

Chemical Analysis Report

SW-DIST-2017-06-23-01

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

Event Description: **Reference Hammock Lake**

Request ID: **RQ-2017-06-19-31**

Customer: **SW-DIST**

Project ID: **LAKESREF**

Send Reports to:

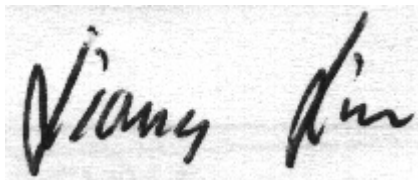
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Judy Ashton

For additional information please contact

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Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-JUL-2017 09:36

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored 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: HAMMOCK LAKE

Collection Date/Time: 06/22/2017 10:00

Field ID: HAMMOCKLK

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1908515	EPA 300.0	Bromide**	0.10		mg Br/L	P327508	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P327505	
		Sulfate	3.1		mg SO4/L	P327507	
	SM 2120 B	Color (true)	95	A	PCU	P327421	
	SM 2320 B-97	Total Alkalinity	3.5		mg CaCO3/L	P327617	
	SM 4500 F-C-97	Fluoride	0.22		mg F/L	P327620	RPD
1908516	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P327431	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P327437	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P327604	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P327469	
1908517	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327426	
1908520	EPA 200.7 Rev. 4.4	Calcium	3.04		mg/L	P327482	
		Iron	170		ug/L	P327482	
		Magnesium	2.85		mg/L	P327482	
		Potassium	2.6		mg/L	P327482	
		Sodium	16.8		mg/L	P327482	
		Zinc	5.0	U	ug/L	P327482	
	EPA 200.8 Rev. 5.4	Arsenic	0.57		ug/L	P327482	
		Cadmium	0.020	U	ug/L	P327482	
		Chromium	0.40	U	ug/L	P327482	
		Copper	0.55	I	ug/L	P327482	
		Lead	0.21		ug/L	P328262	
		Nickel	0.20	U	ug/L	P327482	
		Silver	0.010	U	ug/L	P327482	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P327482

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: P327482

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327482

Component	Result	Code	Units
Copper	0.20	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P328262

Component	Result	Code	Units
Lead	0.050	U	ug/L

Reference Method: EPA 300.0
Batch ID: P327508

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327505

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327507

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327431

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327437

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327604

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327469

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P327426

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

Reference Method: SM 2120 B
 Batch ID: P327421

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
 Batch ID: P327617

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

Reference Method: SM 4500 F-C-97
 Batch ID: P327620

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: P327482

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	100		P	85 - 115
Sodium	101		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P327482

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.2		P	85 - 115
Cadmium	99.2		P	85 - 115
Chromium	95.0		P	85 - 115
Copper	96.7		P	85 - 115
Nickel	97.8		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P328262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Lead	96.5		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0
Batch ID: P327508

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327507

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327431

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327437

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327604

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327469

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: P327426

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

Reference Method: SM 2320 B-97
Batch ID: P327617

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P327620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.8		P	92 - 103

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908126	Calcium	108		P	80 - 120
1908126	Iron	111		P	80 - 120
1908126	Magnesium	113		P	80 - 120
1908126	Potassium	104		P	80 - 120
1908126	Sodium	103		P	80 - 120
1908126	Zinc	105		P	80 - 120
1908510	Calcium	110		P	80 - 120
1908510	Iron	110	109	P/P	80 - 120
1908510	Magnesium	107		P	80 - 120
1908510	Potassium	103	104	P/P	80 - 120
1908510	Sodium	106		P	80 - 120
1908510	Zinc	102	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908126	Arsenic	99.8		P	80 - 120
1908126	Cadmium	99.0		P	80 - 120
1908126	Chromium	93.8		P	80 - 120
1908126	Copper	96.6		P	80 - 120
1908126	Nickel	97.0		P	80 - 120
1908126	Silver	101		P	80 - 120
1908510	Arsenic	103	104	P/P	80 - 120
1908510	Cadmium	103	102	P/P	80 - 120
1908510	Chromium	94.5	94.5	P/P	80 - 120
1908510	Copper	96.1	97.6	P/P	80 - 120
1908510	Nickel	97.1	98.5	P/P	80 - 120
1908510	Silver	101	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P328262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908511	Lead	89.6	98.0	P/P	80 - 120
1909386	Lead	97.0		P	80 - 120

Reference Method: EPA 300.0
Batch ID: P327508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906742	Bromide	98.4		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0
Batch ID: P327508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908515	Bromide	100	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908515	Chloride	94.2	96.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908515	Sulfate	96.9	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327431

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908501	Ammonia-N	94.6	93.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327604

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908516	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908502	Total-P	93.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908517	O-Phosphate-P	97.0	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P327620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908632	Fluoride	93.8	97.2	P/P	91 - 105

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P327482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908510	Calcium	0.865	Spike	P	0 - 20
1908510	Iron	0.223	Spike	P	0 - 20
1908510	Magnesium	0.413	Spike	P	0 - 20
1908510	Potassium	0.428	Spike	P	0 - 20
1908510	Sodium	0.601	Spike	P	0 - 20
1908510	Zinc	0.491	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P327482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908510	Arsenic	0.937	Spike	P	0 - 20
1908510	Cadmium	0.173	Spike	P	0 - 20
1908510	Chromium	0.0337	Spike	P	0 - 20
1908510	Copper	1.59	Spike	P	0 - 20
1908510	Nickel	1.43	Spike	P	0 - 20
1908510	Silver	0.127	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P328262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908511	Lead	8.91	Spike	P	0 - 20

