

Chemical Analysis Report

SO-DIST-2018-08-17-03

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

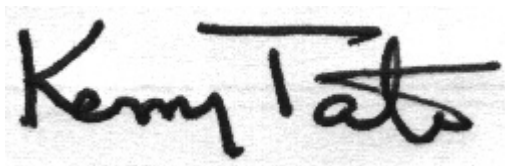
Event Description: **CALOOSA LT 3240BC**
Request ID: **RQ-2018-08-13-77**
Customer: **SO-DIST**
Project ID: **BMAP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 05-SEP-2018 13:16

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 first name.

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: US 41, Marker # 38

Collection Date/Time: 08/16/2018 11:45

Field ID: G3SD0112

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018167	SM 5310 B-00 dissolved	Organic Carbon	20		mg C/L	P350672	
2018175	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P350462	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P350665	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P350672	
2018183	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P350371	
2018202	EPA 200.7 Rev. 4.4	Iron	440		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.77		ug/L	P350545	
		Cadmium	0.020	U	ug/L	P350545	
		Chromium	0.49	I	ug/L	P350545	
		Copper	0.94		ug/L	P350545	
		Lead	0.16	I	ug/L	P350545	
		Nickel	0.58	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Marker # 28

Collection Date/Time: 08/16/2018 12:00

Field ID: G3SD0113

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018168	SM 5310 B-00 dissolved	Organic Carbon	22		mg C/L	P350672	
2018176	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P350572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P350665	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P350672	
2018184	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P350371	
2018203	EPA 200.7 Rev. 4.4	Iron	590		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.67		ug/L	P350545	
		Cadmium	0.020	U	ug/L	P350545	
		Chromium	0.61	I	ug/L	P350545	
		Copper	0.89		ug/L	P350545	
		Lead	0.20		ug/L	P350545	
		Nickel	0.60	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Marker # 22

Collection Date/Time: 08/16/2018 12:10

Field ID: G3SD0114

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018169	SM 5310 B-00 dissolved	Organic Carbon	22		mg C/L	P350672	
2018177	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P350572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P350665	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P350672	
2018185	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P350371	
2018204	EPA 200.7 Rev. 4.4	Iron	560		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.63		ug/L	P350545	
		Cadmium	0.020	U	ug/L	P350545	
		Chromium	0.55	I	ug/L	P350545	
		Copper	0.83		ug/L	P350545	
		Lead	0.18	I	ug/L	P350545	
		Nickel	0.58	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Old Swing Bridge

Collection Date/Time: 08/16/2018 12:15

Field ID: G3SD0115

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018170	SM 5310 B-00 dissolved	Organic Carbon	22		mg C/L	P350672	
2018178	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P350572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P350665	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P350672	
2018186	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P350371	
2018205	EPA 200.7 Rev. 4.4	Iron	570		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.65		ug/L	P350545	
		Cadmium	0.020	U	ug/L	P350545	
		Chromium	0.57	I	ug/L	P350545	
		Copper	0.85		ug/L	P350545	
		Lead	0.18	I	ug/L	P350545	
		Nickel	0.60	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: MidChannel@OrangeRiver

Collection Date/Time: 08/16/2018 12:25

Field ID: G3SD0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018171	SM 5310 B-00 dissolved	Organic Carbon	22		mg C/L	P350672	
2018179	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P350572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P350665	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P350672	
2018187	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P350371	
2018206	EPA 200.7 Rev. 4.4	Iron	610		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.63		ug/L	P350545	
		Cadmium	0.020	U	ug/L	P350545	
		Chromium	0.65	I	ug/L	P350545	
		Copper	0.85		ug/L	P350545	
		Lead	0.18	I	ug/L	P350545	
		Nickel	0.60	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Upstream of Power Plant

Collection Date/Time: 08/16/2018 12:35

Field ID: G3SD0117

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018172	SM 5310 B-00 dissolved	Organic Carbon	24		mg C/L	P350672	
2018180	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P350572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.28		mg N/L	P350665	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P350672	
2018188	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P350371	
2018207	EPA 200.7 Rev. 4.4	Iron	590		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.57		ug/L	P350545	
		Cadmium	0.037	I	ug/L	P350545	
		Chromium	0.55	I	ug/L	P350545	
		Copper	0.83		ug/L	P350545	
		Lead	0.18	I	ug/L	P350545	
		Nickel	0.55	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Mid Channel off Oxbow

