Chemical Analysis Report

TLH-ROC-2019-01-08-01

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

Event Description: **Run 2**
Request ID: **RQ-2018-12-31-29**
Customer: **TLH-ROC**
Project ID: **SMP**

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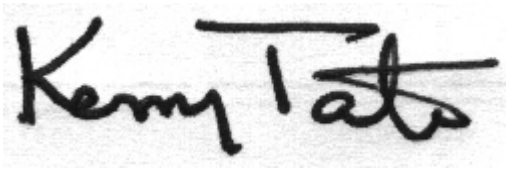
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 28-JAN-2019 13:17



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: Waccasassa River @ Boat Ramp **Collection Date/Time: 01/08/2019 12:20**

Field ID: G1TLHR0032 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2052697	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P356989	
	EPA 300.0	Bromide	0.048		mg Br/L	P357121	
	SM 2320 B-97	Total Alkalinity	87		mg CaCO3/L	P357389	
	SM 2540 D-97	TSS	3	I	mg/L	P357575	
	SM 4500 F-C-97	Fluoride	0.072	I	mg F/L	P357523	
2052699	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P357247	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P357342	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P357132	
	EPA 365.1 Rev. 2.0	Total-P	0.047		mg P/L	P357165	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P357195	
2052701	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.026		mg P/L	P357033	
2052709	EPA 200.7 Rev. 4.4	Iron	740		ug/L	P357021	
		Manganese	21.2		ug/L	P357021	
		Zinc	5.0	U	ug/L	P357021	
	EPA 200.8 Rev. 5.4	Aluminum	80		ug/L	P357021	
		Antimony	0.050	U	ug/L	P357021	
		Arsenic	0.45		ug/L	P357021	
		Cadmium	0.020	U	ug/L	P357021	
		Chromium	0.55	I	ug/L	P357021	
		Copper	0.40	U	ug/L	P357021	
		Lead	0.20	U	ug/L	P357021	
		Nickel	0.50	U	ug/L	P357021	
		Selenium	0.20	U	ug/L	P357021	
		Silver	0.010	U	ug/L	P357021	
		Thallium	0.10	U	ug/L	P357021	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Waccasassa River @ Otter Creek **Collection Date/Time: 01/08/2019 12:02**

Field ID: G1TLHR0101 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2052698	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P356989	
	EPA 300.0	Bromide	0.29		mg Br/L	P357121	
	SM 2320 B-97	Total Alkalinity	127		mg CaCO3/L	P357389	
	SM 2540 D-97	TSS	2	I	mg/L	P357573	
	SM 4500 F-C-97	Fluoride	0.093	I	mg F/L	P357523	
2052700	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P357247	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P357342	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P357132	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P357165	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P357195	
2052702	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P357033	
2052710	EPA 200.7 Rev. 4.4	Iron	760		ug/L	P357021	
		Manganese	19.2		ug/L	P357021	
		Zinc	5.0	U	ug/L	P357021	
	EPA 200.8 Rev. 5.4	Aluminum	31		ug/L	P357021	
		Antimony	0.050	U	ug/L	P357021	
		Arsenic	0.88		ug/L	P357021	
		Cadmium	0.020	U	ug/L	P357021	
		Chromium	0.55	I	ug/L	P357021	
		Copper	0.40	U	ug/L	P357021	
		Lead	0.20	U	ug/L	P357021	
		Nickel	0.50	U	ug/L	P357021	
		Selenium	0.20	U	ug/L	P357021	
		Silver	0.010	U	ug/L	P357021	
		Thallium	0.10	U	ug/L	P357021	

Ref. Method and Comment:
SM 2540 D-97: 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: P356989

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357021

Component	Result	Code	Units
Iron	30	U	ug/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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
Batch ID: P357121

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357247

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357342

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357132

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357165

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357033

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

Reference Method: SM 2320 B-97
Batch ID: P357389

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

Reference Method: SM 2540 D-97
Batch ID: P357573

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P357575

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P357195

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: P357021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	106		P	85 - 115
Manganese	101		P	85 - 115
Zinc	99.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.7		P	85 - 115
Antimony	98.6		P	85 - 115
Arsenic	103		P	85 - 115
Cadmium	98.1		P	85 - 115
Chromium	96.8		P	85 - 115
Copper	100		P	85 - 115
Lead	96.5		P	85 - 115
Nickel	100		P	85 - 115
Selenium	102		P	85 - 115
Silver	102		P	85 - 115
Thallium	97.8		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P357121

