

Chemical Analysis Report

SW-DIST-2018-09-07-03

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

Event Description: **Wire, Bonnet, Beulah**
Request ID: **RQ-2018-08-27-05**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
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Certified by: Colin Wright, Program Administrator

Date Certified: 27-SEP-2018 16:19

A handwritten signature in black ink, appearing to read "Colin Wright", 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: LAKE WIRE EAST

Collection Date/Time: 09/06/2018 11:05

Field ID: G2SW0055

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2023159	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P351325	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P351861	
		Sulfate	0.42	I	mg SO4/L	P351865	
		Color (true)	14		PCU	P351299	
	SM 2320 B-97	Total Alkalinity	60		mg CaCO3/L	P351534	
	SM 2540 C-97	TDS	77		mg/L	P351796	
	SM 2540 D-97	TSS	2	I	mg/L	P351729	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P351537	
2023164	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P351607	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P351484	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P351586	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P351397	
	SM 5310 B-00	Organic Carbon	4.4		mg C/L	P352043	
2023169	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351303	
2023196	EPA 200.7 Rev. 4.4	Calcium	20.8		mg/L	P351334	
		Iron	56	I	ug/L	P351334	
		Magnesium	1.07		mg/L	P351334	
		Potassium	0.30	U	mg/L	P351334	
		Sodium	1.9	I	mg/L	P351334	
		Zinc	5.0	U	ug/L	P351334	
	EPA 200.8 Rev. 5.4	Arsenic	0.65		ug/L	P351334	
		Cadmium	0.020	U	ug/L	P351334	
		Chromium	0.40	U	ug/L	P351334	
		Copper	0.20	U	ug/L	P351334	
		Lead	0.27		ug/L	P351334	
		Nickel	0.20	U	ug/L	P351334	
		Silver	0.010	U	ug/L	P351334	

Ref. Method and Comment:

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

Sample Location: LAKE WIRE WEST

Collection Date/Time: 09/06/2018 10:50

Field ID: G2SW0056

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2023160	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P351325	
	EPA 300.0 Rev. 2.1	Chloride	4.4		mg Cl/L	P351861	
		Sulfate	0.43	I	mg SO4/L	P351865	
		Color (true)	15		PCU	P351300	
	SM 2320 B-97	Total Alkalinity	59		mg CaCO3/L	P351534	
	SM 2540 C-97	TDS	79		mg/L	P351796	
	SM 2540 D-97	TSS	4	I	mg/L	P351729	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P351537	
2023165	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P351607	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P351484	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351586	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P351397	
	SM 5310 B-00	Organic Carbon	4.7		mg C/L	P352043	
2023170	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351303	
2023197	EPA 200.7 Rev. 4.4	Calcium	21.3		mg/L	P351334	
		Iron	55	I	ug/L	P351334	
		Magnesium	1.10		mg/L	P351334	
		Potassium	0.30	U	mg/L	P351334	
		Sodium	2.0	I	mg/L	P351334	
		Zinc	5.0	U	ug/L	P351334	
	EPA 200.8 Rev. 5.4	Arsenic	0.64		ug/L	P351334	
		Cadmium	0.020	U	ug/L	P351334	
		Chromium	0.40	U	ug/L	P351334	
		Copper	0.20	U	ug/L	P351334	
		Lead	0.81		ug/L	P351334	
		Nickel	0.20	U	ug/L	P351334	
		Silver	0.010	U	ug/L	P351334	

Ref. Method and Comment:

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

Sample Location: LAKE BEULAH NW

Collection Date/Time: 09/06/2018 09:50

Field ID: G2SW0052

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2023161	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P351325	
	EPA 300.0 Rev. 2.1	Chloride	3.4		mg Cl/L	P351984	
		Sulfate	2.8		mg SO4/L	P351988	
		Color (true)	13		PCU	P351300	
	SM 2320 B-97	Total Alkalinity	38		mg CaCO3/L	P351534	
	SM 2540 C-97	TDS	57		mg/L	P351796	
	SM 2540 D-97	TSS	3	I	mg/L	P351729	
	SM 4500 F-C-97	Fluoride	0.23		mg F/L	P351537	
2023166	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P351607	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P351484	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351587	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P351397	
	SM 5310 B-00	Organic Carbon	5.1		mg C/L	P352043	
2023171	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351303	
2023198	EPA 200.7 Rev. 4.4	Calcium	13.9		mg/L	P351334	
		Iron	30	U	ug/L	P351334	
		Magnesium	1.24		mg/L	P351334	
		Potassium	0.77	I	mg/L	P351334	
		Sodium	2.2		mg/L	P351334	
		Zinc	5.0	U	ug/L	P351334	
	EPA 200.8 Rev. 5.4	Arsenic	0.44		ug/L	P351334	
		Cadmium	0.020	U	ug/L	P351334	
		Chromium	0.40	U	ug/L	P351334	
		Copper	0.20	U	ug/L	P351334	
		Lead	0.050	U	ug/L	P351334	
		Nickel	0.20	U	ug/L	P351334	
		Silver	0.010	U	ug/L	P351334	

Ref. Method and Comment:

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

Sample Location: LAKE BEULAH SW

Collection Date/Time: 09/06/2018 09:35

Field ID: G2SW0053

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2023162	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P351325	
	EPA 300.0 Rev. 2.1	Chloride	3.4		mg Cl/L	P351984	
		Sulfate	2.8		mg SO4/L	P351988	
		Color (true)	13		PCU	P351300	
	SM 2320 B-97	Total Alkalinity	37		mg CaCO3/L	P351534	
	SM 2540 C-97	TDS	53		mg/L	P351796	
	SM 2540 D-97	TSS	3	I	mg/L	P351729	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P351537	
2023167	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P351607	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P351494	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351587	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P351397	
	SM 5310 B-00	Organic Carbon	5.3		mg C/L	P352043	
2023172	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351303	
2023199	EPA 200.7 Rev. 4.4	Calcium	13.1		mg/L	P351334	
		Iron	30	U	ug/L	P351334	
		Magnesium	1.22		mg/L	P351334	
		Potassium	0.70	I	mg/L	P351334	
		Sodium	2.1		mg/L	P351334	
		Zinc	5.0	U	ug/L	P351334	
	EPA 200.8 Rev. 5.4	Arsenic	0.46		ug/L	P351334	
		Cadmium	0.020	U	ug/L	P351334	
		Chromium	0.40	U	ug/L	P351334	
		Copper	0.20	U	ug/L	P351334	
		Lead	0.088	I	ug/L	P351334	
		Nickel	0.20	U	ug/L	P351334	
		Silver	0.010	U	ug/L	P351334	

Ref. Method and Comment:

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

Sample Location: LAKE BEULAH EAST

Collection Date/Time: 09/06/2018 10:00

Field ID: G2SW0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2023163	EPA 180.1 Rev. 2.0	Turbidity	2.7	A	NTU	P351325	
	EPA 300.0 Rev. 2.1	Chloride	3.4		mg Cl/L	P351984	
		Sulfate	2.8		mg SO4/L	P351988	
		Color (true)	16		PCU	P351300	
	SM 2320 B-97	Total Alkalinity	37		mg CaCO3/L	P351534	
	SM 2540 C-97	TDS	60		mg/L	P351797	
	SM 2540 D-97	TSS	6	I	mg/L	P351730	
	SM 4500 F-C-97	Fluoride	0.24		mg F/L	P351537	
2023168	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P351607	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P351494	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351587	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P351397	
	SM 5310 B-00	Organic Carbon	5.6		mg C/L	P352043	
2023173	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351305	
2023200	EPA 200.7 Rev. 4.4	Calcium	13.1		mg/L	P351334	
		Iron	30	U	ug/L	P351334	
		Magnesium	1.16		mg/L	P351334	
		Potassium	0.78	I	mg/L	P351334	
		Sodium	2.1		mg/L	P351334	
		Zinc	5.0	U	ug/L	P351334	
	EPA 200.8 Rev. 5.4	Arsenic	0.49		ug/L	P351334	
		Cadmium	0.020	U	ug/L	P351334	
		Chromium	0.40	U	ug/L	P351334	
		Copper	0.22	I	ug/L	P351334	
		Lead	0.071	I	ug/L	P351334	
		Nickel	0.20	U	ug/L	P351334	
		Silver	0.010	U	ug/L	P351334	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P351325

