

Chemical Analysis Report

TLH-ROC-2018-04-02-01

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

Event Description: **kit C_pesticides**
Request ID: **RQ-2017-12-04-50**
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.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 02-MAY-2018 14:28



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: ECONFINA RIVER @ US19/27

Collection Date/Time: 04/02/2018 10:20

Field ID: G1TLHR0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979641	EPA 180.1 Rev. 2.0	Turbidity	2.7	A	NTU	P342703	
	EPA 300.0 Rev. 2.1	Chloride	5.9		mg Cl/L	P342688	
		Sulfate	0.34	I	mg SO4/L	P342689	
	SM 2120 B	Color (true)	620		PCU	P342635	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P343369	
	SM 2540 C-97	TDS	127		mg/L	P343012	
	SM 2540 D-97	TSS	2	U	mg/L	P342959	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P343374	
1979644	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P343425	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P342670	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342936	
	EPA 365.1 Rev. 2.0	Total-P	0.045		mg P/L	P342653	
	SM 5310 B-00	Organic Carbon	57		mg C/L	P343083	
1979647	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P342694	
1979653	EPA 200.7 Rev. 4.4	Calcium	6.41		mg/L	P342665	
		Iron	540		ug/L	P342665	
		Magnesium	1.89		mg/L	P342665	
		Potassium	0.30	U	mg/L	P342665	
		Sodium	3.0		mg/L	P342665	
		Zinc	5.0	U	ug/L	P342665	
	EPA 200.8 Rev. 5.4	Arsenic	0.32		ug/L	P342665	
		Cadmium	0.020	U	ug/L	P342665	
		Chromium	0.63	I	ug/L	P342665	
		Copper	0.45	I	ug/L	P342665	
		Lead	0.45		ug/L	P342665	
		Nickel	0.48	I	ug/L	P342665	
		Silver	0.010	U	ug/L	P342665	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: ECONFINA RIVER @ FULFORD BRIDGE RD

Collection Date/Time: 04/02/2018 11:05

Field ID: G1TLHR0093

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979642	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P342703	
	EPA 300.0 Rev. 2.1	Chloride	5.8		mg Cl/L	P342688	
		Sulfate	0.28	I	mg SO4/L	P342689	
	SM 2120 B	Color (true)	620		PCU	P342635	
	SM 2320 B-97	Total Alkalinity	30		mg CaCO3/L	P343369	
	SM 2540 C-97	TDS	135		mg/L	P343012	
	SM 2540 D-97	TSS	3	I	mg/L	P342959	
	SM 4500 F-C-97	Fluoride	0.056	I	mg F/L	P343374	
1979645	EPA 350.1 Rev. 2.0	Ammonia-N	0.029		mg N/L	P343425	

Field ID: G1TLHR0093

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979645	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.7		mg N/L	P342670	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342936	
	EPA 365.1 Rev. 2.0	Total-P	0.46		mg P/L	P342653	
	SM 5310 B-00	Organic Carbon	51		mg C/L	P343083	
1979648	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.052		mg P/L	P342694	
1979654	EPA 200.7 Rev. 4.4	Calcium	14.3		mg/L	P342665	
		Iron	1.54E+03		ug/L	P342665	
		Magnesium	3.74		mg/L	P342665	
		Potassium	0.30	U	mg/L	P342665	
		Sodium	2.9		mg/L	P342665	
		Zinc	5.0	U	ug/L	P342665	
	EPA 200.8 Rev. 5.4	Arsenic	0.44		ug/L	P342665	
		Cadmium	0.020	U	ug/L	P342665	
		Chromium	0.87	I	ug/L	P342665	
		Copper	0.32	I	ug/L	P342665	
		Lead	0.96		ug/L	P342665	
		Nickel	0.49	I	ug/L	P342665	
		Silver	0.010	U	ug/L	P342665	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: ECONFINARIVER@POWERLINERD

Collection Date/Time: 04/02/2018 12:05

Field ID: G1TLHR0090

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979643	EPA 180.1 Rev. 2.0	Turbidity	5.8		NTU	P342703	
	EPA 300.0 Rev. 2.1	Chloride	5.6		mg Cl/L	P342688	
		Sulfate	1.9		mg SO4/L	P342689	
	SM 2120 B	Color (true)	350		PCU	P342635	
	SM 2320 B-97	Total Alkalinity	143		mg CaCO3/L	P343369	
	SM 2540 C-97	TDS	211		mg/L	P343012	
	SM 2540 D-97	TSS	17		mg/L	P342959	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P343374	
1979646	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P343425	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P342670	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.031		mg N/L	P342936	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P342653	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P343083	
1979649	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.060		mg P/L	P342694	
1979655	EPA 200.7 Rev. 4.4	Calcium	48.6		mg/L	P342665	
		Iron	2.26E+03		ug/L	P342665	
		Magnesium	11.7		mg/L	P342665	
		Potassium	0.30	U	mg/L	P342665	
		Sodium	3.1		mg/L	P342665	

