

Chemical Analysis Report

SO-DIST-2018-11-15-03

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

Event Description: **CALOOSA LT 3240A**
Request ID: **RQ-2018-11-05-08**
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: Liang Lin, Environmental Administrator

Date Certified: 05-DEC-2018 13:52

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: USGSStation-PuntaBlanca

Collection Date/Time: 11/14/2018 09:47

Field ID: G3SD0108

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041875	SM 2320 B-97	Total Alkalinity	117		mg CaCO3/L	P355203	
	SM 4500 F-C-97	Fluoride	0.93		mg F/L	P355278	
2041879	SM 5310 B-00 dissolved	Organic Carbon	7.0		mg C/L	P354967	
2041883	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P355072	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P354975	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.025		mg N/L	P355141	
	EPA 365.1 Rev. 2.0	Total-P	0.062		mg P/L	P354974	
	SM 5310 B-00	Organic Carbon	7.1		mg C/L	P354967	
2041887	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P354781	
2041948	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P354983	
		Zinc	15	U	ug/L	P354983	
	EPA 200.8 Rev. 5.4	Arsenic	2.94		ug/L	P354983	
		Cadmium	0.060	U	ug/L	P354983	
		Chromium	1.2	U	ug/L	P354983	
		Copper	1.2	I	ug/L	P354983	
		Lead	0.50	U	ug/L	P354983	
		Nickel	0.60	U	ug/L	P354983	
		Silver	0.030	U	ug/L	P354983	

Sample Location: USGS Station-ShellPoint

Collection Date/Time: 11/14/2018 10:20

Field ID: G3SD0109

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041876	SM 2320 B-97	Total Alkalinity	115		mg CaCO3/L	P355203	
	SM 4500 F-C-97	Fluoride	0.85		mg F/L	P355278	
2041880	SM 5310 B-00 dissolved	Organic Carbon	7.6		mg C/L	P354967	
2041884	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P355072	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P354975	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.031		mg N/L	P355141	
	EPA 365.1 Rev. 2.0	Total-P	0.061		mg P/L	P354974	
	SM 5310 B-00	Organic Carbon	7.9		mg C/L	P354967	
2041888	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.044		mg P/L	P354781	
2041949	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P354983	
		Zinc	15	U	ug/L	P354983	
	EPA 200.8 Rev. 5.4	Arsenic	2.66		ug/L	P354983	
		Cadmium	0.060	U	ug/L	P354983	
		Chromium	1.2	U	ug/L	P354983	
		Copper	0.99	I	ug/L	P354983	
		Lead	0.50	U	ug/L	P354983	
		Nickel	0.60	U	ug/L	P354983	
		Silver	0.030	U	ug/L	P354983	

Sample Location: Marker # 76

Collection Date/Time: 11/14/2018 10:52

Field ID: G3SD0110

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041877	SM 2320 B-97	Total Alkalinity	114		mg CaCO3/L	P355203	
	SM 4500 F-C-97	Fluoride	0.62		mg F/L	P355278	
2041881	SM 5310 B-00 dissolved	Organic Carbon	10		mg C/L	P354967	
2041885	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P355072	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P354977	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P355142	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P354974	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P354967	
2041889	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.054		mg P/L	P354781	
2041950	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P354983	
		Zinc	15	U	ug/L	P354983	
	EPA 200.8 Rev. 5.4	Arsenic	2.52		ug/L	P354983	
		Cadmium	0.060	U	ug/L	P354983	
		Chromium	1.2	U	ug/L	P354983	
		Copper	1.2	I	ug/L	P354983	
		Lead	0.15	U	ug/L	P354983	
		Nickel	0.60	U	ug/L	P354983	
		Silver	0.030	U	ug/L	P354983	