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351334

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351334

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351861

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351865

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351607

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351484

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351494

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351586

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351587

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351397

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351303

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351305

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

Reference Method: SM 2120 B
Batch ID: P351299

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2120 B
Batch ID: P351300

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P351534

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

Reference Method: SM 2540 C-97
Batch ID: P351796

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P351797

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P351729

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P351730

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P351537

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P352043

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: P351334

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	107		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	103		P	85 - 115
Sodium	103		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351334

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	98.1		P	85 - 115
Chromium	96.8		P	85 - 115
Copper	102		P	85 - 115
Lead	94.2		P	85 - 115
Nickel	100		P	85 - 115
Silver	99.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351861

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351865

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351607

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.8		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351484

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351494

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351586

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351587

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351397

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351303

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351305

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

Reference Method: SM 2120 B
Batch ID: P351299

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.7		P	85 - 115

Reference Method: SM 2120 B
Batch ID: P351300

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P351534

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P351537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352043

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2022898	Calcium	98.9		P	80 - 120
2022898	Iron	102		P	80 - 120
2022898	Magnesium	101		P	80 - 120
2022898	Potassium	101		P	80 - 120
2022898	Sodium	100		P	80 - 120
2022898	Zinc	100		P	80 - 120
2023045	Calcium	98.1	104	P/P	80 - 120
2023045	Iron	100	106	P/P	80 - 120
2023045	Magnesium	100	109	P/P	80 - 120
2023045	Potassium	96.0	101	P/P	80 - 120
2023045	Sodium	95.1		P	80 - 120
2023045	Zinc	99.6	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2022898	Arsenic	101		P	80 - 120
2022898	Cadmium	101		P	80 - 120
2022898	Chromium	99.2		P	80 - 120
2022898	Copper	97.5		P	80 - 120
2022898	Lead	95.5		P	80 - 120
2022898	Nickel	98.6		P	80 - 120
2022898	Silver	99.8		P	80 - 120
2023045	Arsenic	98.5	99.6	P/P	80 - 120
2023045	Cadmium	99.0	99.6	P/P	80 - 120
2023045	Chromium	98.1	99.2	P/P	80 - 120
2023045	Copper	99.7	101	P/P	80 - 120
2023045	Lead	93.8	95.0	P/P	80 - 120
2023045	Nickel	96.3	97.9	P/P	80 - 120
2023045	Silver	98.0	98.6	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351861

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2022932	Chloride	104		P	90 - 110
2023016	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351865

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2022932	Sulfate	101		P	90 - 110
2023016	Sulfate	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023174	Chloride	98.2		P	90 - 110
2023721	Chloride	99.5		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023174	Sulfate	98.3		P	90 - 110
2023721	Sulfate	98.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351607

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023164	Ammonia-N	98.2	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023164	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351494

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023167	Kjeldahl Nitrogen	105	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351586

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023022	NO2NO3-N	105	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351587

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023166	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351397

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023165	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023170	O-Phosphate-P	99.3	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023173	O-Phosphate-P	98.0	98.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P351537

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023223	Fluoride	98.2	98.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352043

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023023	Organic Carbon	99.4	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P351325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023163	Turbidity	2.21	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023045	Calcium	4.37	Spike	P	0 - 20
2023045	Iron	6.29	Spike	P	0 - 20
2023045	Magnesium	6.36	Spike	P	0 - 20
2023045	Potassium	4.82	Spike	P	0 - 20
2023045	Sodium	4.34	Spike	P	0 - 20
2023045	Zinc	2.57	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023045	Arsenic	1.08	Spike	P	0 - 20
2023045	Cadmium	0.580	Spike	P	0 - 20
2023045	Chromium	1.11	Spike	P	0 - 20
2023045	Copper	1.48	Spike	P	0 - 20
2023045	Lead	1.32	Spike	P	0 - 20
2023045	Nickel	1.63	Spike	P	0 - 20
2023045	Silver	0.540	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2022932	Chloride	0.0907	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351865

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2022932	Sulfate	0.353	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023174	Chloride	0.135	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023174	Sulfate	0.0848	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351607

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023164	Ammonia-N	2.26	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023164	Kjeldahl Nitrogen	0.530	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351494

