

Chemical Analysis Report

TLH-ROC-2019-02-14-02

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

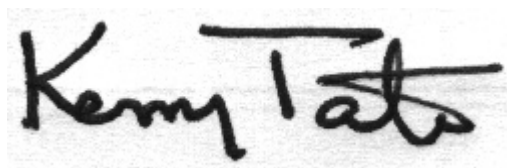
Event Description: **Run 2**
Request ID: **RQ-2019-02-04-75**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 07-MAR-2019 12:41

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the "T" and a long horizontal stroke at the end.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: STEINHATCHEE RIVER 40M N OF YEARLING RD.

Collection Date/Time: 02/14/2019 11:00

Field ID: G1TLHR0065

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2062741	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P358973	
	EPA 300.0 Rev. 2.1	Chloride	6.8		mg Cl/L	P359564	
		Sulfate	1.3		mg SO4/L	P359566	
	SM 2120 B	Color (true)	310		PCU	P358962	
	SM 2320 B-97	Total Alkalinity	73		mg CaCO3/L	P359382	
	SM 2540 C-97	TDS	147		mg/L	P359203	
	SM 2540 D-97	TSS	3	I	mg/L	P359125	
	SM 4500 F-C-97	Fluoride	0.090	I	mg F/L	P359389	
2062743	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P359239	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P359235	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P359356	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P359077	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P359416	
2062745	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.076		mg P/L	P358966	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: STEINHATCHEE RIVER @ S CANAL RD

Collection Date/Time: 02/14/2019 11:25

Field ID: G1TLHR0064

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2062747	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P358973	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P359564	
		Sulfate	1.3		mg SO4/L	P359566	
		Color (true)	440		PCU	P358962	
	SM 2320 B-97	Total Alkalinity	57		mg CaCO3/L	P359382	
	SM 2540 C-97	TDS	141		mg/L	P359203	
	SM 2540 D-97	TSS	3	I	mg/L	P359125	
	SM 4500 F-C-97	Fluoride	0.067	I	mg F/L	P359389	
2062748	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P359241	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P359086	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P359356	
	EPA 365.1 Rev. 2.0	Total-P	0.093		mg P/L	P359091	
	SM 5310 B-00	Organic Carbon	35		mg C/L	P359416	
2062749	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.053		mg P/L	P358966	
2062756	EPA 200.7 Rev. 4.4	Barium	5.78		ug/L	P359073	
		Calcium	26.5		mg/L	P359073	
		Iron	822		ug/L	P359073	
		Magnesium	3.19		mg/L	P359073	
		Potassium	0.30	U	mg/L	P359073	
		Sodium	3.24		mg/L	P359073	
		Zinc	5.0	U	ug/L	P359073	
	EPA 200.8 Rev. 5.4	Aluminum	252		ug/L	P359073	
		Antimony	0.050	U	ug/L	P359073	
		Arsenic	0.23		ug/L	P359073	
		Boron**	10.0		ug/L	P359073	
		Cadmium	0.020	U	ug/L	P359073	
		Chromium	0.59	I	ug/L	P359073	
		Copper	0.40	U	ug/L	P359073	
		Lead	0.20	U	ug/L	P359073	
		Nickel	0.50	U	ug/L	P359073	
		Selenium	0.20	U	ug/L	P359073	
		Silver	0.010	U	ug/L	P359073	
		Thallium	0.10	U	ug/L	P359073	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: MIDDLE WARRIOR CREEK

Collection Date/Time: 02/14/2019 12:05

Field ID: G1TLHR0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2062742	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P358973	
	EPA 300.0 Rev. 2.1	Chloride	5.6		mg Cl/L	P359564	
		Sulfate	0.20	U	mg SO4/L	P359566	
	SM 2120 B	Color (true)	430		PCU	P358962	
	SM 2320 B-97	Total Alkalinity	40		mg CaCO3/L	P359382	
	SM 2540 C-97	TDS	117		mg/L	P359203	
	SM 2540 D-97	TSS	2	U	mg/L	P359125	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P359389	
2062744	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P359239	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P359234	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P359356	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P359077	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P359416	
2062746	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.030		mg P/L	P358966	

Ref. Method and Comment:

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

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P358973

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P359073

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
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: P359073

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359564

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359566

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359239

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359241

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359086

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359234

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359235

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359356

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359077

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359091

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P358966

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

Reference Method: SM 2120 B
Batch ID: P358962

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P359382

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P359203

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P359125

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P359389

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P359416

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: P359073

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	105		P	85 - 115
Iron	108		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	109		P	85 - 115
Sodium	106		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359073

