Chemical Analysis Report

SO-DIST-2018-05-11-02

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-2018-05-07-05**
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: Colin Wright, Program Administrator

Date Certified: 15-JUN-2018 11:15

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: 05/10/2018 11:50**

Field ID: G3SD0112 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992368	SM 5310 B-00 dissolved	Organic Carbon	13		mg C/L	P345546	
1992376	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345351	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P345546	
1992384	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.097		mg P/L	P345153	
1992392	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P345381	
	EPA 200.8 Rev. 5.4	Arsenic	1.83		ug/L	P345381	
		Cadmium	0.060	U	ug/L	P345381	
		Chromium	1.2	U	ug/L	P345381	
		Copper	1.4	I	ug/L	P345381	
		Lead	0.15	U	ug/L	P345381	
		Nickel	0.60	U	ug/L	P345381	
		Silver	0.030	U	ug/L	P345381	
		Zinc	3.0	U	ug/L	P345381	

Sample Location: Marker # 28 **Collection Date/Time: 05/10/2018 12:00**

Field ID: G3SD0113 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992369	SM 5310 B-00 dissolved	Organic Carbon	14		mg C/L	P345545	
1992377	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345351	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P345545	
1992385	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.099		mg P/L	P345153	
1992393	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P345381	
	EPA 200.8 Rev. 5.4	Arsenic	1.86		ug/L	P345381	
		Cadmium	0.060	U	ug/L	P345381	
		Chromium	1.2	U	ug/L	P345381	
		Copper	1.3	I	ug/L	P345381	
		Lead	0.15	U	ug/L	P345381	
		Nickel	0.60	U	ug/L	P345381	
		Silver	0.030	U	ug/L	P345381	
		Zinc	3.0	U	ug/L	P345381	

Sample Location: Marker # 22 **Collection Date/Time: 05/10/2018 12:10**

Field ID: G3SD0114 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992370	SM 5310 B-00 dissolved	Organic Carbon	13		mg C/L	P345545	
1992378	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345352	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345545	
1992386	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P345153	

Field ID: G3SD0114 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992394	EPA 200.7 Rev. 4.4	Iron	160	I	ug/L	P345381	
	EPA 200.8 Rev. 5.4	Arsenic	1.91		ug/L	P345381	
		Cadmium	0.060	U	ug/L	P345381	
		Chromium	1.2	U	ug/L	P345381	
		Copper	1.3	I	ug/L	P345381	
		Lead	0.15	U	ug/L	P345381	
		Nickel	0.60	U	ug/L	P345381	
		Silver	0.030	U	ug/L	P345381	
		Zinc	3.0	U	ug/L	P345381	

Sample Location: Old Swing Bridge **Collection Date/Time: 05/10/2018 12:20**

Field ID: G3SD0115 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992371	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P345545	
1992379	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345352	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345545	
1992387	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P345153	
1992395	EPA 200.7 Rev. 4.4	Iron	120		ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	1.87		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	1.37		ug/L	P345280	
		Lead	0.12	I	ug/L	P345280	
		Nickel	0.41	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	
		Zinc	2.3	I	ug/L	P345280	

Sample Location: MidChannel@OrangeRiver **Collection Date/Time: 05/10/2018 12:30**

Field ID: G3SD0116 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992372	SM 5310 B-00 dissolved	Organic Carbon	14		mg C/L	P345545	
1992380	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345352	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P345545	
1992388	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.074		mg P/L	P345153	
1992396	EPA 200.7 Rev. 4.4	Iron	160		ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	1.91		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	1.47		ug/L	P345280	
		Lead	0.14	I	ug/L	P345280	
		Nickel	0.43	I	ug/L	P345280	

Field ID: G3SD0116 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992396	EPA 200.8 Rev. 5.4	Silver	0.010	U	ug/L	P345280	
		Zinc	2.9	I	ug/L	P345280	

Sample Location: Upstream of Power Plant **Collection Date/Time: 05/10/2018 12:40**

