

Chemical Analysis Report

NW-DIST-2021-10-28-01

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

Event Description: **Yellow River Run**
Request ID: **RQ-2021-09-13-25**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-NOV-2021 10:29

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: Yellow River upstream of Miller Bluff Landing Collection Date/Time: 10/27/2021 11:05

Field ID: G4NW0534

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2286495	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P405732	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P406038	
		Sulfate	1.1		mg SO4/L	P406041	
		Color (true)	48	AJ	PCU	P405727	
	SM 2320 B-2011	Total Alkalinity	9.3		mg CaCO3/L	P406012	
	SM 2540 C-2011	TDS	31		mg/L	P405930	
	SM 2540 D-2011	TSS	16		mg/L	P405828	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P406014	
2286496	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P406065	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26		mg N/L	P406412	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P405759	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P405870	
	SM 5310 B-2011	Organic Carbon	2.8		mg C/L	P405837	
2286497	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P405723	
2286506	EPA 200.7 Rev. 4.4	Barium	13.1		ug/L	P405731	
		Calcium	3.74		mg/L	P405731	
		Iron	440		ug/L	P405731	
		Magnesium	1.03		mg/L	P405731	
		Manganese	36.6		ug/L	P405731	
		Potassium	0.43	I	mg/L	P405731	
		Sodium	1.9	I	mg/L	P405731	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P405731	
		Aluminum	208		ug/L	P405731	
		Antimony	0.050	U	ug/L	P405731	
		Arsenic	0.24		ug/L	P405731	
		Beryllium	0.029	I	ug/L	P405731	
		Boron**	9.8		ug/L	P405731	
		Cadmium	0.020	U	ug/L	P405731	
		Chromium	0.40	U	ug/L	P405731	
		Copper	0.47	I	ug/L	P405731	
		Lead	0.37	I	ug/L	P405731	
		Nickel	0.50	U	ug/L	P405731	
		Selenium	0.20	U	ug/L	P405731	
		Silver	0.010	U	ug/L	P405731	
		Thallium	0.10	U	ug/L	P405731	
		Hardness	13.6		mg/L	P405731	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2120 B-2011: The result may be biased high because of matrix interference.

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

Sample Location: FB

Collection Date/Time: 10/27/2021 11:20

Field ID: FB_10272021

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2286498	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P405732	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P406038	
		Sulfate	0.20	U	mg SO4/L	P406041	
		Color (true)	2.5	U	PCU	P405727	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P406012	
	SM 2540 C-2011	TDS	15	U	mg/L	P405930	
	SM 2540 D-2011	TSS	2	U	mg/L	P405828	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P406014	
2286499	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P406065	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P406412	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P405759	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P405870	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P405837	
2286500	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P405723	
2286507	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P405731	
		Calcium	0.075	U	mg/L	P405731	
		Iron	30	U	ug/L	P405731	
		Magnesium	0.040	U	mg/L	P405731	
		Manganese	1.0	U	ug/L	P405731	
		Potassium	0.30	U	mg/L	P405731	
		Sodium	0.50	U	mg/L	P405731	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P405731	
		Aluminum	5.0	U	ug/L	P405731	
		Antimony	0.050	U	ug/L	P405731	
		Arsenic	0.050	U	ug/L	P405731	
		Beryllium	0.010	U	ug/L	P405731	
		Boron**	2.0	U	ug/L	P405731	
		Cadmium	0.020	U	ug/L	P405731	
		Chromium	0.40	U	ug/L	P405731	
		Copper	0.40	U	ug/L	P405731	
		Lead	0.20	U	ug/L	P405731	
		Nickel	0.50	U	ug/L	P405731	
		Selenium	0.20	U	ug/L	P405731	
		Silver	0.010	U	ug/L	P405731	
		Thallium	0.10	U	ug/L	P405731	
		Hardness	0.35	U	mg/L	P405731	
	SM 2340B						

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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: EPA 180.1 Rev. 2.0
Batch ID: P405732

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P405731

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: P405731

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: P406038

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406041

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406065

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: P406412

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405759

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405870

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405723

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

Reference Method: SM 2120 B-2011
Batch ID: P405727

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P406012

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P405930

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P405828

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P406014

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: P405837

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: P405731

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	106		P	85 - 115
Iron	104		P	85 - 115
Magnesium	106		P	85 - 115
Manganese	101		P	85 - 115
Potassium	102		P	85 - 115
Sodium	104		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P405731

