

Chemical Analysis Report

TLH-ROC-2019-07-22-01

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

Event Description: **Run 4**
Request ID: **RQ-2019-07-01-51**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 08-AUG-2019 19:18



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: MOSQUITO CREEK @ SR269

Collection Date/Time: 07/22/2019 10:55

Field ID: G2TLHR0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2104958	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P367785	
	EPA 300.0 Rev. 2.1	Chloride	4.7		mg Cl/L	P367916	
		Sulfate	0.79		mg SO4/L	P367918	
		Color (true)	55		PCU	P367761	
	SM 2320 B-97	Total Alkalinity	28		mg CaCO3/L	P367974	
	SM 2540 C-97	TDS	66		mg/L	P368080	
	SM 2540 D-97	TSS	14		mg/L	P367953	
	SM 4500 F-C-97	Fluoride	0.062	I	mg F/L	P367976	
2104961	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P368306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38		mg N/L	P367897	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.64		mg N/L	P367799	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P367809	
	SM 5310 B-00	Organic Carbon	5.3		mg C/L	P367964	
2104964	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P367788	
2104974	EPA 200.7 Rev. 4.4	Barium	25.6		ug/L	P367832	
		Calcium	7.87		mg/L	P367832	
		Iron	1.05E+03		ug/L	P367832	
		Magnesium	3.40		mg/L	P367832	
		Potassium	0.87	I	mg/L	P367832	
		Sodium	2.6		mg/L	P367832	
		Zinc	5.0	U	ug/L	P367832	
	EPA 200.8 Rev. 5.4	Aluminum	466		ug/L	P367832	
		Antimony	0.050	U	ug/L	P367832	
		Arsenic	0.67		ug/L	P367832	
		Boron**	11.7		ug/L	P367832	
		Cadmium	0.020	U	ug/L	P367832	
		Chromium	0.80	I	ug/L	P367832	
		Copper	1.56		ug/L	P367832	
		Lead	0.46		ug/L	P367832	
		Nickel	0.50	U	ug/L	P367832	
		Selenium	0.20	U	ug/L	P367832	
		Silver	0.010	U	ug/L	P367832	
		Thallium	0.10	U	ug/L	P367832	

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: UNNAMED BRANCH @ FLAT CREEK RD

Collection Date/Time: 07/22/2019 11:25

Field ID: G2TLHR0031

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2104959	EPA 180.1 Rev. 2.0	Turbidity	16	A	NTU	P367785	
	EPA 300.0 Rev. 2.1	Chloride	4.9		mg Cl/L	P367916	
		Sulfate	1.0		mg SO4/L	P367918	
		Color (true)	28	A	PCU	P367782	
	SM 2320 B-97	Total Alkalinity	44		mg CaCO3/L	P367974	
	SM 2540 C-97	TDS	79		mg/L	P368080	
	SM 2540 D-97	TSS	15		mg/L	P367953	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P367976	
2104962	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P368306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P367897	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P367799	
	EPA 365.1 Rev. 2.0	Total-P	0.077		mg P/L	P367809	
	SM 5310 B-00	Organic Carbon	5.6		mg C/L	P367964	
2104965	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.035		mg P/L	P367788	
2104975	EPA 200.7 Rev. 4.4	Barium	20.2		ug/L	P367832	
		Calcium	11.5		mg/L	P367832	
		Iron	1.40E+03		ug/L	P367832	
		Magnesium	5.15		mg/L	P367832	
		Potassium	0.56	I	mg/L	P367832	
	EPA 200.8 Rev. 5.4	Sodium	2.8		mg/L	P367832	
		Zinc	16	I	ug/L	P368314	
		Aluminum	821		ug/L	P367832	
		Antimony	0.050	U	ug/L	P367832	
		Arsenic	0.84		ug/L	P367832	
		Boron**	10.7		ug/L	P367832	
		Cadmium	0.029	I	ug/L	P367832	
		Chromium	1.5	I	ug/L	P367832	
		Copper	2.26		ug/L	P367832	
		Lead	0.55		ug/L	P367832	
		Nickel	0.50	U	ug/L	P367832	
		Selenium	0.20	U	ug/L	P367832	
		Silver	0.010	U	ug/L	P367832	
		Thallium	0.10	U	ug/L	P367832	