Sample Location: Marker # 52

Collection Date/Time: 11/14/2018 11:35

Field ID: G3SD0111

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041878	SM 2320 B-97	Total Alkalinity	115		mg CaCO3/L	P355203	
	SM 4500 F-C-97	Fluoride	0.39		mg F/L	P355278	
2041882	SM 5310 B-00 dissolved	Organic Carbon	13		mg C/L	P354964	
2041886	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P355072	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P354977	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P355142	
	EPA 365.1 Rev. 2.0	Total-P	0.085		mg P/L	P354974	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P354964	
2041890	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.058		mg P/L	P354781	
2041951	EPA 200.7 Rev. 4.4	Iron	52	I	ug/L	P354983	
		Zinc	5.0	U	ug/L	P354983	
	EPA 200.8 Rev. 5.4	Arsenic	2.05		ug/L	P354983	
		Cadmium	0.060	U	ug/L	P354983	
		Chromium	1.2	U	ug/L	P354983	
		Copper	1.3	I	ug/L	P354983	
		Lead	0.15	U	ug/L	P354983	
		Nickel	0.60	U	ug/L	P354983	
		Silver	0.030	U	ug/L	P354983	

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354983

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: P354983

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 350.1 Rev. 2.0
Batch ID: P355072

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354975

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354977

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355141

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355142

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354974

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354781

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

Reference Method: SM 2320 B-97
Batch ID: P355203

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 4500 F-C-97
Batch ID: P355278

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P354964

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

Reference Method: SM 5310 B-00
Batch ID: P354967

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

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354964

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

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354967

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: P354983

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	96.3		P	85 - 115
Zinc	89.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354983

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	107		P	85 - 115
Chromium	108		P	85 - 115
Copper	102		P	85 - 115
Lead	101		P	85 - 115
Nickel	102		P	85 - 115
Silver	99.2		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355072

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354975

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354977

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355141

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355142

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354974

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354781

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

Reference Method: SM 2320 B-97
Batch ID: P355203

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.7		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P355278

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P354967

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354967

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041951	Iron	97.4	99.8	P/P	70 - 130
2041951	Zinc	93.5	93.6	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041951	Arsenic	112	114	P/P	80 - 120
2041951	Cadmium	98.4	101	P/P	80 - 120
2041951	Chromium	87.9	89.4	P/P	80 - 120
2041951	Copper	101	101	P/P	80 - 120
2041951	Lead	106	109	P/P	80 - 120
2041951	Nickel	103	105	P/P	80 - 120
2041951	Silver	90.4	92.1	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355072

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041883	Ammonia-N	99.5	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354975

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041856	Kjeldahl Nitrogen	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354977

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041885	Kjeldahl Nitrogen	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041790	NO2NO3-N	98.4	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041885	NO2NO3-N	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354974

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041901	Total-P	102	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354781

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041890	O-Phosphate-P	96.7	98.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P355278

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041897	Fluoride	99.8	99.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041793	Organic Carbon	97.0	92.2	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P354967

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041879	Organic Carbon	93.5	92.6	P/P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041793	Organic Carbon	97.0	92.2	P/P	85 - 115

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354967

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041879	Organic Carbon	93.5	92.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041951	Iron	2.38	Spike	P	0 - 20
2041951	Zinc	0.0281	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041951	Arsenic	1.83	Spike	P	0 - 20
2041951	Cadmium	3.00	Spike	P	0 - 20
2041951	Chromium	1.61	Spike	P	0 - 20
2041951	Copper	0.595	Spike	P	0 - 20
2041951	Lead	2.26	Spike	P	0 - 20
2041951	Nickel	1.53	Spike	P	0 - 20
2041951	Silver	1.81	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041883	Ammonia-N	1.92	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354975

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041856	Kjeldahl Nitrogen	0.646	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041885	Kjeldahl Nitrogen	1.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041790	NO2NO3-N	0.956	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041885	NO2NO3-N	0.959	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041901	Total-P	1.33	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041890	O-Phosphate-P	1.41	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P355203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041897	Total Alkalinity	0.439	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P355278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041897	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P354964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041793	Organic Carbon	2.82	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P354967

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041879	Organic Carbon	0.770	Spike	P	0 - 20

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041793	Organic Carbon	2.82	Spike	P	0 - 20

Reference Method: SM 5310 B-00 dissolved
Batch ID: P354967

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041879	Organic Carbon	0.770	Spike	P	0 - 20

