

Chemical Analysis Report

NW-DIST-2021-07-22-02

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-2021-07-19-17**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 18-AUG-2021 11:39



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: 07/21/2021 11:15

Field ID: G4NW0534

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2264208	EPA 180.1 Rev. 2.0	Turbidity	9.5		NTU	P401434	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P401812	
		Sulfate	0.81		mg SO4/L	P402023	
		Color (true)	80		PCU	P401432	
	SM 2320 B-2011	Total Alkalinity	8.7		mg CaCO3/L	P401516	
	SM 2540 C-2011	TDS	41		mg/L	P401970	
	SM 2540 D-2011	TSS	6	I	mg/L	P401963	
2264209	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P401520	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P401894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35		mg N/L	P402316	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P401529	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P401697	
2264210	SM 5310 B-2011	Organic Carbon	5.9		mg C/L	P402025	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P401407	
2264215	EPA 200.7 Rev. 4.4	Barium	14.0		ug/L	P401584	
		Calcium	3.59		mg/L	P401584	
		Iron	1.00E+03		ug/L	P401584	
		Magnesium	0.96		mg/L	P401584	
		Manganese	37.3		ug/L	P401584	
		Potassium	0.57	I	mg/L	P401584	
		Sodium	1.6	I	mg/L	P401584	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P401584	
		Aluminum	287		ug/L	P401584	
		Antimony	0.050	U	ug/L	P401584	
		Arsenic	0.55		ug/L	P401584	
		Beryllium	0.031	I	ug/L	P401584	
		Boron**	10.6		ug/L	P401584	
		Cadmium	0.020	U	ug/L	P401584	
		Chromium	0.45	I	ug/L	P401584	
		Copper	0.40	U	ug/L	P401584	
		Lead	0.43		ug/L	P401584	
		Nickel	0.50	U	ug/L	P401584	
		Selenium	0.20	U	ug/L	P401584	
		Silver	0.010	U	ug/L	P401584	
		Thallium	0.10	U	ug/L	P401584	
		Hardness	12.9		mg/L	P401584	

Ref. Method and Comment:

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

Sample Location: Yellow River below Malone Creek

Collection Date/Time: 07/21/2021 12:45

Field ID: G4NW0373

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2264216	EPA 200.7 Rev. 4.4	Barium	15.7		ug/L	P401584	
		Calcium	3.67		mg/L	P401584	
		Iron	1.09E+03		ug/L	P401584	
		Magnesium	0.98		mg/L	P401584	
		Manganese	45.1		ug/L	P401584	
		Potassium	0.62	I	mg/L	P401584	
		Sodium	1.7	I	mg/L	P401584	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P401584	
		Aluminum	354		ug/L	P401584	
		Antimony	0.050	U	ug/L	P401584	
		Arsenic	0.55		ug/L	P401584	
		Beryllium	0.038	I	ug/L	P401584	
		Boron**	10.8		ug/L	P401584	
		Cadmium	0.020	U	ug/L	P401584	
		Chromium	0.51	I	ug/L	P401584	
		Copper	0.40	U	ug/L	P401584	
		Lead	0.44		ug/L	P401584	
		Nickel	0.51	I	ug/L	P401584	
		Selenium	0.20	U	ug/L	P401584	
		Silver	0.010	U	ug/L	P401584	
		Thallium	0.10	U	ug/L	P401584	
	SM 2340B	Hardness	13.2		mg/L	P401584	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P401434

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P401584

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: P401584

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: P401812

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402023

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401894

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: P402316

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401697

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401407

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

Reference Method: SM 2120 B-2011
Batch ID: P401432

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P401516

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

Reference Method: SM 2540 C-2011
Batch ID: P401970

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P401963

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P401520

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: P402025

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: P401584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	93.9		P	85 - 115
Calcium	104		P	85 - 115
Iron	97.1		P	85 - 115
Magnesium	99.9		P	85 - 115
Manganese	93.6		P	85 - 115
Potassium	95.4		P	85 - 115
Sodium	93.0		P	85 - 115
Zinc	95.1		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.3		P	85 - 115
Antimony	95.4		P	85 - 115
Arsenic	94.0		P	85 - 115
Beryllium	95.8		P	85 - 115
Boron	94.0		P	85 - 115
Cadmium	91.8		P	85 - 115
Chromium	91.2		P	85 - 115
Copper	92.1		P	85 - 115
Lead	92.8		P	85 - 115
Nickel	94.3		P	85 - 115
Selenium	92.9		P	85 - 115
Silver	113		P	85 - 115
Thallium	95.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401812