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: UNNAMED BRANCH @ HARDAWAY RD 2

Collection Date/Time: 07/22/2019 12:00

Field ID: G2TLHR0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2104960	EPA 180.1 Rev. 2.0	Turbidity	6.1		NTU	P367785	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P367916	
		Sulfate	0.60		mg SO4/L	P367918	
		Color (true)	42		PCU	P367761	
	SM 2320 B-97	Total Alkalinity	2.8		mg CaCO3/L	P367974	
	SM 2540 C-97	TDS	29		mg/L	P368080	
	SM 2540 D-97	TSS	7	I	mg/L	P367953	
	SM 4500 F-C-97	Fluoride	0.045	I	mg F/L	P367976	
2104963	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P368306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P367897	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P367799	
	EPA 365.1 Rev. 2.0	Total-P	0.096		mg P/L	P367809	
	SM 5310 B-00	Organic Carbon	4.6		mg C/L	P367968	
2104966	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P367788	
2104976	EPA 200.7 Rev. 4.4	Barium	13.3		ug/L	P367832	
		Calcium	1.33		mg/L	P367832	
		Iron	940		ug/L	P367832	
		Magnesium	0.77		mg/L	P367832	
		Potassium	0.37	I	mg/L	P367832	
		Sodium	2.1		mg/L	P367832	
		Zinc	5.0	U	ug/L	P367832	
	EPA 200.8 Rev. 5.4	Aluminum	268		ug/L	P367832	
		Antimony	0.050	U	ug/L	P367832	
		Arsenic	0.86		ug/L	P367832	
		Boron**	8.0		ug/L	P367832	
		Cadmium	0.020	U	ug/L	P367832	
		Chromium	0.48	I	ug/L	P367832	
		Copper	0.40	U	ug/L	P367832	
		Lead	0.21	I	ug/L	P367832	
		Nickel	0.50	U	ug/L	P367832	
		Selenium	0.20	U	ug/L	P367832	
		Silver	0.010	U	ug/L	P367832	
		Thallium	0.10	U	ug/L	P367832	

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: P367785

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P367832

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 200.7 Rev. 4.4
Batch ID: P368314

Component	Result	Code	Units
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P367832

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: P367916

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P367918

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368306

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367897

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367799

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367809

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367788

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

Reference Method: SM 2120 B
Batch ID: P367761

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P367782

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P367974

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

Reference Method: SM 2540 C-97
Batch ID: P368080

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P367953

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P367976

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P367964

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P367968

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: P367832

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	104		P	85 - 115
Iron	103		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	100		P	85 - 115
Sodium	98.0		P	85 - 115
Zinc	99.8		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368314

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Zinc	97.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P367832

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	94.2		P	85 - 115
Arsenic	105		P	85 - 115
Boron	101		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	97.0		P	85 - 115
Copper	103		P	85 - 115
Lead	95.6		P	85 - 115
Nickel	103		P	85 - 115
Selenium	102		P	85 - 115
Silver	94.7		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P367916

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P367918

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368306

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	104		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367897

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367809

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367788

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.4		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P367761

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

Reference Method: SM 2120 B
Batch ID: P367782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.2		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P367974

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P367976

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P367964

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P367968

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P367832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104985	Barium	101	101	P/P	80 - 120
2104985	Calcium	102	103	P/P	80 - 120
2104985	Iron	99.6	100	P/P	80 - 120
2104985	Magnesium	103	103	P/P	80 - 120
2104985	Potassium	102	102	P/P	80 - 120
2104985	Sodium	99.7		P	80 - 120
2104985	Zinc	98.4	98.9	P/P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368314

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107038	Zinc	99.3	98.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P367832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104985	Aluminum	100	100	P/P	80 - 120
2104985	Antimony	92.3	93.3	P/P	80 - 120
2104985	Arsenic	102	103	P/P	80 - 120
2104985	Boron	101	101	P/P	80 - 120
2104985	Cadmium	98.2	100	P/P	80 - 120
2104985	Chromium	96.2	97.5	P/P	80 - 120
2104985	Copper	101	108	P/P	80 - 120
2104985	Lead	94.7	95.7	P/P	80 - 120
2104985	Nickel	101	103	P/P	80 - 120
2104985	Selenium	100	101	P/P	80 - 120
2104985	Silver	92.4	93.7	P/P	80 - 120
2104985	Thallium	99.5	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P367916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104714	Chloride	97.2		P	90 - 110
2104930	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P367918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104714	Sulfate	98.9		P	90 - 110
2104930	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104790	Ammonia-N	103	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367897

