

Chemical Analysis Report

WQAP-2021-12-21-04

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

Event Description: **Lake Jackson**
Request ID: **RQ-2021-09-13-04**
Customer: **WQAP**
Project ID: **LK-JACKSON**

Send Reports to:
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 13-JAN-2022 17:35



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: Crystal Lake Center

Collection Date/Time: 12/21/2021 11:25

Field ID: G3TLHR0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2296542	EPA 180.1 Rev. 2.0	Turbidity	0.45		NTU	P407777	
	EPA 300.0 Rev. 2.1	Chloride	2.4		mg Cl/L	P408063	
		Sulfate	3.5		mg SO4/L	P408065	
		Color (true)	3.2	I	PCU	P407774	
	SM 2320 B-2011	Total Alkalinity	5.1		mg CaCO3/L	P407987	
	SM 2540 C-2011	TDS	19	I	mg/L	P407915	
	SM 2540 D-2011	TSS	2	U	mg/L	P407819	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P407994	
2296543	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P408071	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.15	I	mg N/L	P408017	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P407885	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P408003	MS
	SM 5310 B-2011	Organic Carbon	1.8		mg C/L	P408266	
2296544	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P407806	
2296548	EPA 200.7 Rev. 4.4	Barium	4.4		ug/L	P407790	
		Calcium	2.68		mg/L	P407790	
		Iron	30	U	ug/L	P407790	
		Magnesium	0.70		mg/L	P407790	
		Manganese	2.0	I	ug/L	P407790	
		Potassium	0.35	I	mg/L	P407790	
		Sodium	1.6	I	mg/L	P407790	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P407790	
		Aluminum	10	I	ug/L	P407790	
		Antimony	0.050	U	ug/L	P407790	
		Arsenic	1.35		ug/L	P407790	
		Beryllium	0.010	U	ug/L	P407790	
		Boron**	11.5		ug/L	P407790	
		Cadmium	0.020	U	ug/L	P407790	
		Chromium	0.40	U	ug/L	P407790	
		Copper	0.53	I	ug/L	P407790	
		Lead	0.20	U	ug/L	P407790	
		Nickel	0.50	U	ug/L	P407790	
		Selenium	0.20	U	ug/L	P407790	
		Silver	0.010	U	ug/L	P407790	
		Thallium	0.10	U	ug/L	P407790	
		Hardness	9.6		mg/L	P407790	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P407777

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P407790

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: P407790

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: P408063

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P408065

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408071

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408017

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407885

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408003

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407806

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

Reference Method: SM 2120 B-2011
Batch ID: P407774

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P407987

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

Reference Method: SM 2540 C-2011
Batch ID: P407915

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P407819

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P407994

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P408266

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: P407790

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	107		P	85 - 115
Iron	108		P	85 - 115
Magnesium	107		P	85 - 115
Manganese	102		P	85 - 115
Potassium	106		P	85 - 115
Sodium	105		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P407790

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	97.6		P	85 - 115
Boron	98.6		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	103		P	85 - 115
Copper	102		P	85 - 115
Lead	98.2		P	85 - 115
Nickel	104		P	85 - 115
Selenium	104		P	85 - 115
Silver	107		P	85 - 115
Thallium	99.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P408063

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P408065

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408071

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408017

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407885

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408003

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407806

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P407774

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P407987

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.9		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P407994

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

Reference Method: SM 5310 B-2011
Batch ID: P408266

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P407790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296447	Barium	99.4		P	80 - 120
2296447	Calcium	98.8		P	80 - 120
2296447	Iron	104		P	80 - 120
2296447	Magnesium	99.2		P	80 - 120
2296447	Manganese	98.8		P	80 - 120
2296447	Potassium	103		P	80 - 120
2296447	Sodium	99.5		P	80 - 120
2296447	Zinc	102		P	80 - 120
2296531	Barium	101	101	P/P	80 - 120
2296531	Calcium	99.7	103	P/P	80 - 120
2296531	Iron	103	106	P/P	80 - 120
2296531	Magnesium	100	105	P/P	80 - 120
2296531	Manganese	101	101	P/P	80 - 120
2296531	Potassium	109	111	P/P	80 - 120
2296531	Sodium	104	103	P/P	80 - 120
2296531	Zinc	104	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P407790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296447	Aluminum	104		P	80 - 120
2296447	Antimony	105		P	80 - 120
2296447	Arsenic	102		P	80 - 120
2296447	Beryllium	95.3		P	80 - 120
2296447	Boron	103		P	80 - 120
2296447	Cadmium	104		P	80 - 120
2296447	Chromium	105		P	80 - 120
2296447	Copper	101		P	80 - 120
2296447	Lead	98.6		P	80 - 120
2296447	Nickel	101		P	80 - 120
2296447	Selenium	101		P	80 - 120
2296447	Silver	107		P	80 - 120
2296447	Thallium	101		P	80 - 120
2296531	Aluminum	105	103	P/P	80 - 120
2296531	Antimony	103	103	P/P	80 - 120
2296531	Arsenic	103	102	P/P	80 - 120
2296531	Beryllium	96.6	96.4	P/P	80 - 120
2296531	Boron	103	101	P/P	80 - 120
2296531	Cadmium	102	102	P/P	80 - 120
2296531	Chromium	104	104	P/P	80 - 120
2296531	Copper	106	105	P/P	80 - 120
2296531	Lead	101	100	P/P	80 - 120
2296531	Nickel	105	105	P/P	80 - 120
2296531	Selenium	103	104	P/P	80 - 120
2296531	Silver	107	107	P/P	80 - 120
2296531	Thallium	102	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P408063