Field ID: G1TLHR0090

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979655	EPA 200.7 Rev. 4.4	Zinc	5.0	U	ug/L	P342665	
	EPA 200.8 Rev. 5.4	Arsenic	1.01		ug/L	P342665	
		Cadmium	0.024	I	ug/L	P342665	
		Chromium	1.3	I	ug/L	P342665	
		Copper	0.22	I	ug/L	P342665	
		Lead	0.60		ug/L	P342665	
		Nickel	0.34	I	ug/L	P342665	
		Silver	0.010	U	ug/L	P342665	

Ref. Method and Comment:
 EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
 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: P342703

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P342665

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P342665

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P342688

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P342689

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343425

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342936

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342653

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342694

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

Reference Method: SM 2120 B
Batch ID: P342635

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P343369

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

Reference Method: SM 2540 C-97
Batch ID: P343012

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P342959

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P343374

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343083

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: P342665

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	102		P	85 - 115
Magnesium	99.6		P	85 - 115
Potassium	98.2		P	85 - 115
Sodium	100		P	85 - 115
Zinc	99.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342665

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Cadmium	107		P	85 - 115
Chromium	103		P	85 - 115
Copper	105		P	85 - 115
Lead	99.9		P	85 - 115
Nickel	105		P	85 - 115
Silver	97.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342688

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.5		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343425

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342936

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342653

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342694

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.5		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P343369

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

Reference Method: SM 4500 F-C-97
Batch ID: P343374

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979679	Calcium	97.0		P	80 - 120
1979679	Iron	103		P	80 - 120
1979679	Magnesium	99.9		P	80 - 120
1979679	Potassium	99.4		P	80 - 120
1979679	Sodium	99.0		P	80 - 120
1979679	Zinc	94.9		P	80 - 120
1979955	Calcium	99.5		P	80 - 120
1979955	Iron	103	97.5	P/P	80 - 120
1979955	Magnesium	99.1		P	80 - 120
1979955	Potassium	98.8	91.6	P/P	80 - 120
1979955	Sodium	98.1		P	80 - 120
1979955	Zinc	96.0	93.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979679	Arsenic	105		P	80 - 120
1979679	Cadmium	108		P	80 - 120
1979679	Chromium	103		P	80 - 120
1979679	Copper	100		P	80 - 120
1979679	Lead	101		P	80 - 120
1979679	Nickel	101		P	80 - 120
1979679	Silver	98.2		P	80 - 120
1979955	Arsenic	103	103	P/P	80 - 120
1979955	Cadmium	107	109	P/P	80 - 120
1979955	Chromium	105	105	P/P	80 - 120
1979955	Copper	101	101	P/P	80 - 120
1979955	Lead	102	101	P/P	80 - 120
1979955	Nickel	99.6	99.5	P/P	80 - 120
1979955	Silver	97.6	99.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979517	Sulfate	97.4		P	90 - 110
1979575	Sulfate	93.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979644	Ammonia-N	101	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979670	Kjeldahl Nitrogen	98.0	93.1	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P342936

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979644	NO2NO3-N	94.8	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P342653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979670	Total-P	98.8	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P342694

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979690	O-Phosphate-P	98.6	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P343374

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1980665	Fluoride	97.5	98.0	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P343083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979380	Organic Carbon	95.0	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P342703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979641	Turbidity	7.91	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P342665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979955	Calcium	3.53	Spike	P	0 - 20
1979955	Iron	5.64	Spike	P	0 - 20
1979955	Magnesium	5.04	Spike	P	0 - 20
1979955	Potassium	5.42	Spike	P	0 - 20
1979955	Sodium	3.89	Spike	P	0 - 20
1979955	Zinc	2.34	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979955	Arsenic	0.312	Spike	P	0 - 20
1979955	Cadmium	1.66	Spike	P	0 - 20
1979955	Chromium	0.380	Spike	P	0 - 20
1979955	Copper	0.653	Spike	P	0 - 20
1979955	Lead	0.447	Spike	P	0 - 20
1979955	Nickel	0.112	Spike	P	0 - 20
1979955	Silver	1.62	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342688

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979517	Chloride	0.433	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979517	Sulfate	0.338	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979644	Ammonia-N	1.21	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979670	Kjeldahl Nitrogen	4.04	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342936

