

Chemical Analysis Report

NW-DIST-2022-10-28-02

Florida DEP Laboratory
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DOH Accreditation E31780

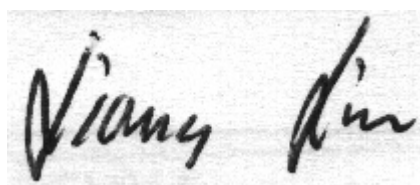
Event Description: **Eastern Lakes Run**
Request ID: **RQ-2022-10-24-15**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government Street
Suite 208
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 22-NOV-2022 13:39

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: Lake Karick (Center) (also 33040210)

Collection Date/Time: 10/27/2022 10:30

Field ID: G4NW0274

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2366073	DEP SOP: NU-094-1	Color (true)	14		PCU	P421625	
	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P421622	
	EPA 300.0 Rev. 2.1	Chloride	2.5		mg Cl/L	P422460	
		Sulfate	0.22	I	mg SO4/L	P422464	
	SM 2320 B-2011	Total Alkalinity	2.1	I	mg CaCO3/L	P422119	
	SM 2540 C-2015	TDS	21	I	mg/L	P422175	
	SM 2540 D-2015	TSS	2	I	mg/L	P421962	
	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P422020	
2366074	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P422034	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.30		mg N/L	P421875	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P421938	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P421937	
	SM 5310 B-2011	Organic Carbon	3.5		mg C/L	P421998	
2366080	EPA 200.7 Rev. 4.4	Calcium	0.82		mg/L	P421702	
		Iron	330		ug/L	P421702	
		Magnesium	0.41		mg/L	P421702	
		Potassium	0.30	U	mg/L	P421702	
		Sodium	1.6	I	mg/L	P421702	
		Strontium	2.7	I	ug/L	P421702	
		Tin	3.0	U	ug/L	P421702	
		Titanium	1.0	I	ug/L	P421702	
		Vanadium	2.0	U	ug/L	P421702	
		Zinc	5.0	U	ug/L	P421702	
		Aluminum	69		ug/L	P421702	
		Antimony	0.050	U	ug/L	P421702	
	EPA 200.8 Rev. 5.4	Arsenic	0.46		ug/L	P421702	
		Barium	3.02		ug/L	P421702	
		Beryllium	0.012	I	ug/L	P421702	
		Boron	9.4		ug/L	P421702	
		Cadmium	0.020	U	ug/L	P421702	
		Chromium	0.40	U	ug/L	P421702	
		Cobalt	0.029	I	ug/L	P421702	
		Copper	0.40	U	ug/L	P421702	
		Lead	0.20	U	ug/L	P421702	
		Manganese	1.73		ug/L	P421702	
		Molybdenum	0.15	U	ug/L	P421702	
		Nickel	0.50	U	ug/L	P421702	
		Selenium	0.20	U	ug/L	P421702	
		Silver	0.010	U	ug/L	P421702	
		Thallium	0.10	U	ug/L	P421702	
	SM 2340 B-2011	Hardness	3.7		mg/L	P421702	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Roberts Lake

Collection Date/Time: 10/27/2022 12:05

Field ID: G3NW0447

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2366071	DEP SOP: NU-094-1	Color (true)	17		PCU	P421625	
	EPA 180.1 Rev. 2.0	Turbidity	0.85	I	NTU	P421622	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P422460	
		Sulfate	1.9		mg SO4/L	P422464	
	SM 2320 B-2011	Total Alkalinity	1.3	I	mg CaCO3/L	P422119	
	SM 2540 C-2015	TDS	22	I	mg/L	P422175	
	SM 2540 D-2015	TSS	3	I	mg/L	P421962	
	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P422020	
2366072	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P422034	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26		mg N/L	P421875	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.055		mg N/L	P421938	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P421937	
	SM 5310 B-2011	Organic Carbon	2.6		mg C/L	P421887	

Ref. Method and Comment:

SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P421625

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421622

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421702

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421702

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422460

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422464

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422034

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421875

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421938

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421937

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

Reference Method: SM 2320 B-2011
Batch ID: P422119

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

Reference Method: SM 2540 C-2015
Batch ID: P422175

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P421962

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P422020

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P421887

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

Reference Method: SM 5310 B-2011
Batch ID: P421998

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P421625

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421622

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	102		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	102		P	85 - 115
Sodium	105		P	85 - 115
Strontium	104		P	85 - 115
Tin	98.2		P	85 - 115
Titanium	97.8		P	85 - 115
Vanadium	100		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.4		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	101		P	85 - 115
Barium	105		P	85 - 115
Beryllium	96.8		P	85 - 115
Boron	104		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	100		P	85 - 115
Cobalt	102		P	85 - 115
Copper	99.2		P	85 - 115
Lead	97.3		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	99.0		P	85 - 115
Nickel	101		P	85 - 115
Selenium	99.5		P	85 - 115
Silver	102		P	85 - 115
Thallium	94.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.4		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422464