Collection Date/Time: 08/16/2018 12:55

Field ID: G3SD0118

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018173	SM 5310 B-00 dissolved	Organic Carbon	25		mg C/L	P350672	
2018181	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P350572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P350665	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P350672	
2018189	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P350371	
2018208	EPA 200.7 Rev. 4.4	Iron	670		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.46		ug/L	P350545	
		Cadmium	0.020	U	ug/L	P350545	
		Chromium	0.60	I	ug/L	P350545	
		Copper	0.86		ug/L	P350545	
		Lead	0.21		ug/L	P350545	
		Nickel	0.54	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Mid channel off point

Collection Date/Time: 08/16/2018 13:05

Field ID: G3SD0119

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018174	SM 5310 B-00 dissolved	Organic Carbon	25		mg C/L	P350672	
2018182	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P350572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P350666	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P350672	
2018190	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P350371	
2018209	EPA 200.7 Rev. 4.4	Iron	640		ug/L	P350545	
		Zinc	5.0	U	ug/L	P350545	
	EPA 200.8 Rev. 5.4	Arsenic	1.47		ug/L	P350545	
		Cadmium	0.020	U	ug/L	P350545	
		Chromium	0.63	I	ug/L	P350545	
		Copper	0.87		ug/L	P350545	
		Lead	0.22		ug/L	P350545	
		Nickel	0.55	I	ug/L	P350545	
		Silver	0.010	U	ug/L	P350545	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350545

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350545

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 351.2 Rev. 2.0
Batch ID: P350462

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350572

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350665

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350666

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350371

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

Reference Method: SM 5310 B-00
Batch ID: P350672

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00 dissolved
Batch ID: P350672

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: P350545

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	105		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350545

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.3		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	97.9		P	85 - 115
Copper	96.1		P	85 - 115
Lead	101		P	85 - 115
Nickel	99.3		P	85 - 115
Silver	99.8		P	85 - 115

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350462

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350572

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: P350665

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350666

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350371

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

Reference Method: SM 5310 B-00
Batch ID: P350672

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00 dissolved
Batch ID: P350672

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018099	Iron	102	105	P/P	80 - 120
2018099	Zinc	103	104	P/P	80 - 120
2018202	Iron	101		P	80 - 120
2018202	Zinc	98.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018099	Arsenic	98.5	98.3	P/P	80 - 120
2018099	Cadmium	101	103	P/P	80 - 120
2018099	Chromium	90.9	94.5	P/P	80 - 120
2018099	Copper	96.8	97.2	P/P	80 - 120
2018099	Lead	96.8	98.4	P/P	80 - 120
2018099	Nickel	96.8	97.6	P/P	80 - 120
2018099	Silver	96.1	98.1	P/P	80 - 120
2018202	Arsenic	102		P	80 - 120
2018202	Cadmium	103		P	80 - 120
2018202	Chromium	93.7		P	80 - 120
2018202	Copper	94.8		P	80 - 120
2018202	Lead	101		P	80 - 120
2018202	Nickel	96.5		P	80 - 120
2018202	Silver	97.0		P	80 - 120

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350462

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018056	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018319	Kjeldahl Nitrogen	104	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018175	NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350666

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018319	NO2NO3-N	99.0	102	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P350672

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

Reference Method: SM 5310 B-00
Batch ID: P350672

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018141	Organic Carbon	99.0	99.4	P/P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P350672

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018141	Organic Carbon	99.0	99.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018099	Iron	2.65	Spike	P	0 - 20
2018099	Zinc	0.674	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018099	Arsenic	0.215	Spike	P	0 - 20
2018099	Cadmium	1.94	Spike	P	0 - 20
2018099	Chromium	3.65	Spike	P	0 - 20
2018099	Copper	0.513	Spike	P	0 - 20
2018099	Lead	1.63	Spike	P	0 - 20
2018099	Nickel	0.795	Spike	P	0 - 20
2018099	Silver	2.03	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350462

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018056	Kjeldahl Nitrogen	0.587	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018319	Kjeldahl Nitrogen	0.583	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018175	NO2NO3-N	0.804	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350666

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018319	NO2NO3-N	2.99	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018183	O-Phosphate-P	1.66	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P350672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018141	Organic Carbon	0.245	Spike	P	0 - 20