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P408063

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296526	Chloride	103		P	90 - 110
2296550	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P408065

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296526	Sulfate	99.5		P	90 - 110
2296550	Sulfate	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296481	Ammonia-N	93.8	95.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408017

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2295142	Kjeldahl Nitrogen	106	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296543	NO2NO3-N	99.6	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408003

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296576	Total-P	110	109	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296539	O-Phosphate-P	98.2	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P407994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296526	Fluoride	98.6	99.2	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P408266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2296426	Organic Carbon	92.1	94.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P407777

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296187	Turbidity	0.922	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P407790

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296531	Barium	0.579	Spike	P	0 - 20
2296531	Calcium	3.09	Spike	P	0 - 20
2296531	Iron	3.00	Spike	P	0 - 20
2296531	Magnesium	3.74	Spike	P	0 - 20
2296531	Manganese	0.858	Spike	P	0 - 20
2296531	Potassium	1.43	Spike	P	0 - 20
2296531	Sodium	0.354	Spike	P	0 - 20
2296531	Zinc	1.25	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P407790

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296531	Aluminum	1.69	Spike	P	0 - 20
2296531	Antimony	0.126	Spike	P	0 - 20
2296531	Arsenic	0.426	Spike	P	0 - 20
2296531	Beryllium	0.255	Spike	P	0 - 20
2296531	Boron	1.27	Spike	P	0 - 20
2296531	Cadmium	0.0844	Spike	P	0 - 20
2296531	Chromium	0.427	Spike	P	0 - 20
2296531	Copper	0.537	Spike	P	0 - 20
2296531	Lead	0.604	Spike	P	0 - 20
2296531	Nickel	0.438	Spike	P	0 - 20
2296531	Selenium	0.734	Spike	P	0 - 20
2296531	Silver	0.470	Spike	P	0 - 20
2296531	Thallium	1.43	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P408063

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296526	Chloride	0.968	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P408065

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296526	Sulfate	1.39	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296481	Ammonia-N	1.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408017

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295142	Kjeldahl Nitrogen	2.85	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296543	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408003

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296576	Total-P	1.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296539	O-Phosphate-P	3.21	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P407774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296537	Color (true)	3.14	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P407987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296526	Total Alkalinity	3.63	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P407915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295938	TDS	2.87	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P407994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296526	Fluoride	0.492	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P408266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2296426	Organic Carbon	1.62	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B-2011

Run ID: A109516

Included Lab Sample IDs: 2296542

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A109517

Included Lab Sample IDs: 2296542

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A109534

Included Lab Sample IDs: 2296544

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A109563

Included Lab Sample IDs: 2296543

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A109575

Included Lab Sample IDs: 2296548

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.4	96.0	P/P	90 - 110
Calcium	97.9	97.0	P/P	90 - 110
Iron	98.7	98.1	P/P	90 - 110
Magnesium	98.0	97.3	P/P	90 - 110
Manganese	98.0	97.1	P/P	90 - 110
Potassium	98.3	98.4	P/P	90 - 110
Sodium	97.8	97.8	P/P	90 - 110
Zinc	100	96.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109624

Included Lab Sample IDs: 2296548

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	100	P/P	90 - 110
Antimony	99.3	99.5	P/P	90 - 110
Arsenic	100	98.1	P/P	90 - 110
Beryllium	94.4	94.2	P/P	90 - 110
Boron	99.6	99.6	P/P	90 - 110
Cadmium	100	99.8	P/P	90 - 110
Chromium	96.7	96.2	P/P	90 - 110
Nickel	96.9	97.1	P/P	90 - 110
Selenium	98.9	98.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109624

Included Lab Sample IDs: 2296548

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	103	103	P/P	90 - 110
Thallium	107	102	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A109633

Included Lab Sample IDs: 2296542

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.3	96.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A109633