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422034

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: P421875

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421938

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421937

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

Reference Method: SM 2320 B-2011
Batch ID: P422119

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.4		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P422175

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

Reference Method: SM 2540 D-2015
Batch ID: P421962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	97.7		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P422020

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	96 - 104

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P421887

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P421998

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P421702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366080	Calcium	99.3	102	P/P	80 - 120
2366080	Iron	98.7	104	P/P	80 - 120
2366080	Magnesium	99.1	104	P/P	80 - 120
2366080	Potassium	102	104	P/P	80 - 120
2366080	Sodium	99.0	103	P/P	80 - 120
2366080	Strontium	97.8	101	P/P	80 - 120
2366080	Tin	98.4	102	P/P	80 - 120
2366080	Titanium	94.7	96.5	P/P	80 - 120
2366080	Vanadium	94.5	96.8	P/P	80 - 120
2366080	Zinc	96.4	97.6	P/P	80 - 120
2366164	Calcium	96.6		P	80 - 120
2366164	Iron	105		P	80 - 120
2366164	Magnesium	102		P	80 - 120
2366164	Potassium	97.7		P	80 - 120
2366164	Sodium	97.8		P	80 - 120
2366164	Strontium	99.0		P	80 - 120
2366164	Tin	96.8		P	80 - 120
2366164	Titanium	97.5		P	80 - 120
2366164	Vanadium	95.2		P	80 - 120
2366164	Zinc	92.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P421702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366080	Aluminum	99.3	100	P/P	80 - 120
2366080	Antimony	101	102	P/P	80 - 120
2366080	Arsenic	102	102	P/P	80 - 120
2366080	Barium	104	104	P/P	80 - 120
2366080	Beryllium	94.1	95.3	P/P	80 - 120
2366080	Boron	104	105	P/P	80 - 120
2366080	Cadmium	98.3	99.6	P/P	80 - 120
2366080	Chromium	100	100	P/P	80 - 120
2366080	Cobalt	101	101	P/P	80 - 120
2366080	Copper	100	101	P/P	80 - 120
2366080	Lead	98.1	99.1	P/P	80 - 120
2366080	Manganese	101	101	P/P	80 - 120
2366080	Molybdenum	98.5	99.3	P/P	80 - 120
2366080	Nickel	100	101	P/P	80 - 120
2366080	Selenium	98.5	101	P/P	80 - 120
2366080	Silver	102	103	P/P	80 - 120
2366080	Thallium	96.2	98.6	P/P	80 - 120
2366164	Aluminum	99.6		P	80 - 120
2366164	Antimony	104		P	80 - 120
2366164	Arsenic	104		P	80 - 120
2366164	Barium	106		P	80 - 120
2366164	Beryllium	94.4		P	80 - 120
2366164	Boron	105		P	80 - 120
2366164	Cadmium	102		P	80 - 120
2366164	Chromium	100		P	80 - 120
2366164	Cobalt	103		P	80 - 120
2366164	Copper	101		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366164	Lead	100		P	80 - 120
2366164	Manganese	102		P	80 - 120
2366164	Molybdenum	101		P	80 - 120
2366164	Nickel	102		P	80 - 120
2366164	Selenium	99.6		P	80 - 120
2366164	Silver	103		P	80 - 120
2366164	Thallium	98.0		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366091	Chloride	100		P	90 - 110
2366215	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422464

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366091	Sulfate	102		P	90 - 110
2366215	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366167	Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421875

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366094	Kjeldahl Nitrogen	102	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366072	NO2NO3-N	108	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366072	Total-P	106	108	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P422020

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366166	Fluoride	102	102	P/P	94 - 104

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P421887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366054	Organic Carbon	103		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P421998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366238	Organic Carbon	97.8	98.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P421625

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366066	Color (true)	2.93	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421622

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366066	Turbidity	2.82	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366080	Calcium	2.57	Spike	P	0 - 20
2366080	Iron	5.23	Spike	P	0 - 20
2366080	Magnesium	4.79	Spike	P	0 - 20
2366080	Potassium	2.22	Spike	P	0 - 20
2366080	Sodium	2.75	Spike	P	0 - 20
2366080	Strontium	2.75	Spike	P	0 - 20
2366080	Tin	3.32	Spike	P	0 - 20
2366080	Titanium	1.82	Spike	P	0 - 20
2366080	Vanadium	2.37	Spike	P	0 - 20
2366080	Zinc	1.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366080	Aluminum	0.976	Spike	P	0 - 20
2366080	Antimony	0.357	Spike	P	0 - 20
2366080	Arsenic	0.347	Spike	P	0 - 20
2366080	Barium	0.249	Spike	P	0 - 20
2366080	Beryllium	1.17	Spike	P	0 - 20
2366080	Boron	0.906	Spike	P	0 - 20
2366080	Cadmium	1.33	Spike	P	0 - 20
2366080	Chromium	0.332	Spike	P	0 - 20
2366080	Cobalt	0.0955	Spike	P	0 - 20
2366080	Copper	0.276	Spike	P	0 - 20
2366080	Lead	0.953	Spike	P	0 - 20
2366080	Manganese	0.413	Spike	P	0 - 20
2366080	Molybdenum	0.785	Spike	P	0 - 20
2366080	Nickel	0.640	Spike	P	0 - 20
2366080	Selenium	2.17	Spike	P	0 - 20
2366080	Silver	1.33	Spike	P	0 - 20
2366080	Thallium	2.44	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366091	Chloride	0.535	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422464

