Chemical Analysis Report

WQAP-2022-10-26-04

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Reference Lakes (2)**
Request ID: **RQ-2022-09-12-51**
Customer: **WQAP**
Project ID: **LAKESREF**

Send Reports to:
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2199 South Rock Road
Fort Pierce, FL 34945
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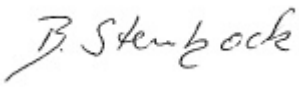
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 19-NOV-2022 14:29



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 Eden **Collection Date/Time: 10/25/2022 11:30**

Field ID: 28010595 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2365359	DEP SOP: NU-094-1	Color (true)	98		PCU	P421485	
	EPA 300.0 Rev. 2.1	Chloride	49	A	mg Cl/L	P422163	
		Sulfate	2.8	A	mg SO4/L	P422167	
	SM 2320 B-2011	Total Alkalinity	24		mg CaCO3/L	P421670	
	SM 4500-F- C-2011	Fluoride	0.089	I	mg F/L	P421673	
2365360	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P422032	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P421695	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P421776	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P421601	
2365361	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P421474	
2365364	EPA 200.7 Rev. 4.4	Calcium	10.9		mg/L	P421668	
		Iron	61	I	ug/L	P421668	
		Magnesium	3.20		mg/L	P421668	
		Potassium	0.87	I	mg/L	P421668	
		Sodium	28.9		mg/L	P421668	
		Strontium	106		ug/L	P421590	
		Tin	3.0	U	ug/L	P421590	
		Titanium	0.75	U	ug/L	P421590	
		Vanadium	2.0	U	ug/L	P421590	
		Zinc	5.0	U	ug/L	P421590	
	EPA 200.8 Rev. 5.4	Aluminum	9.5	I	ug/L	P421590	
		Antimony	0.050	U	ug/L	P421590	
		Arsenic	0.35		ug/L	P421590	
		Barium	3.30		ug/L	P421590	
		Beryllium	0.010	U	ug/L	P421590	
		Boron	44.5		ug/L	P421590	
		Cadmium	0.020	U	ug/L	P421590	
		Chromium	0.40	U	ug/L	P421590	
		Cobalt	0.021	I	ug/L	P421590	
		Copper	0.40	U	ug/L	P421590	
		Lead	0.20	U	ug/L	P421590	
		Manganese	3.53		ug/L	P421590	
		Molybdenum	0.15	U	ug/L	P421590	
		Nickel	0.50	U	ug/L	P421590	
		Selenium	0.20	U	ug/L	P421590	
		Silver	0.010	U	ug/L	P421590	
		Thallium	0.10	U	ug/L	P421590	
	SM 2340 B-2011	Hardness	40.3		mg/L	P421668	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 4500-F- C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P421485

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421590

Component	Result	Code	Units
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 200.7 Rev. 4.4
Batch ID: P421668

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421590

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: P422163

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: P422167

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422032

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421695

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421776

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421601

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421474

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

Reference Method: SM 2320 B-2011
Batch ID: P421670

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

Reference Method: SM 4500-F- C-2011
Batch ID: P421673

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P421485

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	92.7		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421590

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Strontium	111		P	85 - 115
Tin	113		P	85 - 115
Titanium	109		P	85 - 115
Vanadium	109		P	85 - 115
Zinc	109		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421668

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	99.8		P	85 - 115
Iron	110		P	85 - 115
Magnesium	99.6		P	85 - 115
Potassium	108		P	85 - 115
Sodium	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421590

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.8		P	85 - 115
Antimony	95.0		P	85 - 115
Arsenic	96.0		P	85 - 115
Barium	96.2		P	85 - 115
Beryllium	89.2		P	85 - 115
Boron	98.6		P	85 - 115
Cadmium	93.1		P	85 - 115
Chromium	101		P	85 - 115
Cobalt	102		P	85 - 115
Copper	95.2		P	85 - 115
Lead	98.8		P	85 - 115
Manganese	98.8		P	85 - 115
Molybdenum	92.7		P	85 - 115
Nickel	96.2		P	85 - 115
Selenium	93.1		P	85 - 115
Silver	95.4		P	85 - 115
Thallium	94.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422163

