

Chemical Analysis Report

SW-DIST-2016-08-19-01

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

Event Description: **Reference Lake**
Request ID: **RQ-2016-08-15-38**
Customer: **SW-DIST**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Judy Ashton

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 13-SEP-2016 12:58

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light-colored rectangular background.

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 or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Arbuckle Ref. Lake

Collection Date/Time: 08/18/2016 15:15

Field ID: Arbuckle

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1825042	EPA 300.0	Bromide**	0.037	I	mg Br/L	P310191	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P310192	
		Sulfate	16		mg SO4/L	P310193	
		Color (true)	200		PCU	P310049	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P310236	
	SM 4500 F-C-97	Fluoride	0.077	I	mg F/L	P310241	
1825043	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P310059	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.97		mg N/L	P310124	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P310476	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P310103	
1825044	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P310033	
1825047	EPA 200.7 Rev. 4.4	Calcium	8.53		mg/L	P310115	
		Iron	240		ug/L	P310115	
		Magnesium	4.77		mg/L	P310115	
		Potassium	4.7		mg/L	P310115	
		Sodium	6.3		mg/L	P310115	
		Zinc	5.0	U	ug/L	P310115	
	EPA 200.8 Rev. 5.4	Arsenic	0.41		ug/L	P310115	
		Cadmium	0.020	U	ug/L	P310115	
		Chromium	0.33		ug/L	P310115	
		Copper	0.35	I	ug/L	P310115	
		Lead	0.23		ug/L	P310115	
		Nickel	0.24		ug/L	P310115	
		Silver	0.0050	U	ug/L	P310115	

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P310115

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P310115

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310115

Component	Result	Code	Units
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0
Batch ID: P310191

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310192

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310193

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310124

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310476

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310103

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310033

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
 Batch ID: P310049

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
 Batch ID: P310236

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

Reference Method: SM 4500 F-C-97
 Batch ID: P310241

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P310115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	107		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P310115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	103		P	85 - 115
Copper	96.0		P	85 - 115
Lead	98.7		P	85 - 115
Nickel	97.2		P	85 - 115
Silver	98.8		P	85 - 115

Reference Method: EPA 300.0
 Batch ID: P310191

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

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P310192

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310193

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310124

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310476

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310103

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310033

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

Reference Method: SM 2320 B-97
Batch ID: P310236

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P310241

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.7		P	92 - 103

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310115

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824544	Calcium	105		P	80 - 120
1824544	Iron	107	108	P/P	80 - 120
1824544	Magnesium	104		P	80 - 120
1824544	Potassium	102	104	P/P	80 - 120
1824544	Sodium	105		P	80 - 120
1824544	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824544	Arsenic	101	101	P/P	80 - 120
1824544	Cadmium	99.9	103	P/P	80 - 120
1824544	Chromium	101	102	P/P	80 - 120
1824544	Copper	92.3	92.1	P/P	80 - 120
1824544	Lead	98.0	99.0	P/P	80 - 120
1824544	Nickel	93.4	93.4	P/P	80 - 120
1824544	Silver	98.7	95.0	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P310191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825042	Bromide	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310192

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825042	Chloride	98.6	99.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825042	Sulfate	97.9	98.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824536	Ammonia-N	101	99.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824772	Kjeldahl Nitrogen	88.8	89.0	F/F	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310476

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824933	NO2NO3-N	92.7	94.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310103

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824933	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825082	O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P310241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824689	Fluoride	98.8	99.4	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P310115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824544	Calcium	0.238	Spike	P	0 - 20
1824544	Iron	1.05	Spike	P	0 - 20
1824544	Magnesium	0.580	Spike	P	0 - 20
1824544	Potassium	1.63	Spike	P	0 - 20
1824544	Sodium	1.50	Spike	P	0 - 20
1824544	Zinc	0.781	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P310115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824544	Arsenic	0.244	Spike	P	0 - 20
1824544	Cadmium	3.15	Spike	P	0 - 20
1824544	Chromium	0.646	Spike	P	0 - 20
1824544	Copper	0.285	Spike	P	0 - 20
1824544	Lead	0.983	Spike	P	0 - 20
1824544	Nickel	0.0365	Spike	P	0 - 20
1824544	Silver	3.89	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0
Batch ID: P310191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1825042	Bromide	1.37	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310192

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1825042	Chloride	0.277	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1825042	Sulfate	0.495	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824536	Ammonia-N	0.983	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824772	Kjeldahl Nitrogen	0.158	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824933	NO2NO3-N	1.51	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824933	Total-P	1.21	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310033

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1825082	O-Phosphate-P	0.801	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P310049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1825058	Color (true)	4.54	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P310236

