

Chemical Analysis Report

SO-DIST-2018-10-25-03

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-2018-10-01-11**
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: 16-NOV-2018 13:52

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light-colored rectangular background.

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: 10/24/2018 11:55

Field ID: G3SD0112

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036018	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P354154	
2036026	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P354058	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P353830	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P354154	
2036034	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.045		mg P/L	P353715	
2036042	EPA 200.7 Rev. 4.4	Iron	150		ug/L	P353717	
		Zinc	5.0	U	ug/L	P353717	
	EPA 200.8 Rev. 5.4	Arsenic	1.94		ug/L	P353717	
		Cadmium	0.020	U	ug/L	P353717	
		Chromium	0.40	U	ug/L	P353717	
		Copper	1.21		ug/L	P353717	
		Lead	0.083	I	ug/L	P353717	
		Nickel	0.52	I	ug/L	P353717	
		Silver	0.010	U	ug/L	P353717	

Sample Location: Marker # 28

Collection Date/Time: 10/24/2018 12:10

Field ID: G3SD0113

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036019	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P354154	
2036027	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P354058	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P353830	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P354154	
2036035	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.075		mg P/L	P353715	
2036043	EPA 200.7 Rev. 4.4	Iron	150		ug/L	P353839	
		Zinc	5.0	U	ug/L	P353839	
	EPA 200.8 Rev. 5.4	Arsenic	1.77		ug/L	P353839	
		Cadmium	0.020	U	ug/L	P353839	
		Chromium	0.40	U	ug/L	P353839	
		Copper	1.01		ug/L	P353839	
		Lead	0.070	I	ug/L	P353839	
		Nickel	0.47	I	ug/L	P353839	
		Silver	0.010	U	ug/L	P353839	

Sample Location: Marker # 22

Collection Date/Time: 10/24/2018 12:20

Field ID: G3SD0114

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036020	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P354154	
2036028	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P354057	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.26		mg N/L	P353965	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P354154	
2036036	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.076		mg P/L	P353715	
2036044	EPA 200.7 Rev. 4.4	Iron	180		ug/L	P353717	
		Zinc	5.0	U	ug/L	P353717	
	EPA 200.8 Rev. 5.4	Arsenic	1.79		ug/L	P353717	
		Cadmium	0.020	U	ug/L	P353717	
		Chromium	0.40	U	ug/L	P353717	
		Copper	1.11		ug/L	P353717	
		Lead	0.084	I	ug/L	P353717	
		Nickel	0.48	I	ug/L	P353717	
		Silver	0.010	U	ug/L	P353717	

Sample Location: Old Swing Bridge

Collection Date/Time: 10/24/2018 12:30

Field ID: G3SD0115

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036021	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P354154	
2036029	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P354057	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P353965	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P354154	
2036037	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.077		mg P/L	P353692	
2036045	EPA 200.7 Rev. 4.4	Iron	190		ug/L	P353717	
		Zinc	5.0	U	ug/L	P353717	
	EPA 200.8 Rev. 5.4	Arsenic	1.91		ug/L	P353717	
		Cadmium	0.020	U	ug/L	P353717	
		Chromium	0.40	I	ug/L	P353717	
		Copper	1.05		ug/L	P353717	
		Lead	0.086	I	ug/L	P353717	
		Nickel	0.56	I	ug/L	P353717	
		Silver	0.010	U	ug/L	P353717	

Sample Location: MidChannel@OrangeRiver

Collection Date/Time: 10/24/2018 12:40

Field ID: G3SD0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036022	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P354154	
2036030	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P354057	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P353965	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P354154	
2036038	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.072		mg P/L	P353692	
2036046	EPA 200.7 Rev. 4.4	Iron	210		ug/L	P353717	
		Zinc	5.4	I	ug/L	P353717	
	EPA 200.8 Rev. 5.4	Arsenic	1.76		ug/L	P353717	
		Cadmium	0.020	U	ug/L	P353717	
		Chromium	0.40	U	ug/L	P353717	
		Copper	0.89		ug/L	P353717	
		Lead	0.095	I	ug/L	P353717	
		Nickel	0.49	I	ug/L	P353717	
		Silver	0.010	U	ug/L	P353717	