Field ID: G3SD0117 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992373	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P345545	
1992381	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P345352	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345545	
1992389	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.076		mg P/L	P345153	
1992397	EPA 200.7 Rev. 4.4	Iron	110	I	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	1.86		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	1.29		ug/L	P345280	
		Lead	0.12	I	ug/L	P345280	
		Nickel	0.44	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	
		Zinc	1.9	I	ug/L	P345280	

Sample Location: Mid Channel off Oxbow **Collection Date/Time: 05/10/2018 12:55**

Field ID: G3SD0118 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992374	SM 5310 B-00 dissolved	Organic Carbon	14		mg C/L	P345545	
1992382	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345352	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345545	
1992390	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.077		mg P/L	P345153	
1992398	EPA 200.7 Rev. 4.4	Iron	85	I	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	1.89		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.61	I	ug/L	P345280	
		Copper	1.27		ug/L	P345280	
		Lead	0.078	I	ug/L	P345280	
		Nickel	0.47	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	
		Zinc	1.9	I	ug/L	P345280	

Sample Location: Mid channel off point **Collection Date/Time: 05/10/2018 13:10**

Field ID: G3SD0119 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

Field ID: G3SD0119 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992375	SM 5310 B-00 dissolved	Organic Carbon	14		mg C/L	P345545	
1992383	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P345534	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.019		mg N/L	P345352	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345545	
1992391	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.090		mg P/L	P345153	
1992399	EPA 200.7 Rev. 4.4	Iron	120	I	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	1.90		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	1.30		ug/L	P345280	
		Lead	0.13	I	ug/L	P345280	
		Nickel	0.43	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	
		Zinc	2.1	I	ug/L	P345280	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345381

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

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
Zinc	1.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345381

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345381

Component	Result	Code	Units
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345534

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345351

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345352

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345153

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

Reference Method: SM 5310 B-00
Batch ID: P345545

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

Reference Method: SM 5310 B-00
Batch ID: P345546

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

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345545

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

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345546

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: P345280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	104		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345381

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	108		P	85 - 115
Copper	103		P	85 - 115
Lead	105		P	85 - 115
Nickel	102		P	85 - 115
Silver	102		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345381

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	106		P	85 - 115
Copper	95.2		P	85 - 115
Lead	98.2		P	85 - 115
Nickel	98.0		P	85 - 115
Silver	105		P	85 - 115
Zinc	95.8		P	85 - 115

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345534

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345351

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345352

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345153

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

Reference Method: SM 5310 B-00
Batch ID: P345545

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P345546

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345545

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345546

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992363	Iron	103	103	P/P	80 - 120
1992415	Iron	104		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345381

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992394	Iron	100	101	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992363	Arsenic	101	104	P/P	80 - 120
1992363	Cadmium	102	105	P/P	80 - 120
1992363	Chromium	107	111	P/P	80 - 120
1992363	Copper	99.8	105	P/P	80 - 120
1992363	Lead	104	107	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992363	Nickel	99.4	102	P/P	80 - 120
1992363	Silver	98.2	103	P/P	80 - 120
1992363	Zinc	99.9	103	P/P	80 - 120
1992415	Arsenic	105		P	80 - 120
1992415	Cadmium	110		P	80 - 120
1992415	Chromium	101		P	80 - 120
1992415	Copper	105		P	80 - 120
1992415	Lead	106		P	80 - 120
1992415	Nickel	100		P	80 - 120
1992415	Silver	107		P	80 - 120
1992415	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345381

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992394	Arsenic	109	111	P/P	70 - 130
1992394	Cadmium	95.7	97.4	P/P	70 - 130
1992394	Chromium	104	104	P/P	70 - 130
1992394	Copper	90.2	92.1	P/P	70 - 130
1992394	Lead	105	105	P/P	70 - 130
1992394	Nickel	93.1	94.1	P/P	70 - 130
1992394	Silver	100	101	P/P	70 - 130
1992394	Zinc	95.2	96.2	P/P	70 - 130