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979644	NO2NO3-N	2.09	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979670	Total-P	0.201	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P342694

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979690	O-Phosphate-P	0.707	Spike	P	0 - 20

Reference Method: SM 2120 B
 Batch ID: P342635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979667	Color (true)	0.430	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P343369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1980665	Total Alkalinity	0.0395	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
 Batch ID: P343012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979397	TDS	7.52	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P343374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1980665	Fluoride	0.498	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
 Batch ID: P343083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979380	Organic Carbon	1.05	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: A83001
 Included Lab Sample IDs: 1979641, 1979642, 1979643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.1	98.5	P/P	90 - 110
Chloride	98.5	97.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A83001

Included Lab Sample IDs: 1979641, 1979642, 1979643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	97.5	97.6	P/P	90 - 110
Sulfate	97.6	96.8	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A83009

Included Lab Sample IDs: 1979641, 1979642, 1979643

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83020

Included Lab Sample IDs: 1979645, 1979646

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A83021

Included Lab Sample IDs: 1979647, 1979648, 1979649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A83022

Included Lab Sample IDs: 1979641, 1979642, 1979643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.5	P/P	95 - 105

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A83043

Included Lab Sample IDs: 1979644, 1979645, 1979646

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	97.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83044

Included Lab Sample IDs: 1979653, 1979654, 1979655

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.4	98.6	P/P	95 - 105
Calcium	98.6	99.3	P/P	90 - 110
Iron	97.8	99.7	P/P	90 - 110
Iron	97.8	97.8	P/P	95 - 105
Magnesium	98.0	99.9	P/P	90 - 110
Magnesium	98.4	98.0	P/P	95 - 105
Potassium	96.6	97.2	P/P	95 - 105
Potassium	97.2	98.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83044

Included Lab Sample IDs: 1979653, 1979654, 1979655

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	98.3	99.1	P/P	90 - 110
Sodium	98.7	98.3	P/P	95 - 105
Zinc	98.4	99.8	P/P	90 - 110
Zinc	99.5	98.4	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83052

Included Lab Sample IDs: 1979644

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A83084

Included Lab Sample IDs: 1979644, 1979645, 1979646

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A83136

Included Lab Sample IDs: 1979644, 1979645, 1979646

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.1	96.7	P/P	90 - 110
Organic Carbon	96.7	95.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A83225

Included Lab Sample IDs: 1979641, 1979642, 1979643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A83225

Included Lab Sample IDs: 1979641, 1979642, 1979643

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A83245

Included Lab Sample IDs: 1979644, 1979645, 1979646

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83248

Included Lab Sample IDs: 1979653, 1979654, 1979655

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	103	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Chromium	98.1	99.5	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Lead	97.8	97.5	P/P	90 - 110
Nickel	102	101	P/P	90 - 110
Silver	101	101	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						7.91	
EPA 200.7 Rev. 4.4	Calcium	102	97.0	99.5				3.53
	Iron	102	103	103	97.5			5.64
	Magnesium	99.6	99.9	99.1				5.04
	Potassium	98.2	99.4	98.8	91.6			5.42
	Sodium	100	99.0	98.1				3.89
	Zinc	99.5	94.9	96.0	93.8			2.34
EPA 200.8 Rev. 5.4	Arsenic	105	105	103	103			0.312
	Cadmium	107	108	107	109			1.66
	Chromium	103	103	105	105			0.380
	Copper	105	100	101	101			0.653
	Lead	99.9	101	102	101			0.447
	Nickel	105	101	99.6	99.5			0.112
	Silver	97.9	98.2	97.6	99.2			1.62
EPA 300.0 Rev. 2.1	Chloride	97.5					0.433	
	Sulfate	96.5	97.4	93.0			0.338	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	101	99.8				1.21
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.0	93.1				4.04
EPA 353.2 Rev. 2.0	NO2NO3-N	100	94.8	96.8				2.09
EPA 365.1 Rev. 2.0	Total-P	98.8	98.8	99.1				0.201
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.5	98.6	99.3				0.707
SM 2120 B	Color (true)						0.430	
SM 2320 B-97	Total Alkalinity	101					0.0395	
SM 2540 C-97	TDS						7.52	
SM 4500 F-C-97	Fluoride	97.0	97.5	98.0				0.498
SM 5310 B-00	Organic Carbon	95.9	95.0	96.4				1.05