Reference Method: SM 5310 B-00 dissolved
Batch ID: P350672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018141	Organic Carbon	0.245	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: A85971

Included Lab Sample IDs: 2018183, 2018184, 2018185, 2018186, 2018187, 2018188, 2018189, 2018190

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110
O-Phosphate-P	99.7	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86029

Included Lab Sample IDs: 2018175

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.1	96.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86066

Included Lab Sample IDs: 2018202, 2018203, 2018204, 2018205, 2018206, 2018207, 2018208, 2018209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	97.9	98.0	P/P	90 - 110
Iron	98.0	97.9	P/P	90 - 110
Zinc	97.8	99.7	P/P	90 - 110
Zinc	99.7	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86079

Included Lab Sample IDs: 2018176, 2018177, 2018178, 2018179, 2018180, 2018181, 2018182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.2	99.5	P/P	90 - 110
Kjeldahl Nitrogen	99.5	96.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86085

Included Lab Sample IDs: 2018175, 2018176, 2018177, 2018178, 2018179, 2018180, 2018181, 2018182

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

Reference Method: SM 5310 B-00

Run ID: A86088

Included Lab Sample IDs: 2018175, 2018176, 2018177, 2018178, 2018179, 2018180, 2018181, 2018182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	95.3	P/P	90 - 110
Organic Carbon	97.6	96.8	P/P	90 - 110

Reference Method: SM 5310 B-00 dissolved

Run ID: A86088

Included Lab Sample IDs: 2018167, 2018168, 2018169, 2018170, 2018171, 2018172, 2018173, 2018174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.5	97.6	P/P	90 - 110
Organic Carbon	97.6	96.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86120

Included Lab Sample IDs: 2018202, 2018203, 2018204, 2018205, 2018206, 2018207, 2018208, 2018209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	93.6	95.2	P/P	90 - 110
Arsenic	95.2	95.2	P/P	90 - 110
Cadmium	96.9	97.0	P/P	90 - 110
Cadmium	97.5	96.9	P/P	90 - 110
Chromium	92.2	93.0	P/P	90 - 110
Chromium	93.7	92.2	P/P	90 - 110
Copper	92.3	94.2	P/P	90 - 110
Copper	94.2	93.7	P/P	90 - 110
Lead	100	101	P/P	90 - 110
Lead	101	100	P/P	90 - 110
Nickel	92.2	94.0	P/P	90 - 110
Nickel	94.0	93.5	P/P	90 - 110
Silver	95.2	95.3	P/P	90 - 110
Silver	95.5	95.2	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Iron	105	102	105	101		2.65
	Zinc	101	103	104	98.5		0.674
EPA 200.8 Rev. 5.4	Arsenic	99.3	98.5	98.3	102		0.215
	Cadmium	104	101	103	103		1.94
	Chromium	97.9	90.9	94.5	93.7		3.65
	Copper	96.1	96.8	97.2	94.8		0.513
	Lead	101	96.8	98.4	101		1.63
	Nickel	99.3	96.8	97.6	96.5		0.795
	Silver	99.8	96.1	98.1	97.0		2.03
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	102	101			0.587
	Kjeldahl Nitrogen	101	104	103			0.583
EPA 353.2 Rev. 2.0	NO2NO3-N	101	99.0				0.804
	NO2NO3-N	102	99.0	102			2.99
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101					1.66
SM 5310 B-00	Organic Carbon	95.8	99.0	99.4			0.245
SM 5310 B-00 dissolved	Organic Carbon	95.8	99.0	99.4			0.245

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	2018202, 2018203, 2018204, 2018205, 2018206, 2018207, 2018208, 2018209
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2018202, 2018203, 2018204, 2018205, 2018206, 2018207, 2018208, 2018209
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2018175, 2018176, 2018177, 2018178, 2018179, 2018180, 2018181, 2018182
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2018175, 2018176, 2018177, 2018178, 2018179, 2018180, 2018181, 2018182
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2018183, 2018184, 2018185, 2018186, 2018187, 2018188, 2018189, 2018190
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2018175, 2018176, 2018177, 2018178, 2018179, 2018180, 2018181, 2018182
SM 5310 B-00 dissolved / E31780	Dissolved Nonpurgeable Organic Carbon in filtered, aqueous matrices	2018167, 2018168, 2018169, 2018170, 2018171, 2018172, 2018173, 2018174

