg C/L	P413752	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: Pine Barn Creek @ Woodrest Rd

Collection Date/Time: 05/04/2022 10:15

Field ID: G3TLHR0047

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2324447	DEP SOP: NU-094-1	Color (true)**	140		PCU	P413372	
	EPA 180.1 Rev. 2.0	Turbidity	7.6		NTU	P413369	
	EPA 300.0 Rev. 2.1	Chloride	4.4		mg Cl/L	P413635	
		Sulfate	0.20	U	mg SO4/L	P413637	
	SM 2320 B-2011	Total Alkalinity	6.7		mg CaCO3/L	P413845	
	SM 2540 C-2011	TDS	40		mg/L	P413686	
	SM 2540 D-2011	TSS	5	I	mg/L	P413679	
2324448	SM 4500-F- C-2011	Fluoride	0.042	I	mg F/L	P413847	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P413702	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P413871	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P413632	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P413894	
2324455	SM 5310 B-2011	Organic Carbon	11		mg C/L	P413752	
	EPA 200.7 Rev. 4.4	Calcium	2.84		mg/L	P413453	
		Iron	2.92E+03		ug/L	P413453	
		Magnesium	1.20		mg/L	P413453	
		Potassium	1.8		mg/L	P413453	
		Sodium	1.6	I	mg/L	P413453	
		Strontium	7.6	I	ug/L	P413453	
		Tin	3.0	U	ug/L	P413453	
		Titanium	4.0		ug/L	P413453	
		Vanadium	2.0	U	ug/L	P413453	
		Zinc	5.0	U	ug/L	P413453	
	EPA 200.8 Rev. 5.4	Aluminum	182		ug/L	P413453	
		Antimony	0.050	U	ug/L	P413453	
		Arsenic	0.79		ug/L	P413453	
		Barium	18.6		ug/L	P413453	
		Beryllium	0.011	I	ug/L	P413453	
		Boron**	13.2		ug/L	P413453	
		Cadmium	0.020	U	ug/L	P413453	
		Chromium	0.40	U	ug/L	P413453	
		Cobalt	0.742		ug/L	P413453	
		Copper	0.42	I	ug/L	P413453	
		Lead	0.91		ug/L	P413453	
		Manganese	571		ug/L	P413453	
		Molybdenum	0.15	U	ug/L	P413453	
		Nickel	0.50	U	ug/L	P413453	
		Selenium	0.20	U	ug/L	P413453	
		Silver	0.010	U	ug/L	P413453	
		Thallium	0.10	U	ug/L	P413453	
	SM 2340 B-2011	Hardness	12.0		mg/L	P413453	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 05/10/2022.

Sample Location: Gilberts Mill Creek @ Aycock Rd

Collection Date/Time: 05/04/2022 10:50

Field ID: G3TLHR0050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2324454	EPA 200.7 Rev. 4.4	Calcium	2.07		mg/L	P413453	
		Iron	1.95E+03		ug/L	P413453	
		Magnesium	0.82		mg/L	P413453	
		Potassium	0.81	I	mg/L	P413453	
		Sodium	1.6	I	mg/L	P413453	
		Strontium	8.2		ug/L	P413453	
		Tin	3.0	U	ug/L	P413453	
		Titanium	2.7	I	ug/L	P413453	
		Vanadium	2.0	U	ug/L	P413453	
		Zinc	5.0	U	ug/L	P413453	
	EPA 200.8 Rev. 5.4	Aluminum	332		ug/L	P413453	
		Antimony	0.050	U	ug/L	P413453	
		Arsenic	0.68		ug/L	P413453	
		Barium	13.5		ug/L	P413453	
		Beryllium	0.017	I	ug/L	P413453	
		Boron**	11.9		ug/L	P413453	
		Cadmium	0.020	U	ug/L	P413453	
		Chromium	0.40	U	ug/L	P413453	
		Cobalt	0.271		ug/L	P413453	
		Copper	0.50	I	ug/L	P413453	
		Lead	0.87		ug/L	P413453	
		Manganese	136		ug/L	P413453	
		Molybdenum	0.15	U	ug/L	P413453	
		Nickel	0.50	U	ug/L	P413453	
		Selenium	0.20	U	ug/L	P413453	
		Silver	0.010	U	ug/L	P413453	
		Thallium	0.10	U	ug/L	P413453	
	SM 2340 B-2011	Hardness	8.5		mg/L	P413453	