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1979641, 1979642, 1979643

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1979653, 1979654, 1979655
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1979653, 1979654, 1979655
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1979641, 1979642, 1979643
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1979641, 1979642, 1979643
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1979644, 1979645, 1979646
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1979644, 1979645, 1979646
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1979644, 1979645, 1979646
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1979644, 1979645, 1979646
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1979647, 1979648, 1979649
SM 2120 B / E31780	True Color measured at 450 nm	1979641, 1979642, 1979643
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1979641, 1979642, 1979643
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1979641, 1979642, 1979643
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1979641, 1979642, 1979643
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1979641, 1979642, 1979643
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1979644, 1979645, 1979646

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	04/02/2018			04/03/2018 16:07	DeAsia Armster	1979641, 1979642, 1979643
EPA 200.7 Rev. 4.4	04/02/2018	04/03/2018 16:50	Elliott D. Healy	04/04/2018 12:21	Betina Topolski	1979653
	04/02/2018	04/03/2018 16:50	Elliott D. Healy	04/04/2018 12:28	Betina Topolski	1979654
	04/02/2018	04/03/2018 16:50	Elliott D. Healy	04/04/2018 13:00	Betina Topolski	1979655
EPA 200.8 Rev. 5.4	04/02/2018	04/03/2018 16:50	Elliott D. Healy	04/13/2018 14:12	Nadine Brooks	1979653
	04/02/2018	04/03/2018 16:50	Elliott D. Healy	04/13/2018 14:22	Nadine Brooks	1979654
	04/02/2018	04/03/2018 16:50	Elliott D. Healy	04/13/2018 14:32	Nadine Brooks	1979655
EPA 300.0 Rev. 2.1	04/02/2018			04/03/2018 21:06	Lipi Saha	1979641
	04/02/2018			04/03/2018 21:42	Lipi Saha	1979642
	04/02/2018			04/03/2018 21:54	Lipi Saha	1979643
EPA 350.1 Rev. 2.0	04/02/2018			04/13/2018 11:42	Ping Hua	1979644
	04/02/2018			04/13/2018 11:47	Ping Hua	1979645
	04/02/2018			04/13/2018 11:48	Ping Hua	1979646
EPA 351.2 Rev. 2.0	04/02/2018	04/03/2018 09:50	Adrian Shelby	04/04/2018 15:30	Joseph Suarez	1979644
	04/02/2018	04/03/2018 09:50	Adrian Shelby	04/04/2018 15:32	Joseph Suarez	1979645
	04/02/2018	04/03/2018 09:50	Adrian Shelby	04/04/2018 15:34	Joseph Suarez	1979646
EPA 353.2 Rev. 2.0	04/02/2018			04/06/2018 11:10	Lauren Bottorf	1979644
	04/02/2018			04/06/2018 11:16	Lauren Bottorf	1979645
	04/02/2018			04/06/2018 11:17	Lauren Bottorf	1979646
EPA 365.1 Rev. 2.0	04/02/2018	04/03/2018 13:07	Sima Feizi	04/04/2018 10:02	Beverly Y. Sanders	1979645
	04/02/2018	04/03/2018 13:07	Sima Feizi	04/04/2018 10:03	Beverly Y. Sanders	1979646
	04/02/2018	04/03/2018 13:07	Sima Feizi	04/04/2018 13:38	Beverly Y. Sanders	1979644
EPA 365.1 Rev. 2.0 dissolved	04/02/2018			04/03/2018 15:25	Megan Treadwell	1979647
	04/02/2018			04/03/2018 15:26	Megan Treadwell	1979648
	04/02/2018			04/03/2018 15:27	Megan Treadwell	1979649
SM 2120 B	04/02/2018			04/03/2018 14:34	Tanya Welborn	1979641
	04/02/2018			04/03/2018 14:35	Tanya Welborn	1979642
	04/02/2018			04/03/2018 14:36	Tanya Welborn	1979643
SM 2320 B-97	04/02/2018			04/13/2018 04:22	Dale L. Simmons	1979641
	04/02/2018			04/13/2018 04:35	Dale L. Simmons	1979642
	04/02/2018			04/13/2018 04:47	Dale L. Simmons	1979643
SM 2540 C-97	04/02/2018			04/04/2018 15:34	Yijie Li	1979641, 1979642, 1979643
SM 2540 D-97	04/02/2018			04/04/2018 15:34	Yijie Li	1979641, 1979642, 1979643
SM 4500 F-C-97	04/02/2018			04/13/2018 04:22	Dale L. Simmons	1979641
	04/02/2018			04/13/2018 04:35	Dale L. Simmons	1979642
	04/02/2018			04/13/2018 04:47	Dale L. Simmons	1979643
SM 5310 B-00	04/02/2018			04/07/2018 04:37	Julia Storbeck	1979644
	04/02/2018			04/07/2018 04:49	Julia Storbeck	1979645
	04/02/2018			04/07/2018 05:28	Julia Storbeck	1979646