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.7		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	101		P	85 - 115
Boron	101		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	94.9		P	85 - 115
Copper	98.1		P	85 - 115
Lead	94.4		P	85 - 115
Nickel	95.1		P	85 - 115
Selenium	100		P	85 - 115
Silver	102		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359564

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359566

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359239

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359241

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P359086

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P359234

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P359235

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P359356

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P359077

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P359091

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P358966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.5		P	90 - 110

Reference Method: SM 2120 B
 Batch ID: P358962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-97
 Batch ID: P359382

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P359389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.9		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P359416

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P359073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062446	Barium	102	103	P/P	80 - 120
2062446	Calcium	94.2		P	80 - 120
2062446	Iron	107	107	P/P	80 - 120
2062446	Magnesium	98.4		P	80 - 120
2062446	Potassium	107	107	P/P	80 - 120
2062446	Sodium	98.0		P	80 - 120
2062446	Zinc	102	102	P/P	80 - 120
2062578	Barium	101		P	80 - 120
2062578	Calcium	101		P	80 - 120
2062578	Iron	109		P	80 - 120
2062578	Magnesium	105		P	80 - 120
2062578	Potassium	105		P	80 - 120
2062578	Sodium	103		P	80 - 120
2062578	Zinc	107		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062446	Aluminum	98.7	97.6	P/P	80 - 120
2062446	Antimony	104	101	P/P	80 - 120
2062446	Arsenic	100	98.0	P/P	80 - 120
2062446	Boron	96.4	95.7	P/P	80 - 120
2062446	Cadmium	105	101	P/P	80 - 120
2062446	Chromium	96.7	94.4	P/P	80 - 120
2062446	Copper	96.7	95.7	P/P	80 - 120
2062446	Lead	95.7	93.6	P/P	80 - 120
2062446	Nickel	93.8	91.0	P/P	80 - 120
2062446	Selenium	98.3	95.3	P/P	80 - 120
2062446	Silver	102	101	P/P	80 - 120
2062446	Thallium	105	103	P/P	80 - 120
2062578	Aluminum	97.5		P	80 - 120
2062578	Antimony	104		P	80 - 120
2062578	Arsenic	103		P	80 - 120
2062578	Boron	90.0		P	80 - 120
2062578	Cadmium	102		P	80 - 120
2062578	Chromium	94.3		P	80 - 120
2062578	Copper	95.5		P	80 - 120
2062578	Lead	96.4		P	80 - 120
2062578	Nickel	96.8		P	80 - 120
2062578	Selenium	99.6		P	80 - 120
2062578	Silver	101		P	80 - 120
2062578	Thallium	106		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062599	Chloride	99.0		P	90 - 110
2062701	Chloride	99.7		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062599	Sulfate	98.6		P	90 - 110
2062701	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359239

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062640	Ammonia-N	103	96.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062748	Ammonia-N	105	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062800	Kjeldahl Nitrogen	101	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063110	Kjeldahl Nitrogen	105	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359235

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063009	Kjeldahl Nitrogen	99.3	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359356

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062702	NO2NO3-N	97.5	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062800	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062944	Total-P	102	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P358966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062607	O-Phosphate-P	94.6	96.4	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P359416

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062702	Organic Carbon	96.6	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P358973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062652	Turbidity	10.5	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P359073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062446	Barium	0.428	Spike	P	0 - 20
2062446	Calcium	0.199	Spike	P	0 - 20
2062446	Iron	0.193	Spike	P	0 - 20
2062446	Magnesium	0.154	Spike	P	0 - 20
2062446	Potassium	0.228	Spike	P	0 - 20
2062446	Sodium	1.26	Spike	P	0 - 20
2062446	Zinc	0.698	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062446	Aluminum	1.17	Spike	P	0 - 20
2062446	Antimony	2.01	Spike	P	0 - 20
2062446	Arsenic	2.28	Spike	P	0 - 20
2062446	Boron	0.678	Spike	P	0 - 20
2062446	Cadmium	3.47	Spike	P	0 - 20
2062446	Chromium	2.35	Spike	P	0 - 20
2062446	Copper	1.02	Spike	P	0 - 20
2062446	Lead	2.21	Spike	P	0 - 20
2062446	Nickel	3.04	Spike	P	0 - 20
2062446	Selenium	3.05	Spike	P	0 - 20
2062446	Silver	0.406	Spike	P	0 - 20
2062446	Thallium	2.00	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062599	Chloride	0.402	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062599	Sulfate	0.514	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359239

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062640	Ammonia-N	4.10	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062748	Ammonia-N	1.53	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062800	Kjeldahl Nitrogen	2.68	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063110	Kjeldahl Nitrogen	4.83	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359235

