Chemical Analysis Report

TLH-ROC-2022-01-25-02

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

Event Description: **Run 6**
Request ID: **RQ-2022-01-03-56**
Customer: **TLH-ROC**
Project ID: **SMP**

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

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 15-FEB-2022 09:37

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: 01/25/2022 11:20**

Field ID: G2TLHR0006 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2301575	DEP SOP: NU-094-1	Color (true)**	190		PCU	P409003	
	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P409007	
	EPA 300.0 Rev. 2.1	Chloride	8.0		mg Cl/L	P409287	
		Sulfate	1.2		mg SO4/L	P409290	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P409140	
	SM 2540 C-2011	TDS	78		mg/L	P409501	
	SM 2540 D-2011	TSS	5	I	mg/L	P409493	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P409145	
2301576	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P409405	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P409191	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P409096	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P409032	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P409520	
2301577	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P409000	
2301581	EPA 200.7 Rev. 4.4	Calcium	2.79		mg/L	P409051	
		Iron	630		ug/L	P409051	
		Magnesium	0.65		mg/L	P409051	
		Potassium	0.30	U	mg/L	P409051	
		Sodium	3.9		mg/L	P409051	
		Strontium	11.9		ug/L	P409051	
		Tin	3.0	U	ug/L	P409051	
		Titanium	6.1		ug/L	P409051	
		Vanadium	2.0	U	ug/L	P409051	
		Zinc	5.0	U	ug/L	P409051	
	EPA 200.8 Rev. 5.4	Aluminum	624		ug/L	P409051	
		Antimony	0.050	U	ug/L	P409051	
		Arsenic	0.18	I	ug/L	P409051	
		Barium	5.58		ug/L	P409051	
		Beryllium	0.022	I	ug/L	P409051	
		Boron**	11.0		ug/L	P409051	
		Cadmium	0.020	U	ug/L	P409051	
		Chromium	0.56	I	ug/L	P409051	
		Cobalt	0.106		ug/L	P409051	
		Copper	0.40	U	ug/L	P409051	
		Lead	0.38	I	ug/L	P409051	
		Manganese	7.53		ug/L	P409051	
		Molybdenum	0.15	U	ug/L	P409051	
		Nickel	0.50	U	ug/L	P409051	
		Selenium	0.20	U	ug/L	P409051	
		Silver	0.010	U	ug/L	P409051	
		Thallium	0.10	U	ug/L	P409051	
	SM 2340B	Hardness	9.6		mg/L	P409051	

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: P409003

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409007

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409051

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: P409051

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: P409287

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: P409290

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409405

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409191

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409096

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409032

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409000

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

Reference Method: SM 2320 B-2011
Batch ID: P409140

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

Reference Method: SM 2540 C-2011
Batch ID: P409501

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P409493

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P409145

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P409520

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: P409003

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.4		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409051

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Iron	112		P	85 - 115
Magnesium	114		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Strontium	102		P	85 - 115
Tin	108		P	85 - 115
Titanium	106		P	85 - 115
Vanadium	105		P	85 - 115
Zinc	108		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409051

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	102		P	85 - 115
Barium	105		P	85 - 115
Beryllium	96.2		P	85 - 115
Boron	103		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	97.9		P	85 - 115
Cobalt	102		P	85 - 115
Copper	102		P	85 - 115
Lead	101		P	85 - 115
Manganese	96.6		P	85 - 115
Molybdenum	103		P	85 - 115
Nickel	103		P	85 - 115
Selenium	99.9		P	85 - 115
Silver	102		P	85 - 115
Thallium	108		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409287

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409290

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409405

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409191

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409096

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409032

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: P409000

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.3		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P409140

