

Chemical Analysis Report

NE-DIST-2022-01-27-01

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

Event Description: **LSJR Lake**
Request ID: **RQ-2022-01-24-13**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
Attn: Jeremy Parrish

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: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 18-FEB-2022 10:49

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Silver Lake Center

Collection Date/Time: 01/26/2022 11:15

Field ID: G2NE1132

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302098	DEP SOP: NU-094-1	Color (true)**	360		PCU	P409091	
	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P409104	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P409418	
		Sulfate	3.8		mg SO4/L	P409421	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P409175	
	SM 2540 C-2011	TDS	69		mg/L	P409661	
	SM 2540 D-2011	TSS	2	U	mg/L	P409663	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P409177	
2302099	EPA 350.1 Rev. 2.0	Ammonia-N	0.039		mg N/L	P409473	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P409233	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P409242	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P409181	
	SM 5310 B-2011	Organic Carbon	30		mg C/L	P409830	
2302100	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P409088	

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: Lake Broward South

Collection Date/Time: 01/26/2022 12:50

Field ID: G2NE1218

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302092	DEP SOP: NU-094-1	Color (true)**	20	A	PCU	P409091	
	EPA 180.1 Rev. 2.0	Turbidity	0.65		NTU	P409104	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P409418	
		Sulfate	9.8		mg SO4/L	P409421	
	SM 2320 B-2011	Total Alkalinity	3.3		mg CaCO3/L	P409175	
	SM 2540 C-2011	TDS	55		mg/L	P409661	
	SM 2540 D-2011	TSS	2	U	mg/L	P409663	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P409177	
2302094	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P409473	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.43		mg N/L	P409237	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.019		mg N/L	P409242	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P409181	
	SM 5310 B-2011	Organic Carbon	6.1		mg C/L	P409830	
2302096	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P409087	
2302106	EPA 200.7 Rev. 4.4	Barium	10.5		ug/L	P409205	
		Calcium	4.63		mg/L	P409205	
		Iron	30	U	ug/L	P409205	
		Magnesium	1.51		mg/L	P409205	
		Manganese	4.6		ug/L	P409205	
		Potassium	1.1	I	mg/L	P409205	
		Sodium	8.9		mg/L	P409205	
		Zinc	5.0	U	ug/L	P409205	
	EPA 200.8 Rev. 5.4	Aluminum	48		ug/L	P409205	
		Antimony	0.065	I	ug/L	P409205	
		Arsenic	2.52		ug/L	P409205	
		Beryllium	0.010	U	ug/L	P409205	
		Boron**	28.8		ug/L	P409205	
		Cadmium	0.020	U	ug/L	P409205	
		Chromium	0.40	U	ug/L	P409205	
		Copper	0.76	I	ug/L	P409205	
		Lead	0.20	U	ug/L	P409205	
		Nickel	0.50	U	ug/L	P409205	
		Selenium	0.20	U	ug/L	P409205	
		Silver	0.010	U	ug/L	P409205	
		Thallium	0.10	U	ug/L	P409205	
	SM 2340B	Hardness	17.8		mg/L	P409205	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Broward North