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023167	Kjeldahl Nitrogen	0.812	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023022	NO2NO3-N	0.948	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023166	NO2NO3-N	0.962	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023165	Total-P	0.359	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023170	O-Phosphate-P	0.302	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023173	O-Phosphate-P	0.509	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P351299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023018	Color (true)	0.673	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P351300

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023180	Color (true)	1.77	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P351534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023223	Total Alkalinity	1.14	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P351796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023083	TDS	8.29	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P351797

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023579	TDS	0.749	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P351730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023579	TSS	7.69	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P351537

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023223	Fluoride	0.0	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P352043

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023023	Organic Carbon	0.996	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: SM 2120 B

Run ID: A86351

Included Lab Sample IDs: 2023159, 2023160, 2023161, 2023162, 2023163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.9	P/P	90 - 115
Color (true)	101	100	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A86353

Included Lab Sample IDs: 2023169, 2023170, 2023171, 2023172, 2023173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.1	P/P	90 - 110
O-Phosphate-P	101	102	P/P	90 - 110
O-Phosphate-P	99.5	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A86366

Included Lab Sample IDs: 2023159, 2023160, 2023161, 2023162, 2023163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86411

Included Lab Sample IDs: 2023196, 2023197, 2023198, 2023199, 2023200

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.6	98.1	P/P	90 - 110
Iron	101	98.6	P/P	90 - 110
Magnesium	99.8	97.7	P/P	90 - 110
Potassium	97.9	97.7	P/P	90 - 110
Sodium	96.9	96.4	P/P	90 - 110
Zinc	98.3	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86437

Included Lab Sample IDs: 2023164, 2023165, 2023166, 2023167, 2023168

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

Reference Method: SM 2320 B-97

Run ID: A86448

Included Lab Sample IDs: 2023159, 2023160, 2023161, 2023162, 2023163

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

Reference Method: SM 4500 F-C-97

Run ID: A86448

Included Lab Sample IDs: 2023159, 2023160, 2023161, 2023162, 2023163

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86460

Included Lab Sample IDs: 2023164, 2023165, 2023166, 2023167, 2023168

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86462

Included Lab Sample IDs: 2023164, 2023165, 2023166, 2023167, 2023168

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86469

Included Lab Sample IDs: 2023196, 2023197, 2023198, 2023199, 2023200

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.5	95.0	P/P	90 - 110
Cadmium	95.7	95.6	P/P	90 - 110
Chromium	97.2	95.4	P/P	90 - 110
Lead	94.7	93.6	P/P	90 - 110
Nickel	96.1	94.6	P/P	90 - 110
Silver	95.1	93.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86508

Included Lab Sample IDs: 2023164, 2023165, 2023166, 2023167, 2023168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	108	109	P/P	90 - 110
Kjeldahl Nitrogen	109	97.7	P/P	90 - 110
Kjeldahl Nitrogen	97.7	99.6	P/P	90 - 110
Kjeldahl Nitrogen	99.6	110	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86534

Included Lab Sample IDs: 2023196, 2023197, 2023198, 2023199, 2023200

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	98.2	99.9	P/P	90 - 110
Copper	99.9	97.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86566

Included Lab Sample IDs: 2023159, 2023160, 2023161, 2023162, 2023163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Chloride	104	104	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110
Sulfate	104	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A86629

Included Lab Sample IDs: 2023164, 2023165, 2023166, 2023167, 2023168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	99.2	P/P	90 - 110