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063009	Kjeldahl Nitrogen	0.758	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359356

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062702	NO2NO3-N	0.323	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062800	Total-P	0.896	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062944	Total-P	1.82	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P358966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062607	O-Phosphate-P	1.88	Spike	P	0 - 20

Reference Method: SM 2120 B
 Batch ID: P358962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062601	Color (true)	1.03	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P359382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062955	Total Alkalinity	0.238	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
 Batch ID: P359203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062639	TDS	0.797	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P359389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062955	Fluoride	0.470	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
 Batch ID: P359416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062702	Organic Carbon	0.221	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 365.1 Rev. 2.0 dissolved
Run ID: A89426
Included Lab Sample IDs: 2062745, 2062746, 2062749

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.4	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A89427
Included Lab Sample IDs: 2062741, 2062742, 2062747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A89430
Included Lab Sample IDs: 2062741, 2062742, 2062747

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A89505
Included Lab Sample IDs: 2062748

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A89521
Included Lab Sample IDs: 2062756

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	100	P/P	90 - 110
Calcium	101	101	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	102	103	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A89528
Included Lab Sample IDs: 2062743, 2062744, 2062748

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A89534
Included Lab Sample IDs: 2062743, 2062744, 2062748

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	105	103	P/P	90 - 110
Ammonia-N	106	106	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A89551

Included Lab Sample IDs: 2062756

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	100	101	P/P	90 - 110
Arsenic	97.1	97.2	P/P	90 - 110
Boron	93.6	97.2	P/P	90 - 110
Cadmium	98.7	100	P/P	90 - 110
Chromium	96.5	97.9	P/P	90 - 110
Lead	95.3	96.1	P/P	90 - 110
Nickel	95.6	96.4	P/P	90 - 110
Selenium	98.7	99.7	P/P	90 - 110
Thallium	95.1	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A89583

Included Lab Sample IDs: 2062744

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.6	95.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A89586

Included Lab Sample IDs: 2062743, 2062744, 2062748

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A89593

Included Lab Sample IDs: 2062741, 2062742, 2062747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A89593

Included Lab Sample IDs: 2062741, 2062742, 2062747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.6	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A89603

Included Lab Sample IDs: 2062743, 2062744, 2062748

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.5	93.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A89640

Included Lab Sample IDs: 2062743

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.2	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A89668

Included Lab Sample IDs: 2062756

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.2	98.1	P/P	90 - 110
Copper	99.8	99.8	P/P	90 - 110
Silver	102	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A89674

Included Lab Sample IDs: 2062741, 2062742, 2062747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	104	P/P	90 - 110
Sulfate	104	104	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 180.1 Rev. 2.0	Turbidity						10.5	
EPA 200.7 Rev. 4.4	Barium	104	102	103	101			0.428
	Calcium	105	94.2	101				0.199
	Iron	108	107	107	109			0.193
	Magnesium	105	98.4	105				0.154
	Potassium	109	107	107	105			0.228
	Sodium	106	98.0	103				1.26
	Zinc	103	102	102	107			0.698
EPA 200.8 Rev. 5.4	Aluminum	97.7	98.7	97.6	97.5			1.17
	Antimony	101	104	101	104			2.01
	Arsenic	101	100	98.0	103			2.28
	Boron	101	96.4	95.7	90.0			0.678
	Cadmium	99.6	105	101	102			3.47
	Chromium	94.9	96.7	94.4	94.3			2.35
	Copper	98.1	96.7	95.7	95.5			1.02
	Lead	94.4	95.7	93.6	96.4			2.21
	Nickel	95.1	93.8	91.0	96.8			3.04
	Selenium	100	98.3	95.3	99.6			3.05
	Silver	102	102	101	101			0.406
	Thallium	102	105	103	106			2.00
EPA 300.0 Rev. 2.1	Chloride	102	99.0	99.7			0.402	
	Sulfate	101	98.6	98.4			0.514	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	103	96.3				4.10
	Ammonia-N	99.9	105	107				1.53
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	101	105				2.68
	Kjeldahl Nitrogen	94.1	105	97.7				4.83
	Kjeldahl Nitrogen	105	99.3	100				0.758
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	97.5	97.0				0.323
EPA 365.1 Rev. 2.0	Total-P	105	102	102				0.896
	Total-P	103	102	104				1.82
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	94.6	96.4				1.88
SM 2120 B	Color (true)	101					1.03	
SM 2320 B-97	Total Alkalinity	102					0.238	
SM 2540 C-97	TDS						0.797	
SM 4500 F-C-97	Fluoride	96.9						0.470
SM 5310 B-00	Organic Carbon	96.2	96.6	96.4				0.221