Included Lab Sample IDs: 2296542

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A109643

Included Lab Sample IDs: 2296548

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	100	98.0	P/P	90 - 110
Lead	93.2	93.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A109657

Included Lab Sample IDs: 2296542

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	105	104	P/P	90 - 110
Sulfate	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A109659

Included Lab Sample IDs: 2296543

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A109698

Included Lab Sample IDs: 2296543

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.7	96.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A109706

Included Lab Sample IDs: 2296543

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.2	96.8	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A109754

Included Lab Sample IDs: 2296543

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.8	98.4	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				
EPA 180.1 Rev. 2.0	Turbidity					0.922	
EPA 200.7 Rev. 4.4	Barium	102	99.4	101	101		0.579
	Calcium	107	98.8	99.7	103		3.09
	Iron	108	104	103	106		3.00
	Magnesium	107	99.2	100	105		3.74
	Manganese	102	98.8	101	101		0.858
	Potassium	106	103	109	111		1.43
	Sodium	105	99.5	104	103		0.354
	Zinc	104	102	104	105		1.25
EPA 200.8 Rev. 5.4	Aluminum	102	105	103	104		1.69
	Antimony	102	103	103	105		0.126
	Arsenic	102	103	102	102		0.426
	Beryllium	97.6	96.6	96.4	95.3		0.255
	Boron	98.6	103	101	103		1.27
	Cadmium	101	102	102	104		0.0844
	Chromium	103	104	104	105		0.427
	Copper	102	106	105	101		0.537
	Lead	98.2	101	100	98.6		0.604
	Nickel	104	105	105	101		0.438
	Selenium	104	103	104	101		0.734
	Silver	107	107	107	107		0.470
	Thallium	99.8	102	103	101		1.43
EPA 300.0 Rev. 2.1	Chloride	103	103	103		0.968	
	Sulfate	99.9	99.5	99.3		1.39	
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	93.8	95.0			1.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	103	106			2.85
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	99.6	99.6			0.0
EPA 365.1 Rev. 2.0	Total-P	109	110	109			1.03
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	98.2	101			3.21
SM 2120 B-2011	Color (true)	103				3.14	
SM 2320 B-2011	Total Alkalinity	99.9				3.63	
SM 2540 C-2011	TDS					2.87	
SM 4500 F-C-2011	Fluoride	99.8	98.6	99.2			0.492
SM 5310 B-2011	Organic Carbon	95.5	92.1	94.6			1.62

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2296542
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2296548
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2296548
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2296542
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2296542
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2296543
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2296543
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2296543
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2296543
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2296544
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2296542
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2296542

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2296548
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2296542
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2296542
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2296542
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2296543

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	12/21/2021			12/21/2021 16:02	Khloe J Berg	2296542
EPA 200.7 Rev. 4.4	12/21/2021	12/22/2021 10:05	Vijayalakshmi Reddy	12/28/2021 03:53	Josef B Mick	2296548
EPA 200.8 Rev. 5.4	12/21/2021	12/22/2021 10:05	Vijayalakshmi Reddy	01/03/2022 17:58	Alexander Thompson	2296548
	12/21/2021	12/22/2021 10:05	Vijayalakshmi Reddy	12/29/2021 18:25	McKinley C Carter	2296548
EPA 300.0 Rev. 2.1	12/21/2021			12/29/2021 15:02	Roberta Tatti	2296542
EPA 350.1 Rev. 2.0	12/21/2021			01/04/2022 12:08	Roberta Tatti	2296543
EPA 351.2 Rev. 2.0	12/21/2021	01/04/2022 12:52	Samantha L Bates	01/06/2022 11:33	Alexandra J Mattheus	2296543
EPA 353.2 Rev. 2.0	12/21/2021			12/27/2021 11:53	Beverly Y. Sanders	2296543
EPA 365.1 Rev. 2.0	12/21/2021	01/04/2022 16:25	Simonne.V. Calhoun	01/06/2022 15:37	Shengyu Ding	2296543
EPA 365.1 Rev. 2.0 dissolved	12/21/2021			12/22/2021 14:02	James L Waggeberby	2296544
SM 2120 B-2011	12/21/2021			12/21/2021 16:39	Samantha L Bates	2296542
SM 2320 B-2011	12/21/2021			12/28/2021 20:00	Dale L. Simmons	2296542
SM 2340B	12/21/2021			12/28/2021 03:53	Josef B Mick	2296548
SM 2540 C-2011	12/21/2021			12/21/2021 16:06	Yijie Li	2296542
SM 2540 D-2011	12/21/2021			12/21/2021 16:06	Yijie Li	2296542
SM 4500 F-C-2011	12/21/2021			12/28/2021 20:00	Dale L. Simmons	2296542
SM 5310 B-2011	12/21/2021			01/07/2022 00:26	Touraj Touran	2296543