Sample Location: Upstream of Power Plant

Collection Date/Time: 10/24/2018 12:50

Field ID: G3SD0117

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036023	SM 5310 B-00 dissolved	Organic Carbon	16		mg C/L	P354154	
2036031	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P354147	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P353965	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P354154	
2036039	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.086		mg P/L	P353692	
2036047	EPA 200.7 Rev. 4.4	Iron	240		ug/L	P353717	
		Zinc	5.0	U	ug/L	P353717	
	EPA 200.8 Rev. 5.4	Arsenic	1.77		ug/L	P353717	
		Cadmium	0.020	U	ug/L	P353717	
		Chromium	0.40	U	ug/L	P353717	
		Copper	0.99		ug/L	P353717	
		Lead	0.13	I	ug/L	P353717	
		Nickel	0.46	I	ug/L	P353717	
		Silver	0.010	U	ug/L	P353717	

Sample Location: Mid Channel off Oxbow

Collection Date/Time: 10/24/2018 13:05

Field ID: G3SD0118

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036024	SM 5310 B-00 dissolved	Organic Carbon	16		mg C/L	P354154	
2036032	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P354147	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P353965	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P354154	
2036040	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.086		mg P/L	P353692	
2036048	EPA 200.7 Rev. 4.4	Iron	200		ug/L	P353717	
		Zinc	5.0	U	ug/L	P353717	
	EPA 200.8 Rev. 5.4	Arsenic	1.73		ug/L	P353717	
		Cadmium	0.020	U	ug/L	P353717	
		Chromium	0.40	U	ug/L	P353717	
		Copper	0.90		ug/L	P353717	
		Lead	0.094	I	ug/L	P353717	
		Nickel	0.43	I	ug/L	P353717	
		Silver	0.010	U	ug/L	P353717	

Sample Location: Mid channel off point

Collection Date/Time: 10/24/2018 13:15

Field ID: G3SD0119

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2036025	SM 5310 B-00 dissolved	Organic Carbon	15		mg C/L	P354154	
2036033	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P354147	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P353965	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P354154	
2036041	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.085		mg P/L	P353692	
2036049	EPA 200.7 Rev. 4.4	Iron	220		ug/L	P353717	
		Zinc	5.0	U	ug/L	P353717	
	EPA 200.8 Rev. 5.4	Arsenic	1.70		ug/L	P353717	
		Cadmium	0.020	U	ug/L	P353717	
		Chromium	0.40	U	ug/L	P353717	
		Copper	0.83		ug/L	P353717	
		Lead	0.10	I	ug/L	P353717	
		Nickel	0.49	I	ug/L	P353717	
		Silver	0.010	U	ug/L	P353717	

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353717

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353839

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: P353717

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 200.8 Rev. 5.4
Batch ID: P353839

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: P354057

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354058

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354147

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353830

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353965

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353692

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353715

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

Reference Method: SM 5310 B-00
Batch ID: P354154

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

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354154

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: P353717

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	107		P	85 - 115
Zinc	99.3		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353839

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	106		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353717

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	103		P	85 - 115
Copper	106		P	85 - 115
Lead	103		P	85 - 115
Nickel	102		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353839

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	103		P	85 - 115
Copper	101		P	85 - 115
Lead	102		P	85 - 115
Nickel	102		P	85 - 115
Silver	97.3		P	85 - 115

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354057

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354058

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354147

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353830

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353965

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: P353692

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353715

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

Reference Method: SM 5310 B-00
Batch ID: P354154

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.9		P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354154

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2035813	Iron	105	106	P/P	80 - 120
2035813	Zinc	99.7	100	P/P	80 - 120
2036099	Iron	105		P	80 - 120
2036099	Zinc	102		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353839

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036346	Iron	106	105	P/P	80 - 120
2036346	Zinc	101	101	P/P	80 - 120
2036605	Iron	103		P	80 - 120
2036605	Zinc	96.1		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2035813	Arsenic	103	102	P/P	80 - 120
2035813	Cadmium	103	102	P/P	80 - 120
2035813	Chromium	102	101	P/P	80 - 120
2035813	Copper	103	101	P/P	80 - 120
2035813	Lead	103	103	P/P	80 - 120
2035813	Nickel	98.2	97.1	P/P	80 - 120
2035813	Silver	101	99.1	P/P	80 - 120
2036099	Arsenic	102		P	80 - 120
2036099	Cadmium	102		P	80 - 120
2036099	Chromium	98.6		P	80 - 120
2036099	Copper	104		P	80 - 120
2036099	Lead	104		P	80 - 120
2036099	Nickel	97.6		P	80 - 120
2036099	Silver	98.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353839