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P409145

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P409520

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409051

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301138	Calcium	106	107	P/P	80 - 120
2301138	Iron	109	110	P/P	80 - 120
2301138	Magnesium	109	111	P/P	80 - 120
2301138	Potassium	104	103	P/P	80 - 120
2301138	Sodium	104	103	P/P	80 - 120
2301138	Strontium	103	104	P/P	80 - 120
2301138	Tin	109	108	P/P	80 - 120
2301138	Titanium	105	107	P/P	80 - 120
2301138	Vanadium	105	108	P/P	80 - 120
2301138	Zinc	107	111	P/P	80 - 120
2301572	Calcium	105		P	80 - 120
2301572	Iron	110		P	80 - 120
2301572	Magnesium	108		P	80 - 120
2301572	Potassium	103		P	80 - 120
2301572	Sodium	104		P	80 - 120
2301572	Strontium	102		P	80 - 120
2301572	Tin	105		P	80 - 120
2301572	Titanium	106		P	80 - 120
2301572	Vanadium	106		P	80 - 120
2301572	Zinc	108		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409051

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301138	Aluminum	103	103	P/P	80 - 120
2301138	Antimony	101	101	P/P	80 - 120
2301138	Arsenic	103	101	P/P	80 - 120
2301138	Barium	105	105	P/P	80 - 120
2301138	Beryllium	102	103	P/P	80 - 120
2301138	Boron	103	103	P/P	80 - 120
2301138	Cadmium	103	101	P/P	80 - 120
2301138	Chromium	99.8	98.9	P/P	80 - 120
2301138	Cobalt	104	103	P/P	80 - 120
2301138	Copper	105	105	P/P	80 - 120
2301138	Lead	102	101	P/P	80 - 120
2301138	Manganese	98.3	97.7	P/P	80 - 120
2301138	Molybdenum	103	103	P/P	80 - 120
2301138	Nickel	104	104	P/P	80 - 120
2301138	Selenium	99.1	99.2	P/P	80 - 120
2301138	Silver	102	101	P/P	80 - 120
2301138	Thallium	108	109	P/P	80 - 120
2301572	Aluminum	101		P	80 - 120
2301572	Antimony	103		P	80 - 120
2301572	Arsenic	102		P	80 - 120
2301572	Barium	103		P	80 - 120
2301572	Beryllium	94.9		P	80 - 120
2301572	Boron	106		P	80 - 120
2301572	Cadmium	103		P	80 - 120
2301572	Chromium	98.8		P	80 - 120
2301572	Cobalt	100		P	80 - 120
2301572	Copper	101		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409051

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301572	Lead	102		P	80 - 120
2301572	Manganese	97.3		P	80 - 120
2301572	Molybdenum	107		P	80 - 120
2301572	Nickel	101		P	80 - 120
2301572	Selenium	97.9		P	80 - 120
2301572	Silver	101		P	80 - 120
2301572	Thallium	110		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409287

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301449	Chloride	96.9		P	90 - 110
2301575	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409290

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301449	Sulfate	95.2		P	90 - 110
2301575	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409405

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301562	Ammonia-N	95.6	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301639	Kjeldahl Nitrogen	102	111	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301561	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301586	Total-P	105	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409000

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301600	O-Phosphate-P	92.9	94.5	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P409145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301654	Fluoride	99.1	97.8	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P409520

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300871	Organic Carbon	97.2	99.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P409003

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301595	Color (true)	0.680	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409007

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301653	Turbidity	8.86	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409051

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301138	Calcium	1.22	Spike	P	0 - 20
2301138	Iron	0.683	Spike	P	0 - 20
2301138	Magnesium	1.27	Spike	P	0 - 20
2301138	Potassium	0.842	Spike	P	0 - 20
2301138	Sodium	0.764	Spike	P	0 - 20
2301138	Strontium	1.29	Spike	P	0 - 20
2301138	Tin	0.162	Spike	P	0 - 20
2301138	Titanium	1.65	Spike	P	0 - 20
2301138	Vanadium	2.14	Spike	P	0 - 20
2301138	Zinc	3.32	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409051