Collection Date/Time: 01/26/2022 12:25

Field ID: G2NE1219

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302093	DEP SOP: NU-094-1	Color (true)**	9.8		PCU	P409091	
	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P409104	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P409418	
		Sulfate	10		mg SO4/L	P409421	
	SM 2320 B-2011	Total Alkalinity	2.5		mg CaCO3/L	P409175	
	SM 2540 C-2011	TDS	44		mg/L	P409661	
	SM 2540 D-2011	TSS	2	U	mg/L	P409663	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P409177	
2302095	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P409473	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35		mg N/L	P409237	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P409242	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P409181	
	SM 5310 B-2011	Organic Carbon	5.1		mg C/L	P409830	
2302097	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P409087	
2302107	EPA 200.7 Rev. 4.4	Barium	9.5		ug/L	P409205	
		Calcium	4.07		mg/L	P409205	
		Iron	30	U	ug/L	P409205	
		Magnesium	1.53		mg/L	P409205	
		Manganese	1.5	I	ug/L	P409205	
		Potassium	1.0	I	mg/L	P409205	
		Sodium	9.0		mg/L	P409205	
		Zinc	5.0	U	ug/L	P409205	
	EPA 200.8 Rev. 5.4	Aluminum	45		ug/L	P409205	
		Antimony	0.073	I	ug/L	P409205	
		Arsenic	1.98		ug/L	P409205	
		Beryllium	0.010	U	ug/L	P409205	
		Boron**	29.1		ug/L	P409205	
		Cadmium	0.020	U	ug/L	P409205	
		Chromium	0.40	U	ug/L	P409205	
		Copper	0.40	U	ug/L	P409205	
		Lead	0.20	U	ug/L	P409205	
		Nickel	0.50	U	ug/L	P409205	
		Selenium	0.20	U	ug/L	P409205	
		Silver	0.010	U	ug/L	P409205	
		Thallium	0.10	U	ug/L	P409205	
	SM 2340B	Hardness	16.5		mg/L	P409205	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: 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: P409091

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409104

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409205

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: P409205

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: P409418

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409421

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409473

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409233

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409237

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409242

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409181

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409087

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409088

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

Reference Method: SM 2320 B-2011
Batch ID: P409175

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

Reference Method: SM 2540 C-2011
Batch ID: P409661

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P409663

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P409177

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P409830

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: P409091

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.4		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409205

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	106		P	85 - 115
Calcium	104		P	85 - 115
Iron	106		P	85 - 115
Magnesium	106		P	85 - 115
Manganese	105		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409205

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	98.5		P	85 - 115
Boron	100		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	100		P	85 - 115
Nickel	103		P	85 - 115
Selenium	101		P	85 - 115
Silver	105		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409421

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409473

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409237

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409242

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: P409181

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409087

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.9		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P409175

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.1		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P409177

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.8		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P409830

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P409205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302002	Barium	106	105	P/P	80 - 120
2302002	Calcium	103		P	80 - 120
2302002	Iron	111	106	P/P	80 - 120
2302002	Magnesium	110	104	P/P	80 - 120
2302002	Manganese	106	105	P/P	80 - 120
2302002	Potassium	108	105	P/P	80 - 120
2302002	Sodium	106	101	P/P	80 - 120
2302002	Zinc	105	104	P/P	80 - 120
2302107	Barium	107		P	80 - 120
2302107	Calcium	102		P	80 - 120
2302107	Iron	108		P	80 - 120
2302107	Magnesium	106		P	80 - 120
2302107	Manganese	105		P	80 - 120
2302107	Potassium	103		P	80 - 120
2302107	Sodium	98.4		P	80 - 120
2302107	Zinc	108		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P409205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302002	Aluminum	102	99.8	P/P	80 - 120
2302002	Antimony	103	102	P/P	80 - 120
2302002	Arsenic	98.3	97.9	P/P	80 - 120
2302002	Beryllium	93.9	92.5	P/P	80 - 120
2302002	Boron	100	97.5	P/P	80 - 120
2302002	Cadmium	103	101	P/P	80 - 120
2302002	Chromium	103	102	P/P	80 - 120
2302002	Copper	99.4	98.4	P/P	80 - 120
2302002	Lead	98.0	98.0	P/P	80 - 120
2302002	Nickel	106	100	P/P	80 - 120
2302002	Selenium	96.3	95.3	P/P	80 - 120
2302002	Silver	103	103	P/P	80 - 120
2302002	Thallium	107	107	P/P	80 - 120
2302107	Aluminum	101		P	80 - 120
2302107	Antimony	104		P	80 - 120
2302107	Arsenic	100		P	80 - 120
2302107	Beryllium	95.5		P	80 - 120
2302107	Boron	101		P	80 - 120
2302107	Cadmium	102		P	80 - 120
2302107	Chromium	101		P	80 - 120
2302107	Copper	101		P	80 - 120
2302107	Lead	102		P	80 - 120
2302107	Nickel	101		P	80 - 120
2302107	Selenium	99.1		P	80 - 120
2302107	Silver	104		P	80 - 120
2302107	Thallium	109		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P409418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
---------------	-----------	---------	---------	-----------	----------------