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036346	Arsenic	105	105	P/P	80 - 120
2036346	Cadmium	102	101	P/P	80 - 120
2036346	Chromium	102	102	P/P	80 - 120
2036346	Copper	102	102	P/P	80 - 120
2036346	Lead	102	101	P/P	80 - 120
2036346	Nickel	103	103	P/P	80 - 120
2036346	Silver	96.4	96.5	P/P	80 - 120
2036605	Arsenic	105		P	75 - 125
2036605	Cadmium	106		P	75 - 125
2036605	Chromium	99.8		P	75 - 125
2036605	Copper	97.4		P	75 - 125
2036605	Lead	102		P	75 - 125
2036605	Nickel	98.5		P	75 - 125
2036605	Silver	98.1		P	75 - 125

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354057

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036029	Kjeldahl Nitrogen	104	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036143	Kjeldahl Nitrogen	97.0	97.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354147

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036032	Kjeldahl Nitrogen	91.2	91.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353830

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2035964	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353965

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2035974	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036038	O-Phosphate-P	97.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353715

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2035968	O-Phosphate-P	99.4	96.3	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P354154

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036106	Organic Carbon	97.2	96.5	P/P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354154

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2036106	Organic Carbon	97.2	96.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2035813	Iron	0.509	Spike	P	0 - 20
2035813	Zinc	0.547	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P353839

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036346	Iron	0.249	Spike	P	0 - 20
2036346	Zinc	0.657	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2035813	Arsenic	1.02	Spike	P	0 - 20
2035813	Cadmium	1.68	Spike	P	0 - 20
2035813	Chromium	0.881	Spike	P	0 - 20
2035813	Copper	1.41	Spike	P	0 - 20
2035813	Lead	0.448	Spike	P	0 - 20
2035813	Nickel	1.09	Spike	P	0 - 20
2035813	Silver	2.02	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P353839

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036346	Arsenic	0.0875	Spike	P	0 - 20
2036346	Cadmium	1.15	Spike	P	0 - 20
2036346	Chromium	0.360	Spike	P	0 - 20
2036346	Copper	0.0987	Spike	P	0 - 20
2036346	Lead	0.752	Spike	P	0 - 20
2036346	Nickel	0.0777	Spike	P	0 - 20
2036346	Silver	0.132	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036029	Kjeldahl Nitrogen	4.13	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036143	Kjeldahl Nitrogen	0.0860	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036032	Kjeldahl Nitrogen	0.220	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2035964	NO2NO3-N	0.464	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P353965

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2035974	NO2NO3-N	0.334	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036038	O-Phosphate-P	0.885	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P353715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2035968	O-Phosphate-P	2.35	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P354154

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036106	Organic Carbon	0.449	Spike	P	0 - 20

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354154

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2036106	Organic Carbon	0.449	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: A87287

Included Lab Sample IDs: 2036037, 2036038, 2036039, 2036040, 2036041

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A87305

Included Lab Sample IDs: 2036034, 2036035, 2036036

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A87354

Included Lab Sample IDs: 2036026, 2036027

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87399

Included Lab Sample IDs: 2036042, 2036044, 2036045, 2036046, 2036047, 2036048, 2036049

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	101	P/P	90 - 110
Zinc	97.8	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A87412

Included Lab Sample IDs: 2036028, 2036029, 2036030, 2036031, 2036032, 2036033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87466

Included Lab Sample IDs: 2036042

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87473

Included Lab Sample IDs: 2036043

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	103	P/P	90 - 110
Zinc	101	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87488

Included Lab Sample IDs: 2036026, 2036027, 2036028, 2036029, 2036030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.5	98.1	P/P	90 - 110
Kjeldahl Nitrogen	96.4	98.5	P/P	90 - 110
Kjeldahl Nitrogen	98.1	96.4	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A87498

Included Lab Sample IDs: 2036026, 2036027, 2036028, 2036029, 2036030, 2036031, 2036032, 2036033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	98.2	P/P	90 - 110

Reference Method: SM 5310 B-00 dissolved

Run ID: A87498

Included Lab Sample IDs: 2036018, 2036019, 2036020, 2036021, 2036022, 2036023, 2036024, 2036025

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87524

Included Lab Sample IDs: 2036031, 2036032, 2036033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	99.9	P/P	90 - 110
Kjeldahl Nitrogen	99.9	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87582

