

Chemical Analysis Report

NW-DIST-2021-08-20-01

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

Event Description: **Holmes Run**
Request ID: **RQ-2021-08-09-51**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Myranda K Butler

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
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Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 17-SEP-2021 11:10

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style.

NON-CONFORMANCE REPORT INCLUDED

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: Bay Branch upstream of Hwy 331

Collection Date/Time: 08/18/2021 10:15

Field ID: G3NW0171

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2270759	EPA 180.1 Rev. 2.0	Turbidity	9.0	Q	NTU	P402773	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P403163	
		Sulfate	1.4		mg SO4/L	P403165	
		Color (true)	130	Q	PCU	P402777	
	SM 2320 B-2011	Total Alkalinity	7.0		mg CaCO3/L	P402851	
	SM 2540 C-2011	TDS	43		mg/L	P403217	
	SM 2540 D-2011	TSS	17		mg/L	P403196	
2270760	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P402854	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P403078	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P403157	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.01	I	mg N/L	P402939	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P402844	
2270761	SM 5310 B-2011	Organic Carbon	10		mg C/L	P403240	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P402770	
2270769	EPA 200.7 Rev. 4.4	Barium	11.4		ug/L	P402815	
		Calcium	3.93		mg/L	P402815	
		Iron	1.19E+03		ug/L	P402815	
		Magnesium	0.84		mg/L	P402815	
		Manganese	16.1		ug/L	P402815	
		Potassium	0.34	I	mg/L	P402815	
		Sodium	2.3		mg/L	P402815	
	EPA 200.8 Rev. 5.4	Zinc	5.3	I	ug/L	P402815	
		Aluminum	275		ug/L	P402815	
		Antimony	0.050	U	ug/L	P402815	
		Arsenic	0.59		ug/L	P402815	
		Beryllium	0.025	I	ug/L	P402815	
		Boron**	11.1		ug/L	P402815	
		Cadmium	0.020	U	ug/L	P402815	
		Chromium	0.41	I	ug/L	P402815	
		Copper	0.40	U	ug/L	P402815	
		Lead	0.36	I	ug/L	P402815	
		Nickel	0.50	U	ug/L	P402815	
		Selenium	0.20	U	ug/L	P402815	
		Silver	0.010	U	ug/L	P402815	
		Thallium	0.10	U	ug/L	P402815	
	SM 2340B	Hardness	13.3		mg/L	P402815	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The sample expired prior to receipt.

SM 2120 B-2011: The sample expired prior to receipt.

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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired prior to receipt.

Sample Location: Panther Creek upstream of SR280

Collection Date/Time: 08/18/2021 10:45

Field ID: G3NW0061

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2270756	EPA 180.1 Rev. 2.0	Turbidity	5.0	Q	NTU	P402773	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P403163	
		Sulfate	0.77		mg SO4/L	P403165	
	SM 2120 B-2011	Color (true)	70	AQ	PCU	P402777	
	SM 2320 B-2011	Total Alkalinity	1.9	I	mg CaCO3/L	P402851	
	SM 2540 C-2011	TDS	25		mg/L	P403217	
	SM 2540 D-2011	TSS	3	I	mg/L	P403196	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P402854	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P403078	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P403157	
2270757	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P402939	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P402844	
	SM 5310 B-2011	Organic Carbon	6.9		mg C/L	P403240	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	UQ	mg P/L	P402770	
	dissolved						

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The sample expired upon receipt.

SM 2120 B-2011: The sample expired upon receipt.

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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Sample Location: Sikes Creek upstream of Harris Stevenson Rd Collection Date/Time: 08/18/2021 12:55

Field ID: G3NW0450

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2270770	EPA 200.7 Rev. 4.4	Barium	16.9		ug/L	P402815	
		Calcium	10.8		mg/L	P402815	
		Iron	1.13E+03		ug/L	P402815	
		Magnesium	0.58		mg/L	P402815	
		Manganese	56.7		ug/L	P402815	
		Potassium	0.53	I	mg/L	P402815	
		Sodium	1.4	I	mg/L	P402815	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P402815	
		Aluminum	244		ug/L	P402815	
		Antimony	0.050	U	ug/L	P402815	
		Arsenic	0.45		ug/L	P402815	
		Beryllium	0.038	I	ug/L	P402815	
		Boron**	9.3		ug/L	P402815	
		Cadmium	0.020	U	ug/L	P402815	
		Chromium	0.51	I	ug/L	P402815	
		Copper	0.40	U	ug/L	P402815	
		Lead	0.54		ug/L	P402815	
		Nickel	0.50	U	ug/L	P402815	
		Selenium	0.20	U	ug/L	P402815	
		Silver	0.010	U	ug/L	P402815	
		Thallium	0.10	U	ug/L	P402815	
	SM 2340B	Hardness	29.4		mg/L	P402815	

Non-Conformance Report

NCR ID: 9032

Event(s)

NW-DIST-2021-08-20-01

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived late, samples received within the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.

