Chemical Analysis Report

NE-DIST-2021-10-15-04

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

Event Description: **LSJR West Boat 2021**
Request ID: **RQ-2021-10-11-27**
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: Colin Wright, Program Administrator

Date Certified: 10-NOV-2021 09:04

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: Cedar CR Blanding Blvd Br Rt 21 **Collection Date/Time: 10/14/2021 10:05**

Field ID: 20030083 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2283865	EPA 180.1 Rev. 2.0	Turbidity	10		NTU	P405129	
	SM 2320 B-2011	Total Alkalinity	97		mg CaCO3/L	P405378	
	SM 2540 D-2011	TSS	14		mg/L	P405596	
	SM 4500 F-C-2011	Fluoride	0.13		mg F/L	P405382	
2283866	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P405562	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P405312	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.033		mg N/L	P405317	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P405331	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P405620	
2283867	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.051		mg P/L	P405126	
2283872	EPA 200.7 Rev. 4.4	Calcium	37.1		mg/L	P405273	
		Iron	210		ug/L	P405273	
		Magnesium	8.27		mg/L	P405273	
		Manganese	23.9		ug/L	P405273	
		Zinc	10	I	ug/L	P405273	
	EPA 200.8 Rev. 5.4	Aluminum	147		ug/L	P405273	
		Antimony	0.24		ug/L	P405273	
		Arsenic	2.95		ug/L	P405273	
		Beryllium	0.010	U	ug/L	P405273	
		Cadmium	0.020	U	ug/L	P405273	
		Chromium	0.46	I	ug/L	P405273	
		Copper	1.92		ug/L	P405273	
		Lead	2.25		ug/L	P405273	
		Nickel	0.62	I	ug/L	P405273	
		Selenium	0.20	U	ug/L	P405273	
		Silver	0.010	U	ug/L	P405273	
		Thallium	0.10	U	ug/L	P405273	

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

Sample Location: Yellow Water CR At Sr 228 **Collection Date/Time: 10/14/2021 11:20**

Field ID: 20030549 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2283873	EPA 200.7 Rev. 4.4	Barium	26.0		ug/L	P405273	
		Calcium	11.2		mg/L	P405273	
		Iron	790		ug/L	P405273	
		Magnesium	2.42		mg/L	P405273	
		Manganese	10.3		ug/L	P405273	
		Potassium	0.81	I	mg/L	P405273	
		Sodium	6.7		mg/L	P405273	
		Zinc	5.0	U	ug/L	P405273	
	EPA 200.8 Rev. 5.4	Aluminum	93		ug/L	P405273	
		Antimony	0.050	U	ug/L	P405273	
		Arsenic	0.26		ug/L	P405273	
		Beryllium	0.021	I	ug/L	P405273	
		Boron**	16.1		ug/L	P405273	
		Cadmium	0.020	U	ug/L	P405273	
		Chromium	0.40	I	ug/L	P405273	
		Copper	0.40	U	ug/L	P405273	
		Lead	0.26	I	ug/L	P405273	
		Nickel	0.50	U	ug/L	P405273	
		Selenium	0.20	U	ug/L	P405273	
		Silver	0.010	U	ug/L	P405273	
		Thallium	0.10	U	ug/L	P405273	
	SM 2340B	Hardness	38.0		mg/L	P405273	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P405129

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P405273

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: P405273

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 350.1 Rev. 2.0
Batch ID: P405562

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405312

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405317

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405126

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

Reference Method: SM 2320 B-2011
Batch ID: P405378

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

Reference Method: SM 2540 D-2011
Batch ID: P405596

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P405382

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P405620

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P405273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	106		P	85 - 115
Calcium	107		P	85 - 115
Iron	109		P	85 - 115
Magnesium	111		P	85 - 115
Manganese	105		P	85 - 115
Potassium	105		P	85 - 115
Sodium	108		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P405273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	104		P	85 - 115
Antimony	106		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	95.5		P	85 - 115
Boron	102		P	85 - 115
Cadmium	99.5		P	85 - 115
Chromium	102		P	85 - 115
Copper	102		P	85 - 115
Lead	104		P	85 - 115
Nickel	102		P	85 - 115
Selenium	107		P	85 - 115
Silver	104		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405562

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405312

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405317

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405126

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

Reference Method: SM 2320 B-2011
Batch ID: P405378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.0		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P405382