Ref. Method and Comment:
 EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 05/10/2022.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P413372

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413369

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413453

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: P413453

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: P413635

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: P413637

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413702

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413869

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413871

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413632

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413894

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

Reference Method: SM 2320 B-2011
Batch ID: P413845

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

Reference Method: SM 2540 C-2011
Batch ID: P413686

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413679

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P413847

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P413752

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: P413372

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413369

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	95.9		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413453

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	104		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Strontium	103		P	85 - 115
Tin	104		P	85 - 115
Titanium	104		P	85 - 115
Vanadium	98.6		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413453

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	104		P	80 - 120
Antimony	101		P	80 - 120
Arsenic	99.4		P	80 - 120
Barium	105		P	80 - 120
Beryllium	101		P	80 - 120
Boron	105		P	80 - 120
Cadmium	99.9		P	80 - 120
Chromium	99.8		P	80 - 120
Cobalt	98.6		P	80 - 120
Copper	98.0		P	80 - 120
Lead	102		P	80 - 120
Manganese	99.8		P	80 - 120
Molybdenum	99.1		P	80 - 120
Nickel	99.2		P	80 - 120
Selenium	101		P	80 - 120
Silver	96.6		P	80 - 120
Thallium	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413635

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413637

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413869

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413632

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413894

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

Reference Method: SM 2320 B-2011
Batch ID: P413845

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.9		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P413847

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P413752

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P413453

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324875	Calcium	107		P	80 - 120
2324875	Iron	112	110	P/P	80 - 120
2324875	Magnesium	113	110	P/P	80 - 120
2324875	Potassium	107	107	P/P	80 - 120
2324875	Sodium	110	108	P/P	80 - 120
2324875	Strontium	109	107	P/P	80 - 120
2324875	Tin	113	108	P/P	80 - 120
2324875	Titanium	111	108	P/P	80 - 120
2324875	Vanadium	107	103	P/P	80 - 120
2324875	Zinc	104	99.5	P/P	80 - 120
2324891	Calcium	111		P	80 - 120
2324891	Iron	111		P	80 - 120
2324891	Magnesium	112		P	80 - 120
2324891	Potassium	110		P	80 - 120
2324891	Sodium	112		P	80 - 120
2324891	Strontium	109		P	80 - 120
2324891	Tin	110		P	80 - 120
2324891	Titanium	110		P	80 - 120
2324891	Vanadium	103		P	80 - 120
2324891	Zinc	110		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P413453

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324875	Aluminum	94.7	113	P/P	80 - 120
2324875	Antimony	99.6	101	P/P	80 - 120
2324875	Arsenic	96.1	99.0	P/P	80 - 120
2324875	Barium	103	109	P/P	80 - 120
2324875	Beryllium	94.6	96.4	P/P	80 - 120
2324875	Boron	102	108	P/P	80 - 120
2324875	Cadmium	98.8	102	P/P	80 - 120
2324875	Chromium	102	106	P/P	80 - 120
2324875	Cobalt	95.9	99.3	P/P	80 - 120
2324875	Copper	96.3	98.8	P/P	80 - 120
2324875	Lead	99.5	105	P/P	80 - 120
2324875	Manganese	101	110	P/P	80 - 120
2324875	Molybdenum	98.8	102	P/P	80 - 120
2324875	Nickel	97.4	100	P/P	80 - 120
2324875	Selenium	96.2	97.8	P/P	80 - 120
2324875	Silver	96.6	99.1	P/P	80 - 120
2324875	Thallium	99.6	106	P/P	80 - 120
2324891	Aluminum	99.7		P	80 - 120
2324891	Antimony	98.8		P	80 - 120
2324891	Arsenic	98.0		P	80 - 120
2324891	Barium	103		P	80 - 120
2324891	Beryllium	97.6		P	80 - 120
2324891	Boron	99.2		P	80 - 120
2324891	Cadmium	96.7		P	80 - 120
2324891	Chromium	98.4		P	80 - 120
2324891	Cobalt	96.1		P	80 - 120
2324891	Copper	96.4		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413453