Included Lab Sample IDs: 2036043

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	102	P/P	90 - 110
Cadmium	99.6	99.1	P/P	90 - 110
Chromium	102	99.3	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Nickel	102	99.9	P/P	90 - 110
Silver	95.4	94.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87658

Included Lab Sample IDs: 2036042, 2036044, 2036045, 2036046, 2036047, 2036048, 2036049

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	101	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	104	102	P/P	90 - 110
Copper	105	105	P/P	90 - 110
Lead	103	103	P/P	90 - 110
Nickel	100	101	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Quality Assurance Report

Calibration Verification

* 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	107	105	106	105		0.509
	Iron	106	106	105	103		0.249
	Zinc	99.3	99.7	100	102		0.547
	Zinc	102	101	101	96.1		0.657
EPA 200.8 Rev. 5.4	Arsenic	104	103	102	102		1.02
	Arsenic	105	105	105	105		0.0875
	Cadmium	103	103	102	102		1.68
	Cadmium	104	102	101	106		1.15
	Chromium	103	102	101	98.6		0.881
	Chromium	103	102	102	99.8		0.360
	Copper	106	103	101	104		1.41
	Copper	101	102	102	97.4		0.0987
	Lead	103	103	103	104		0.448
	Lead	102	102	101	102		0.752
	Nickel	102	98.2	97.1	97.6		1.09
	Nickel	102	103	103	98.5		0.0777
	Silver	103	101	99.1	98.9		2.02
	Silver	97.3	96.4	96.5	98.1		0.132
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.3	104	97.0			4.13
	Kjeldahl Nitrogen	99.8	97.0	97.1			0.0860
	Kjeldahl Nitrogen	105	91.2	91.6			0.220
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	101			0.464
	NO2NO3-N	102	103	102			0.334
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	97.0	98.5			0.885
	O-Phosphate-P	98.8	99.4	96.3			2.35
SM 5310 B-00	Organic Carbon	97.9	97.2	96.5			0.449
SM 5310 B-00 dissolved	Organic Carbon	97.9	97.2	96.5			0.449

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	2036042, 2036043, 2036044, 2036045, 2036046, 2036047, 2036048, 2036049
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2036042, 2036043, 2036044, 2036045, 2036046, 2036047, 2036048, 2036049
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2036026, 2036027, 2036028, 2036029, 2036030, 2036031, 2036032, 2036033
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2036026, 2036027, 2036028, 2036029, 2036030, 2036031, 2036032, 2036033
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2036034, 2036035, 2036036, 2036037, 2036038, 2036039, 2036040, 2036041
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2036026, 2036027, 2036028, 2036029, 2036030, 2036031, 2036032, 2036033
SM 5310 B-00 dissolved / E31780	Dissolved Nonpurgeable Organic Carbon in filtered, aqueous matrices	2036018, 2036019, 2036020, 2036021, 2036022, 2036023, 2036024, 2036025