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301865	Chloride	97.1		P	90 - 110
2302092	Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409421

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301865	Sulfate	94.9		P	90 - 110
2302092	Sulfate	94.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409473

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302094	Ammonia-N	94.2	95.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301867	Kjeldahl Nitrogen	95.7	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409242

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302094	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409181

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302131	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409087

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302030	O-Phosphate-P	98.2	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302133	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P409177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301997	Fluoride	98.4	97.8	P/P	92 - 107

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P409830

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302038	Organic Carbon	97.1	97.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P409091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302092	Color (true)	1.21	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409104

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302140	Turbidity	3.65	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302002	Barium	0.755	Spike	P	0 - 20
2302002	Calcium	3.68	Spike	P	0 - 20
2302002	Iron	3.92	Spike	P	0 - 20
2302002	Magnesium	3.98	Spike	P	0 - 20
2302002	Manganese	0.794	Spike	P	0 - 20
2302002	Potassium	3.38	Spike	P	0 - 20
2302002	Sodium	3.42	Spike	P	0 - 20
2302002	Zinc	1.05	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302002	Aluminum	1.73	Spike	P	0 - 20
2302002	Antimony	1.20	Spike	P	0 - 20
2302002	Arsenic	0.374	Spike	P	0 - 20
2302002	Beryllium	1.33	Spike	P	0 - 20
2302002	Boron	2.41	Spike	P	0 - 20
2302002	Cadmium	2.02	Spike	P	0 - 20
2302002	Chromium	1.01	Spike	P	0 - 20
2302002	Copper	1.01	Spike	P	0 - 20
2302002	Lead	0.0354	Spike	P	0 - 20
2302002	Nickel	5.52	Spike	P	0 - 20
2302002	Selenium	1.08	Spike	P	0 - 20
2302002	Silver	0.236	Spike	P	0 - 20
2302002	Thallium	0.0833	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301865	Chloride	0.229	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301865	Sulfate	0.698	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302094	Ammonia-N	0.897	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301867	Kjeldahl Nitrogen	5.89	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409237

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302132	Kjeldahl Nitrogen	2.37	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409242

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302094	NO2NO3-N	0.451	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302131	Total-P	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302030	O-Phosphate-P	1.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302133	O-Phosphate-P	0.692	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P409175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301997	Total Alkalinity	2.01	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P409661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302028	TDS	5.36	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P409177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301997	Fluoride	0.480	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P409830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302038	Organic Carbon	0.442	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: A110080

Included Lab Sample IDs: 2302096, 2302097, 2302100

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	100	99.6	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A110082

Included Lab Sample IDs: 2302092, 2302093, 2302098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A110086

Included Lab Sample IDs: 2302092, 2302093, 2302098

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

Reference Method: SM 2320 B-2011

Run ID: A110117

Included Lab Sample IDs: 2302092, 2302093, 2302098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	97.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A110117

Included Lab Sample IDs: 2302092, 2302093, 2302098

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A110144

Included Lab Sample IDs: 2302094, 2302095, 2302099

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A110154

Included Lab Sample IDs: 2302092, 2302093, 2302098

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.4	99.8	P/P	90 - 110
Chloride	99.8	101	P/P	90 - 110
Sulfate	99.1	99.6	P/P	90 - 110
Sulfate	99.6	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A110160

Included Lab Sample IDs: 2302106, 2302107

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	P/P	90 - 110
Antimony	104	104	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Beryllium	96.7	94.4	P/P	90 - 110
Boron	103	103	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Chromium	99.6	100	P/P	90 - 110
Copper	98.3	99.4	P/P	90 - 110
Lead	97.5	97.5	P/P	90 - 110
Nickel	98.5	99.9	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Silver	104	105	P/P	90 - 110
Thallium	105	105	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A110187