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2062741, 2062742, 2062747
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2062756
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2062756
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2062741, 2062742, 2062747
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2062741, 2062742, 2062747
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2062743, 2062744, 2062748
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2062743, 2062744, 2062748

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2062743, 2062744, 2062748
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2062743, 2062744, 2062748
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2062745, 2062746, 2062749
SM 2120 B / E31780	True Color measured at 450 nm	2062741, 2062742, 2062747
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2062741, 2062742, 2062747
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2062741, 2062742, 2062747
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2062741, 2062742, 2062747
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2062741, 2062742, 2062747
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2062743, 2062744, 2062748

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	02/14/2019			02/14/2019 17:36	Adrian Shelby	2062741, 2062742, 2062747
EPA 200.7 Rev. 4.4	02/14/2019	02/18/2019 13:20	Elliott D. Healy	02/19/2019 17:02	Martin Acosta	2062756
EPA 200.8 Rev. 5.4	02/14/2019	02/18/2019 13:20	Elliott D. Healy	02/21/2019 06:09	Robert K Palmer	2062756
	02/14/2019	02/18/2019 13:20	Elliott D. Healy	02/26/2019 21:57	Robert K Palmer	2062756
EPA 300.0 Rev. 2.1	02/14/2019			02/26/2019 08:22	Lipi Saha	2062741
	02/14/2019			02/26/2019 08:37	Lipi Saha	2062742
	02/14/2019			02/26/2019 08:52	Lipi Saha	2062747
EPA 350.1 Rev. 2.0	02/14/2019			02/20/2019 12:00	Adrian Shelby	2062743
	02/14/2019			02/20/2019 12:02	Adrian Shelby	2062744
	02/14/2019			02/20/2019 12:39	Adrian Shelby	2062748
EPA 351.2 Rev. 2.0	02/14/2019	02/18/2019 13:50	Adrian Shelby	02/19/2019 12:17	Joseph Suarez	2062748
	02/14/2019	02/19/2019 11:30	Adrian Shelby	02/22/2019 13:11	Joseph Suarez	2062743
	02/14/2019	02/20/2019 12:40	Jhamieka S. Greenwood	02/22/2019 10:21	Joseph Suarez	2062744
EPA 353.2 Rev. 2.0	02/14/2019			02/22/2019 10:06	Beverly Y. Sanders	2062743
	02/14/2019			02/22/2019 10:07	Beverly Y. Sanders	2062744
	02/14/2019			02/22/2019 10:09	Beverly Y. Sanders	2062748
EPA 365.1 Rev. 2.0	02/14/2019	02/18/2019 13:35	Sima Feizi	02/20/2019 11:54	Rosalyn Ballman	2062743
	02/14/2019	02/18/2019 13:35	Sima Feizi	02/20/2019 11:55	Rosalyn Ballman	2062744
	02/14/2019	02/18/2019 13:35	Sima Feizi	02/20/2019 12:04	Rosalyn Ballman	2062748
EPA 365.1 Rev. 2.0 dissolved	02/14/2019			02/14/2019 15:52	Jhamieka S. Greenwood	2062745, 2062749
	02/14/2019			02/14/2019 15:53	Jhamieka S. Greenwood	2062746
SM 2120 B	02/14/2019			02/14/2019 16:33	Chelsea Hernandez	2062741
	02/14/2019			02/14/2019 16:34	Chelsea Hernandez	2062742, 2062747
SM 2320 B-97	02/14/2019			02/21/2019 00:23	Dale L. Simmons	2062741
	02/14/2019			02/21/2019 00:35	Dale L. Simmons	2062742
	02/14/2019			02/21/2019 00:47	Dale L. Simmons	2062747
SM 2540 C-97	02/14/2019			02/15/2019 17:10	Mariam Hanna	2062741, 2062742, 2062747
SM 2540 D-97	02/14/2019			02/15/2019 16:00	Mariam Hanna	2062741, 2062742, 2062747
SM 4500 F-C-97	02/14/2019			02/21/2019 00:23	Dale L. Simmons	2062741
	02/14/2019			02/21/2019 00:35	Dale L. Simmons	2062742
	02/14/2019			02/21/2019 00:47	Dale L. Simmons	2062747
SM 5310 B-00	02/14/2019			02/24/2019 01:11	Julia Storbeck	2062748
	02/14/2019			02/24/2019 12:41	Julia Storbeck	2062743
	02/14/2019			02/24/2019 12:55	Julia Storbeck	2062744