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422167

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422032

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421695

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421776

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421601

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421474

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

Reference Method: SM 2320 B-2011
Batch ID: P421670

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.1		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P421673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	96 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365533	Strontium	112	110	P/P	80 - 120
2365533	Tin	117	113	P/P	80 - 120
2365533	Titanium	112	109	P/P	80 - 120
2365533	Vanadium	111	107	P/P	80 - 120
2365533	Zinc	107	105	P/P	80 - 120
2365709	Strontium	112		P	80 - 120
2365709	Tin	115		P	80 - 120
2365709	Titanium	113		P	80 - 120
2365709	Vanadium	111		P	80 - 120
2365709	Zinc	112		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421668

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365710	Calcium	108		P	80 - 120
2365710	Iron	109		P	80 - 120
2365710	Magnesium	110		P	80 - 120
2365710	Potassium	109		P	80 - 120
2365710	Sodium	113		P	80 - 120
2366127	Calcium	95.2		P	80 - 120
2366127	Iron	110	109	P/P	80 - 120
2366127	Magnesium	96.1		P	80 - 120
2366127	Potassium	107	107	P/P	80 - 120
2366127	Sodium	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365533	Aluminum	90.8	93.6	P/P	80 - 120
2365533	Antimony	93.4	96.7	P/P	80 - 120
2365533	Arsenic	94.0	96.0	P/P	80 - 120
2365533	Barium	92.8	93.8	P/P	80 - 120
2365533	Beryllium	88.3	92.2	P/P	80 - 120
2365533	Boron	97.3	104	P/P	80 - 120
2365533	Cadmium	91.6	95.1	P/P	80 - 120
2365533	Chromium	97.7	99.9	P/P	80 - 120
2365533	Cobalt	98.7	101	P/P	80 - 120
2365533	Copper	90.8	91.8	P/P	80 - 120
2365533	Lead	96.5	98.3	P/P	80 - 120
2365533	Manganese	98.7	101	P/P	80 - 120
2365533	Molybdenum	91.3	93.5	P/P	80 - 120
2365533	Nickel	90.1	92.1	P/P	80 - 120
2365533	Selenium	90.8	90.3	P/P	80 - 120
2365533	Silver	92.2	93.8	P/P	80 - 120
2365533	Thallium	93.6	96.7	P/P	80 - 120
2365709	Aluminum	91.4		P	80 - 120
2365709	Antimony	94.3		P	80 - 120
2365709	Arsenic	94.7		P	80 - 120
2365709	Barium	95.8		P	80 - 120
2365709	Beryllium	91.8		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365709	Boron	95.0		P	80 - 120
2365709	Cadmium	92.8		P	80 - 120
2365709	Chromium	99.7		P	80 - 120
2365709	Cobalt	101		P	80 - 120
2365709	Copper	93.8		P	80 - 120
2365709	Lead	98.9		P	80 - 120
2365709	Manganese	99.6		P	80 - 120
2365709	Molybdenum	91.4		P	80 - 120
2365709	Nickel	94.5		P	80 - 120
2365709	Selenium	92.8		P	80 - 120
2365709	Silver	93.8		P	80 - 120
2365709	Thallium	94.0		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422163

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365359	Chloride	96.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422167

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365359	Sulfate	103		P	90 - 110
2365627	Sulfate	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365823	Ammonia-N	95.6	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421695

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365274	Kjeldahl Nitrogen	109	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365274	NO2NO3-N	98.9	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421601

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2365309	Total-P	105	108	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421474

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364861	O-Phosphate-P	99.2	98.0	P/P	90 - 110