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401894

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402316

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401529

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: P401697

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: P401407

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

Reference Method: SM 2120 B-2011
Batch ID: P401432

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.3		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P401516

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P401520

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

Reference Method: SM 5310 B-2011
Batch ID: P402025

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2263597	Barium	90.4		P	80 - 120
2263597	Calcium	103		P	80 - 120
2263597	Iron	96.7		P	80 - 120
2263597	Magnesium	104		P	80 - 120
2263597	Manganese	90.5		P	80 - 120
2263597	Potassium	96.5		P	80 - 120
2263597	Sodium	106		P	80 - 120
2263597	Zinc	90.4		P	80 - 120
2264182	Barium	93.3	91.1	P/P	80 - 120
2264182	Calcium	102		P	80 - 120
2264182	Iron	96.9	95.5	P/P	80 - 120
2264182	Magnesium	95.4	93.7	P/P	80 - 120
2264182	Manganese	93.3	91.1	P/P	80 - 120
2264182	Potassium	94.4	93.2	P/P	80 - 120
2264182	Sodium	95.6	95.1	P/P	80 - 120
2264182	Zinc	93.4	91.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2263597	Aluminum	93.3		P	80 - 120
2263597	Antimony	97.4		P	80 - 120
2263597	Arsenic	91.9		P	80 - 120
2263597	Beryllium	95.4		P	80 - 120
2263597	Boron	95.0		P	80 - 120
2263597	Cadmium	94.0		P	80 - 120
2263597	Chromium	93.0		P	80 - 120
2263597	Copper	88.2		P	80 - 120
2263597	Lead	92.3		P	80 - 120
2263597	Nickel	89.6		P	80 - 120
2263597	Selenium	89.7		P	80 - 120
2263597	Silver	113		P	80 - 120
2263597	Thallium	95.4		P	80 - 120
2264182	Aluminum	92.3	93.8	P/P	80 - 120
2264182	Antimony	95.4	96.5	P/P	80 - 120
2264182	Arsenic	90.5	91.3	P/P	80 - 120
2264182	Beryllium	96.6	96.9	P/P	80 - 120
2264182	Boron	93.9	94.0	P/P	80 - 120
2264182	Cadmium	91.4	91.5	P/P	80 - 120
2264182	Chromium	92.6	93.3	P/P	80 - 120
2264182	Copper	88.8	89.1	P/P	80 - 120
2264182	Lead	90.9	92.5	P/P	80 - 120
2264182	Nickel	89.9	91.4	P/P	80 - 120
2264182	Selenium	89.8	88.9	P/P	80 - 120
2264182	Silver	112	113	P/P	80 - 120
2264182	Thallium	94.6	97.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401812

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: P401812

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2263862	Chloride	100		P	90 - 110
2263991	Chloride	97.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2263988	Sulfate	97.1		P	90 - 110
2264579	Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264209	Ammonia-N	96.0	94.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2263600	Kjeldahl Nitrogen	103	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264204	NO2NO3-N	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264238	Total-P	107	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401407

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264180	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P401520

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2263991	Fluoride	101	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P402025

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264582	Organic Carbon	95.3	96.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P401434

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264187	Turbidity	2.39	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401584

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264182	Barium	2.42	Spike	P	0 - 20
2264182	Calcium	0.568	Spike	P	0 - 20
2264182	Iron	1.44	Spike	P	0 - 20
2264182	Magnesium	0.956	Spike	P	0 - 20
2264182	Manganese	2.40	Spike	P	0 - 20
2264182	Potassium	1.23	Spike	P	0 - 20
2264182	Sodium	0.354	Spike	P	0 - 20
2264182	Zinc	2.54	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401584