Quality Assurance Report

Precision

* 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: A87803

Included Lab Sample IDs: 2041887, 2041888, 2041889, 2041890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110
O-Phosphate-P	99.2	99.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A87888

Included Lab Sample IDs: 2041883, 2041884, 2041885, 2041886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.4	96.4	P/P	90 - 110
Organic Carbon	94.1	93.4	P/P	90 - 110
Organic Carbon	94.2	93.8	P/P	90 - 110

Reference Method: SM 5310 B-00 dissolved

Run ID: A87888

Included Lab Sample IDs: 2041879, 2041880, 2041881, 2041882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.1	93.4	P/P	90 - 110
Organic Carbon	94.2	93.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87911

Included Lab Sample IDs: 2041883, 2041884, 2041885, 2041886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	103	P/P	90 - 110
Kjeldahl Nitrogen	97.3	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A87925

Included Lab Sample IDs: 2041883, 2041884, 2041885, 2041886

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87946

Included Lab Sample IDs: 2041883, 2041884, 2041885, 2041886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110
Ammonia-N	98.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A87974

Included Lab Sample IDs: 2041883, 2041884, 2041885, 2041886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	98.0	P/P	90 - 110
NO2NO3-N	98.0	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87982

Included Lab Sample IDs: 2041948, 2041949, 2041950, 2041951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	98.3	99.8	P/P	90 - 110
Iron	99.4	98.3	P/P	90 - 110
Zinc	92.2	99.3	P/P	90 - 110
Zinc	99.3	94.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A87999

Included Lab Sample IDs: 2041875, 2041876, 2041877, 2041878

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.3	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88028

Included Lab Sample IDs: 2041875, 2041876, 2041877, 2041878

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88076

Included Lab Sample IDs: 2041948, 2041949, 2041950, 2041951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	103	P/P	90 - 110
Cadmium	104	103	P/P	90 - 110
Chromium	104	100	P/P	90 - 110
Copper	104	102	P/P	90 - 110
Lead	100	102	P/P	90 - 110
Lead	102	103	P/P	90 - 110
Nickel	103	103	P/P	90 - 110
Silver	97.9	97.2	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 LCS	SMP	MS
EPA 200.7 Rev. 4.4	Iron	96.3	97.4	99.8			2.38
	Zinc	89.6	93.5	93.6			0.0281
EPA 200.8 Rev. 5.4	Arsenic	103	112	114			1.83
	Cadmium	107	98.4	101			3.00
	Chromium	108	87.9	89.4			1.61
	Copper	102	101	101			0.595
	Lead	101	106	109			2.26
	Nickel	102	103	105			1.53
	Silver	99.2	90.4	92.1			1.81
EPA 350.1 Rev. 2.0	Ammonia-N	97.3	99.5	103			1.92
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	104	105			0.646
	Kjeldahl Nitrogen	97.9	101	103			1.94
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	98.4	99.4			0.956
	NO2NO3-N	98.5	99.0	100			0.959
EPA 365.1 Rev. 2.0	Total-P	99.3	102	101			1.33
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	96.7	98.9			1.41
SM 2320 B-97	Total Alkalinity	99.7				0.439	
SM 4500 F-C-97	Fluoride	98.9	99.8	99.8			0.0
SM 5310 B-00	Organic Carbon	93.2	97.0	92.2			2.82
	Organic Carbon	93.2	93.5	92.6			0.770
SM 5310 B-00 dissolved	Organic Carbon	93.2	97.0	92.2			2.82
	Organic Carbon	93.2	93.5	92.6			0.770

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	2041948, 2041949, 2041950, 2041951
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2041948, 2041949, 2041950, 2041951
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2041883, 2041884, 2041885, 2041886
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2041883, 2041884, 2041885, 2041886
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2041883, 2041884, 2041885, 2041886
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2041883, 2041884, 2041885, 2041886
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2041887, 2041888, 2041889, 2041890
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2041875, 2041876, 2041877, 2041878
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2041875, 2041876, 2041877, 2041878
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2041883, 2041884, 2041885, 2041886
SM 5310 B-00 dissolved / E31780	Dissolved Nonpurgeable Organic Carbon in filtered, aqueous matrices	2041879, 2041880, 2041881, 2041882