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366091	Sulfate	0.417	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366167	Ammonia-N	1.19	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421875

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366094	Kjeldahl Nitrogen	1.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366072	NO2NO3-N	0.371	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366072	Total-P	1.52	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P422119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366911	Total Alkalinity	0.228	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P422175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365900	TDS	1.75	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P422020

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366166	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P421887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366054	Organic Carbon	0.0113	Sample	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P421998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366238	Organic Carbon	0.593	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A115604

Included Lab Sample IDs: 2366071, 2366073

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

Reference Method: DEP SOP: NU-094-1

Run ID: A115609

Included Lab Sample IDs: 2366071, 2366073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A115705

Included Lab Sample IDs: 2366080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	99.1	P/P	90 - 110
Antimony	96.1	98.4	P/P	90 - 110
Arsenic	99.9	99.7	P/P	90 - 110
Barium	98.5	99.6	P/P	90 - 110
Beryllium	97.5	97.4	P/P	90 - 110
Boron	102	101	P/P	90 - 110
Cadmium	98.2	99.3	P/P	90 - 110
Chromium	95.7	97.6	P/P	90 - 110
Copper	97.6	98.0	P/P	90 - 110
Lead	95.5	95.5	P/P	90 - 110
Molybdenum	98.8	99.4	P/P	90 - 110
Nickel	98.9	99.1	P/P	90 - 110
Selenium	98.0	99.0	P/P	90 - 110
Silver	100	101	P/P	90 - 110
Thallium	95.9	96.4	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A115735

Included Lab Sample IDs: 2366072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	98.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A115737

Included Lab Sample IDs: 2366080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cobalt	100	97.7	P/P	90 - 110
Manganese	97.4	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A115752

Included Lab Sample IDs: 2366072, 2366074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	106	106	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500-F- C-2011

Run ID: A115774

Included Lab Sample IDs: 2366071, 2366073

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

Reference Method: SM 5310 B-2011

Run ID: A115775

Included Lab Sample IDs: 2366074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	97.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A115789

Included Lab Sample IDs: 2366072, 2366074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.6	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A115790

Included Lab Sample IDs: 2366072, 2366074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	96.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A115791

Included Lab Sample IDs: 2366080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	93.8	93.5	P/P	90 - 110
Iron	94.9	94.7	P/P	90 - 110
Magnesium	93.4	93.4	P/P	90 - 110
Potassium	94.0	94.9	P/P	90 - 110
Sodium	95.7	95.6	P/P	90 - 110
Strontium	93.4	93.9	P/P	90 - 110
Tin	92.7	94.7	P/P	90 - 110
Titanium	91.4	93.6	P/P	90 - 110
Vanadium	92.2	92.6	P/P	90 - 110
Zinc	91.7	94.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A115813

Included Lab Sample IDs: 2366072, 2366074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.2	97.9	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A115822

Included Lab Sample IDs: 2366071, 2366073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A115822

Included Lab Sample IDs: 2366071, 2366073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.9	95.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A115939