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.8		P	80 - 120
Antimony	100		P	80 - 120
Arsenic	98.0		P	80 - 120
Beryllium	98.2		P	80 - 120
Boron	96.5		P	80 - 120
Cadmium	96.2		P	80 - 120
Chromium	94.7		P	80 - 120
Copper	96.9		P	80 - 120
Lead	96.9		P	80 - 120
Nickel	97.3		P	80 - 120
Selenium	97.5		P	80 - 120
Silver	98.4		P	80 - 120
Thallium	98.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406041

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406065

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406412

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405759

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405870

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405723

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.9		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P405727

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.9		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P406012

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

Reference Method: SM 4500 F-C-2011
Batch ID: P406014

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

Reference Method: SM 5310 B-2011
Batch ID: P405837

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: P405731

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2285813	Barium	104		P	80 - 120
2285813	Calcium	106		P	80 - 120
2285813	Iron	106		P	80 - 120
2285813	Magnesium	109		P	80 - 120
2285813	Manganese	104		P	80 - 120
2285813	Potassium	108		P	80 - 120
2285813	Sodium	102		P	80 - 120
2285813	Zinc	105		P	80 - 120
2286487	Barium	104	103	P/P	80 - 120
2286487	Calcium	105	107	P/P	80 - 120
2286487	Iron	110	111	P/P	80 - 120
2286487	Magnesium	112	114	P/P	80 - 120
2286487	Manganese	109	108	P/P	80 - 120
2286487	Potassium	99.2	101	P/P	80 - 120
2286487	Sodium	102	102	P/P	80 - 120
2286487	Zinc	113	111	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P405731

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2285813	Aluminum	101		P	80 - 120
2285813	Antimony	102		P	80 - 120
2285813	Arsenic	97.8		P	80 - 120
2285813	Beryllium	97.5		P	80 - 120
2285813	Boron	101		P	80 - 120
2285813	Cadmium	97.2		P	80 - 120
2285813	Chromium	95.5		P	80 - 120
2285813	Copper	97.8		P	80 - 120
2285813	Lead	100		P	80 - 120
2285813	Nickel	96.2		P	80 - 120
2285813	Selenium	95.9		P	80 - 120
2285813	Silver	101		P	80 - 120
2285813	Thallium	102		P	80 - 120
2286487	Aluminum	100	102	P/P	80 - 120
2286487	Antimony	102	102	P/P	80 - 120
2286487	Arsenic	98.3	99.1	P/P	80 - 120
2286487	Beryllium	94.0	94.5	P/P	80 - 120
2286487	Boron	99.4	101	P/P	80 - 120
2286487	Cadmium	98.6	99.8	P/P	80 - 120
2286487	Chromium	96.1	95.7	P/P	80 - 120
2286487	Copper	98.3	98.8	P/P	80 - 120
2286487	Lead	98.7	98.7	P/P	80 - 120
2286487	Nickel	97.4	97.0	P/P	80 - 120
2286487	Selenium	97.6	97.6	P/P	80 - 120
2286487	Silver	99.0	99.1	P/P	80 - 120
2286487	Thallium	99.5	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406038

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: P406038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286577	Chloride	99.9		P	90 - 110
2286670	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P406041

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286577	Sulfate	101		P	90 - 110
2286670	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406065

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286581	Ammonia-N	95.6	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286483	Kjeldahl Nitrogen	95.5	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286496	NO2NO3-N	97.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405870

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286538	Total-P	102	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286485	O-Phosphate-P	98.8	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P406014

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286492	Fluoride	99.9	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P405837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286384	Organic Carbon	97.8	98.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P405732

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286537	Turbidity	11.2	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P405731

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286487	Barium	0.960	Spike	P	0 - 20
2286487	Calcium	1.42	Spike	P	0 - 20
2286487	Iron	1.58	Spike	P	0 - 20
2286487	Magnesium	1.50	Spike	P	0 - 20
2286487	Manganese	1.21	Spike	P	0 - 20
2286487	Potassium	1.02	Spike	P	0 - 20
2286487	Sodium	0.359	Spike	P	0 - 20
2286487	Zinc	2.06	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P405731

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286487	Aluminum	1.87	Spike	P	0 - 20
2286487	Antimony	0.454	Spike	P	0 - 20
2286487	Arsenic	0.832	Spike	P	0 - 20
2286487	Beryllium	0.365	Spike	P	0 - 20
2286487	Boron	1.65	Spike	P	0 - 20
2286487	Cadmium	1.17	Spike	P	0 - 20
2286487	Chromium	0.408	Spike	P	0 - 20
2286487	Copper	0.522	Spike	P	0 - 20
2286487	Lead	0.0542	Spike	P	0 - 20
2286487	Nickel	0.321	Spike	P	0 - 20
2286487	Selenium	0.0669	Spike	P	0 - 20
2286487	Silver	0.110	Spike	P	0 - 20
2286487	Thallium	1.62	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P406038