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104962	Kjeldahl Nitrogen	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2103447	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104932	Total-P	100	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367788

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104966	O-Phosphate-P	97.2	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P367976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2105513	Fluoride	95.8	96.5	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P367964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104789	Organic Carbon	107	103	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P367968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2105137	Organic Carbon	98.6	98.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P367785

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104959	Turbidity	1.25	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P367832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104985	Barium	0.0898	Spike	P	0 - 20
2104985	Calcium	0.767	Spike	P	0 - 20
2104985	Iron	0.376	Spike	P	0 - 20
2104985	Magnesium	0.0476	Spike	P	0 - 20
2104985	Potassium	0.541	Spike	P	0 - 20
2104985	Sodium	1.81	Spike	P	0 - 20
2104985	Zinc	0.461	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107038	Zinc	0.704	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P367832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104985	Aluminum	0.129	Spike	P	0 - 20
2104985	Antimony	1.04	Spike	P	0 - 20
2104985	Arsenic	1.32	Spike	P	0 - 20
2104985	Boron	0.0335	Spike	P	0 - 20
2104985	Cadmium	2.25	Spike	P	0 - 20
2104985	Chromium	1.27	Spike	P	0 - 20
2104985	Copper	6.43	Spike	P	0 - 20
2104985	Lead	1.08	Spike	P	0 - 20
2104985	Nickel	1.66	Spike	P	0 - 20
2104985	Selenium	1.13	Spike	P	0 - 20
2104985	Silver	1.42	Spike	P	0 - 20
2104985	Thallium	1.54	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P367916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104714	Chloride	1.90	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P367918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104714	Sulfate	2.03	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104790	Ammonia-N	1.60	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367897

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104962	Kjeldahl Nitrogen	1.38	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2103447	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104932	Total-P	4.57	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104966	O-Phosphate-P	1.01	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P367761

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104981	Color (true)	0.312	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P367782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104959	Color (true)	0.112	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
 Batch ID: P367974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2105513	Total Alkalinity	0.0517	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
 Batch ID: P368080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104532	TDS	2.25	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P367976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2105513	Fluoride	0.476	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
 Batch ID: P367964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104789	Organic Carbon	2.17	Spike	P	0 - 20

Reference Method: SM 5310 B-00
 Batch ID: P367968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2105137	Organic Carbon	0.139	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 300.0 Rev. 2.1

Run ID: A92954

Included Lab Sample IDs: 2104958, 2104959, 2104960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.5	P/P	90 - 110
Chloride	99.5	101	P/P	90 - 110
Sulfate	100	101	P/P	90 - 110
Sulfate	100	100	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A92959

Included Lab Sample IDs: 2104958, 2104960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115

Reference Method: SM 2120 B

Run ID: A92963

Included Lab Sample IDs: 2104959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A92964

Included Lab Sample IDs: 2104958, 2104959, 2104960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A92967

Included Lab Sample IDs: 2104964, 2104965, 2104966

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.8	P/P	90 - 110
O-Phosphate-P	99.5	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A92975

Included Lab Sample IDs: 2104961, 2104962, 2104963

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93009

Included Lab Sample IDs: 2104962, 2104963

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93024

Included Lab Sample IDs: 2104961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A93034

Included Lab Sample IDs: 2104974, 2104975, 2104976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	103	P/P	95 - 105
Barium	103	98.9	P/P	90 - 110
Calcium	99.0	99.6	P/P	95 - 105
Calcium	99.6	102	P/P	90 - 110
Iron	101	102	P/P	95 - 105
Iron	102	102	P/P	90 - 110
Magnesium	100	101	P/P	95 - 105
Magnesium	101	101	P/P	90 - 110
Potassium	100	102	P/P	90 - 110
Potassium	99.7	100	P/P	95 - 105
Sodium	100	104	P/P	90 - 110
Sodium	97.9	100	P/P	95 - 105
Zinc	101	103	P/P	95 - 105
Zinc	103	98.1	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A93041