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301138	Aluminum	0.242	Spike	P	0 - 20
2301138	Antimony	0.00172	Spike	P	0 - 20
2301138	Arsenic	1.57	Spike	P	0 - 20
2301138	Barium	0.105	Spike	P	0 - 20
2301138	Beryllium	0.654	Spike	P	0 - 20
2301138	Boron	0.190	Spike	P	0 - 20
2301138	Cadmium	2.23	Spike	P	0 - 20
2301138	Chromium	0.943	Spike	P	0 - 20
2301138	Cobalt	0.589	Spike	P	0 - 20
2301138	Copper	0.606	Spike	P	0 - 20
2301138	Lead	0.333	Spike	P	0 - 20
2301138	Manganese	0.446	Spike	P	0 - 20
2301138	Molybdenum	0.0810	Spike	P	0 - 20
2301138	Nickel	0.661	Spike	P	0 - 20
2301138	Selenium	0.0880	Spike	P	0 - 20
2301138	Silver	0.724	Spike	P	0 - 20
2301138	Thallium	0.518	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301449	Chloride	0.102	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409290

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301449	Sulfate	0.142	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301562	Ammonia-N	0.611	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301639	Kjeldahl Nitrogen	5.08	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301561	NO2NO3-N	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301586	Total-P	3.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409000

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301600	O-Phosphate-P	1.71	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P409140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301654	Total Alkalinity	0.494	Sample	P	0 - 5.2

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P409501

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301601	TDS	4.80	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P409145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301654	Fluoride	0.960	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P409520

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300871	Organic Carbon	1.54	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A110055
Included Lab Sample IDs: 2301577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.9	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1
Run ID: A110056
Included Lab Sample IDs: 2301575

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A110058
Included Lab Sample IDs: 2301575

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110085
Included Lab Sample IDs: 2301576

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110087
Included Lab Sample IDs: 2301581

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	101	P/P	90 - 110
Antimony	101	103	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Barium	99.3	100	P/P	90 - 110
Beryllium	93.1	93.4	P/P	90 - 110
Boron	104	104	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	96.4	96.4	P/P	90 - 110
Cobalt	98.3	97.3	P/P	90 - 110
Copper	99.2	98.1	P/P	90 - 110
Lead	97.7	97.7	P/P	90 - 110
Manganese	96.8	96.8	P/P	90 - 110
Molybdenum	101	101	P/P	90 - 110
Nickel	98.5	97.8	P/P	90 - 110
Selenium	100	100	P/P	90 - 110
Silver	102	102	P/P	90 - 110
Thallium	105	105	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A110099
Included Lab Sample IDs: 2301575

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A110099
Included Lab Sample IDs: 2301575

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	96.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A110099
Included Lab Sample IDs: 2301575

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110112
Included Lab Sample IDs: 2301581

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	104	P/P	90 - 110
Iron	104	106	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Potassium	98.7	99.0	P/P	90 - 110
Sodium	102	102	P/P	90 - 110
Strontium	101	103	P/P	90 - 110
Tin	101	103	P/P	90 - 110
Titanium	103	103	P/P	90 - 110
Vanadium	102	102	P/P	90 - 110
Zinc	103	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110154
Included Lab Sample IDs: 2301575

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.9	101	P/P	90 - 110
Sulfate	98.8	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110173
Included Lab Sample IDs: 2301576