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286577	Chloride	3.30	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P406065

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286581	Ammonia-N	0.758	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286483	Kjeldahl Nitrogen	1.63	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286496	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405870

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286538	Total-P	0.979	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286485	O-Phosphate-P	0.202	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P405727

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286495	Color (true)	1.56	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P406012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286492	Total Alkalinity	2.24	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P405930

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286537	TDS	2.32	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P406014

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286492	Fluoride	0.483	Spike	P	0 - 2.1

Quality Assurance Report

Precision

Reference Method: SM 5310 B-2011
Batch ID: P405837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286384	Organic Carbon	0.398	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: A108592

Included Lab Sample IDs: 2286497, 2286500

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.2	97.9	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A108596

Included Lab Sample IDs: 2286495, 2286498

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A108602

Included Lab Sample IDs: 2286495, 2286498

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108614

Included Lab Sample IDs: 2286496, 2286499

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

Reference Method: SM 5310 B-2011

Run ID: A108656

Included Lab Sample IDs: 2286496, 2286499

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	99.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A108667

Included Lab Sample IDs: 2286506, 2286507

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	101	P/P	90 - 110
Barium	103	101	P/P	95 - 105
Calcium	101	101	P/P	95 - 105
Calcium	103	103	P/P	90 - 110
Iron	101	101	P/P	95 - 105
Iron	103	104	P/P	90 - 110
Magnesium	105	104	P/P	95 - 105
Magnesium	106	107	P/P	90 - 110
Manganese	102	104	P/P	95 - 105
Manganese	104	105	P/P	90 - 110
Potassium	98.0	97.9	P/P	95 - 105
Potassium	98.1	98.3	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Sodium	101	100	P/P	95 - 105
Zinc	101	103	P/P	95 - 105
Zinc	104	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A108673

Included Lab Sample IDs: 2286506, 2286507

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	99.2	P/P	90 - 110
Aluminum	99.3	100	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	101	99.3	P/P	90 - 110
Arsenic	98.6	99.0	P/P	90 - 110
Beryllium	94.2	94.8	P/P	90 - 110
Beryllium	96.1	95.6	P/P	90 - 110
Boron	97.4	97.6	P/P	90 - 110
Boron	99.6	99.5	P/P	90 - 110
Cadmium	97.3	97.8	P/P	90 - 110
Cadmium	97.8	98.4	P/P	90 - 110
Chromium	93.6	94.1	P/P	90 - 110
Chromium	95.1	94.3	P/P	90 - 110
Copper	95.5	95.3	P/P	90 - 110
Copper	98.2	97.3	P/P	90 - 110
Lead	97.1	95.7	P/P	90 - 110
Lead	97.1	97.9	P/P	90 - 110
Nickel	94.9	95.1	P/P	90 - 110
Nickel	98.0	97.1	P/P	90 - 110
Selenium	98.2	98.7	P/P	90 - 110
Selenium	99.5	99.7	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Silver	99.8	99.6	P/P	90 - 110
Thallium	98.0	99.7	P/P	90 - 110
Thallium	98.9	96.2	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A108714

Included Lab Sample IDs: 2286495, 2286498

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.2	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A108714

Included Lab Sample IDs: 2286495, 2286498

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108721

Included Lab Sample IDs: 2286496, 2286499

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A108733

Included Lab Sample IDs: 2286495, 2286498

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108743

Included Lab Sample IDs: 2286496, 2286499

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108965

Included Lab Sample IDs: 2286496, 2286499

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.5	96.6	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
EPA 180.1 Rev. 2.0	Turbidity						11.2
EPA 200.7 Rev. 4.4	Barium	100	104	104	103		0.960
	Calcium	106	106	105	107		1.42
	Iron	104	106	110	111		1.58
	Magnesium	106	109	112	114		1.50
	Manganese	101	104	109	108		1.21
	Potassium	102	108	99.2	101		1.02
	Sodium	104	102	102	102		0.359
	Zinc	101	105	113	111		2.06
EPA 200.8 Rev. 5.4	Aluminum	98.8	100	102	101		1.87
	Antimony	100	102	102	102		0.454
	Arsenic	98.0	98.3	99.1	97.8		0.832
	Beryllium	98.2	94.0	94.5	97.5		0.365
	Boron	96.5	99.4	101	101		1.65
	Cadmium	96.2	98.6	99.8	97.2		1.17
	Chromium	94.7	96.1	95.7	95.5		0.408
	Copper	96.9	98.3	98.8	97.8		0.522
	Lead	96.9	98.7	98.7	100		0.0542
	Nickel	97.3	97.4	97.0	96.2		0.321
	Selenium	97.5	97.6	97.6	95.9		0.0669
	Silver	98.4	99.0	99.1	101		0.110
	Thallium	98.6	99.5	101	102		1.62
EPA 300.0 Rev. 2.1	Chloride	99.4	99.9	100		3.30	
	Sulfate	101	101	102			
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	95.6	96.4			0.758
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.4	95.5	97.0			1.63
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	97.5	97.5			0.0
EPA 365.1 Rev. 2.0	Total-P	104	102	99.8			0.979
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	98.8	99.0			0.202
SM 2120 B-2011	Color (true)	97.9				1.56	
SM 2320 B-2011	Total Alkalinity	101				2.24	
SM 2540 C-2011	TDS					2.32	
SM 4500 F-C-2011	Fluoride	100	99.9	101			0.483
SM 5310 B-2011	Organic Carbon	96.7	97.8	98.4			0.398