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824689	Total Alkalinity	0.233	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P310241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824689	Fluoride	0.474	Spike	P	0 - 3.0

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71234
Included Lab Sample IDs: 1825044

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.4	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A71237
Included Lab Sample IDs: 1825042

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.5	97.2	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71238
Included Lab Sample IDs: 1825043

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71278
Included Lab Sample IDs: 1825043

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0

Run ID: A71280

Included Lab Sample IDs: 1825042

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	97.1	97.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71280

Included Lab Sample IDs: 1825042

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.7	99.7	P/P	90 - 110
Sulfate	99.6	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71286

Included Lab Sample IDs: 1825043

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	106	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A71291

Included Lab Sample IDs: 1825042

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A71291

Included Lab Sample IDs: 1825042

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71309

Included Lab Sample IDs: 1825047

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	101	102	P/P	90 - 110
Sodium	100	100	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71314

Included Lab Sample IDs: 1825047

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.3	98.9	P/P	90 - 110
Cadmium	99.3	99.3	P/P	90 - 110
Chromium	104	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71314

Included Lab Sample IDs: 1825047

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	97.2	96.9	P/P	90 - 110
Nickel	97.4	95.6	P/P	90 - 110
Silver	98.3	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71367

Included Lab Sample IDs: 1825047

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	97.8	95.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71378

Included Lab Sample IDs: 1825043

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	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	LCS	Precision SMP	MS
EPA 200.7 Rev. 4.4	Calcium	105	105			0.238
	Iron	107	107	108		1.05
	Magnesium	103	104			0.580
	Potassium	101	102	104		1.63
	Sodium	102	105			1.50
	Zinc	104	101	102		0.781
EPA 200.8 Rev. 5.4	Arsenic	100	101	101		0.244
	Cadmium	98.9	99.9	103		3.15
	Chromium	103	101	102		0.646
	Copper	96.0	92.3	92.1		0.285
	Lead	98.7	98.0	99.0		0.983
	Nickel	97.2	93.4	93.4		0.0365
	Silver	98.8	98.7	95.0		3.89
EPA 300.0	Bromide	103	103	104		1.37
EPA 300.0 Rev. 2.1	Chloride	99.5	98.6	99.0		0.277
	Sulfate	99.5	97.9	98.7		0.495
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	99.9		0.983
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.9	88.8	89.0		0.158
EPA 353.2 Rev. 2.0	NO2NO3-N	101	92.7	94.7		1.51
EPA 365.1 Rev. 2.0	Total-P	99.4	103	105		1.21
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.5	100		0.801
SM 2120 B	Color (true)				4.54	
SM 2320 B-97	Total Alkalinity	103			0.233	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
SM 4500 F-C-97	Fluoride	99.7	98.8 99.4			0.474

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1825047
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1825047
EPA 300.0 / E31780	Bromide in aqueous matrices	1825042
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1825042
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1825042
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1825043
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1825043
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1825043
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1825043
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1825044
SM 2120 B / E31780	True Color measured at 450 nm	1825042
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1825042
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1825042

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	08/19/2016	08/22/2016	Elliott D. Healy	08/24/2016	Joshua Ayres	1825047
EPA 200.8 Rev. 5.4	08/19/2016	08/22/2016	Elliott D. Healy	08/24/2016	Charles J. Peterson	1825047
	08/19/2016	08/22/2016	Elliott D. Healy	08/26/2016	Charles J. Peterson	1825047
EPA 300.0	08/19/2016			08/23/2016	Ping Hua	1825042
EPA 300.0 Rev. 2.1	08/19/2016			08/23/2016	Ping Hua	1825042
EPA 350.1 Rev. 2.0	08/19/2016			08/21/2016	Julie Michelle Frank	1825043
EPA 351.2 Rev. 2.0	08/19/2016	08/23/2016	Sofia Elnemr	08/24/2016	Christopher Armour	1825043
EPA 353.2 Rev. 2.0	08/19/2016			08/29/2016	Beverly Y. Sanders	1825043
EPA 365.1 Rev. 2.0	08/19/2016	08/22/2016	Vijayalakshmi Reddy	08/23/2016	Lipi Saha	1825043
EPA 365.1 Rev. 2.0 dissolved	08/19/2016			08/19/2016 14:43	Julia Storbeck	1825044
SM 2120 B	08/19/2016			08/19/2016 16:40	Rochelle Y Jackson	1825042
SM 2320 B-97	08/19/2016			08/24/2016	Dale L. Simmons	1825042
SM 4500 F-C-97	08/19/2016			08/24/2016	Dale L. Simmons	1825042