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P421485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365272	Color (true)	3.31	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365533	Strontium	1.65	Spike	P	0 - 20
2365533	Tin	3.11	Spike	P	0 - 20
2365533	Titanium	2.63	Spike	P	0 - 20
2365533	Vanadium	3.21	Spike	P	0 - 20
2365533	Zinc	2.11	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366127	Calcium	0.0432	Spike	P	0 - 20
2366127	Iron	0.736	Spike	P	0 - 20
2366127	Magnesium	0.619	Spike	P	0 - 20
2366127	Potassium	0.234	Spike	P	0 - 20
2366127	Sodium	0.337	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365533	Aluminum	3.05	Spike	P	0 - 20
2365533	Antimony	3.48	Spike	P	0 - 20
2365533	Arsenic	2.07	Spike	P	0 - 20
2365533	Barium	0.577	Spike	P	0 - 20
2365533	Beryllium	4.30	Spike	P	0 - 20
2365533	Boron	6.06	Spike	P	0 - 20
2365533	Cadmium	3.68	Spike	P	0 - 20
2365533	Chromium	2.20	Spike	P	0 - 20
2365533	Cobalt	2.24	Spike	P	0 - 20
2365533	Copper	1.11	Spike	P	0 - 20
2365533	Lead	1.88	Spike	P	0 - 20
2365533	Manganese	2.27	Spike	P	0 - 20
2365533	Molybdenum	2.16	Spike	P	0 - 20
2365533	Nickel	2.16	Spike	P	0 - 20
2365533	Selenium	0.528	Spike	P	0 - 20
2365533	Silver	1.79	Spike	P	0 - 20
2365533	Thallium	3.30	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422163

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365359	Chloride	0.0658	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365359	Sulfate	1.56	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365823	Ammonia-N	1.66	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421695

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365274	Kjeldahl Nitrogen	0.534	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365274	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421601

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365309	Total-P	1.26	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421474

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364861	O-Phosphate-P	0.999	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P421670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365524	Total Alkalinity	0.150	Sample	P	0 - 3.8

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P421673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2365524	Fluoride	0.490	Spike	P	0 - 1.6

* 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: A115544
Included Lab Sample IDs: 2365361

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	98.5	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1
Run ID: A115546
Included Lab Sample IDs: 2365359

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	94.4	93.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115613
Included Lab Sample IDs: 2365364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	101	101	P/P	90 - 110
Tin	105	103	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	101	99.3	P/P	90 - 110
Zinc	103	100	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A115628
Included Lab Sample IDs: 2365359

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.3	101	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A115628
Included Lab Sample IDs: 2365359

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: A115636
Included Lab Sample IDs: 2365360

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115652
Included Lab Sample IDs: 2365364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.2	93.0	P/P	90 - 110
Antimony	91.3	91.6	P/P	90 - 110
Arsenic	92.3	93.3	P/P	90 - 110
Barium	92.2	92.2	P/P	90 - 110
Beryllium	92.2	93.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115652
Included Lab Sample IDs: 2365364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	94.4	92.0	P/P	90 - 110
Cadmium	92.9	91.8	P/P	90 - 110
Copper	91.0	91.0	P/P	90 - 110
Molybdenum	90.6	91.2	P/P	90 - 110
Nickel	92.0	91.8	P/P	90 - 110
Selenium	90.7	92.6	P/P	90 - 110
Silver	91.6	92.1	P/P	90 - 110
Thallium	92.0	90.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115662
Included Lab Sample IDs: 2365364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	96.5	96.6	P/P	90 - 110
Iron	99.5	99.7	P/P	90 - 110
Magnesium	97.8	98.1	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	103	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115670
Included Lab Sample IDs: 2365364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	93.4	95.0	P/P	90 - 110
Cobalt	95.5	96.4	P/P	90 - 110
Lead	94.7	94.5	P/P	90 - 110
Manganese	93.2	94.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115682
Included Lab Sample IDs: 2365360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115712
Included Lab Sample IDs: 2365360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	108	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115789
Included Lab Sample IDs: 2365360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	98.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115800
Included Lab Sample IDs: 2365359