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

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.21	
EPA 200.7 Rev. 4.4	Calcium	106	98.9	98.1	104		4.37
	Iron	107	102	100	106		6.29
	Magnesium	109	101	100	109		6.36
	Potassium	103	101	96.0	101		4.82
	Sodium	103	100	95.1			4.34
	Zinc	102	100	99.6	102		2.57
EPA 200.8 Rev. 5.4	Arsenic	102	101	98.5	99.6		1.08
	Cadmium	98.1	101	99.0	99.6		0.580
	Chromium	96.8	99.2	98.1	99.2		1.11
	Copper	102	97.5	99.7	101		1.48
	Lead	94.2	95.5	93.8	95.0		1.32
	Nickel	100	98.6	96.3	97.9		1.63
	Silver	99.7	99.8	98.0	98.6		0.540
EPA 300.0 Rev. 2.1	Chloride	106	104	103		0.0907	
	Chloride	100	98.2	99.5		0.135	
	Sulfate	105	101	102		0.353	
	Sulfate	99.2	98.3	98.1		0.0848	
EPA 350.1 Rev. 2.0	Ammonia-N	96.8	98.2	101			2.26
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	102	102			0.530
	Kjeldahl Nitrogen	96.9	105	107			0.812
EPA 353.2 Rev. 2.0	NO2NO3-N	104	105	106			0.948
	NO2NO3-N	102	104	104			0.962
EPA 365.1 Rev. 2.0	Total-P	101	102	103			0.359
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.3	99.6			0.302
	O-Phosphate-P	98.9	98.0	98.5			0.509
SM 2120 B	Color (true)	98.7				0.673	
	Color (true)	99.6				1.77	
SM 2320 B-97	Total Alkalinity	103				1.14	
SM 2540 C-97	TDS					8.29	
	TDS					0.749	
SM 2540 D-97	TSS					7.69	
SM 4500 F-C-97	Fluoride	99.2	98.2	98.2			0.0
SM 5310 B-00	Organic Carbon	101	99.4	101			0.996

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2023159, 2023160, 2023161, 2023162, 2023163
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2023196, 2023197, 2023198, 2023199, 2023200
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2023196, 2023197, 2023198, 2023199, 2023200
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2023159, 2023160, 2023161, 2023162, 2023163
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2023159, 2023160, 2023161, 2023162, 2023163
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2023164, 2023165, 2023166, 2023167, 2023168
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2023164, 2023165, 2023166, 2023167, 2023168
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2023164, 2023165, 2023166, 2023167, 2023168

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2023164, 2023165, 2023166, 2023167, 2023168
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2023169, 2023170, 2023171, 2023172, 2023173
SM 2120 B / E31780	True Color measured at 450 nm	2023159, 2023160, 2023161, 2023162, 2023163
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2023159, 2023160, 2023161, 2023162, 2023163
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2023159, 2023160, 2023161, 2023162, 2023163
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2023159, 2023160, 2023161, 2023162, 2023163
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2023159, 2023160, 2023161, 2023162, 2023163
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2023164, 2023165, 2023166, 2023167, 2023168

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/07/2018			09/07/2018 16:38	Megan Treadwell	2023159, 2023160, 2023161, 2023162, 2023163
EPA 200.7 Rev. 4.4	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/11/2018 20:10	Betina Topolski	2023196
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/11/2018 20:17	Betina Topolski	2023197
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/11/2018 20:24	Betina Topolski	2023198
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/11/2018 20:31	Betina Topolski	2023199
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/11/2018 20:39	Betina Topolski	2023200
EPA 200.8 Rev. 5.4	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/13/2018 21:51	Robert K Palmer	2023196
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/13/2018 22:00	Robert K Palmer	2023197
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/13/2018 22:10	Robert K Palmer	2023198
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/13/2018 22:19	Robert K Palmer	2023199
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/13/2018 22:29	Robert K Palmer	2023200
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/14/2018 15:27	Robert K Palmer	2023196
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/14/2018 15:47	Robert K Palmer	2023197
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/14/2018 15:54	Robert K Palmer	2023198
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/14/2018 16:01	Robert K Palmer	2023199
	09/07/2018	09/10/2018 14:55	Elliott D. Healy	09/14/2018 16:07	Robert K Palmer	2023200
EPA 300.0 Rev. 2.1	09/07/2018			09/18/2018 12:20	Lipi Saha	2023159
	09/07/2018			09/18/2018 12:33	Lipi Saha	2023160
	09/07/2018			09/18/2018 16:43	Lipi Saha	2023161
	09/07/2018			09/18/2018 16:55	Lipi Saha	2023162
	09/07/2018			09/18/2018 17:07	Lipi Saha	2023163
EPA 350.1 Rev. 2.0	09/07/2018			09/12/2018 13:27	Ping Hua	2023164
	09/07/2018			09/12/2018 13:32	Ping Hua	2023165
	09/07/2018			09/12/2018 13:33	Ping Hua	2023166
	09/07/2018			09/12/2018 13:35	Ping Hua	2023167
	09/07/2018			09/12/2018 13:36	Ping Hua	2023168
EPA 351.2 Rev. 2.0	09/07/2018	09/12/2018 10:45	Adrian Shelby	09/14/2018 17:23	Joseph Suarez	2023164
	09/07/2018	09/12/2018 10:45	Adrian Shelby	09/14/2018 17:31	Joseph Suarez	2023165
	09/07/2018	09/12/2018 10:45	Adrian Shelby	09/14/2018 17:33	Joseph Suarez	2023166
	09/07/2018	09/12/2018 10:45	Adrian Shelby	09/14/2018 18:02	Joseph Suarez	2023167
	09/07/2018	09/12/2018 10:45	Adrian Shelby	09/14/2018 18:10	Joseph Suarez	2023168
EPA 353.2 Rev. 2.0	09/07/2018			09/13/2018 12:32	Lauren Bottorf	2023164
	09/07/2018			09/13/2018 12:33	Lauren Bottorf	2023165
	09/07/2018			09/13/2018 12:40	Lauren Bottorf	2023166
	09/07/2018			09/13/2018 12:49	Lauren Bottorf	2023167
	09/07/2018			09/13/2018 12:51	Lauren Bottorf	2023168
EPA 365.1 Rev. 2.0	09/07/2018	09/11/2018 12:05	Sima Feizi	09/12/2018 12:18	Beverly Y. Sanders	2023164
	09/07/2018	09/11/2018 12:05	Sima Feizi	09/12/2018 12:19	Beverly Y. Sanders	2023165
	09/07/2018	09/11/2018 12:05	Sima Feizi	09/12/2018 12:20	Beverly Y. Sanders	2023166