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	10/25/2018	10/26/2018 11:37	Devin Thornton	10/31/2018 01:44	Betina Topolski	2036042
	10/25/2018	10/26/2018 11:37	Devin Thornton	10/31/2018 01:52	Betina Topolski	2036044
	10/25/2018	10/26/2018 11:37	Devin Thornton	10/31/2018 01:59	Betina Topolski	2036045
	10/25/2018	10/26/2018 11:37	Devin Thornton	10/31/2018 02:07	Betina Topolski	2036046
	10/25/2018	10/26/2018 11:37	Devin Thornton	10/31/2018 02:14	Betina Topolski	2036047
	10/25/2018	10/26/2018 11:37	Devin Thornton	10/31/2018 02:22	Betina Topolski	2036048
	10/25/2018	10/26/2018 11:37	Devin Thornton	10/31/2018 02:29	Betina Topolski	2036049
	10/25/2018	10/26/2018 11:37	Devin Thornton	11/01/2018 17:50	Betina Topolski	2036042
	10/25/2018	10/29/2018 14:05	Elliott D. Healy	11/01/2018 14:09	Betina Topolski	2036043
	10/25/2018	10/26/2018 11:37	Devin Thornton	11/08/2018 20:25	Allison Taylor	2036042
EPA 200.8 Rev. 5.4	10/25/2018	10/26/2018 11:37	Devin Thornton	11/08/2018 20:35	Allison Taylor	2036044
	10/25/2018	10/26/2018 11:37	Devin Thornton	11/08/2018 20:45	Allison Taylor	2036045
	10/25/2018	10/26/2018 11:37	Devin Thornton	11/08/2018 20:54	Allison Taylor	2036046
	10/25/2018	10/26/2018 11:37	Devin Thornton	11/08/2018 21:04	Allison Taylor	2036047
	10/25/2018	10/26/2018 11:37	Devin Thornton	11/08/2018 21:14	Allison Taylor	2036048
	10/25/2018	10/26/2018 11:37	Devin Thornton	11/08/2018 21:23	Allison Taylor	2036049
	10/25/2018	10/29/2018 14:05	Elliott D. Healy	11/06/2018 07:52	Allison Taylor	2036043
	10/25/2018	11/01/2018 17:00	Adrian Shelby	11/02/2018 12:16	Virginia P. Brown	2036028
	10/25/2018	11/01/2018 17:00	Adrian Shelby	11/02/2018 12:20	Virginia P. Brown	2036029
	10/25/2018	11/01/2018 17:00	Adrian Shelby	11/02/2018 12:25	Virginia P. Brown	2036030
EPA 351.2 Rev. 2.0	10/25/2018	11/01/2018 17:00	Adrian Shelby	11/02/2018 12:39	Virginia P. Brown	2036026
	10/25/2018	11/01/2018 17:00	Adrian Shelby	11/02/2018 12:40	Virginia P. Brown	2036027
	10/25/2018	11/02/2018 12:30	Adrian Shelby	11/05/2018 10:31	Joseph Suarez	2036031
	10/25/2018	11/02/2018 12:30	Adrian Shelby	11/05/2018 10:33	Joseph Suarez	2036032
	10/25/2018	11/02/2018 12:30	Adrian Shelby	11/05/2018 10:41	Joseph Suarez	2036033
EPA 353.2 Rev. 2.0	10/25/2018			10/29/2018 11:42	Beverly Y. Sanders	2036026
	10/25/2018			10/29/2018 11:43	Beverly Y. Sanders	2036027
	10/25/2018			10/31/2018 11:00	Beverly Y. Sanders	2036028
	10/25/2018			10/31/2018 11:01	Beverly Y. Sanders	2036029
	10/25/2018			10/31/2018 11:02	Beverly Y. Sanders	2036030
	10/25/2018			10/31/2018 11:04	Beverly Y. Sanders	2036031
	10/25/2018			10/31/2018 11:05	Beverly Y. Sanders	2036032
	10/25/2018			10/31/2018 11:06	Beverly Y. Sanders	2036033
	10/25/2018			10/25/2018 14:44	Lipi Saha	2036038
	10/25/2018			10/25/2018 15:27	Lipi Saha	2036037
EPA 365.1 Rev. 2.0 dissolved	10/25/2018			10/25/2018 15:28	Lipi Saha	2036039
	10/25/2018			10/25/2018 15:33	Lipi Saha	2036040
	10/25/2018			10/25/2018 15:34	Lipi Saha	2036041
	10/25/2018			10/26/2018 09:02	Lipi Saha	2036034
	10/25/2018			10/26/2018 09:03	Lipi Saha	2036035

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 SM 5310 B-00	10/25/2018			10/26/2018 09:04	Lipi Saha	2036036
	10/25/2018			11/02/2018 03:45	Megan Treadwell	2036026
	10/25/2018			11/02/2018 04:00	Megan Treadwell	2036027
	10/25/2018			11/02/2018 04:14	Megan Treadwell	2036028
	10/25/2018			11/02/2018 04:27	Megan Treadwell	2036029
	10/25/2018			11/02/2018 04:39	Megan Treadwell	2036030
	10/25/2018			11/02/2018 04:51	Megan Treadwell	2036031
	10/25/2018			11/02/2018 05:05	Megan Treadwell	2036032
	10/25/2018			11/02/2018 05:17	Megan Treadwell	2036033
	10/25/2018			11/02/2018 01:43	Megan Treadwell	2036018
SM 5310 B-00 dissolved	10/25/2018			11/02/2018 01:55	Megan Treadwell	2036019
	10/25/2018			11/02/2018 02:07	Megan Treadwell	2036020
	10/25/2018			11/02/2018 02:20	Megan Treadwell	2036021
	10/25/2018			11/02/2018 02:32	Megan Treadwell	2036022
	10/25/2018			11/02/2018 02:44	Megan Treadwell	2036023
	10/25/2018			11/02/2018 02:57	Megan Treadwell	2036024
	10/25/2018			11/02/2018 03:09	Megan Treadwell	2036025