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264182	Aluminum	1.67	Spike	P	0 - 20
2264182	Antimony	1.15	Spike	P	0 - 20
2264182	Arsenic	0.906	Spike	P	0 - 20
2264182	Beryllium	0.373	Spike	P	0 - 20
2264182	Boron	0.141	Spike	P	0 - 20
2264182	Cadmium	0.155	Spike	P	0 - 20
2264182	Chromium	0.744	Spike	P	0 - 20
2264182	Copper	0.359	Spike	P	0 - 20
2264182	Lead	1.82	Spike	P	0 - 20
2264182	Nickel	1.60	Spike	P	0 - 20
2264182	Selenium	0.997	Spike	P	0 - 20
2264182	Silver	1.03	Spike	P	0 - 20
2264182	Thallium	2.71	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401812

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2263991	Chloride	0.779	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P402023

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2263988	Sulfate	0.672	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P401894

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264209	Ammonia-N	0.954	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P402316

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2263600	Kjeldahl Nitrogen	4.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P401529

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264204	NO2NO3-N	0.361	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P401697

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264238	Total-P	0.846	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P401407

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264180	O-Phosphate-P	0.181	Spike	P	0 - 20

Reference Method: SM 2120 B-2011

Batch ID: P401432

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264175	Color (true)	0.420	Sample	P	0 - 20

Reference Method: SM 2320 B-2011

Batch ID: P401516

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2263991	Total Alkalinity	2.31	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011

Batch ID: P401970

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264769	TDS	0.797	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P401520

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2263991	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P402025

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264582	Organic Carbon	0.800	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: A106770

Included Lab Sample IDs: 2264210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.7	98.3	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A106777

Included Lab Sample IDs: 2264208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.6	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A106778

Included Lab Sample IDs: 2264208

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

Reference Method: SM 2320 B-2011

Run ID: A106814

Included Lab Sample IDs: 2264208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	99.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A106814

Included Lab Sample IDs: 2264208

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A106821

Included Lab Sample IDs: 2264209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A106905

Included Lab Sample IDs: 2264208

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A106978

Included Lab Sample IDs: 2264209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	95.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107003

Included Lab Sample IDs: 2264209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	93.8	94.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107025

Included Lab Sample IDs: 2264208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	99.3	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107048

Included Lab Sample IDs: 2264215, 2264216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	105	105	P/P	90 - 110
Antimony	106	105	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Beryllium	102	103	P/P	90 - 110
Boron	105	105	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110
Chromium	103	102	P/P	90 - 110
Lead	103	104	P/P	90 - 110
Nickel	102	101	P/P	90 - 110
Selenium	102	99.8	P/P	90 - 110
Silver	95.8	95.9	P/P	90 - 110
Thallium	107	108	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A107056

Included Lab Sample IDs: 2264209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	95.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107070

Included Lab Sample IDs: 2264215, 2264216

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107071

Included Lab Sample IDs: 2264215, 2264216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	103	P/P	90 - 110
Calcium	103	102	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	104	103	P/P	90 - 110
Manganese	104	106	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107071

Included Lab Sample IDs: 2264215, 2264216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Potassium	106	107	P/P	90 - 110
Sodium	106	106	P/P	90 - 110
Zinc	106	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107210