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324891	Lead	101		P	80 - 120
2324891	Manganese	97.9		P	80 - 120
2324891	Molybdenum	97.6		P	80 - 120
2324891	Nickel	94.9		P	80 - 120
2324891	Selenium	97.1		P	80 - 120
2324891	Silver	95.0		P	80 - 120
2324891	Thallium	100		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324263	Chloride	97.1		P	90 - 110
2324445	Chloride	95.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413637

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324263	Sulfate	98.4		P	90 - 110
2324445	Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325150	Ammonia-N	98.4	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324446	Kjeldahl Nitrogen	112	105	F/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324850	Kjeldahl Nitrogen	102	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413632

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324448	NO2NO3-N	97.0	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324661	Total-P	102	103	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P413847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324917	Fluoride	98.0	97.4	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P413752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324264	Organic Carbon	95.1	95.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P413372

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324445	Color (true)	6.42	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P413369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324263	Turbidity	8.55	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P413453

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324875	Calcium	1.52	Spike	P	0 - 20
2324875	Iron	1.45	Spike	P	0 - 20
2324875	Magnesium	1.53	Spike	P	0 - 20
2324875	Potassium	0.279	Spike	P	0 - 20
2324875	Sodium	0.874	Spike	P	0 - 20
2324875	Strontium	1.89	Spike	P	0 - 20
2324875	Tin	4.64	Spike	P	0 - 20
2324875	Titanium	2.74	Spike	P	0 - 20
2324875	Vanadium	3.09	Spike	P	0 - 20
2324875	Zinc	4.69	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P413453

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324875	Aluminum	15.8	Spike	P	0 - 20
2324875	Antimony	1.38	Spike	P	0 - 20
2324875	Arsenic	2.92	Spike	P	0 - 20
2324875	Barium	4.64	Spike	P	0 - 20
2324875	Beryllium	1.73	Spike	P	0 - 20
2324875	Boron	4.75	Spike	P	0 - 20
2324875	Cadmium	2.78	Spike	P	0 - 20
2324875	Chromium	3.96	Spike	P	0 - 20
2324875	Cobalt	3.42	Spike	P	0 - 20
2324875	Copper	2.55	Spike	P	0 - 20
2324875	Lead	5.29	Spike	P	0 - 20
2324875	Manganese	3.68	Spike	P	0 - 20
2324875	Molybdenum	3.21	Spike	P	0 - 20
2324875	Nickel	3.03	Spike	P	0 - 20
2324875	Selenium	1.64	Spike	P	0 - 20
2324875	Silver	2.60	Spike	P	0 - 20
2324875	Thallium	6.13	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324263	Chloride	0.116	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413637

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324263	Sulfate	0.0768	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325150	Ammonia-N	0.179	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324446	Kjeldahl Nitrogen	5.03	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324850	Kjeldahl Nitrogen	0.726	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413632

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324448	NO2NO3-N	0.514	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324661	Total-P	0.732	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P413845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324917	Total Alkalinity	0.764	Sample	P	0 - 3.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P413686

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324087	TDS	2.92	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P413847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324917	Fluoride	0.480	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P413752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324264	Organic Carbon	0.311	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: A111912

Included Lab Sample IDs: 2324445, 2324447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1

Run ID: A111913

Included Lab Sample IDs: 2324445, 2324447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A111983

Included Lab Sample IDs: 2324454, 2324455

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.7	103	P/P	90 - 110
Iron	99.4	103	P/P	90 - 110
Magnesium	99.6	103	P/P	90 - 110
Potassium	98.6	102	P/P	90 - 110
Sodium	98.1	101	P/P	90 - 110
Strontium	107	108	P/P	90 - 110
Tin	107	105	P/P	90 - 110
Titanium	108	105	P/P	90 - 110
Vanadium	109	105	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A112012

