Chemical Analysis Report

WQAP-2022-10-21-01

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:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Andrew Luering

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 15-NOV-2022 10:21

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: Blue Cypress near Center **Collection Date/Time: 10/20/2022 12:30**

Field ID: G3SE0040 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2364229	DEP SOP: NU-094-1	Color (true)	320		PCU	P421266	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P422011	
		Sulfate	3.8		mg SO4/L	P421824	
	SM 2320 B-2011	Total Alkalinity	24		mg CaCO3/L	P421457	
	SM 4500-F- C-2011	Fluoride	0.070	I	mg F/L	P421906	
2364230	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P421860	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P421574	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P421530	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P421428	
2364231	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.18		mg P/L	P421271	
2364234	EPA 200.7 Rev. 4.4	Calcium	14.9		mg/L	P421316	
		Iron	830		ug/L	P421316	
		Magnesium	3.36		mg/L	P421316	
		Potassium	2.1		mg/L	P421316	
		Sodium	14.5		mg/L	P421316	
		Strontium	363		ug/L	P421316	
		Tin	3.0	U	ug/L	P421316	
		Titanium	2.7	I	ug/L	P421316	
		Vanadium	2.0	U	ug/L	P421316	
		Zinc	5.0	U	ug/L	P421316	
	EPA 200.8 Rev. 5.4	Aluminum	276		ug/L	P421316	
		Antimony	0.050	U	ug/L	P421316	
		Arsenic	0.54		ug/L	P421316	
		Barium	10.6		ug/L	P421316	
		Beryllium	0.020	I	ug/L	P421316	
		Boron	28.6		ug/L	P421316	
		Cadmium	0.020	U	ug/L	P421316	
		Chromium	0.54	I	ug/L	P421316	
		Cobalt	0.173		ug/L	P421316	
		Copper	0.71	I	ug/L	P421316	
		Lead	0.46		ug/L	P421316	
		Manganese	13.7		ug/L	P421316	
		Molybdenum	0.15	U	ug/L	P421316	
		Nickel	0.50	U	ug/L	P421316	
		Selenium	0.20	U	ug/L	P421316	MS
		Silver	0.010	U	ug/L	P421316	
		Thallium	0.10	U	ug/L	P421316	
	SM 2340 B-2011	Hardness	50.9		mg/L	P421316	

Ref. Method and Comment:
EPA 365.1 Rev. 2.0: Total-P: 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: P421266

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421316

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: P421316

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: P421824

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422011

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421860

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421574

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421530

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421428

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421271

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

Reference Method: SM 2320 B-2011
Batch ID: P421457

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

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P421266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	95.3		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421316

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	112		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	107		P	85 - 115
Sodium	109		P	85 - 115
Strontium	109		P	85 - 115
Tin	106		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	107		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421316

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.3		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	102		P	85 - 115
Barium	104		P	85 - 115
Beryllium	97.3		P	85 - 115
Boron	97.2		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	98.4		P	85 - 115
Cobalt	101		P	85 - 115
Copper	101		P	85 - 115
Lead	92.7		P	85 - 115
Manganese	96.7		P	85 - 115
Molybdenum	97.2		P	85 - 115
Nickel	101		P	85 - 115
Selenium	99.4		P	85 - 115
Silver	99.8		P	85 - 115
Thallium	97.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421824