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	09/07/2018	09/11/2018 12:05	Sima Feizi	09/12/2018 12:21	Beverly Y. Sanders	2023167
	09/07/2018	09/11/2018 12:05	Sima Feizi	09/12/2018 12:22	Beverly Y. Sanders	2023168
EPA 365.1 Rev. 2.0 dissolved	09/07/2018			09/07/2018 15:24	Julia Storbeck	2023170
	09/07/2018			09/07/2018 15:32	Julia Storbeck	2023173
	09/07/2018			09/07/2018 16:09	Julia Storbeck	2023169
	09/07/2018			09/07/2018 16:10	Julia Storbeck	2023171
	09/07/2018			09/07/2018 16:11	Julia Storbeck	2023172
SM 2120 B	09/07/2018			09/07/2018 15:24	DeAsia Armster	2023159
	09/07/2018			09/07/2018 15:28	DeAsia Armster	2023160
	09/07/2018			09/07/2018 15:29	DeAsia Armster	2023161
	09/07/2018			09/07/2018 15:30	DeAsia Armster	2023162
	09/07/2018			09/07/2018 15:31	DeAsia Armster	2023163
SM 2320 B-97	09/07/2018			09/13/2018 04:19	Dale L. Simmons	2023159
	09/07/2018			09/13/2018 04:29	Dale L. Simmons	2023160
	09/07/2018			09/13/2018 04:39	Dale L. Simmons	2023161
	09/07/2018			09/13/2018 04:50	Dale L. Simmons	2023162
	09/07/2018			09/13/2018 05:00	Dale L. Simmons	2023163
SM 2540 C-97	09/07/2018			09/12/2018 15:16	Yijie Li	2023159, 2023160, 2023161, 2023162, 2023163
SM 2540 D-97	09/07/2018			09/12/2018 15:16	Yijie Li	2023159, 2023160, 2023161, 2023162, 2023163
SM 4500 F-C-97	09/07/2018			09/13/2018 04:19	Dale L. Simmons	2023159
	09/07/2018			09/13/2018 04:29	Dale L. Simmons	2023160
	09/07/2018			09/13/2018 04:39	Dale L. Simmons	2023161
	09/07/2018			09/13/2018 04:50	Dale L. Simmons	2023162
	09/07/2018			09/13/2018 05:00	Dale L. Simmons	2023163
SM 5310 B-00	09/07/2018			09/20/2018 05:50	Megan Treadwell	2023164
	09/07/2018			09/20/2018 06:02	Megan Treadwell	2023165
	09/07/2018			09/20/2018 06:14	Megan Treadwell	2023166
	09/07/2018			09/20/2018 06:26	Megan Treadwell	2023167
	09/07/2018			09/20/2018 06:38	Megan Treadwell	2023168