Included Lab Sample IDs: 2324454, 2324455

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	102	99.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112014

Included Lab Sample IDs: 2324454, 2324455

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.1	98.0	P/P	90 - 110
Antimony	97.8	98.4	P/P	90 - 110
Arsenic	94.1	96.5	P/P	90 - 110
Barium	99.0	98.5	P/P	90 - 110
Beryllium	96.6	97.4	P/P	90 - 110
Boron	97.4	94.3	P/P	90 - 110
Cadmium	96.9	97.3	P/P	90 - 110
Chromium	96.7	97.4	P/P	90 - 110
Cobalt	94.6	94.9	P/P	90 - 110
Copper	95.3	95.1	P/P	90 - 110
Lead	97.3	97.3	P/P	90 - 110
Manganese	96.0	97.2	P/P	90 - 110
Molybdenum	95.6	96.0	P/P	90 - 110
Nickel	94.9	95.7	P/P	90 - 110
Selenium	96.0	96.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112014

Included Lab Sample IDs: 2324454, 2324455

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	97.1	97.4	P/P	90 - 110
Thallium	95.0	95.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112023

Included Lab Sample IDs: 2324446, 2324448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A112033

Included Lab Sample IDs: 2324445, 2324447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.4	96.4	P/P	90 - 110
Sulfate	100	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112066

Included Lab Sample IDs: 2324446, 2324448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	97.6	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A112089

Included Lab Sample IDs: 2324446, 2324448

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

Reference Method: SM 2320 B-2011

Run ID: A112154

Included Lab Sample IDs: 2324445, 2324447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.3	96.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A112154

Included Lab Sample IDs: 2324445, 2324447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112260

Included Lab Sample IDs: 2324446, 2324448

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112268

Included Lab Sample IDs: 2324446, 2324448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.7	98.5	P/P	90 - 110
Kjeldahl Nitrogen	98.3	97.8	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)	101				6.42	
EPA 180.1 Rev. 2.0	Turbidity	95.9				8.55	
EPA 200.7 Rev. 4.4	Calcium	107	107	111			1.52
	Iron	104	112	110	111		1.45
	Magnesium	104	113	110	112		1.53
	Potassium	102	107	107	110		0.279
	Sodium	102	110	108	112		0.874
	Strontium	103	109	107	109		1.89
	Tin	104	113	108	110		4.64
	Titanium	104	111	108	110		2.74
	Vanadium	98.6	107	103	103		3.09
	Zinc	107	104	99.5	110		4.69
EPA 200.8 Rev. 5.4	Aluminum	104	94.7	113	99.7		15.8
	Antimony	101	99.6	101	98.8		1.38
	Arsenic	99.4	96.1	99.0	98.0		2.92
	Barium	105	103	109	103		4.64
	Beryllium	101	94.6	96.4	97.6		1.73
	Boron	105	102	108	99.2		4.75
	Cadmium	99.9	98.8	102	96.7		2.78
	Chromium	99.8	102	106	98.4		3.96
	Cobalt	98.6	95.9	99.3	96.1		3.42
	Copper	98.0	96.3	98.8	96.4		2.55
	Lead	102	99.5	105	101		5.29
	Manganese	99.8	101	110	97.9		3.68
	Molybdenum	99.1	98.8	102	97.6		3.21
	Nickel	99.2	97.4	100	94.9		3.03
	Selenium	101	96.2	97.8	97.1		1.64
	Silver	96.6	96.6	99.1	95.0		2.60
	Thallium	102	99.6	106	100		6.13
EPA 300.0 Rev. 2.1	Chloride	98.7	97.1	95.0		0.116	
	Sulfate	102	98.4	99.1		0.0768	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	98.4	98.2			0.179
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	112	105			5.03
	Kjeldahl Nitrogen	95.8	102	103			0.726
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	97.0	97.5			0.514
EPA 365.1 Rev. 2.0	Total-P	102	102	103			0.732
SM 2320 B-2011	Total Alkalinity	97.9				0.764	
SM 2540 C-2011	TDS					2.92	
SM 4500-F- C-2011	Fluoride	97.9	98.0	97.4			0.480
SM 5310 B-2011	Organic Carbon	94.8	95.1	95.5			0.311