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422011

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421860

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: P421574

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421428

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421271

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

Reference Method: SM 2320 B-2011
Batch ID: P421457

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	96 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363911	Calcium	103		P	80 - 120
2363911	Iron	107	110	P/P	80 - 120
2363911	Magnesium	104	109	P/P	80 - 120
2363911	Potassium	101	105	P/P	80 - 120
2363911	Sodium	99.7	104	P/P	80 - 120
2363911	Strontium	100	103	P/P	80 - 120
2363911	Tin	104	105	P/P	80 - 120
2363911	Titanium	104	106	P/P	80 - 120
2363911	Vanadium	103	105	P/P	80 - 120
2363911	Zinc	104	105	P/P	80 - 120
2364018	Calcium	109		P	80 - 120
2364018	Iron	112		P	80 - 120
2364018	Magnesium	113		P	80 - 120
2364018	Potassium	105		P	80 - 120
2364018	Sodium	101		P	80 - 120
2364018	Strontium	106		P	80 - 120
2364018	Tin	109		P	80 - 120
2364018	Titanium	105		P	80 - 120
2364018	Vanadium	106		P	80 - 120
2364018	Zinc	107		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363911	Aluminum	96.9	98.0	P/P	80 - 120
2363911	Antimony	105	105	P/P	80 - 120
2363911	Arsenic	104	104	P/P	80 - 120
2363911	Barium	105	105	P/P	80 - 120
2363911	Beryllium	94.2	93.3	P/P	80 - 120
2363911	Boron	101	104	P/P	80 - 120
2363911	Cadmium	102	103	P/P	80 - 120
2363911	Chromium	99.8	100	P/P	80 - 120
2363911	Cobalt	101	101	P/P	80 - 120
2363911	Copper	100	99.7	P/P	80 - 120
2363911	Lead	92.7	95.3	P/P	80 - 120
2363911	Manganese	101	103	P/P	80 - 120
2363911	Molybdenum	101	102	P/P	80 - 120
2363911	Nickel	101	101	P/P	80 - 120
2363911	Selenium	99.4	101	P/P	80 - 120
2363911	Silver	100	102	P/P	80 - 120
2363911	Thallium	99.5	103	P/P	80 - 120
2364018	Aluminum	99.0		P	80 - 120
2364018	Antimony	103		P	80 - 120
2364018	Arsenic	103		P	80 - 120
2364018	Barium	104		P	80 - 120
2364018	Beryllium	92.2		P	80 - 120
2364018	Boron	107		P	80 - 120
2364018	Cadmium	101		P	80 - 120
2364018	Chromium	98.1		P	80 - 120
2364018	Cobalt	99.2		P	80 - 120
2364018	Copper	101		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364018	Lead	95.4		P	80 - 120
2364018	Manganese	99.3		P	80 - 120
2364018	Molybdenum	97.8		P	80 - 120
2364018	Nickel	99.4		P	80 - 120
2364018	Selenium	71.7		F	80 - 120
2364018	Silver	99.7		P	80 - 120
2364018	Thallium	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421824

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364196	Sulfate	109		P	90 - 110
2364229	Sulfate	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422011

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364196	Chloride	105		P	90 - 110
2364229	Chloride	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421860

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364197	Ammonia-N	100	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421574

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364215	Kjeldahl Nitrogen	101	99.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364143	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421271

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364337	O-Phosphate-P	102	102	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363953	Fluoride	99.3	100	P/P	94 - 104

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P421266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364311	Color (true)	0.514	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363911	Calcium	3.27	Spike	P	0 - 20
2363911	Iron	2.79	Spike	P	0 - 20
2363911	Magnesium	3.09	Spike	P	0 - 20
2363911	Potassium	2.98	Spike	P	0 - 20
2363911	Sodium	2.67	Spike	P	0 - 20
2363911	Strontium	2.73	Spike	P	0 - 20
2363911	Tin	1.55	Spike	P	0 - 20
2363911	Titanium	1.26	Spike	P	0 - 20
2363911	Vanadium	1.60	Spike	P	0 - 20
2363911	Zinc	0.857	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363911	Aluminum	1.08	Spike	P	0 - 20
2363911	Antimony	0.153	Spike	P	0 - 20
2363911	Arsenic	0.0299	Spike	P	0 - 20
2363911	Barium	0.541	Spike	P	0 - 20
2363911	Beryllium	0.898	Spike	P	0 - 20
2363911	Boron	2.06	Spike	P	0 - 20
2363911	Cadmium	1.39	Spike	P	0 - 20
2363911	Chromium	0.361	Spike	P	0 - 20
2363911	Cobalt	0.0223	Spike	P	0 - 20
2363911	Copper	0.550	Spike	P	0 - 20
2363911	Lead	2.75	Spike	P	0 - 20
2363911	Manganese	1.00	Spike	P	0 - 20
2363911	Molybdenum	1.05	Spike	P	0 - 20
2363911	Nickel	0.280	Spike	P	0 - 20
2363911	Selenium	1.72	Spike	P	0 - 20
2363911	Silver	1.42	Spike	P	0 - 20
2363911	Thallium	3.43	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364196	Sulfate	0.512	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P422011

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364196	Chloride	0.0389	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364197	Ammonia-N	0.869	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421574

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364215	Kjeldahl Nitrogen	0.689	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364143	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364314	Total-P	2.70	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421271

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364337	O-Phosphate-P	0.349	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P421457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Total Alkalinity	1.76	Sample	P	0 - 3.8

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Fluoride	0.470	Spike	P	0 - 1.6

Quality Assurance Report
Precision

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

Quality Assurance Report
Calibration Verification

Reference Method: DEP SOP: NU-094-1
Run ID: A115455
Included Lab Sample IDs: 2364229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.6	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A115457
Included Lab Sample IDs: 2364231

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.2	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A115538
Included Lab Sample IDs: 2364229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.1	95.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115562
Included Lab Sample IDs: 2364230

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.5	96.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115564
Included Lab Sample IDs: 2364230

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115584
Included Lab Sample IDs: 2364234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.6	103	P/P	90 - 110
Antimony	101	101	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Barium	101	99.3	P/P	90 - 110
Boron	103	106	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Chromium	97.5	95.3	P/P	90 - 110
Cobalt	98.1	97.0	P/P	90 - 110
Copper	98.9	97.4	P/P	90 - 110
Lead	93.8	95.0	P/P	90 - 110
Manganese	98.1	95.5	P/P	90 - 110
Molybdenum	100	100	P/P	90 - 110
Nickel	97.8	97.0	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Silver	99.8	100	P/P	90 - 110
Thallium	99.7	99.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115621
Included Lab Sample IDs: 2364234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	98.5	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115643
Included Lab Sample IDs: 2364230