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357247

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357342

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357132

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: P357165

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	107		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357033

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

Reference Method: SM 2320 B-97
Batch ID: P357389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P357195

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052801	Iron	104	104	P/P	80 - 120
2052801	Manganese	98.9	98.8	P/P	80 - 120
2052801	Zinc	103	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052801	Aluminum	98.4	97.4	P/P	80 - 120
2052801	Antimony	99.0	99.8	P/P	80 - 120
2052801	Arsenic	101	101	P/P	80 - 120
2052801	Cadmium	101	102	P/P	80 - 120
2052801	Chromium	99.3	98.8	P/P	80 - 120
2052801	Copper	101	99.7	P/P	80 - 120
2052801	Lead	98.5	97.6	P/P	80 - 120
2052801	Nickel	100	99.9	P/P	80 - 120
2052801	Selenium	98.0	99.7	P/P	80 - 120
2052801	Silver	103	104	P/P	80 - 120
2052801	Thallium	106	105	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P357121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052697	Bromide	108	109	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357247

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052700	Ammonia-N	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052758	Kjeldahl Nitrogen	99.3	93.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357132

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052699	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052725	Total-P	103	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052715	O-Phosphate-P	93.9	95.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052880	Fluoride	101	103	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P357195

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052186	Organic Carbon	96.8	98.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356989

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052713	Turbidity	1.35	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052801	Iron	0.0709	Spike	P	0 - 20
2052801	Manganese	0.0751	Spike	P	0 - 20
2052801	Zinc	0.0547	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052801	Aluminum	1.01	Spike	P	0 - 20
2052801	Antimony	0.765	Spike	P	0 - 20
2052801	Arsenic	0.671	Spike	P	0 - 20
2052801	Cadmium	1.12	Spike	P	0 - 20
2052801	Chromium	0.533	Spike	P	0 - 20
2052801	Copper	1.32	Spike	P	0 - 20
2052801	Lead	0.873	Spike	P	0 - 20
2052801	Nickel	0.385	Spike	P	0 - 20
2052801	Selenium	1.71	Spike	P	0 - 20
2052801	Silver	1.18	Spike	P	0 - 20
2052801	Thallium	0.593	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P357121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052697	Bromide	0.794	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052700	Ammonia-N	0.851	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052758	Kjeldahl Nitrogen	3.27	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357132

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052699	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052725	Total-P	2.07	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357033

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052715	O-Phosphate-P	1.34	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P357389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052880	Total Alkalinity	0.752	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052880	Fluoride	1.01	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P357195

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052186	Organic Carbon	0.635	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: EPA 180.1 Rev. 2.0
Run ID: A88710
Included Lab Sample IDs: 2052697, 2052698

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A88720
Included Lab Sample IDs: 2052701, 2052702

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88750
Included Lab Sample IDs: 2052709, 2052710

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	100	P/P	90 - 110
Manganese	102	102	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A88759
Included Lab Sample IDs: 2052697, 2052698

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	106	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A88763
Included Lab Sample IDs: 2052699, 2052700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A88786
Included Lab Sample IDs: 2052699, 2052700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.0	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88802
Included Lab Sample IDs: 2052699, 2052700

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88811
Included Lab Sample IDs: 2052699, 2052700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88811
Included Lab Sample IDs: 2052699, 2052700

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

Reference Method: SM 2320 B-97
Run ID: A88858
Included Lab Sample IDs: 2052697, 2052698

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88871
Included Lab Sample IDs: 2052699, 2052700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A88903
Included Lab Sample IDs: 2052697, 2052698

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88929
Included Lab Sample IDs: 2052709, 2052710

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	101	100	P/P	90 - 110
Arsenic	104	101	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Chromium	99.7	101	P/P	90 - 110
Copper	102	104	P/P	90 - 110
Lead	100	100	P/P	90 - 110
Nickel	101	103	P/P	90 - 110
Selenium	103	101	P/P	90 - 110
Silver	103	103	P/P	90 - 110
Thallium	96.5	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88979
Included Lab Sample IDs: 2052709, 2052710