Included Lab Sample IDs: 2302106, 2302107

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	105	P/P	90 - 110
Barium	105	107	P/P	90 - 110
Calcium	101	99.5	P/P	90 - 110
Calcium	99.5	103	P/P	90 - 110
Iron	102	99.8	P/P	90 - 110
Iron	99.8	103	P/P	90 - 110
Magnesium	101	99.1	P/P	90 - 110
Magnesium	99.1	103	P/P	90 - 110
Manganese	103	104	P/P	90 - 110
Manganese	104	104	P/P	90 - 110
Potassium	96.2	98.4	P/P	90 - 110
Potassium	97.4	96.2	P/P	90 - 110
Sodium	97.9	100	P/P	90 - 110
Sodium	99.5	97.9	P/P	90 - 110
Zinc	101	106	P/P	90 - 110
Zinc	106	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110218

Included Lab Sample IDs: 2302099

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	93.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110252

Included Lab Sample IDs: 2302094, 2302095, 2302099

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	94.7	95.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110277

Included Lab Sample IDs: 2302094, 2302095, 2302099

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110278

Included Lab Sample IDs: 2302094, 2302095

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	97.0	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A110410

Included Lab Sample IDs: 2302094, 2302095, 2302099

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.9	97.9	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)	99.4				1.21	
EPA 180.1 Rev. 2.0	Turbidity					3.65	
EPA 200.7 Rev. 4.4	Barium	106	106	105	107		0.755
	Calcium	104	103	102			3.68
	Iron	106	111	106	108		3.92
	Magnesium	106	110	104	106		3.98
	Manganese	105	106	105	105		0.794
	Potassium	103	108	105	103		3.38
	Sodium	104	106	101	98.4		3.42
	Zinc	104	105	104	108		1.05
EPA 200.8 Rev. 5.4	Aluminum	103	102	99.8	101		1.73
	Antimony	103	103	102	104		1.20
	Arsenic	102	98.3	97.9	100		0.374
	Beryllium	98.5	93.9	92.5	95.5		1.33
	Boron	100	100	97.5	101		2.41
	Cadmium	101	103	101	102		2.02
	Chromium	101	103	102	101		1.01
	Copper	102	99.4	98.4	101		1.01
	Lead	100	98.0	98.0	102		0.0354
	Nickel	103	106	100	101		5.52
	Selenium	101	96.3	95.3	99.1		1.08
	Silver	105	103	103	104		0.236
	Thallium	107	107	107	109		0.0833
EPA 300.0 Rev. 2.1	Chloride	98.9	97.1	98.2		0.229	
	Sulfate	97.8	94.9	94.8		0.698	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	94.2	95.6			0.897
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.6	95.7	103			5.89
	Kjeldahl Nitrogen	97.6					2.37
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	101			0.451
EPA 365.1 Rev. 2.0	Total-P	102	102	101			1.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	98.2	99.7			1.01
	O-Phosphate-P	99.9	101	102			0.692
SM 2320 B-2011	Total Alkalinity	97.1				2.01	
SM 2540 C-2011	TDS					5.36	
SM 4500 F-C-2011	Fluoride	97.8	98.4	97.8			0.480
SM 5310 B-2011	Organic Carbon	94.2	97.1	97.8			0.442

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2302092, 2302093, 2302098
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2302092, 2302093, 2302098
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2302106, 2302107
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2302106, 2302107
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2302092, 2302093, 2302098
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2302092, 2302093, 2302098
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2302094, 2302095, 2302099
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2302094, 2302095, 2302099
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2302094, 2302095, 2302099
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2302094, 2302095, 2302099

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	2302096, 2302097, 2302100
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2302092, 2302093, 2302098
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2302106, 2302107
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2302092, 2302093, 2302098
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2302092, 2302093, 2302098
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2302092, 2302093, 2302098
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2302094, 2302095, 2302099

