

Chemical Analysis Report

NE-DIST-2021-04-01-01

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

Event Description: **Butcher & Mill log rps lvs**
Request ID: **RQ-2021-03-22-14**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
Attn: Jeremy Parrish

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: Colin Wright, Program Administrator

Date Certified: 22-APR-2021 12:57

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a white rectangular background.

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: BUTCHER PEN CR. AT BLANDING BLVD

Collection Date/Time: 03/31/2021 12:05

Field ID: 20030580

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2235418	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P395821	
	EPA 300.0 Rev. 2.1	Chloride	41		mg Cl/L	P395980	
		Sulfate	17		mg SO4/L	P395982	
		Color (true)	78		PCU	P395829	
	SM 2320 B-2011	Total Alkalinity	116		mg CaCO3/L	P396042	
	SM 2540 C-2011	TDS	246		mg/L	P396391	
	SM 2540 D-2011	TSS	5	I	mg/L	P396397	
	SM 4500 F-C-2011	Fluoride	0.20		mg F/L	P396044	
2235419	EPA 350.1 Rev. 2.0	Ammonia-N	0.18		mg N/L	P396571	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P396069	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P395948	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P395891	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P396052	
2235420	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.057		mg P/L	P395807	
2235422	EPA 200.7 Rev. 4.4	Barium	39.9		ug/L	P395972	
		Calcium	50.2		mg/L	P395972	
		Iron	1.95E+03		ug/L	P395972	
		Magnesium	6.31		mg/L	P395972	
		Manganese	50.7		ug/L	P395972	
		Potassium	2.9		mg/L	P395972	
		Sodium	24.8		mg/L	P395972	
	EPA 200.8 Rev. 5.4	Zinc	15	I	ug/L	P395972	
		Aluminum	39		ug/L	P395972	
		Antimony	0.19	I	ug/L	P395972	
		Arsenic	1.47		ug/L	P395972	
		Beryllium	0.018	I	ug/L	P395972	
		Boron**	46.8		ug/L	P395972	
		Cadmium	0.020	U	ug/L	P395972	
		Chromium	0.62	I	ug/L	P395972	
		Copper	2.35		ug/L	P395972	
		Lead	0.27	I	ug/L	P395972	
		Nickel	0.92	I	ug/L	P395972	
		Selenium	0.20	U	ug/L	P395972	
		Silver	0.010	U	ug/L	P395972	
		Thallium	0.10	U	ug/L	P395972	
		Hardness	151		mg/L	P395972	

Ref. Method and Comment:

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

SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P395821

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395972

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395972

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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
Copper	0.40	U	ug/L
Lead	0.20	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: P395980

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395982

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P396571

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P396069

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395948

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395891

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395807

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

Reference Method: SM 2120 B-2011
Batch ID: P395829

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P396042

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

Reference Method: SM 2540 C-2011
Batch ID: P396391

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P396397

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P396044

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P396052

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395972

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.2		P	85 - 115
Calcium	104		P	85 - 115
Iron	104		P	85 - 115
Magnesium	103		P	85 - 115
Manganese	101		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395972

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.8		P	85 - 115
Antimony	99.1		P	85 - 115
Arsenic	96.8		P	85 - 115
Beryllium	93.5		P	85 - 115
Boron	98.7		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	94.8		P	85 - 115
Copper	93.8		P	85 - 115
Lead	96.0		P	85 - 115
Nickel	94.2		P	85 - 115
Selenium	94.0		P	85 - 115
Silver	97.3		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395980

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395982

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P396571

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P396069

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395948

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395891

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395807

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

Reference Method: SM 2120 B-2011
Batch ID: P395829

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

Reference Method: SM 2320 B-2011
Batch ID: P396042

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P396044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P396052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P395972

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235304	Barium	103	101	P/P	80 - 120
2235304	Calcium	108	106	P/P	80 - 120
2235304	Iron	110	108	P/P	80 - 120
2235304	Magnesium	108	106	P/P	80 - 120
2235304	Manganese	106	104	P/P	80 - 120
2235304	Potassium	106	104	P/P	80 - 120
2235304	Sodium	111	108	P/P	80 - 120
2235304	Zinc	108	106	P/P	80 - 120
2235335	Barium	98.7		P	80 - 120
2235335	Calcium	102		P	80 - 120
2235335	Iron	106		P	80 - 120
2235335	Magnesium	105		P	80 - 120
2235335	Manganese	99.5		P	80 - 120
2235335	Potassium	104		P	80 - 120
2235335	Sodium	103		P	80 - 120
2235335	Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395972