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P405620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P405273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283861	Barium	106		P	80 - 120
2283861	Calcium	96.2		P	80 - 120
2283861	Iron	107		P	80 - 120
2283861	Magnesium	98.7		P	80 - 120
2283861	Manganese	105		P	80 - 120
2283861	Potassium	100		P	80 - 120
2283861	Sodium	96.7		P	80 - 120
2283861	Zinc	101		P	80 - 120
2284324	Barium	106	108	P/P	80 - 120
2284324	Calcium	102	106	P/P	80 - 120
2284324	Iron	105	108	P/P	80 - 120
2284324	Magnesium	106	110	P/P	80 - 120
2284324	Manganese	104	106	P/P	80 - 120
2284324	Potassium	101	104	P/P	80 - 120
2284324	Sodium	104	104	P/P	80 - 120
2284324	Zinc	97.9	99.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P405273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283861	Aluminum	103		P	80 - 120
2283861	Antimony	109		P	80 - 120
2283861	Arsenic	104		P	80 - 120
2283861	Beryllium	95.0		P	80 - 120
2283861	Boron	103		P	80 - 120
2283861	Cadmium	102		P	80 - 120
2283861	Chromium	104		P	80 - 120
2283861	Copper	100		P	80 - 120
2283861	Lead	105		P	80 - 120
2283861	Nickel	99.9		P	80 - 120
2283861	Selenium	109		P	80 - 120
2283861	Silver	102		P	80 - 120
2283861	Thallium	105		P	80 - 120
2284324	Aluminum	106	107	P/P	80 - 120
2284324	Antimony	106	106	P/P	80 - 120
2284324	Arsenic	102	102	P/P	80 - 120
2284324	Beryllium	98.6	96.6	P/P	80 - 120
2284324	Boron	102	104	P/P	80 - 120
2284324	Cadmium	101	101	P/P	80 - 120
2284324	Chromium	109	103	P/P	80 - 120
2284324	Copper	100	101	P/P	80 - 120
2284324	Lead	104	104	P/P	80 - 120
2284324	Nickel	113	102	P/P	80 - 120
2284324	Selenium	108	108	P/P	80 - 120
2284324	Silver	103	104	P/P	80 - 120
2284324	Thallium	105	104	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405562

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405562

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283833	Ammonia-N	92.8	94.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2282778	Kjeldahl Nitrogen	100	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405317

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283775	NO2NO3-N	98.6	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284065	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405126

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283867	O-Phosphate-P	97.0	96.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P405382

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283923	Fluoride	99.8	98.7	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P405620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284221	Organic Carbon	98.9	99.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P405129

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283832	Turbidity	1.70	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P405273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284324	Barium	2.44	Spike	P	0 - 20
2284324	Calcium	2.90	Spike	P	0 - 20
2284324	Iron	2.81	Spike	P	0 - 20
2284324	Magnesium	2.71	Spike	P	0 - 20
2284324	Manganese	1.76	Spike	P	0 - 20
2284324	Potassium	2.38	Spike	P	0 - 20
2284324	Sodium	0.317	Spike	P	0 - 20
2284324	Zinc	1.23	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P405273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284324	Aluminum	0.849	Spike	P	0 - 20
2284324	Antimony	0.342	Spike	P	0 - 20
2284324	Arsenic	0.821	Spike	P	0 - 20
2284324	Beryllium	2.01	Spike	P	0 - 20
2284324	Boron	1.52	Spike	P	0 - 20
2284324	Cadmium	0.414	Spike	P	0 - 20
2284324	Chromium	5.71	Spike	P	0 - 20
2284324	Copper	0.868	Spike	P	0 - 20
2284324	Lead	0.585	Spike	P	0 - 20
2284324	Nickel	10.6	Spike	P	0 - 20
2284324	Selenium	0.325	Spike	P	0 - 20
2284324	Silver	1.08	Spike	P	0 - 20
2284324	Thallium	0.412	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405562

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283833	Ammonia-N	0.969	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2282778	Kjeldahl Nitrogen	1.38	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405317

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283775	NO2NO3-N	0.418	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284065	Total-P	2.20	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283867	O-Phosphate-P	0.542	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P405378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283923	Total Alkalinity	0.277	Sample	P	0 - 5.2

Reference Method: SM 4500 F-C-2011
Batch ID: P405382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283923	Fluoride	1.03	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P405620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284221	Organic Carbon	0.212	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: A108361
Included Lab Sample IDs: 2283867

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	97.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A108362
Included Lab Sample IDs: 2283865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A108437
Included Lab Sample IDs: 2283866

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: A108452
Included Lab Sample IDs: 2283872, 2283873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	102	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Beryllium	95.4	93.2	P/P	90 - 110
Boron	100	105	P/P	90 - 110
Cadmium	98.7	99.2	P/P	90 - 110
Chromium	98.2	98.9	P/P	90 - 110
Lead	99.5	100	P/P	90 - 110
Nickel	97.1	97.0	P/P	90 - 110
Selenium	100	102	P/P	90 - 110
Silver	102	102	P/P	90 - 110
Thallium	99.9	100	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A108459
Included Lab Sample IDs: 2283865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.4	95.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A108459
Included Lab Sample IDs: 2283865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A108465
Included Lab Sample IDs: 2283866