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	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/27/2018 23:05	Betina Topolski	2041948
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/27/2018 23:16	Betina Topolski	2041949
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/27/2018 23:28	Betina Topolski	2041950
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/28/2018 00:02	Betina Topolski	2041951
EPA 200.8 Rev. 5.4	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/30/2018 03:18	Allison Taylor	2041948
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/30/2018 03:28	Allison Taylor	2041949
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/30/2018 10:03	Allison Taylor	2041948
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/30/2018 10:13	Allison Taylor	2041949
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/30/2018 10:22	Allison Taylor	2041950
	11/15/2018	11/20/2018 14:40	Elliott D. Healy	11/30/2018 10:32	Allison Taylor	2041951
EPA 350.1 Rev. 2.0	11/15/2018			11/19/2018 14:27	Ping Hua	2041883
	11/15/2018			11/19/2018 14:31	Ping Hua	2041884
	11/15/2018			11/19/2018 14:33	Ping Hua	2041885
	11/15/2018			11/19/2018 14:40	Ping Hua	2041886
EPA 351.2 Rev. 2.0	11/15/2018	11/20/2018 10:20	Adrian Shelby	11/21/2018 09:29	Joseph Suarez	2041883
	11/15/2018	11/20/2018 10:20	Adrian Shelby	11/21/2018 09:30	Joseph Suarez	2041884
	11/15/2018	11/20/2018 10:20	Adrian Shelby	11/21/2018 10:03	Joseph Suarez	2041885
	11/15/2018	11/20/2018 10:20	Adrian Shelby	11/21/2018 10:07	Joseph Suarez	2041886
EPA 353.2 Rev. 2.0	11/15/2018			11/27/2018 11:43	Lauren Bottorf	2041883
	11/15/2018			11/27/2018 11:45	Lauren Bottorf	2041884
	11/15/2018			11/27/2018 11:52	Lauren Bottorf	2041885
	11/15/2018			11/27/2018 11:58	Lauren Bottorf	2041886
EPA 365.1 Rev. 2.0	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 13:01	Beverly Y. Sanders	2041883
	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 13:02	Beverly Y. Sanders	2041884
	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 13:03	Beverly Y. Sanders	2041885
	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 13:04	Beverly Y. Sanders	2041886
EPA 365.1 Rev. 2.0 dissolved	11/15/2018			11/15/2018 16:59	Jhamieka S. Greenwood	2041890
	11/15/2018			11/15/2018 17:48	Jhamieka S. Greenwood	2041887
	11/15/2018			11/15/2018 17:49	Jhamieka S. Greenwood	2041888
	11/15/2018			11/15/2018 17:50	Jhamieka S. Greenwood	2041889
SM 2320 B-97	11/15/2018			11/21/2018 17:13	Dale L. Simmons	2041878
	11/15/2018			11/21/2018 18:01	Dale L. Simmons	2041875
	11/15/2018			11/21/2018 18:12	Dale L. Simmons	2041876
	11/15/2018			11/21/2018 18:26	Dale L. Simmons	2041877
SM 4500 F-C-97	11/15/2018			11/29/2018 03:24	Dale L. Simmons	2041878
	11/15/2018			11/29/2018 03:31	Dale L. Simmons	2041875
	11/15/2018			11/29/2018 03:35	Dale L. Simmons	2041876
	11/15/2018			11/29/2018 03:39	Dale L. Simmons	2041877
SM 5310 B-00	11/15/2018			11/19/2018 21:03	Megan Treadwell	2041886
	11/15/2018			11/20/2018 06:09	Megan Treadwell	2041883

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	11/15/2018			11/20/2018 06:50	Megan Treadwell	2041884
	11/15/2018			11/20/2018 07:03	Megan Treadwell	2041885
SM 5310 B-00 dissolved	11/15/2018			11/19/2018 20:50	Megan Treadwell	2041882
	11/15/2018			11/20/2018 04:49	Megan Treadwell	2041879
	11/15/2018			11/20/2018 05:30	Megan Treadwell	2041880
	11/15/2018			11/20/2018 05:43	Megan Treadwell	2041881