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235304	Aluminum	93.9	92.5	P/P	80 - 120
2235304	Antimony	101	99.3	P/P	80 - 120
2235304	Arsenic	96.4	96.2	P/P	80 - 120
2235304	Beryllium	89.7	93.0	P/P	80 - 120
2235304	Boron	95.9	97.5	P/P	80 - 120
2235304	Cadmium	96.9	95.7	P/P	80 - 120
2235304	Chromium	96.7	94.8	P/P	80 - 120
2235304	Copper	95.8	94.3	P/P	80 - 120
2235304	Lead	96.4	94.2	P/P	80 - 120
2235304	Nickel	93.5	91.3	P/P	80 - 120
2235304	Selenium	94.8	92.4	P/P	80 - 120
2235304	Silver	96.1	94.9	P/P	80 - 120
2235304	Thallium	102	101	P/P	80 - 120
2235335	Aluminum	85.7		P	80 - 120
2235335	Antimony	96.4		P	80 - 120
2235335	Arsenic	92.4		P	80 - 120
2235335	Beryllium	88.3		P	80 - 120
2235335	Boron	96.1		P	80 - 120
2235335	Cadmium	96.8		P	80 - 120
2235335	Chromium	92.3		P	80 - 120
2235335	Copper	88.9		P	80 - 120
2235335	Lead	93.3		P	80 - 120
2235335	Nickel	88.2		P	80 - 120
2235335	Selenium	90.0		P	80 - 120
2235335	Silver	92.5		P	80 - 120
2235335	Thallium	99.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395980

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395980

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235396	Chloride	98.5		P	90 - 110
2235503	Chloride	99.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235396	Sulfate	101		P	90 - 110
2235503	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P396571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235445	Ammonia-N	96.6	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P396069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235395	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395948

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235367	NO2NO3-N	97.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395891

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235394	Total-P	106	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395807

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235312	O-Phosphate-P	99.1	97.7	P/P	90 - 110

Reference Method: SM 5310 B-2011
Batch ID: P396052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2235317	Organic Carbon	95.2	95.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P395821

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235365	Turbidity	4.16	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P395972

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235304	Barium	1.95	Spike	P	0 - 20
2235304	Calcium	1.01	Spike	P	0 - 20
2235304	Iron	2.19	Spike	P	0 - 20
2235304	Magnesium	2.24	Spike	P	0 - 20
2235304	Manganese	1.92	Spike	P	0 - 20
2235304	Potassium	1.32	Spike	P	0 - 20
2235304	Sodium	2.04	Spike	P	0 - 20
2235304	Zinc	2.49	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395972

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235304	Aluminum	1.50	Spike	P	0 - 20
2235304	Antimony	1.27	Spike	P	0 - 20
2235304	Arsenic	0.221	Spike	P	0 - 20
2235304	Beryllium	3.64	Spike	P	0 - 20
2235304	Boron	1.50	Spike	P	0 - 20
2235304	Cadmium	1.25	Spike	P	0 - 20
2235304	Chromium	1.97	Spike	P	0 - 20
2235304	Copper	1.61	Spike	P	0 - 20
2235304	Lead	2.31	Spike	P	0 - 20
2235304	Nickel	2.33	Spike	P	0 - 20
2235304	Selenium	2.50	Spike	P	0 - 20
2235304	Silver	1.28	Spike	P	0 - 20
2235304	Thallium	1.08	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395980

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235396	Chloride	0.703	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395982

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235396	Sulfate	0.255	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P396571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235445	Ammonia-N	1.80	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P396069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235395	Kjeldahl Nitrogen	0.608	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395948

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235367	NO2NO3-N	0.919	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235394	Total-P	3.38	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235312	O-Phosphate-P	1.20	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P395829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235365	Color (true)	3.13	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P396042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235759	Total Alkalinity	0.609	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P396391

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235366	TDS	2.76	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P396044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235759	Fluoride	0.502	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P396052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235317	Organic Carbon	0.479	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: A104426

Included Lab Sample IDs: 2235420

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A104429

Included Lab Sample IDs: 2235418

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A104430

Included Lab Sample IDs: 2235418

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104481

Included Lab Sample IDs: 2235419

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.7	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A104482

Included Lab Sample IDs: 2235419

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A104495

Included Lab Sample IDs: 2235418

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

Reference Method: SM 2320 B-2011

Run ID: A104518

Included Lab Sample IDs: 2235418

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

Reference Method: SM 4500 F-C-2011

Run ID: A104518

Included Lab Sample IDs: 2235418

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A104530

Included Lab Sample IDs: 2235419

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104602

Included Lab Sample IDs: 2235419

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	97.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104678

Included Lab Sample IDs: 2235422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.3	95.1	P/P	90 - 110
Antimony	99.0	97.6	P/P	90 - 110
Arsenic	94.5	94.5	P/P	90 - 110
Beryllium	94.4	90.6	P/P	90 - 110
Boron	96.5	99.3	P/P	90 - 110
Cadmium	96.0	94.2	P/P	90 - 110
Chromium	94.9	94.0	P/P	90 - 110
Copper	90.5	90.8	P/P	90 - 110
Lead	95.5	95.8	P/P	90 - 110
Nickel	90.2	90.5	P/P	90 - 110
Selenium	94.3	93.1	P/P	90 - 110
Silver	94.6	93.8	P/P	90 - 110
Thallium	99.0	96.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A104712