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992376	Kjeldahl Nitrogen	93.5	95.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345351

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991938	NO2NO3-N	102	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345352

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992378	NO2NO3-N	96.7	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345153

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992388	O-Phosphate-P	96.6	97.6	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P345545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992342	Organic Carbon	93.3	94.1	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P345546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991941	Organic Carbon	94.9	94.4	P/P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992342	Organic Carbon	93.3	94.1	P/P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991941	Organic Carbon	94.9	94.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992363	Iron	0.549	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992394	Iron	0.867	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992363	Arsenic	3.25	Spike	P	0 - 20
1992363	Cadmium	2.01	Spike	P	0 - 20
1992363	Chromium	4.06	Spike	P	0 - 20
1992363	Copper	5.14	Spike	P	0 - 20
1992363	Lead	3.04	Spike	P	0 - 20
1992363	Nickel	3.03	Spike	P	0 - 20
1992363	Silver	4.33	Spike	P	0 - 20
1992363	Zinc	3.17	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992394	Arsenic	1.72	Spike	P	0 - 20
1992394	Cadmium	1.79	Spike	P	0 - 20
1992394	Chromium	0.454	Spike	P	0 - 20
1992394	Copper	1.90	Spike	P	0 - 20
1992394	Lead	0.596	Spike	P	0 - 20
1992394	Nickel	1.09	Spike	P	0 - 20
1992394	Silver	0.905	Spike	P	0 - 20
1992394	Zinc	1.13	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992376	Kjeldahl Nitrogen	1.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345351

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1991938	NO2NO3-N	0.971	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992378	NO2NO3-N	1.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992388	O-Phosphate-P	0.586	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P345545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992342	Organic Carbon	0.675	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P345546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1991941	Organic Carbon	0.436	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992342	Organic Carbon	0.675	Spike	P	0 - 20

Reference Method: SM 5310 B-00 dissolved
Batch ID: P345546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1991941	Organic Carbon	0.436	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: A83830
Included Lab Sample IDs: 1992384, 1992385, 1992386, 1992387, 1992388, 1992389, 1992390, 1992391

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110
O-Phosphate-P	101	99.6	P/P	90 - 110
O-Phosphate-P	99.4	98.4	P/P	90 - 110
O-Phosphate-P	99.6	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83899
Included Lab Sample IDs: 1992376, 1992377, 1992378, 1992379, 1992380, 1992381, 1992382, 1992383

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83986
Included Lab Sample IDs: 1992392, 1992393, 1992394, 1992395, 1992396, 1992397, 1992398, 1992399

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	99.7	P/P	90 - 110
Iron	99.7	98.4	P/P	90 - 110
Iron	99.8	100	P/P	90 - 110
Iron	99.9	99.8	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83989
Included Lab Sample IDs: 1992376, 1992377, 1992378, 1992379, 1992380, 1992381, 1992382, 1992383

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	95.2	P/P	90 - 110
Organic Carbon	95.0	95.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A83989
Included Lab Sample IDs: 1992376, 1992377, 1992378, 1992379, 1992380, 1992381, 1992382, 1992383

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	95.0	P/P	90 - 110

Reference Method: SM 5310 B-00 dissolved
Run ID: A83989
Included Lab Sample IDs: 1992368, 1992369, 1992370, 1992371, 1992372, 1992373, 1992374, 1992375

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	95.2	P/P	90 - 110
Organic Carbon	96.0	95.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83991
Included Lab Sample IDs: 1992395, 1992396, 1992397, 1992398, 1992399

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.3	99.5	P/P	90 - 110
Cadmium	100	102	P/P	90 - 110
Chromium	108	104	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Nickel	97.6	96.6	P/P	90 - 110
Zinc	98.3	98.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84028
Included Lab Sample IDs: 1992392, 1992393, 1992394