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A108479
Included Lab Sample IDs: 2283872, 2283873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	90.9	90.9	P/P	90 - 110
Copper	93.8	90.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A108481
Included Lab Sample IDs: 2283866

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A108519
Included Lab Sample IDs: 2283866

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.5	99.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A108528
Included Lab Sample IDs: 2283872, 2283873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	106	106	P/P	90 - 110
Calcium	102	102	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Manganese	105	105	P/P	90 - 110
Potassium	99.2	99.4	P/P	90 - 110
Sodium	103	103	P/P	90 - 110
Zinc	99.7	98.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A108545
Included Lab Sample IDs: 2283866

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	96.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A108604
Included Lab Sample IDs: 2283872

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	103	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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
EPA 180.1 Rev. 2.0	Turbidity						1.70	
EPA 200.7 Rev. 4.4	Barium	106	106	106	108			2.44
	Calcium	107	96.2	102	106			2.90
	Iron	109	107	105	108			2.81
	Magnesium	111	98.7	106	110			2.71
	Manganese	105	105	104	106			1.76
	Potassium	105	100	101	104			2.38
	Sodium	108	96.7	104	104			0.317
	Zinc	100	101	97.9	99.1			1.23
EPA 200.8 Rev. 5.4	Aluminum	104	106	107	103			0.849
	Antimony	106	106	106	109			0.342
	Arsenic	102	102	102	104			0.821
	Beryllium	95.5	98.6	96.6	95.0			2.01
	Boron	102	102	104	103			1.52
	Cadmium	99.5	101	101	102			0.414
	Chromium	102	109	103	104			5.71
	Copper	102	100	100	101			0.868
	Lead	104	104	104	105			0.585
	Nickel	102	113	102	99.9			10.6
	Selenium	107	109	108	108			0.325
	Silver	104	103	104	102			1.08
	Thallium	102	105	104	105			0.412
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	92.8	94.0				0.969
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	100	102				1.38
EPA 353.2 Rev. 2.0	NO2NO3-N	102	98.6	99.0				0.418
EPA 365.1 Rev. 2.0	Total-P	99.6	103	101				2.20
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	97.0	96.2				0.542
SM 2320 B-2011	Total Alkalinity	98.0					0.277	
SM 4500 F-C-2011	Fluoride	99.8	99.8	98.7				1.03
SM 5310 B-2011	Organic Carbon	96.2	98.9	99.2				0.212

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2283865
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2283872, 2283873
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2283872, 2283873
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2283866
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2283866
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2283866
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2283866
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2283867
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2283865
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2283873
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2283865
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2283865
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2283866

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	10/15/2021			10/15/2021 16:27	Khloe J Berg	2283865
EPA 200.7 Rev. 4.4	10/15/2021	10/20/2021 10:00	Emily M Philpot	10/25/2021 23:40	Josef B Mick	2283872
	10/15/2021	10/20/2021 10:00	Emily M Philpot	10/25/2021 23:48	Josef B Mick	2283873
	10/15/2021	10/20/2021 10:00	Emily M Philpot	10/29/2021 00:50	Josef B Mick	2283872
EPA 200.8 Rev. 5.4	10/15/2021	10/20/2021 10:00	Emily M Philpot	10/20/2021 19:09	McKinley C Carter	2283872
	10/15/2021	10/20/2021 10:00	Emily M Philpot	10/20/2021 19:18	McKinley C Carter	2283873
	10/15/2021	10/20/2021 10:00	Emily M Philpot	10/21/2021 15:57	McKinley C Carter	2283872
	10/15/2021	10/20/2021 10:00	Emily M Philpot	10/21/2021 16:38	McKinley C Carter	2283873
EPA 350.1 Rev. 2.0	10/15/2021			10/22/2021 12:53	Ping Hua	2283866
EPA 351.2 Rev. 2.0	10/15/2021	10/20/2021 13:30	Benjamin T. Nordmann	10/21/2021 10:13	Alexandra J Mattheus	2283866
EPA 353.2 Rev. 2.0	10/15/2021			10/20/2021 12:02	Beverly Y. Sanders	2283866
EPA 365.1 Rev. 2.0	10/15/2021	10/20/2021 14:17	Simonne.V. Calhoun	10/22/2021 11:10	Lipi Saha	2283866
EPA 365.1 Rev. 2.0 dissolved	10/15/2021			10/15/2021 14:27	James L Waggerby	2283867
SM 2320 B-2011	10/15/2021			10/19/2021 22:32	Dale L. Simmons	2283865
SM 2340B	10/15/2021			10/25/2021 23:48	Josef B Mick	2283873
SM 2540 D-2011	10/15/2021			10/19/2021 15:08	Yijie Li	2283865
SM 4500 F-C-2011	10/15/2021			10/19/2021 22:32	Dale L. Simmons	2283865
SM 5310 B-2011	10/15/2021			10/25/2021 23:26	Khloe J Berg	2283866