Included Lab Sample IDs: 2235422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	102	P/P	90 - 110
Calcium	103	104	P/P	90 - 110
Iron	105	105	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Manganese	102	104	P/P	90 - 110
Potassium	106	107	P/P	90 - 110
Sodium	104	104	P/P	90 - 110
Zinc	103	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A104733

Included Lab Sample IDs: 2235419

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	97.2	P/P	90 - 110

Quality Assurance Report

Calibration Verification

* 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				
EPA 180.1 Rev. 2.0	Turbidity					4.16	
EPA 200.7 Rev. 4.4	Barium	99.2	103	101	98.7		1.95
	Calcium	104	108	106	102		1.01
	Iron	104	110	108	106		2.19
	Magnesium	103	108	106	105		2.24
	Manganese	101	106	104	99.5		1.92
	Potassium	102	106	104	104		1.32
	Sodium	102	111	108	103		2.04
	Zinc	105	108	106	104		2.49
EPA 200.8 Rev. 5.4	Aluminum	94.8	93.9	92.5	85.7		1.50
	Antimony	99.1	101	99.3	96.4		1.27
	Arsenic	96.8	96.4	96.2	92.4		0.221
	Beryllium	93.5	89.7	93.0	88.3		3.64
	Boron	98.7	95.9	97.5	96.1		1.50
	Cadmium	97.0	96.9	95.7	96.8		1.25
	Chromium	94.8	96.7	94.8	92.3		1.97
	Copper	93.8	95.8	94.3	88.9		1.61
	Lead	96.0	96.4	94.2	93.3		2.31
	Nickel	94.2	93.5	91.3	88.2		2.33
	Selenium	94.0	94.8	92.4	90.0		2.50
	Silver	97.3	96.1	94.9	92.5		1.28
	Thallium	102	102	101	99.5		1.08
EPA 300.0 Rev. 2.1	Chloride	101	98.5	99.7		0.703	
	Sulfate	101	101	101		0.255	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	96.6	98.6			1.80
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	103	104			0.608
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	97.0	98.5			0.919
EPA 365.1 Rev. 2.0	Total-P	107	106	102			3.38
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	99.1	97.7			1.20
SM 2120 B-2011	Color (true)	101				3.13	
SM 2320 B-2011	Total Alkalinity	100				0.609	
SM 2540 C-2011	TDS					2.76	
SM 4500 F-C-2011	Fluoride	99.0					0.502
SM 5310 B-2011	Organic Carbon	93.5	95.2	95.9			0.479

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2235418
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2235422
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2235422
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2235418
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2235418
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2235419
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2235419
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2235419
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2235419
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2235420
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2235418
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2235418

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2235422
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2235418
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2235418
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2235418
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2235419

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	04/01/2021			04/01/2021 15:12	Yen Ta	2235418
EPA 200.7 Rev. 4.4	04/01/2021	04/05/2021 15:55	Elliott D. Healy	04/13/2021 16:20	Betina Topolski	2235422
EPA 200.8 Rev. 5.4	04/01/2021	04/05/2021 15:55	Elliott D. Healy	04/12/2021 16:26	Alexander Thompson	2235422
EPA 300.0 Rev. 2.1	04/01/2021			04/06/2021 02:11	Lipi Saha	2235418
EPA 350.1 Rev. 2.0	04/01/2021			04/14/2021 18:23	Ping Hua	2235419
EPA 351.2 Rev. 2.0	04/01/2021	04/07/2021 12:41	Yen Ta	04/08/2021 16:50	Virginia P. Brown	2235419
EPA 353.2 Rev. 2.0	04/01/2021			04/05/2021 11:00	Beverly Y. Sanders	2235419
EPA 365.1 Rev. 2.0	04/01/2021	04/02/2021 13:22	Yen Ta	04/02/2021 19:14	Shengyu Ding	2235419
EPA 365.1 Rev. 2.0 dissolved	04/01/2021			04/01/2021 13:37	Lipi Saha	2235420
SM 2120 B-2011	04/01/2021			04/01/2021 16:20	Benjamin T. Nordmann	2235418
SM 2320 B-2011	04/01/2021			04/06/2021 06:06	Dale L. Simmons	2235418
SM 2340B	04/01/2021			04/13/2021 16:20	Betina Topolski	2235422
SM 2540 C-2011	04/01/2021			04/06/2021 15:21	Yijie Li	2235418
SM 2540 D-2011	04/01/2021			04/06/2021 15:05	Yijie Li	2235418
SM 4500 F-C-2011	04/01/2021			04/06/2021 06:06	Dale L. Simmons	2235418
SM 5310 B-2011	04/01/2021			04/06/2021 01:33	Madeline Gruver	2235419