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.6	99.1	P/P	90 - 110
Sulfate	98.7	103	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
DEP SOP: NU-094-1	Color (true)	92.7					3.31	
EPA 200.7 Rev. 4.4	Calcium	99.8	108	95.2				0.0432
	Iron	110	109	110	109			0.736
	Magnesium	99.6	110	96.1				0.619
	Potassium	108	109	107	107			0.234
	Sodium	103	113	106				0.337
	Strontium	111	112	112	110			1.65
	Tin	113	117	113	115			3.11
	Titanium	109	112	109	113			2.63
	Vanadium	109	111	107	111			3.21
	Zinc	109	107	105	112			2.11
EPA 200.8 Rev. 5.4	Aluminum	93.8	90.8	93.6	91.4			3.05
	Antimony	95.0	93.4	96.7	94.3			3.48
	Arsenic	96.0	94.0	96.0	94.7			2.07
	Barium	96.2	92.8	93.8	95.8			0.577
	Beryllium	89.2	88.3	92.2	91.8			4.30
	Boron	98.6	97.3	104	95.0			6.06
	Cadmium	93.1	91.6	95.1	92.8			3.68
	Chromium	101	97.7	99.9	99.7			2.20
	Cobalt	102	98.7	101	101			2.24
	Copper	95.2	90.8	91.8	93.8			1.11
	Lead	98.8	96.5	98.3	98.9			1.88
	Manganese	98.8	98.7	101	99.6			2.27
	Molybdenum	92.7	91.3	93.5	91.4			2.16
	Nickel	96.2	90.1	92.1	94.5			2.16
	Selenium	93.1	90.8	90.3	92.8			0.528
	Silver	95.4	92.2	93.8	93.8			1.79
	Thallium	94.9	93.6	96.7	94.0			3.30
EPA 300.0 Rev. 2.1	Chloride	103	96.9				0.0658	
	Sulfate	107	103	107			1.56	
EPA 350.1 Rev. 2.0	Ammonia-N	96.8	95.6	97.6				1.66
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	109	108				0.534
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	98.9	98.9				0.0
EPA 365.1 Rev. 2.0	Total-P	107	105	108				1.26
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.2	98.0				0.999
SM 2320 B-2011	Total Alkalinity	99.1					0.150	
SM 4500-F- C-2011	Fluoride	97.0						0.490

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2365359
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2365364
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2365364
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2365359
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2365359
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2365360
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2365360
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2365360
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2365360

Reference Method Descriptions

Method	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2365361
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2365359
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2365364
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2365359

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	10/26/2022			10/26/2022 14:58	Chandler E Cox	2365359
EPA 200.7 Rev. 4.4	10/26/2022	10/28/2022 11:25	George D Taylor	10/28/2022 22:19	McKinley C Carter	2365364
	10/26/2022	10/31/2022 12:20	George D Taylor	11/01/2022 13:22	Betina Topolski	2365364
EPA 200.8 Rev. 5.4	10/26/2022	10/28/2022 11:25	George D Taylor	11/01/2022 01:41	Emily M Philpot	2365364
	10/26/2022	10/28/2022 11:25	George D Taylor	11/01/2022 23:14	Emily M Philpot	2365364
EPA 300.0 Rev. 2.1	10/26/2022			11/09/2022 00:26	Anna M. Plaviak	2365359
EPA 350.1 Rev. 2.0	10/26/2022			11/07/2022 12:19	Ping Hua	2365360
EPA 351.2 Rev. 2.0	10/26/2022	11/01/2022 11:59	Alexandra J Mattheus	11/02/2022 16:00	Samantha L Bates	2365360
EPA 353.2 Rev. 2.0	10/26/2022			11/02/2022 10:32	Beverly Y. Sanders	2365360
EPA 365.1 Rev. 2.0	10/26/2022	10/28/2022 12:34	Adam P Silver	10/31/2022 13:22	Simonne.V. Calhoun	2365360
EPA 365.1 Rev. 2.0 dissolved	10/26/2022			10/26/2022 15:05	Elise M. Gillis	2365361
SM 2320 B-2011	10/26/2022			10/28/2022 22:24	Dale L. Simmons	2365359
SM 2340 B-2011	10/26/2022			11/01/2022 13:22	Betina Topolski	2365364
SM 4500-F- C-2011	10/26/2022			10/28/2022 22:24	Dale L. Simmons	2365359