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.3	98.8	P/P	90 - 110
Arsenic	99.2	98.3	P/P	90 - 110
Cadmium	95.1	95.2	P/P	90 - 110
Cadmium	95.2	96.7	P/P	90 - 110
Copper	95.4	96.1	P/P	90 - 110
Copper	97.6	95.4	P/P	90 - 110
Lead	96.9	97.4	P/P	90 - 110
Lead	97.4	96.9	P/P	90 - 110
Nickel	94.2	94.1	P/P	90 - 110
Nickel	97.3	94.2	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Silver	104	105	P/P	90 - 110
Zinc	95.9	96.1	P/P	90 - 110
Zinc	97.2	95.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84044
Included Lab Sample IDs: 1992376, 1992377, 1992378, 1992379, 1992380, 1992381, 1992382, 1992383

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.7	94.9	P/P	90 - 110
Kjeldahl Nitrogen	94.9	98.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84054
Included Lab Sample IDs: 1992392, 1992393, 1992394

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	105	104	P/P	90 - 110
Chromium	107	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84101
Included Lab Sample IDs: 1992395, 1992396, 1992397, 1992398, 1992399

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	106	106	P/P	90 - 110
Copper	106	104	P/P	90 - 110
Silver	105	99.4	P/P	90 - 110
Silver	99.8	105	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Iron	104	103	103	104			0.549
	Iron	103	100	101				0.867
EPA 200.8 Rev. 5.4	Arsenic	104	101	104	105			3.25
	Arsenic	100	109	111				1.72
	Cadmium	102	102	105	110			2.01
	Cadmium	97.0	95.7	97.4				1.79
	Chromium	108	107	111	101			4.06
	Chromium	106	104	104				0.454
	Copper	103	99.8	105	105			5.14
	Copper	95.2	90.2	92.1				1.90
	Lead	105	104	107	106			3.04
	Lead	98.2	105	105				0.596
	Nickel	102	99.4	102	100			3.03
	Nickel	98.0	93.1	94.1				1.09
	Silver	102	98.2	103	107			4.33
	Silver	105	100	101				0.905
	Zinc	101	99.9	103	102			3.17
	Zinc	95.8	95.2	96.2				1.13
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	93.5	95.4				1.35
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	104				0.971
	NO2NO3-N	103	96.7	97.7				1.03
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	96.6	97.6				0.586
SM 5310 B-00	Organic Carbon	95.4	93.3	94.1				0.675
	Organic Carbon	94.8	94.9	94.4				0.436
SM 5310 B-00 dissolved	Organic Carbon	95.4	93.3	94.1				0.675
	Organic Carbon	94.8	94.9	94.4				0.436

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	1992392, 1992393, 1992394, 1992395, 1992396, 1992397, 1992398, 1992399
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1992392, 1992393, 1992394, 1992395, 1992396, 1992397, 1992398, 1992399
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1992376, 1992377, 1992378, 1992379, 1992380, 1992381, 1992382, 1992383
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1992376, 1992377, 1992378, 1992379, 1992380, 1992381, 1992382, 1992383
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1992384, 1992385, 1992386, 1992387, 1992388, 1992389, 1992390, 1992391
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1992376, 1992377, 1992378, 1992379, 1992380, 1992381, 1992382, 1992383
SM 5310 B-00 dissolved / E31780	Dissolved Nonpurgeable Organic Carbon in filtered, aqueous matrices	1992368, 1992369, 1992370, 1992371, 1992372, 1992373, 1992374, 1992375