Authorized by/Date: Joshua Ayres 9/15/2021

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P402773

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402815

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: P402815

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: P403163

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403165

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403078

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: P403157

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402939

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402844

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402770

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

Reference Method: SM 2120 B-2011
Batch ID: P402777

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P402851

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

Reference Method: SM 2540 C-2011
Batch ID: P403217

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P403196

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P402854

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: P403240

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: P402815

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	108		P	80 - 120
Calcium	109		P	80 - 120
Iron	109		P	80 - 120
Magnesium	110		P	80 - 120
Manganese	105		P	80 - 120
Potassium	106		P	80 - 120
Sodium	107		P	80 - 120
Zinc	111		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402815

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.4		P	85 - 115
Antimony	98.2		P	85 - 115
Arsenic	99.1		P	85 - 115
Beryllium	97.7		P	85 - 115
Boron	94.8		P	85 - 115
Cadmium	98.5		P	85 - 115
Chromium	100		P	85 - 115
Copper	99.7		P	85 - 115
Lead	97.9		P	85 - 115
Nickel	99.0		P	85 - 115
Selenium	98.7		P	85 - 115
Silver	98.7		P	85 - 115
Thallium	99.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403163

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403165

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P403078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P403157

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402939

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: P402844

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402770

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

Reference Method: SM 2120 B-2011
Batch ID: P402777

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P402851

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

Reference Method: SM 4500 F-C-2011
Batch ID: P402854

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

Reference Method: SM 5310 B-2011
Batch ID: P403240

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P402815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270562	Barium	105	105	P/P	80 - 120
2270562	Calcium	107	106	P/P	80 - 120
2270562	Iron	108	107	P/P	80 - 120
2270562	Magnesium	108	107	P/P	80 - 120
2270562	Manganese	103	103	P/P	80 - 120
2270562	Potassium	112	112	P/P	80 - 120
2270562	Sodium	102	101	P/P	80 - 120
2270562	Zinc	108	109	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270562	Aluminum	96.7	98.2	P/P	80 - 120
2270562	Antimony	98.4	99.3	P/P	80 - 120
2270562	Arsenic	96.2	96.5	P/P	80 - 120
2270562	Beryllium	94.7	96.8	P/P	80 - 120
2270562	Boron	95.8	97.1	P/P	80 - 120
2270562	Cadmium	96.7	97.6	P/P	80 - 120
2270562	Chromium	97.2	98.3	P/P	80 - 120
2270562	Copper	95.4	96.5	P/P	80 - 120
2270562	Lead	98.0	98.7	P/P	80 - 120
2270562	Nickel	95.4	96.9	P/P	80 - 120
2270562	Selenium	95.1	96.8	P/P	80 - 120
2270562	Silver	100	99.5	P/P	80 - 120
2270562	Thallium	102	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403163

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270411	Chloride	99.5		P	90 - 110
2270555	Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270411	Sulfate	99.6		P	90 - 110
2270555	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P403078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270556	Ammonia-N	96.4	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P402939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270700	NO2NO3-N	97.0		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270900	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402770

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270866	O-Phosphate-P	103	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P402854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2271140	Fluoride	99.9	100	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P403240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270722	Organic Carbon	94.0	97.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P402773

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270693	Turbidity	2.81	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P402815

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270562	Barium	0.308	Spike	P	0 - 20
2270562	Calcium	0.635	Spike	P	0 - 20
2270562	Iron	0.738	Spike	P	0 - 20
2270562	Magnesium	0.779	Spike	P	0 - 20
2270562	Manganese	0.238	Spike	P	0 - 20
2270562	Potassium	0.0442	Spike	P	0 - 20
2270562	Sodium	0.545	Spike	P	0 - 20
2270562	Zinc	0.756	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402815