Included Lab Sample IDs: 2104961, 2104962

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	105	P/P	90 - 110
Organic Carbon	106	104	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A93042

Included Lab Sample IDs: 2104963

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	99.9	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A93046

Included Lab Sample IDs: 2104958, 2104959, 2104960

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: A93046

Included Lab Sample IDs: 2104958, 2104959, 2104960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A93073

Included Lab Sample IDs: 2104961, 2104962, 2104963

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	96.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A93196

Included Lab Sample IDs: 2104961, 2104962, 2104963

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A93246

Included Lab Sample IDs: 2104975

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A93262

Included Lab Sample IDs: 2104974, 2104975, 2104976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.7	100	P/P	90 - 110
Antimony	91.0	91.2	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Boron	99.7	101	P/P	90 - 110
Cadmium	98.2	98.6	P/P	90 - 110
Chromium	95.9	97.2	P/P	90 - 110
Copper	102	102	P/P	90 - 110
Lead	98.0	97.6	P/P	90 - 110
Nickel	102	102	P/P	90 - 110
Selenium	99.1	99.6	P/P	90 - 110
Silver	96.2	96.5	P/P	90 - 110
Thallium	96.1	95.9	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		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					1.25	
EPA 200.7 Rev. 4.4	Barium	101	101	101			0.0898
	Calcium	104	102	103			0.767
	Iron	103	99.6	100			0.376
	Magnesium	106	103	103			0.0476
	Potassium	100	102	102			0.541
	Sodium	98.0	99.7				1.81
	Zinc	99.8	98.4	98.9			0.461
	Zinc	97.8	99.3	98.6			0.704
EPA 200.8 Rev. 5.4	Aluminum	101	100	100			0.129
	Antimony	94.2	92.3	93.3			1.04
	Arsenic	105	102	103			1.32
	Boron	101	101	101			0.0335
	Cadmium	100	98.2	100			2.25
	Chromium	97.0	96.2	97.5			1.27
	Copper	103	101	108			6.43
	Lead	95.6	94.7	95.7			1.08
	Nickel	103	101	103			1.66
	Selenium	102	100	101			1.13
	Silver	94.7	92.4	93.7			1.42
	Thallium	100	99.5	101			1.54
EPA 300.0 Rev. 2.1	Chloride	99.6	97.2	102		1.90	
	Sulfate	99.7	98.9	102		2.03	
EPA 350.1 Rev. 2.0	Ammonia-N	104	103	102			1.60
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	104	106			1.38
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.5	99.0	99.0			0.0
EPA 365.1 Rev. 2.0	Total-P	97.0	100	105			4.57
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	97.2	98.6			1.01
SM 2120 B	Color (true)	100				0.312	
	Color (true)	96.2				0.112	
SM 2320 B-97	Total Alkalinity	103				0.0517	
SM 2540 C-97	TDS					2.25	
SM 4500 F-C-97	Fluoride	97.2	95.8	96.5			0.476
SM 5310 B-00	Organic Carbon	105	107	103			2.17
	Organic Carbon	102	98.6	98.8			0.139

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2104958, 2104959, 2104960
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2104974, 2104975, 2104976
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2104974, 2104975, 2104976
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2104958, 2104959, 2104960
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2104958, 2104959, 2104960
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2104961, 2104962, 2104963
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2104961, 2104962, 2104963
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2104961, 2104962, 2104963

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2104961, 2104962, 2104963
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2104964, 2104965, 2104966
SM 2120 B / E31780	True Color measured at 450 nm	2104958, 2104959, 2104960
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2104958, 2104959, 2104960
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2104958, 2104959, 2104960
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2104958, 2104959, 2104960
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2104958, 2104959, 2104960
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2104961, 2104962, 2104963