Included Lab Sample IDs: 2264209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	102	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.39	
EPA 200.7 Rev. 4.4	Barium	93.9	90.4	93.3	91.1		2.42
	Calcium	104	103	102			0.568
	Iron	97.1	96.7	96.9	95.5		1.44
	Magnesium	99.9	104	95.4	93.7		0.956
	Manganese	93.6	90.5	93.3	91.1		2.40
	Potassium	95.4	96.5	94.4	93.2		1.23
	Sodium	93.0	106	95.6	95.1		0.354
	Zinc	95.1	90.4	93.4	91.0		2.54
EPA 200.8 Rev. 5.4	Aluminum	94.3	92.3	93.8	93.3		1.67
	Antimony	95.4	95.4	96.5	97.4		1.15
	Arsenic	94.0	90.5	91.3	91.9		0.906
	Beryllium	95.8	96.6	96.9	95.4		0.373
	Boron	94.0	93.9	94.0	95.0		0.141
	Cadmium	91.8	91.4	91.5	94.0		0.155
	Chromium	91.2	92.6	93.3	93.0		0.744
	Copper	92.1	88.8	89.1	88.2		0.359
	Lead	92.8	90.9	92.5	92.3		1.82
	Nickel	94.3	89.9	91.4	89.6		1.60
	Selenium	92.9	89.8	88.9	89.7		0.997
	Silver	113	112	113	113		1.03
	Thallium	95.2	94.6	97.2	95.4		2.71
EPA 300.0 Rev. 2.1	Chloride	100	97.0	100		0.779	
	Sulfate	98.4	97.1	97.3		0.672	
EPA 350.1 Rev. 2.0	Ammonia-N	94.2	96.0	94.8			0.954
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	103	107			4.33
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	95.5				0.361
EPA 365.1 Rev. 2.0	Total-P	104	107	108			0.846
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	100			0.181
SM 2120 B-2011	Color (true)	97.3				0.420	
SM 2320 B-2011	Total Alkalinity	102				2.31	
SM 2540 C-2011	TDS					0.797	
SM 4500 F-C-2011	Fluoride	100	101	101			0.0
SM 5310 B-2011	Organic Carbon	95.4	95.3	96.6			0.800

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2264208
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2264215, 2264216
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2264215, 2264216
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2264208
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2264208
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2264209
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2264209
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2264209
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2264209
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2264210
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2264208
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2264208

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2264215, 2264216
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2264208
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2264208
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2264208
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2264209

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	07/22/2021			07/22/2021 15:14	Sarah A Nixon	2264208
EPA 200.7 Rev. 4.4	07/22/2021	07/27/2021 13:50	Elliott D. Healy	08/05/2021 21:52	Betina Topolski	2264215
	07/22/2021	07/27/2021 13:50	Elliott D. Healy	08/05/2021 21:58	Betina Topolski	2264216
EPA 200.8 Rev. 5.4	07/22/2021	07/27/2021 13:50	Elliott D. Healy	08/04/2021 21:33	Alexander Thompson	2264215
	07/22/2021	07/27/2021 13:50	Elliott D. Healy	08/04/2021 21:43	Alexander Thompson	2264216
	07/22/2021	07/27/2021 13:50	Elliott D. Healy	08/05/2021 16:01	Alexander Thompson	2264215
	07/22/2021	07/27/2021 13:50	Elliott D. Healy	08/05/2021 16:07	Alexander Thompson	2264216
EPA 300.0 Rev. 2.1	07/22/2021			07/30/2021 19:30	Lipi Saha	2264208
	07/22/2021			08/04/2021 19:05	Lipi Saha	2264208
EPA 350.1 Rev. 2.0	07/22/2021			08/03/2021 13:52	Roberta Tatti	2264209
EPA 351.2 Rev. 2.0	07/22/2021	08/11/2021 13:04	Benjamin T. Nordmann	08/12/2021 10:22	Virginia P. Brown	2264209
EPA 353.2 Rev. 2.0	07/22/2021			07/26/2021 10:33	Beverly Y. Sanders	2264209
EPA 365.1 Rev. 2.0	07/22/2021	07/30/2021 15:31	Simonne.V. Calhoun	08/02/2021 11:56	Shengyu Ding	2264209
EPA 365.1 Rev. 2.0 dissolved	07/22/2021			07/22/2021 13:35	Blanca Fach	2264210
SM 2120 B-2011	07/22/2021			07/22/2021 16:04	Sarah A Nixon	2264208
SM 2320 B-2011	07/22/2021			07/24/2021 03:10	Dale L. Simmons	2264208
SM 2340B	07/22/2021			08/05/2021 21:52	Betina Topolski	2264215
	07/22/2021			08/05/2021 21:58	Betina Topolski	2264216
SM 2540 C-2011	07/22/2021			07/27/2021 14:56	Yijie Li	2264208
SM 2540 D-2011	07/22/2021			07/27/2021 14:56	Yijie Li	2264208
SM 4500 F-C-2011	07/22/2021			07/24/2021 03:10	Dale L. Simmons	2264208
SM 5310 B-2011	07/22/2021			08/04/2021 23:56	Madeline Gruver	2264209