Reference Method: EPA 300.0
 Batch ID: P327508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908515	Bromide	1.28	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P327505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908515	Chloride	0.949	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P327507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908515	Sulfate	0.996	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P327431

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908501	Ammonia-N	0.680	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P327437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908527	Kjeldahl Nitrogen	2.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P327604

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908516	NO2NO3-N	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P327469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908502	Total-P	6.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P327426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908517	O-Phosphate-P	0.821	Spike	P	0 - 20

Reference Method: SM 2120 B
 Batch ID: P327421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908515	Color (true)	2.57	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P327617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908632	Total Alkalinity	0.690	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
 Batch ID: P327620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908632	Fluoride	3.18	Spike	F	0 - 3.0

Quality Assurance Report Precision

* 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: SM 2120 B
Run ID: A77313
Included Lab Sample IDs: 1908515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.0	100	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A77317
Included Lab Sample IDs: 1908517

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77320
Included Lab Sample IDs: 1908516

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.4	97.0	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A77352
Included Lab Sample IDs: 1908515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	95.0	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77352
Included Lab Sample IDs: 1908515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.4	99.4	P/P	90 - 110
Sulfate	101	97.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A77365
Included Lab Sample IDs: 1908516

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	98.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77373
Included Lab Sample IDs: 1908520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A77373

Included Lab Sample IDs: 1908520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	102	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	102	101	P/P	90 - 110
Zinc	99.7	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A77384

Included Lab Sample IDs: 1908516

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A77390

Included Lab Sample IDs: 1908515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A77390

Included Lab Sample IDs: 1908515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.4	96.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A77447

Included Lab Sample IDs: 1908516

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A77530

Included Lab Sample IDs: 1908520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.9	100	P/P	90 - 110
Cadmium	98.3	99.2	P/P	90 - 110
Chromium	93.3	95.4	P/P	90 - 110
Copper	98.8	99.4	P/P	90 - 110
Nickel	97.8	98.5	P/P	90 - 110
Silver	94.9	95.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A77671

Included Lab Sample IDs: 1908520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A77671

Included Lab Sample IDs: 1908520

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	98.2	98.8	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	108	110		0.865
	Iron	105	111	110	109	0.223
	Magnesium	103	113	107		0.413
	Potassium	100	104	103	104	0.428
	Sodium	101	103	106		0.601
	Zinc	103	105	102	102	0.491
EPA 200.8 Rev. 5.4	Arsenic	99.2	99.8	103	104	0.937
	Cadmium	99.2	99.0	103	102	0.173
	Chromium	95.0	93.8	94.5	94.5	0.0337
	Copper	96.7	96.6	96.1	97.6	1.59
	Lead	96.5	89.6	98.0	97.0	8.91
	Nickel	97.8	97.0	97.1	98.5	1.43
	Silver	100	101	101	101	0.127
	Bromide	101	100	102	98.4	1.28
EPA 300.0	Chloride	98.1	94.2	96.0		0.949
EPA 300.0 Rev. 2.1	Sulfate	97.3	96.9	98.0		0.996
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	94.6	93.8		0.680
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102				2.94
EPA 353.2 Rev. 2.0	NO2NO3-N	102	105	104		1.39
EPA 365.1 Rev. 2.0	Total-P	102	93.0	100		6.06
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	97.0	97.8		0.821
SM 2120 B	Color (true)				2.57	
SM 2320 B-97	Total Alkalinity	103			0.690	
SM 4500 F-C-97	Fluoride	95.8	93.8	97.2		3.18

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	1908520
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1908520
EPA 300.0 / E31780	Bromide in aqueous matrices	1908515
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1908515
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1908515
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1908516

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1908516
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1908516
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1908516
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1908517
SM 2120 B / E31780	True Color measured at 450 nm	1908515
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1908515
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1908515

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	06/23/2017	06/26/2017	Elliott D. Healy	06/27/2017	Betina Topolski	1908520
EPA 200.8 Rev. 5.4	06/23/2017	06/26/2017	Elliott D. Healy	07/06/2017	Nadine Brooks	1908520
	06/23/2017	07/11/2017	Elliott D. Healy	07/12/2017	Nadine Brooks	1908520
EPA 300.0	06/23/2017			06/26/2017	Ping Hua	1908515
EPA 300.0 Rev. 2.1	06/23/2017			06/26/2017	Ping Hua	1908515
EPA 350.1 Rev. 2.0	06/23/2017			06/23/2017	Sofia Elnemr	1908516
EPA 351.2 Rev. 2.0	06/23/2017	06/26/2017	Adrian Shelby	06/30/2017	Joseph Suarez	1908516
EPA 353.2 Rev. 2.0	06/23/2017			06/28/2017	Beverly Y. Sanders	1908516
EPA 365.1 Rev. 2.0	06/23/2017	06/26/2017	Vijayalakshmi Reddy	06/27/2017	Lipi Saha	1908516
EPA 365.1 Rev. 2.0 dissolved	06/23/2017			06/23/2017 15:17	Anthony C. Onicha	1908517
SM 2120 B	06/23/2017			06/23/2017 15:03	Tanya Welborn	1908515
SM 2320 B-97	06/23/2017			06/27/2017	Dale L. Simmons	1908515
SM 4500 F-C-97	06/23/2017			06/27/2017	Dale L. Simmons	1908515