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	07/22/2019			07/23/2019 15:18	Samantha Davila	2104958, 2104959, 2104960
EPA 200.7 Rev. 4.4	07/22/2019	07/24/2019 17:15	Elliott D. Healy	07/25/2019 13:24	Betina Topolski	2104974
	07/22/2019	07/24/2019 17:15	Elliott D. Healy	07/25/2019 13:53	Betina Topolski	2104975
	07/22/2019	07/24/2019 17:15	Elliott D. Healy	07/25/2019 14:01	Betina Topolski	2104976
	07/22/2019	08/01/2019 15:20	Elliott D. Healy	08/02/2019 19:10	Betina Topolski	2104975
EPA 200.8 Rev. 5.4	07/22/2019	07/24/2019 17:15	Elliott D. Healy	08/03/2019 00:33	Robert K Palmer	2104974
	07/22/2019	07/24/2019 17:15	Elliott D. Healy	08/03/2019 00:43	Robert K Palmer	2104975
	07/22/2019	07/24/2019 17:15	Elliott D. Healy	08/03/2019 00:52	Robert K Palmer	2104976
EPA 300.0 Rev. 2.1	07/22/2019			07/24/2019 15:17	Jhamieka S. Greenwood	2104958
	07/22/2019			07/24/2019 15:29	Jhamieka S. Greenwood	2104959
	07/22/2019			07/24/2019 16:06	Jhamieka S. Greenwood	2104960
EPA 350.1 Rev. 2.0	07/22/2019			07/31/2019 14:34	Virginia P. Brown	2104961
	07/22/2019			07/31/2019 14:41	Virginia P. Brown	2104962
	07/22/2019			07/31/2019 14:43	Virginia P. Brown	2104963
EPA 351.2 Rev. 2.0	07/22/2019	07/25/2019 12:00	Adrian Shelby	07/26/2019 14:46	Joseph Suarez	2104961
	07/22/2019	07/25/2019 12:00	Adrian Shelby	07/26/2019 14:47	Joseph Suarez	2104962
	07/22/2019	07/25/2019 12:00	Adrian Shelby	07/26/2019 14:52	Joseph Suarez	2104963
EPA 353.2 Rev. 2.0	07/22/2019			07/24/2019 08:59	Beverly Y. Sanders	2104961
	07/22/2019			07/24/2019 09:00	Beverly Y. Sanders	2104962
	07/22/2019			07/24/2019 09:01	Beverly Y. Sanders	2104963
EPA 365.1 Rev. 2.0	07/22/2019	07/24/2019 11:15	Vijayalakshmi Reddy	07/25/2019 09:27	Lipi Saha	2104962
	07/22/2019	07/24/2019 11:15	Vijayalakshmi Reddy	07/25/2019 09:28	Lipi Saha	2104963
	07/22/2019	07/24/2019 11:15	Vijayalakshmi Reddy	07/25/2019 13:40	Lipi Saha	2104961
EPA 365.1 Rev. 2.0 dissolved	07/22/2019			07/23/2019 15:49	Jhamieka S. Greenwood	2104966
	07/22/2019			07/23/2019 16:13	Jhamieka S. Greenwood	2104964, 2104965
SM 2120 B	07/22/2019			07/23/2019 14:03	Madeline Funaro	2104958
	07/22/2019			07/23/2019 14:05	Madeline Funaro	2104960
	07/22/2019			07/23/2019 15:44	Madeline Funaro	2104959
SM 2320 B-97	07/22/2019			07/26/2019 00:02	Dale L. Simmons	2104958
	07/22/2019			07/26/2019 00:14	Dale L. Simmons	2104959
	07/22/2019			07/26/2019 00:26	Dale L. Simmons	2104960
SM 2540 C-97	07/22/2019			07/24/2019 15:20	Blanca Fach	2104958, 2104959, 2104960
SM 2540 D-97	07/22/2019			07/24/2019 15:20	Blanca Fach	2104958, 2104959, 2104960
SM 4500 F-C-97	07/22/2019			07/26/2019 00:02	Dale L. Simmons	2104958
	07/22/2019			07/26/2019 00:14	Dale L. Simmons	2104959
	07/22/2019			07/26/2019 00:26	Dale L. Simmons	2104960
SM 5310 B-00	07/22/2019			07/24/2019 06:23	Madeline Funaro	2104961
	07/22/2019			07/24/2019 11:42	Madeline Funaro	2104962
	07/22/2019			07/25/2019 17:20	Madeline Funaro	2104963