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270562	Aluminum	1.47	Spike	P	0 - 20
2270562	Antimony	0.841	Spike	P	0 - 20
2270562	Arsenic	0.245	Spike	P	0 - 20
2270562	Beryllium	2.09	Spike	P	0 - 20
2270562	Boron	1.18	Spike	P	0 - 20
2270562	Cadmium	0.866	Spike	P	0 - 20
2270562	Chromium	1.10	Spike	P	0 - 20
2270562	Copper	1.15	Spike	P	0 - 20
2270562	Lead	0.697	Spike	P	0 - 20
2270562	Nickel	1.52	Spike	P	0 - 20
2270562	Selenium	1.78	Spike	P	0 - 20
2270562	Silver	0.685	Spike	P	0 - 20
2270562	Thallium	0.693	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403163

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270411	Chloride	0.0268	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403165

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270411	Sulfate	0.650	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270556	Ammonia-N	1.18	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270523	Kjeldahl Nitrogen	2.74	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270700	NO2NO3-N	2.30	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270900	Total-P	0.886	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270866	O-Phosphate-P	0.967	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P402777

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270756	Color (true)	0.663	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P402851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2271140	Total Alkalinity	1.71	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P403217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270495	TDS	2.88	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P402854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2271140	Fluoride	0.472	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P403240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270722	Organic Carbon	1.99	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: A107370

Included Lab Sample IDs: 2270758, 2270761

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107371

Included Lab Sample IDs: 2270756, 2270759

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A107372

Included Lab Sample IDs: 2270756, 2270759

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115

Reference Method: SM 2320 B-2011

Run ID: A107408

Included Lab Sample IDs: 2270756, 2270759

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

Reference Method: SM 4500 F-C-2011

Run ID: A107408

Included Lab Sample IDs: 2270756, 2270759

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107449

Included Lab Sample IDs: 2270756, 2270759

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.1	99.5	P/P	90 - 110
Sulfate	99.2	99.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107455

Included Lab Sample IDs: 2270757, 2270760

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107467

Included Lab Sample IDs: 2270769, 2270770

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.2	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107467

Included Lab Sample IDs: 2270769, 2270770

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	98.6	98.7	P/P	90 - 110
Arsenic	97.9	99.1	P/P	90 - 110
Beryllium	96.3	95.9	P/P	90 - 110
Boron	100	101	P/P	90 - 110
Cadmium	98.3	98.5	P/P	90 - 110
Chromium	97.8	98.2	P/P	90 - 110
Copper	97.1	97.8	P/P	90 - 110
Lead	97.2	97.1	P/P	90 - 110
Nickel	96.5	97.4	P/P	90 - 110
Selenium	97.2	97.8	P/P	90 - 110
Silver	95.7	96.1	P/P	90 - 110
Thallium	99.9	99.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107492

Included Lab Sample IDs: 2270769, 2270770

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	96.7	97.9	P/P	90 - 110
Calcium	98.4	101	P/P	90 - 110
Iron	97.2	98.9	P/P	90 - 110
Magnesium	97.2	99.0	P/P	90 - 110
Manganese	99.9	100	P/P	90 - 110
Potassium	97.5	96.6	P/P	90 - 110
Sodium	98.0	95.9	P/P	90 - 110
Zinc	104	108	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107511

Included Lab Sample IDs: 2270757, 2270760

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	98.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107566

Included Lab Sample IDs: 2270757, 2270760

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107570

Included Lab Sample IDs: 2270757, 2270760

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A107593

Included Lab Sample IDs: 2270757, 2270760

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.5	97.1	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		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					2.81	
EPA 200.7 Rev. 4.4	Barium	108	105	105			0.308
	Calcium	109	107	106			0.635
	Iron	109	108	107			0.738
	Magnesium	110	108	107			0.779
	Manganese	105	103	103			0.238
	Potassium	106	112	112			0.0442
	Sodium	107	102	101			0.545
	Zinc	111	108	109			0.756
EPA 200.8 Rev. 5.4	Aluminum	96.4	96.7	98.2			1.47
	Antimony	98.2	98.4	99.3			0.841
	Arsenic	99.1	96.2	96.5			0.245
	Beryllium	97.7	94.7	96.8			2.09
	Boron	94.8	95.8	97.1			1.18
	Cadmium	98.5	96.7	97.6			0.866
	Chromium	100	97.2	98.3			1.10
	Copper	99.7	95.4	96.5			1.15
	Lead	97.9	98.0	98.7			0.697
	Nickel	99.0	95.4	96.9			1.52
	Selenium	98.7	95.1	96.8			1.78
	Silver	98.7	100	99.5			0.685
	Thallium	99.8	102	102			0.693
EPA 300.0 Rev. 2.1	Chloride	100	99.5	99.9		0.0268	
	Sulfate	99.9	99.6	101		0.650	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	96.4	97.6			1.18
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104					2.74
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	97.0				2.30
EPA 365.1 Rev. 2.0	Total-P	106	104	105			0.886
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	106	103	104			0.967
SM 2120 B-2011	Color (true)	100				0.663	
SM 2320 B-2011	Total Alkalinity	101				1.71	
SM 2540 C-2011	TDS					2.88	
SM 4500 F-C-2011	Fluoride	101	99.9	100			0.472
SM 5310 B-2011	Organic Carbon	96.7	94.0	97.5			1.99