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	01/27/2022			01/27/2022 15:31	Samantha L Bates	2302092
	01/27/2022			01/27/2022 15:32	Samantha L Bates	2302093
	01/27/2022			01/27/2022 15:37	Samantha L Bates	2302098
EPA 180.1 Rev. 2.0	01/27/2022			01/27/2022 15:28	Khloe J Berg	2302092, 2302093, 2302098
EPA 200.7 Rev. 4.4	01/27/2022	02/01/2022 10:00	Vijayalakshmi Reddy	02/02/2022 13:42	Josef B Mick	2302106
	01/27/2022	02/01/2022 10:00	Vijayalakshmi Reddy	02/02/2022 14:21	Josef B Mick	2302107
EPA 200.8 Rev. 5.4	01/27/2022	02/01/2022 10:00	Vijayalakshmi Reddy	02/01/2022 17:32	Alexander Thompson	2302106
	01/27/2022	02/01/2022 10:00	Vijayalakshmi Reddy	02/01/2022 18:19	Alexander Thompson	2302107
EPA 300.0 Rev. 2.1	01/27/2022			02/03/2022 20:32	James L Waggeberby	2302092
	01/27/2022			02/03/2022 23:08	James L Waggeberby	2302093
	01/27/2022			02/03/2022 23:20	James L Waggeberby	2302098
EPA 350.1 Rev. 2.0	01/27/2022			02/04/2022 15:11	Ping Hua	2302094
	01/27/2022			02/04/2022 15:15	Ping Hua	2302095
	01/27/2022			02/04/2022 15:16	Ping Hua	2302099
EPA 351.2 Rev. 2.0	01/27/2022	02/02/2022 09:46	Samantha L Bates	02/03/2022 15:30	Alexandra J Mattheus	2302099
	01/27/2022	02/02/2022 10:16	Alexandra J Mattheus	02/08/2022 09:15	Alexandra J Mattheus	2302094
	01/27/2022	02/02/2022 10:16	Alexandra J Mattheus	02/08/2022 09:16	Alexandra J Mattheus	2302095
EPA 353.2 Rev. 2.0	01/27/2022			02/01/2022 09:09	Beverly Y. Sanders	2302094
	01/27/2022			02/01/2022 09:16	Beverly Y. Sanders	2302095
	01/27/2022			02/01/2022 09:17	Beverly Y. Sanders	2302099
EPA 365.1 Rev. 2.0	01/27/2022	02/01/2022 11:50	Simonne.V. Calhoun	02/07/2022 15:19	Shengyu Ding	2302094
	01/27/2022	02/01/2022 11:50	Simonne.V. Calhoun	02/07/2022 15:20	Shengyu Ding	2302095
	01/27/2022	02/01/2022 11:50	Simonne.V. Calhoun	02/07/2022 15:21	Shengyu Ding	2302099
EPA 365.1 Rev. 2.0 dissolved	01/27/2022			01/27/2022 14:16	James L Waggeberby	2302096
	01/27/2022			01/27/2022 14:21	James L Waggeberby	2302097
	01/27/2022			01/27/2022 14:27	James L Waggeberby	2302100
SM 2320 B-2011	01/27/2022			01/28/2022 19:35	Dale L. Simmons	2302092
	01/27/2022			01/28/2022 19:44	Dale L. Simmons	2302093
	01/27/2022			01/28/2022 19:52	Dale L. Simmons	2302098
SM 2340B	01/27/2022			02/02/2022 13:42	Josef B Mick	2302106
	01/27/2022			02/02/2022 14:21	Josef B Mick	2302107
SM 2540 C-2011	01/27/2022			02/01/2022 14:37	Yijie Li	2302092, 2302093, 2302098
SM 2540 D-2011	01/27/2022			02/01/2022 14:37	Yijie Li	2302092, 2302093, 2302098
SM 4500 F-C-2011	01/27/2022			01/28/2022 19:35	Dale L. Simmons	2302092
	01/27/2022			01/28/2022 19:44	Dale L. Simmons	2302093
	01/27/2022			01/28/2022 19:52	Dale L. Simmons	2302098
SM 5310 B-2011	01/27/2022			02/14/2022 20:33	Khloe J Berg	2302094
	01/27/2022			02/14/2022 20:47	Khloe J Berg	2302095
	01/27/2022			02/14/2022 21:01	Khloe J Berg	2302099