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	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					1.35	
EPA 200.7 Rev. 4.4	Iron	106	104	104			0.0709
	Manganese	101	98.9	98.8			0.0751
	Zinc	99.3	103	103			0.0547
EPA 200.8 Rev. 5.4	Aluminum	99.7	98.4	97.4			1.01
	Antimony	98.6	99.0	99.8			0.765
	Arsenic	103	101	101			0.671
	Cadmium	98.1	101	102			1.12
	Chromium	96.8	99.3	98.8			0.533
	Copper	100	101	99.7			1.32
	Lead	96.5	98.5	97.6			0.873
	Nickel	100	100	99.9			0.385
	Selenium	102	98.0	99.7			1.71
	Silver	102	103	104			1.18
	Thallium	97.8	106	105			0.593
EPA 300.0	Bromide	110	108	109			0.794
EPA 350.1 Rev. 2.0	Ammonia-N	99.3	101	100			0.851
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.2	99.3	93.5			3.27
EPA 353.2 Rev. 2.0	NO2NO3-N	101	99.0	99.0			0.0
EPA 365.1 Rev. 2.0	Total-P	107	103	101			2.07
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.3	93.9	95.6			1.34
SM 2320 B-97	Total Alkalinity	101				0.752	
SM 4500 F-C-97	Fluoride	98.2	101	103			1.01
SM 5310 B-00	Organic Carbon	98.0	96.8	98.1			0.635

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2052697, 2052698
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2052709, 2052710
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2052709, 2052710
EPA 300.0 / E31780	Bromide in aqueous matrices	2052697, 2052698
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2052699, 2052700
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2052699, 2052700
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2052699, 2052700
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2052699, 2052700
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2052701, 2052702
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2052697, 2052698
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2052697, 2052698
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2052697, 2052698
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2052699, 2052700

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	01/08/2019			01/08/2019 17:18	Megan Treadwell	2052697, 2052698
EPA 200.7 Rev. 4.4	01/08/2019	01/09/2019 15:30	Elliott D. Healy	01/10/2019 14:12	Betina Topolski	2052709
	01/08/2019	01/09/2019 15:30	Elliott D. Healy	01/10/2019 14:17	Betina Topolski	2052710
EPA 200.8 Rev. 5.4	01/08/2019	01/09/2019 15:30	Elliott D. Healy	01/19/2019 11:11	Robert K Palmer	2052709
	01/08/2019	01/09/2019 15:30	Elliott D. Healy	01/19/2019 11:21	Robert K Palmer	2052710
	01/08/2019	01/19/2019 15:30	Elliott D. Healy	01/23/2019 14:41	Robert K Palmer	2052709
	01/08/2019	01/19/2019 15:30	Elliott D. Healy	01/23/2019 14:50	Robert K Palmer	2052710
EPA 300.0	01/08/2019			01/09/2019 20:19	Lipi Saha	2052697
	01/08/2019			01/09/2019 21:10	Lipi Saha	2052698
EPA 350.1 Rev. 2.0	01/08/2019			01/14/2019 13:13	Ping Hua	2052699
	01/08/2019			01/14/2019 13:14	Ping Hua	2052700
EPA 351.2 Rev. 2.0	01/08/2019	01/16/2019 11:15	Adrian Shelby	01/17/2019 10:21	Joseph Suarez	2052699
	01/08/2019	01/16/2019 11:15	Adrian Shelby	01/17/2019 10:23	Joseph Suarez	2052700
EPA 353.2 Rev. 2.0	01/08/2019			01/11/2019 09:09	Beverly Y. Sanders	2052699
	01/08/2019			01/11/2019 09:15	Beverly Y. Sanders	2052700
EPA 365.1 Rev. 2.0	01/08/2019	01/11/2019 12:50	Sima Feizi	01/15/2019 12:40	Rosalyn Ballman	2052699
	01/08/2019	01/11/2019 12:50	Sima Feizi	01/15/2019 12:41	Rosalyn Ballman	2052700
EPA 365.1 Rev. 2.0 dissolved	01/08/2019			01/09/2019 15:42	Jhamieka S. Greenwood	2052702
	01/08/2019			01/09/2019 15:43	Jhamieka S. Greenwood	2052701
SM 2320 B-97	01/08/2019			01/16/2019 10:22	Dale L. Simmons	2052697
	01/08/2019			01/16/2019 10:37	Dale L. Simmons	2052698
SM 2540 D-97	01/08/2019			01/10/2019 14:35	Yijie Li	2052697, 2052698
SM 4500 F-C-97	01/08/2019			01/18/2019 03:35	Dale L. Simmons	2052697
	01/08/2019			01/18/2019 03:43	Dale L. Simmons	2052698
SM 5310 B-00	01/08/2019			01/11/2019 17:37	Megan Treadwell	2052699
	01/08/2019			01/11/2019 17:49	Megan Treadwell	2052700