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2270756, 2270759
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2270769, 2270770
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2270769, 2270770
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2270756, 2270759
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2270756, 2270759
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2270757, 2270760
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2270757, 2270760
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2270757, 2270760
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2270757, 2270760
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2270758, 2270761
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2270756, 2270759
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2270756, 2270759

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2270769, 2270770
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2270756, 2270759
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2270756, 2270759
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2270756, 2270759
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2270757, 2270760

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	08/20/2021			08/20/2021 14:54	Sarah A Nixon	2270756
	08/20/2021			08/20/2021 14:55	Sarah A Nixon	2270759
EPA 200.7 Rev. 4.4	08/20/2021	08/23/2021 12:40	Elliott D. Healy	08/26/2021 18:30	Betina Topolski	2270769
	08/20/2021	08/23/2021 12:40	Elliott D. Healy	08/26/2021 18:36	Betina Topolski	2270770
EPA 200.8 Rev. 5.4	08/20/2021	08/23/2021 12:40	Elliott D. Healy	08/25/2021 16:46	Alexander Thompson	2270769
	08/20/2021	08/23/2021 12:40	Elliott D. Healy	08/25/2021 16:56	Alexander Thompson	2270770
EPA 300.0 Rev. 2.1	08/20/2021			08/27/2021 17:25	Lipi Saha	2270756
	08/20/2021			08/27/2021 17:37	Lipi Saha	2270759
EPA 350.1 Rev. 2.0	08/20/2021			08/27/2021 12:39	Ping Hua	2270757
	08/20/2021			08/27/2021 12:40	Ping Hua	2270760
EPA 351.2 Rev. 2.0	08/20/2021	08/30/2021 13:46	Benjamin T. Nordmann	08/31/2021 11:33	Alexandra J Mattheus	2270757
	08/20/2021	08/30/2021 13:46	Benjamin T. Nordmann	08/31/2021 11:35	Alexandra J Mattheus	2270760
EPA 353.2 Rev. 2.0	08/20/2021			08/25/2021 09:38	Beverly Y. Sanders	2270757
	08/20/2021			08/25/2021 09:39	Beverly Y. Sanders	2270760
EPA 365.1 Rev. 2.0	08/20/2021	08/24/2021 14:32	Simonne.V. Calhoun	08/31/2021 13:47	Shengyu Ding	2270757
	08/20/2021	08/24/2021 14:32	Simonne.V. Calhoun	08/31/2021 13:48	Shengyu Ding	2270760
EPA 365.1 Rev. 2.0 dissolved	08/20/2021			08/20/2021 15:12	James L Waggeberby	2270758, 2270761
SM 2120 B-2011	08/20/2021			08/20/2021 18:07	Sarah A Nixon	2270756
	08/20/2021			08/20/2021 18:08	Sarah A Nixon	2270759
SM 2320 B-2011	08/20/2021			08/23/2021 23:24	Sarah A Nixon	2270756
	08/20/2021			08/23/2021 23:34	Sarah A Nixon	2270759
SM 2340B	08/20/2021			08/26/2021 18:30	Betina Topolski	2270769
	08/20/2021			08/26/2021 18:36	Betina Topolski	2270770
SM 2540 C-2011	08/20/2021			08/23/2021 15:36	Yijie Li	2270756, 2270759
SM 2540 D-2011	08/20/2021			08/23/2021 15:36	Yijie Li	2270756, 2270759
SM 4500 F-C-2011	08/20/2021			08/23/2021 23:24	Sarah A Nixon	2270756
	08/20/2021			08/23/2021 23:34	Sarah A Nixon	2270759
SM 5310 B-2011	08/20/2021			08/31/2021 07:54	Touraj Touran	2270757
	08/20/2021			08/31/2021 08:07	Touraj Touran	2270760