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.1	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115675
Included Lab Sample IDs: 2364229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.5	98.7	P/P	90 - 110
Sulfate	104	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115726
Included Lab Sample IDs: 2364230

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115733
Included Lab Sample IDs: 2364234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	106	P/P	90 - 110
Iron	108	109	P/P	90 - 110
Magnesium	106	107	P/P	90 - 110
Potassium	104	103	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Strontium	100	101	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	103	P/P	90 - 110
Vanadium	102	103	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A115743
Included Lab Sample IDs: 2364229

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	99.5	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)	95.3					0.514	
EPA 200.7 Rev. 4.4	Calcium	105	103	109				3.27
	Iron	112	107	110	112			2.79
	Magnesium	112	104	109	113			3.09
	Potassium	107	101	105	105			2.98
	Sodium	109	99.7	104	101			2.67
	Strontium	109	100	103	106			2.73
	Tin	106	104	105	109			1.55
	Titanium	107	104	106	105			1.26
	Vanadium	107	103	105	106			1.60
	Zinc	107	104	105	107			0.857
EPA 200.8 Rev. 5.4	Aluminum	96.3	96.9	98.0	99.0			1.08
	Antimony	103	105	105	103			0.153
	Arsenic	102	104	104	103			0.0299
	Barium	104	105	105	104			0.541
	Beryllium	97.3	94.2	93.3	92.2			0.898
	Boron	97.2	101	104	107			2.06
	Cadmium	99.6	102	103	101			1.39
	Chromium	98.4	99.8	100	98.1			0.361
	Cobalt	101	101	101	99.2			0.0223
	Copper	101	100	99.7	101			0.550
	Lead	92.7	92.7	95.3	95.4			2.75
	Manganese	96.7	101	103	99.3			1.00
	Molybdenum	97.2	101	102	97.8			1.05
	Nickel	101	101	101	99.4			0.280
	Selenium	99.4	99.4	101	71.7			1.72
	Silver	99.8	100	102	99.7			1.42
	Thallium	97.0	99.5	103	102			3.43
EPA 300.0 Rev. 2.1	Chloride	106	105	101			0.0389	
	Sulfate	107	109	108			0.512	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	100	102				0.869
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	101	99.9				0.689
EPA 353.2 Rev. 2.0	NO2NO3-N	103	102	102				0.489
EPA 365.1 Rev. 2.0	Total-P	106						2.70
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	102	102				0.349
SM 2320 B-2011	Total Alkalinity	99.0					1.76	
SM 4500-F- C-2011	Fluoride	100	99.3	100				0.470

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2364229
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2364234
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2364234
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2364229
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2364229
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2364230
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2364230
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2364230
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2364230

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	2364231
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2364229
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2364234
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2364229

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	10/21/2022			10/21/2022 15:06	Samantha L Bates	2364229
EPA 200.7 Rev. 4.4	10/21/2022	10/24/2022 11:55	George D Taylor	11/04/2022 00:07	McKinley C Carter	2364234
EPA 200.8 Rev. 5.4	10/21/2022	10/24/2022 11:55	George D Taylor	10/27/2022 20:48	Megan Whitefoot	2364234
	10/21/2022	10/24/2022 11:55	George D Taylor	10/29/2022 04:16	Megan Whitefoot	2364234
EPA 300.0 Rev. 2.1	10/21/2022			11/02/2022 23:48	Anna M. Plaviak	2364229
	10/21/2022			11/04/2022 20:26	Anna M. Plaviak	2364229
EPA 350.1 Rev. 2.0	10/21/2022			11/03/2022 14:04	Ping Hua	2364230
EPA 351.2 Rev. 2.0	10/21/2022	10/28/2022 11:30	Simonne.V. Calhoun	10/31/2022 13:27	Alexandra J Mattheus	2364230
EPA 353.2 Rev. 2.0	10/21/2022			10/27/2022 11:01	Beverly Y. Sanders	2364230
EPA 365.1 Rev. 2.0	10/21/2022	10/26/2022 15:16	Adam P Silver	10/27/2022 10:05	James L Waggerby	2364230
EPA 365.1 Rev. 2.0 dissolved	10/21/2022			10/21/2022 15:05	Elise M. Gillis	2364231
SM 2320 B-2011	10/21/2022			10/26/2022 02:05	Adam P Silver	2364229
SM 2340 B-2011	10/21/2022			11/04/2022 00:07	McKinley C Carter	2364234
SM 4500-F- C-2011	10/21/2022			11/04/2022 08:33	Dale L. Simmons	2364229