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2286495, 2286498
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2286506, 2286507
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2286506, 2286507
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2286495, 2286498
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2286495, 2286498
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2286496, 2286499
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2286496, 2286499
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2286496, 2286499
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2286496, 2286499
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2286497, 2286500
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2286495, 2286498
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2286495, 2286498

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2286506, 2286507
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2286495, 2286498
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2286495, 2286498
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2286495, 2286498
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2286496, 2286499

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	10/28/2021			10/28/2021 16:09	Khloe J Berg	2286495, 2286498
EPA 200.7 Rev. 4.4	10/28/2021	10/29/2021 09:30	Emily M Philpot	11/02/2021 13:08	Josef B Mick	2286507
	10/28/2021	10/29/2021 09:30	Emily M Philpot	11/02/2021 18:06	Josef B Mick	2286506
EPA 200.8 Rev. 5.4	10/28/2021	10/29/2021 09:30	Emily M Philpot	11/02/2021 16:11	McKinley C Carter	2286507
	10/28/2021	10/29/2021 09:30	Emily M Philpot	11/02/2021 20:51	McKinley C Carter	2286506
EPA 300.0 Rev. 2.1	10/28/2021			11/03/2021 23:36	Roberta Tatti	2286495
	10/28/2021			11/03/2021 23:48	Roberta Tatti	2286498
EPA 350.1 Rev. 2.0	10/28/2021			11/04/2021 12:36	Ping Hua	2286496
	10/28/2021			11/04/2021 12:41	Ping Hua	2286499
EPA 351.2 Rev. 2.0	10/28/2021	11/17/2021 12:10	Benjamin T. Nordmann	11/18/2021 10:15	Alexandra J Mattheus	2286496
	10/28/2021	11/17/2021 12:10	Benjamin T. Nordmann	11/18/2021 10:16	Alexandra J Mattheus	2286499
EPA 353.2 Rev. 2.0	10/28/2021			10/29/2021 11:07	Beverly Y. Sanders	2286496
	10/28/2021			10/29/2021 11:08	Beverly Y. Sanders	2286499
EPA 365.1 Rev. 2.0	10/28/2021	11/02/2021 16:18	Simonne.V. Calhoun	11/04/2021 14:40	Lipi Saha	2286496
	10/28/2021	11/02/2021 16:18	Simonne.V. Calhoun	11/04/2021 14:41	Lipi Saha	2286499
EPA 365.1 Rev. 2.0 dissolved	10/28/2021			10/28/2021 14:09	James L Waggeberby	2286497
	10/28/2021			10/28/2021 14:10	James L Waggeberby	2286500
SM 2120 B-2011	10/28/2021			10/28/2021 15:39	Benjamin T. Nordmann	2286495
	10/28/2021			10/28/2021 15:40	Benjamin T. Nordmann	2286498
SM 2320 B-2011	10/28/2021			11/02/2021 18:55	Dale L. Simmons	2286495
	10/28/2021			11/02/2021 19:04	Dale L. Simmons	2286498
SM 2340B	10/28/2021			11/02/2021 13:08	Josef B Mick	2286507
	10/28/2021			11/02/2021 18:06	Josef B Mick	2286506
SM 2540 C-2011	10/28/2021			10/29/2021 12:45	Simonne.V. Calhoun	2286495, 2286498
SM 2540 D-2011	10/28/2021			10/29/2021 12:45	Simonne.V. Calhoun	2286495, 2286498
SM 4500 F-C-2011	10/28/2021			11/02/2021 18:55	Dale L. Simmons	2286495
	10/28/2021			11/02/2021 19:04	Dale L. Simmons	2286498
SM 5310 B-2011	10/28/2021			11/01/2021 23:23	Khloe J Berg	2286496
	10/28/2021			11/01/2021 23:38	Khloe J Berg	2286499