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110188
Included Lab Sample IDs: 2301576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.3	94.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110212
Included Lab Sample IDs: 2301576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	103	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A110267
Included Lab Sample IDs: 2301576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	106	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	97.4					0.680	
EPA 180.1 Rev. 2.0	Turbidity						8.86	
EPA 200.7 Rev. 4.4	Calcium	109	106	107	105			1.22
	Iron	112	109	110	110			0.683
	Magnesium	114	109	111	108			1.27
	Potassium	103	104	103	103			0.842
	Sodium	104	104	103	104			0.764
	Strontium	102	103	104	102			1.29
	Tin	108	109	108	105			0.162
	Titanium	106	105	107	106			1.65
	Vanadium	105	105	108	106			2.14
	Zinc	108	107	111	108			3.32
EPA 200.8 Rev. 5.4	Aluminum	102	103	103	101			0.242
	Antimony	101	101	101	103			0.0017
	Arsenic	102	103	101	102			1.57
	Barium	105	105	105	103			0.105
	Beryllium	96.2	94.9	102	103			0.654
	Boron	103	103	103	106			0.190
	Cadmium	100	103	101	103			2.23
	Chromium	97.9	99.8	98.9	98.8			0.943
	Cobalt	102	104	103	100			0.589
	Copper	102	105	105	101			0.606
	Lead	101	102	101	102			0.333
	Manganese	96.6	98.3	97.7	97.3			0.446
	Molybdenum	103	103	103	107			0.0810
	Nickel	103	104	104	101			0.661
	Selenium	99.9	99.1	99.2	97.9			0.0880
	Silver	102	102	101	101			0.724
	Thallium	108	108	109	110			0.518
EPA 300.0 Rev. 2.1	Chloride	102	96.9	100			0.102	
	Sulfate	99.0	95.2	98.4			0.142	
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	95.6	96.4				0.611
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	102	111				5.08
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	102				1.39
EPA 365.1 Rev. 2.0	Total-P	103	105	100				3.23
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	92.9	94.5				1.71
SM 2320 B-2011	Total Alkalinity	99.0					0.494	
SM 2540 C-2011	TDS						4.80	
SM 4500 F-C-2011	Fluoride	97.5	99.1	97.8				0.960
SM 5310 B-2011	Organic Carbon	96.4	97.2	99.9				1.54

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2301575
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2301575
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2301581
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2301581
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2301575
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2301575
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2301576

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2301576
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2301576
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2301576
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2301577
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2301575
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2301581
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2301575
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2301575
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2301575
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2301576

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	01/25/2022			01/26/2022 15:53	Samantha L Bates	2301575
EPA 180.1 Rev. 2.0	01/25/2022			01/26/2022 14:59	Khloe J Berg	2301575
EPA 200.7 Rev. 4.4	01/25/2022	01/27/2022 10:45	Vijayalakshmi Reddy	01/28/2022 20:12	Josef B Mick	2301581
EPA 200.8 Rev. 5.4	01/25/2022	01/27/2022 10:45	Vijayalakshmi Reddy	01/27/2022 20:41	Alexander Thompson	2301581
EPA 300.0 Rev. 2.1	01/25/2022			02/02/2022 03:45	James L Waggerby	2301575
EPA 350.1 Rev. 2.0	01/25/2022			02/03/2022 14:33	Ping Hua	2301576
EPA 351.2 Rev. 2.0	01/25/2022	02/01/2022 09:14	Samantha L Bates	02/02/2022 14:31	Alexandra J Mattheus	2301576
EPA 353.2 Rev. 2.0	01/25/2022			01/27/2022 14:04	Nathaniel J Jones	2301576
EPA 365.1 Rev. 2.0	01/25/2022	01/27/2022 17:15	Simonne.V. Calhoun	01/31/2022 15:52	Sarah A Nixon	2301576
EPA 365.1 Rev. 2.0 dissolved	01/25/2022			01/26/2022 14:19	James L Waggerby	2301577
SM 2320 B-2011	01/25/2022			01/27/2022 19:08	Dale L. Simmons	2301575
SM 2340B	01/25/2022			01/28/2022 20:12	Josef B Mick	2301581
SM 2540 C-2011	01/25/2022			01/28/2022 14:02	Yijie Li	2301575
SM 2540 D-2011	01/25/2022			01/28/2022 14:02	Yijie Li	2301575
SM 4500 F-C-2011	01/25/2022			01/27/2022 19:08	Dale L. Simmons	2301575
SM 5310 B-2011	01/25/2022			02/05/2022 09:02	Nathaniel J Jones	2301576