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 17:44	Betina Topolski	2018202
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 18:04	Betina Topolski	2018203
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 18:36	Betina Topolski	2018204
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 18:43	Betina Topolski	2018205
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 18:51	Betina Topolski	2018206
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 18:58	Betina Topolski	2018207
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 19:06	Betina Topolski	2018208
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/22/2018 19:13	Betina Topolski	2018209
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/24/2018 22:41	Allison Taylor	2018202
EPA 200.8 Rev. 5.4	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/24/2018 23:29	Allison Taylor	2018203
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/24/2018 23:39	Allison Taylor	2018204
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/24/2018 23:48	Allison Taylor	2018205
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/24/2018 23:58	Allison Taylor	2018206
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/25/2018 00:08	Allison Taylor	2018207
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/25/2018 00:17	Allison Taylor	2018208
	08/17/2018	08/21/2018 17:45	Elliott D. Healy	08/25/2018 00:27	Allison Taylor	2018209
	08/17/2018	08/20/2018 11:00	Adrian Shelby	08/21/2018 13:44	Joseph Suarez	2018175
	08/17/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 11:02	Joseph Suarez	2018176
EPA 351.2 Rev. 2.0	08/17/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 11:07	Joseph Suarez	2018177
	08/17/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 11:08	Joseph Suarez	2018178
	08/17/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 11:10	Joseph Suarez	2018179
	08/17/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 11:11	Joseph Suarez	2018180
	08/17/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 11:13	Joseph Suarez	2018181
	08/17/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 11:14	Joseph Suarez	2018182
	08/17/2018			08/23/2018 12:16	Lauren Bottorf	2018175
	08/17/2018			08/23/2018 12:25	Lauren Bottorf	2018176
	08/17/2018			08/23/2018 12:26	Lauren Bottorf	2018177
EPA 353.2 Rev. 2.0	08/17/2018			08/23/2018 12:28	Lauren Bottorf	2018178
	08/17/2018			08/23/2018 12:29	Lauren Bottorf	2018179
	08/17/2018			08/23/2018 12:30	Lauren Bottorf	2018180
	08/17/2018			08/23/2018 12:31	Lauren Bottorf	2018181
	08/17/2018			08/23/2018 12:45	Lauren Bottorf	2018182
	08/17/2018			08/17/2018 14:02	Lipi Saha	2018183
	08/17/2018			08/17/2018 14:06	Lipi Saha	2018184
	08/17/2018			08/17/2018 14:07	Lipi Saha	2018185
	08/17/2018			08/17/2018 14:12	Lipi Saha	2018186
EPA 365.1 Rev. 2.0 dissolved	08/17/2018			08/17/2018 14:13	Lipi Saha	2018187
	08/17/2018			08/17/2018 14:14	Lipi Saha	2018188
	08/17/2018			08/17/2018 14:15	Lipi Saha	2018189
	08/17/2018			08/17/2018 14:16	Lipi Saha	2018190
	08/17/2018					

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	08/17/2018			08/22/2018 18:57	Megan Treadwell	2018175
	08/17/2018			08/22/2018 19:13	Megan Treadwell	2018176
	08/17/2018			08/22/2018 19:27	Megan Treadwell	2018177
	08/17/2018			08/22/2018 20:07	Megan Treadwell	2018178
	08/17/2018			08/22/2018 20:21	Megan Treadwell	2018179
	08/17/2018			08/22/2018 20:34	Megan Treadwell	2018180
	08/17/2018			08/22/2018 20:48	Megan Treadwell	2018181
	08/17/2018			08/22/2018 21:01	Megan Treadwell	2018182
SM 5310 B-00 dissolved	08/17/2018			08/22/2018 16:39	Megan Treadwell	2018167
	08/17/2018			08/22/2018 17:20	Megan Treadwell	2018168
	08/17/2018			08/22/2018 17:33	Megan Treadwell	2018169
	08/17/2018			08/22/2018 17:49	Megan Treadwell	2018170
	08/17/2018			08/22/2018 18:03	Megan Treadwell	2018171
	08/17/2018			08/22/2018 18:17	Megan Treadwell	2018172
	08/17/2018			08/22/2018 18:30	Megan Treadwell	2018173
	08/17/2018			08/22/2018 18:44	Megan Treadwell	2018174