Chemical Analysis Report

TLH-ROC-2018-05-24-02

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

Event Description: **kit C-b (WBID 3310) Aucilla River**
Request ID: **RQ-2018-04-16-35**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 18-JUN-2018 14:33

B. Steinbock

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: Aucilla River **Collection Date/Time: 05/24/2018 09:00**

Field ID: G1TLHR0019 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1995423	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P345908	
	EPA 300.0 Rev. 2.1	Chloride	4.7		mg Cl/L	P346221	
		Sulfate	0.78		mg SO4/L	P346225	
	SM 2120 B	Color (true)	460		PCU	P345888	
	SM 2320 B-97	Total Alkalinity	13		mg CaCO3/L	P346092	RPD
	SM 2540 C-97	TDS	120		mg/L	P346204	
	SM 2540 D-97	TSS	5	I	mg/L	P346206	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P346097	
1995424	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P346341	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P346355	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.048		mg N/L	P346060	
	EPA 365.1 Rev. 2.0	Total-P	0.086		mg P/L	P346101	
	SM 5310 B-00	Organic Carbon	40		mg C/L	P346490	
1995425	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P345937	
1995428	EPA 200.7 Rev. 4.4	Iron	1.0E+03		ug/L	P346055	
	EPA 200.8 Rev. 5.4	Arsenic	0.35		ug/L	P346055	
		Cadmium	0.025	I	ug/L	P346055	
		Chromium	0.67	I	ug/L	P346055	
		Copper	0.42	I	ug/L	P346055	
		Lead	0.35		ug/L	P346470	
		Nickel	0.57	I	ug/L	P346055	
		Silver	0.010	U	ug/L	P346055	
		Zinc	4.2		ug/L	P346055	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345908

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P346055

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346055

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Nickel	0.20	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346055

Component	Result	Code	Units
Silver	0.010	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346470

Component	Result	Code	Units
Lead	0.050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346221

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346225

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346341

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P346355

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346060

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346101

Component	Result	Code	Units
Total-P	0.005	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345937

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: P345888

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P346092

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

Reference Method: SM 2540 C-97
Batch ID: P346204

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P346206

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P346097

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P346490

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: P346055

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346055

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	98.7		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	99.8		P	85 - 115
Nickel	104		P	85 - 115
Silver	101		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346055

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346470

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Lead	95.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346221

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346225

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346341

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P346355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346060

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: P346101

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345937

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P346092

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P346097

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.8		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P346490

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P346055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1994888	Iron	105		P	80 - 120
1995709	Iron	106	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1994888	Arsenic	111		P	80 - 120
1994888	Cadmium	96.6		P	80 - 120
1994888	Chromium	91.7		P	80 - 120
1994888	Copper	96.8		P	80 - 120
1994888	Nickel	100		P	80 - 120
1994888	Silver	95.1		P	80 - 120
1994888	Zinc	94.2		P	80 - 120
1995709	Arsenic	104	106	P/P	80 - 120
1995709	Cadmium	101	102	P/P	80 - 120
1995709	Chromium	98.6	99.8	P/P	80 - 120
1995709	Copper	98.7	99.9	P/P	80 - 120
1995709	Nickel	102	103	P/P	80 - 120
1995709	Silver	101	102	P/P	80 - 120
1995709	Zinc	101	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993371	Lead	99.1		P	80 - 120
1994932	Lead	94.2	99.7	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346221

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1994926	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346225

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1994926	Sulfate	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346341

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1995453	Ammonia-N	96.3	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P346355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1995606	Kjeldahl Nitrogen	102	95.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346060

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1995431	NO2NO3-N	101	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346101

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1995453	Total-P	106	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1995425	O-Phosphate-P	95.8	95.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P346097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1995691	Fluoride	96.8	96.1	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P346490

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1995351	Organic Carbon	96.9		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345908

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995131	Turbidity	9.16	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P346055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995709	Iron	0.517	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995709	Arsenic	1.30	Spike	P	0 - 20
1995709	Cadmium	0.659	Spike	P	0 - 20
1995709	Chromium	1.19	Spike	P	0 - 20
1995709	Copper	1.21	Spike	P	0 - 20
1995709	Nickel	1.08	Spike	P	0 - 20
1995709	Silver	0.672	Spike	P	0 - 20
1995709	Zinc	1.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P346470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1994932	Lead	5.59	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346221

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1994926	Chloride	1.51	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346225

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1994926	Sulfate	2.69	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995453	Ammonia-N	1.05	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P346355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995606	Kjeldahl Nitrogen	3.20	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346060

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995431	NO2NO3-N	1.09	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346101

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995453	Total-P	3.92	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995425	O-Phosphate-P	0.0731	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995131	Color (true)	1.89	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P346092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995691	Total Alkalinity	2.32	Sample	F	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P346204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995450	TDS	2.01	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P346206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995450	TSS	2.53	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P346097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995691	Fluoride	0.470	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P346490