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2324445, 2324447
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2324445, 2324447
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2324454, 2324455
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2324454, 2324455
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2324445, 2324447
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2324445, 2324447
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2324446, 2324448

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2324446, 2324448
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2324446, 2324448
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2324446, 2324448
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2324445, 2324447
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2324454, 2324455
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2324445, 2324447
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2324445, 2324447
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2324445, 2324447
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2324446, 2324448

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	05/04/2022			05/04/2022 16:19	Samantha L Bates	2324445
	05/04/2022			05/04/2022 16:20	Samantha L Bates	2324447
EPA 180.1 Rev. 2.0	05/04/2022			05/04/2022 14:50	Anna M. Plaviak	2324445
	05/04/2022			05/04/2022 14:51	Anna M. Plaviak	2324447
EPA 200.7 Rev. 4.4	05/04/2022	05/06/2022 10:30	Megan Whitefoot	05/06/2022 22:40	McKinley C Carter	2324454
	05/04/2022	05/06/2022 10:30	Megan Whitefoot	05/06/2022 22:45	McKinley C Carter	2324455
	05/04/2022	05/06/2022 10:30	Megan Whitefoot	05/09/2022 21:42	McKinley C Carter	2324454
	05/04/2022	05/06/2022 10:30	Megan Whitefoot	05/09/2022 21:48	McKinley C Carter	2324455
EPA 200.8 Rev. 5.4	05/04/2022	05/06/2022 10:30	Megan Whitefoot	05/09/2022 17:41	Alexander Thompson	2324454
	05/04/2022	05/06/2022 10:30	Megan Whitefoot	05/09/2022 17:50	Alexander Thompson	2324455
EPA 300.0 Rev. 2.1	05/04/2022			05/10/2022 07:31	Anna M. Plaviak	2324445
	05/04/2022			05/10/2022 08:32	Anna M. Plaviak	2324447
EPA 350.1 Rev. 2.0	05/04/2022			05/11/2022 10:30	Ping Hua	2324446
	05/04/2022			05/11/2022 10:32	Ping Hua	2324448
EPA 351.2 Rev. 2.0	05/04/2022	05/17/2022 14:29	Samantha L Bates	05/19/2022 10:36	Samantha L Bates	2324446
	05/04/2022	05/17/2022 14:29	Samantha L Bates	05/19/2022 11:27	Samantha L Bates	2324448
EPA 353.2 Rev. 2.0	05/04/2022			05/10/2022 11:19	Beverly Y. Sanders	2324448
	05/04/2022			05/10/2022 12:13	Beverly Y. Sanders	2324446
EPA 365.1 Rev. 2.0	05/04/2022	05/17/2022 14:42	Simonne.V. Calhoun	05/18/2022 19:06	Sarah A Nixon	2324446
	05/04/2022	05/17/2022 14:42	Simonne.V. Calhoun	05/18/2022 19:07	Sarah A Nixon	2324448
SM 2320 B-2011	05/04/2022			05/12/2022 19:27	Dale L. Simmons	2324445
	05/04/2022			05/12/2022 19:37	Dale L. Simmons	2324447
SM 2340 B-2011	05/04/2022			05/06/2022 22:40	McKinley C Carter	2324454
	05/04/2022			05/06/2022 22:45	McKinley C Carter	2324455
SM 2540 C-2011	05/04/2022			05/05/2022 14:39	Yijie Li	2324445, 2324447
SM 2540 D-2011	05/04/2022			05/05/2022 14:39	Yijie Li	2324445, 2324447
SM 4500-F- C-2011	05/04/2022			05/12/2022 19:27	Dale L. Simmons	2324445
	05/04/2022			05/12/2022 19:37	Dale L. Simmons	2324447
SM 5310 B-2011	05/04/2022			05/12/2022 02:57	Judith K. Clark	2324446
	05/04/2022			05/12/2022 03:16	Judith K. Clark	2324448