Included Lab Sample IDs: 2366071, 2366073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.9	99.1	P/P	90 - 110
Sulfate	97.2	101	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				
DEP SOP: NU-094-1	Color (true)	101				2.93	
EPA 180.1 Rev. 2.0	Turbidity	101				2.82	
EPA 200.7 Rev. 4.4	Calcium	102	99.3	102	96.6		2.57
	Iron	102	98.7	104	105		5.23
	Magnesium	102	99.1	104	102		4.79
	Potassium	102	102	104	97.7		2.22
	Sodium	105	99.0	103	97.8		2.75
	Strontium	104	97.8	101	99.0		2.75
	Tin	98.2	98.4	102	96.8		3.32
	Titanium	97.8	94.7	96.5	97.5		1.82
	Vanadium	100	94.5	96.8	95.2		2.37
	Zinc	101	96.4	97.6	92.9		1.24
EPA 200.8 Rev. 5.4	Aluminum	98.4	99.3	100	99.6		0.976
	Antimony	101	101	102	104		0.357
	Arsenic	101	102	102	104		0.347
	Barium	105	104	104	106		0.249
	Beryllium	96.8	94.1	95.3	94.4		1.17
	Boron	104	104	105	105		0.906
	Cadmium	98.9	98.3	99.6	102		1.33
	Chromium	100	100	100	100		0.332
	Cobalt	102	101	101	103		0.0955
	Copper	99.2	100	101	101		0.276
	Lead	97.3	98.1	99.1	100		0.953
	Manganese	101	101	101	102		0.413
	Molybdenum	99.0	98.5	99.3	101		0.785
	Nickel	101	100	101	102		0.640
	Selenium	99.5	98.5	101	99.6		2.17
	Silver	102	102	103	103		1.33
	Thallium	94.6	96.2	98.6	98.0		2.44
EPA 300.0 Rev. 2.1	Chloride	96.4	100	99.5		0.535	
	Sulfate	98.0	102	100		0.417	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	100	101			1.19
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	102	104			1.09
EPA 353.2 Rev. 2.0	NO2NO3-N	107	108	107			0.371
EPA 365.1 Rev. 2.0	Total-P	105	106	108			1.52
SM 2320 B-2011	Total Alkalinity	98.4				0.228	
SM 2540 C-2015	TDS	101				1.75	
SM 2540 D-2015	TSS	97.7					
SM 4500-F- C-2011	Fluoride	101	102	102			0.0
SM 5310 B-2011	Organic Carbon	100	103			0.0113	
	Organic Carbon	96.3	97.8	98.6			0.593

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2366071, 2366073
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2366071, 2366073
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2366080
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2366080
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2366071, 2366073
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2366071, 2366073

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2366072, 2366074
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2366072, 2366074
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2366072, 2366074
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2366072, 2366074
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2366071, 2366073
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2366080
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2366071, 2366073
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2366071, 2366073
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2366071, 2366073
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2366072, 2366074

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	10/28/2022			10/28/2022 15:24	Samantha L Bates	2366071, 2366073
EPA 180.1 Rev. 2.0	10/28/2022			10/28/2022 13:59	Chandler E Cox	2366071
	10/28/2022			10/28/2022 14:01	Chandler E Cox	2366073
EPA 200.7 Rev. 4.4	10/28/2022	11/01/2022 10:50	George D Taylor	11/08/2022 00:32	McKinley C Carter	2366080
EPA 200.8 Rev. 5.4	10/28/2022	11/01/2022 10:50	George D Taylor	11/02/2022 19:17	Emily M Philpot	2366080
	10/28/2022	11/01/2022 10:50	George D Taylor	11/03/2022 15:49	Emily M Philpot	2366080
EPA 300.0 Rev. 2.1	10/28/2022			11/15/2022 16:29	Anna M. Plaviak	2366071
	10/28/2022			11/15/2022 16:44	Anna M. Plaviak	2366073
EPA 350.1 Rev. 2.0	10/28/2022			11/07/2022 13:13	Ping Hua	2366072
	10/28/2022			11/07/2022 13:15	Ping Hua	2366074
EPA 351.2 Rev. 2.0	10/28/2022	11/04/2022 10:30	Simonne.V. Calhoun	11/08/2022 16:23	Samantha L Bates	2366072
	10/28/2022	11/04/2022 10:30	Simonne.V. Calhoun	11/08/2022 16:25	Samantha L Bates	2366074
EPA 353.2 Rev. 2.0	10/28/2022			11/04/2022 10:59	Beverly Y. Sanders	2366072
	10/28/2022			11/04/2022 11:01	Beverly Y. Sanders	2366074
EPA 365.1 Rev. 2.0	10/28/2022	11/04/2022 13:44	Adam P Silver	11/07/2022 15:04	James L Waggeberby	2366072
	10/28/2022	11/04/2022 13:44	Adam P Silver	11/07/2022 15:06	James L Waggeberby	2366074
SM 2320 B-2011	10/28/2022			11/09/2022 01:30	Dale L. Simmons	2366071
	10/28/2022			11/09/2022 01:37	Dale L. Simmons	2366073
SM 2340 B-2011	10/28/2022			11/08/2022 00:32	McKinley C Carter	2366080
SM 2540 C-2015	10/28/2022			11/02/2022 15:18	Yijie Li	2366071, 2366073
SM 2540 D-2015	10/28/2022			11/02/2022 15:18	Yijie Li	2366071, 2366073
SM 4500-F- C-2011	10/28/2022			11/05/2022 16:09	Dale L. Simmons	2366071
	10/28/2022			11/05/2022 16:19	Dale L. Simmons	2366073
SM 5310 B-2011	10/28/2022			11/03/2022 15:15	Khloe J Berg	2366072
	10/28/2022			11/04/2022 23:46	Khloe J Berg	2366074