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	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:08	Betina Topolski	1992395
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:20	Betina Topolski	1992396
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:55	Betina Topolski	1992397
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:07	Betina Topolski	1992398
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:19	Betina Topolski	1992399
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/17/2018 23:23	Betina Topolski	1992392
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/17/2018 23:30	Betina Topolski	1992393
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/18/2018 00:02	Betina Topolski	1992394
EPA 200.8 Rev. 5.4	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 18:34	Robert K Palmer	1992395
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 18:43	Robert K Palmer	1992396
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 18:53	Robert K Palmer	1992397
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:03	Robert K Palmer	1992398
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:13	Robert K Palmer	1992399
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 11:06	Robert K Palmer	1992395
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 11:12	Robert K Palmer	1992396
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 11:17	Robert K Palmer	1992397
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 11:39	Robert K Palmer	1992398
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 11:45	Robert K Palmer	1992399
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/18/2018 13:06	Robert K Palmer	1992392
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/18/2018 13:16	Robert K Palmer	1992393
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/18/2018 14:03	Robert K Palmer	1992394
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/21/2018 15:00	Robert K Palmer	1992392
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/21/2018 15:06	Robert K Palmer	1992393
	05/11/2018	05/16/2018 12:00	Martin Acosta	05/21/2018 15:34	Robert K Palmer	1992394
EPA 351.2 Rev. 2.0	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:12	Joseph Suarez	1992376
	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:16	Joseph Suarez	1992377
	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:20	Joseph Suarez	1992378
	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:21	Joseph Suarez	1992379
	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:23	Joseph Suarez	1992380
	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:24	Joseph Suarez	1992381
	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:26	Joseph Suarez	1992382
	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:27	Joseph Suarez	1992383
EPA 353.2 Rev. 2.0	05/11/2018			05/15/2018 13:37	Lauren Bottorf	1992376
	05/11/2018			05/15/2018 13:38	Lauren Bottorf	1992377
	05/11/2018			05/15/2018 13:45	Lauren Bottorf	1992378
	05/11/2018			05/15/2018 13:51	Lauren Bottorf	1992379
	05/11/2018			05/15/2018 13:52	Lauren Bottorf	1992380
	05/11/2018			05/15/2018 13:54	Lauren Bottorf	1992381
	05/11/2018			05/15/2018 13:55	Lauren Bottorf	1992382
	05/11/2018			05/15/2018 13:56	Lauren Bottorf	1992383

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	05/11/2018			05/11/2018 14:26	Julia Storbeck	1992388
	05/11/2018			05/11/2018 14:40	Julia Storbeck	1992385
	05/11/2018			05/11/2018 14:46	Julia Storbeck	1992386
	05/11/2018			05/11/2018 14:47	Julia Storbeck	1992387
	05/11/2018			05/11/2018 14:48	Julia Storbeck	1992389, 1992390
	05/11/2018			05/11/2018 14:49	Julia Storbeck	1992391
	05/11/2018			05/11/2018 15:27	Julia Storbeck	1992384
SM 5310 B-00	05/11/2018			05/17/2018 02:23	Megan Treadwell	1992377
	05/11/2018			05/17/2018 03:08	Megan Treadwell	1992378
	05/11/2018			05/17/2018 03:23	Megan Treadwell	1992379
	05/11/2018			05/17/2018 03:38	Megan Treadwell	1992380
	05/11/2018			05/17/2018 03:53	Megan Treadwell	1992381
	05/11/2018			05/17/2018 04:08	Megan Treadwell	1992382
	05/11/2018			05/17/2018 04:23	Megan Treadwell	1992383
	05/11/2018			05/17/2018 09:38	Megan Treadwell	1992376
SM 5310 B-00 dissolved	05/11/2018			05/17/2018 00:36	Megan Treadwell	1992369
	05/11/2018			05/17/2018 00:51	Megan Treadwell	1992370
	05/11/2018			05/17/2018 01:06	Megan Treadwell	1992371
	05/11/2018			05/17/2018 01:21	Megan Treadwell	1992372
	05/11/2018			05/17/2018 01:36	Megan Treadwell	1992373
	05/11/2018			05/17/2018 01:53	Megan Treadwell	1992374
	05/11/2018			05/17/2018 02:08	Megan Treadwell	1992375
	05/11/2018			05/17/2018 09:21	Megan Treadwell	1992368