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1995351	Organic Carbon	0.0	Spike	P	0 - 20

* 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: A84140
Included Lab Sample IDs: 1995423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A84145
Included Lab Sample IDs: 1995423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A84154
Included Lab Sample IDs: 1995425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A84207
Included Lab Sample IDs: 1995424

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

Reference Method: SM 2320 B-97
Run ID: A84220
Included Lab Sample IDs: 1995423

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A84220
Included Lab Sample IDs: 1995423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A84230
Included Lab Sample IDs: 1995423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	99.9	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A84249
Included Lab Sample IDs: 1995428

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84253
Included Lab Sample IDs: 1995428

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	101	P/P	90 - 110
Cadmium	98.0	98.3	P/P	90 - 110
Chromium	99.6	100	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Silver	99.5	99.6	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A84336
Included Lab Sample IDs: 1995424

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84352
Included Lab Sample IDs: 1995424

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

Reference Method: SM 5310 B-00
Run ID: A84394
Included Lab Sample IDs: 1995424

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.5	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84411
Included Lab Sample IDs: 1995424

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.9	96.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84470
Included Lab Sample IDs: 1995428

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	97.1	93.9	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						9.16	
EPA 200.7 Rev. 4.4	Iron	105	105	106	105			0.517
EPA 200.8 Rev. 5.4	Arsenic	104	111	104	106			1.30
	Cadmium	98.7	96.6	101	102			0.659
	Chromium	99.5	91.7	98.6	99.8			1.19
	Copper	99.8	96.8	98.7	99.9			1.21
	Lead	95.3	99.1	94.2	99.7			5.59
	Nickel	104	100	102	103			1.08
	Silver	101	95.1	101	102			0.672
	Zinc	101	94.2	101	102			1.24
EPA 300.0 Rev. 2.1	Chloride	102	97.9				1.51	
	Sulfate	100	99.2				2.69	
EPA 350.1 Rev. 2.0	Ammonia-N	103	96.3	97.6				1.05
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.8	102	95.7				3.20
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	99.2				1.09
EPA 365.1 Rev. 2.0	Total-P	101	106	101				3.92
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	95.8	95.9				0.0731
SM 2120 B	Color (true)						1.89	
SM 2320 B-97	Total Alkalinity	102					2.32	
SM 2540 C-97	TDS						2.01	
SM 2540 D-97	TSS						2.53	
SM 4500 F-C-97	Fluoride	95.8	96.8	96.1				0.470
SM 5310 B-00	Organic Carbon	98.1	96.9					0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1995423
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1995428

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1995428
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1995423
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1995423
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1995424
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1995424
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1995424
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1995424
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1995425
SM 2120 B / E31780	True Color measured at 450 nm	1995423
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1995423
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1995423
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	1995423
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1995423
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1995424

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	05/24/2018			05/24/2018 16:55	William L. Brown IV	1995423
EPA 200.7 Rev. 4.4	05/24/2018	05/29/2018 13:50	Elliott D. Healy	05/30/2018 18:03	Betina Topolski	1995428
EPA 200.8 Rev. 5.4	05/24/2018	05/29/2018 13:50	Elliott D. Healy	05/30/2018 18:07	Nadine Brooks	1995428
	05/24/2018	06/06/2018 14:40	Elliott D. Healy	06/08/2018 15:09	Nadine Brooks	1995428
EPA 300.0 Rev. 2.1	05/24/2018			06/01/2018 04:26	Lipi Saha	1995423
EPA 350.1 Rev. 2.0	05/24/2018			06/04/2018 14:59	Julia Storbeck	1995424
EPA 351.2 Rev. 2.0	05/24/2018	06/05/2018 11:50	Adrian Shelby	06/07/2018 08:41	Joseph Suarez	1995424
EPA 353.2 Rev. 2.0	05/24/2018			05/29/2018 13:25	Lauren Bottorf	1995424
EPA 365.1 Rev. 2.0	05/24/2018	05/30/2018 13:15	Sima Feizi	06/05/2018 09:17	Beverly Y. Sanders	1995424
EPA 365.1 Rev. 2.0 dissolved	05/24/2018			05/24/2018 16:31	Megan Treadwell	1995425
SM 2120 B	05/24/2018			05/24/2018 14:48	Tanya Welborn	1995423
SM 2320 B-97	05/24/2018			05/29/2018 22:01	Dale L. Simmons	1995423
SM 2540 C-97	05/24/2018			05/25/2018 13:00	William L. Brown IV	1995423
SM 2540 D-97	05/24/2018			05/25/2018 13:00	William L. Brown IV	1995423
SM 4500 F-C-97	05/24/2018			05/29/2018 22:01	Dale L. Simmons	1995423
SM 5310 B-00	05/24/2018			06/05/2018 03:38	Megan Treadwell	1995424