

Chemical Analysis Report

SW-DIST-2018-12-11-01

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

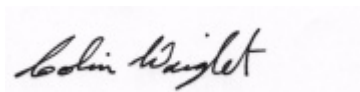
Event Description: **Wire, Bonnet, Beulah**
Request ID: **RQ-2018-12-10-04**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Ben Paswater

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 04-JAN-2019 15:00

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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: LAKE BEULAH NW

Collection Date/Time: 12/10/2018 11:50

Field ID: G2SW0052

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047742	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P355975	
	EPA 300.0 Rev. 2.1	Chloride	3.8		mg Cl/L	P356211	
		Sulfate	2.6		mg SO4/L	P356213	
		Color (true)	11		PCU	P355960	
	SM 2320 B-97	Total Alkalinity	54		mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	72		mg/L	P356405	
	SM 2540 D-97	TSS	3	I	mg/L	P356477	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P356131	
2047748	EPA 350.1 Rev. 2.0	Ammonia-N	0.029		mg N/L	P356261	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P356093	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.061		mg N/L	P356135	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P356176	
	SM 5310 B-00	Organic Carbon	6.0		mg C/L	P356070	
2047754	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P356026	
2047791	EPA 200.7 Rev. 4.4	Calcium	21.2		mg/L	P356049	
		Iron	91	I	ug/L	P356049	
		Magnesium	1.57		mg/L	P356049	
		Potassium	1.3		mg/L	P356049	
		Sodium	2.9		mg/L	P356049	
		Zinc	5.0	U	ug/L	P356049	
	EPA 200.8 Rev. 5.4	Arsenic	0.47		ug/L	P356049	
		Cadmium	0.020	U	ug/L	P356049	
		Chromium	0.40	U	ug/L	P356049	
		Copper	0.21	I	ug/L	P356049	
		Lead	0.13	I	ug/L	P356049	
		Nickel	0.20	U	ug/L	P356049	
		Silver	0.010	U	ug/L	P356049	

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: 12/10/2018 11:30

Field ID: G2SW0053

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047743	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P355975	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P356211	
		Sulfate	2.6		mg SO4/L	P356213	
		Color (true)	11		PCU	P355960	
	SM 2320 B-97	Total Alkalinity	54		mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	73		mg/L	P356405	
	SM 2540 D-97	TSS	2	I	mg/L	P356477	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P356131	
2047749	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P356261	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P356093	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.061		mg N/L	P356135	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P356176	
	SM 5310 B-00	Organic Carbon	5.9		mg C/L	P356070	
2047755	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P356026	
2047792	EPA 200.7 Rev. 4.4	Calcium	21.6		mg/L	P356049	
		Iron	50	I	ug/L	P356049	
		Magnesium	1.60		mg/L	P356049	
		Potassium	1.3		mg/L	P356049	
		Sodium	2.9		mg/L	P356049	
		Zinc	5.0	U	ug/L	P356049	
	EPA 200.8 Rev. 5.4	Arsenic	0.46		ug/L	P356049	
		Cadmium	0.020	U	ug/L	P356049	
		Chromium	0.40	U	ug/L	P356049	
		Copper	0.20	U	ug/L	P356049	
		Lead	0.11	I	ug/L	P356049	
		Nickel	0.20	U	ug/L	P356049	
		Silver	0.010	U	ug/L	P356049	

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: 12/10/2018 11:40

Field ID: G2SW0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047744	EPA 180.1 Rev. 2.0	Turbidity	4.6		NTU	P355975	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P356211	
		Sulfate	2.6		mg SO4/L	P356213	
		Color (true)	11		PCU	P355960	
	SM 2320 B-97	Total Alkalinity	54		mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	74		mg/L	P356406	
	SM 2540 D-97	TSS	4	I	mg/L	P356478	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P356131	
2047750	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P356261	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.87		mg N/L	P356093	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.054		mg N/L	P356135	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P356176	
	SM 5310 B-00	Organic Carbon	6.0		mg C/L	P356070	
2047756	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P356026	
2047793	EPA 200.7 Rev. 4.4	Calcium	21.7		mg/L	P356049	
		Iron	67	I	ug/L	P356049	
		Magnesium	1.59		mg/L	P356049	
		Potassium	1.3		mg/L	P356049	
		Sodium	2.9		mg/L	P356049	
		Zinc	5.0	U	ug/L	P356049	
	EPA 200.8 Rev. 5.4	Arsenic	0.44		ug/L	P356049	
		Cadmium	0.020	U	ug/L	P356049	
		Chromium	0.40	U	ug/L	P356049	
		Copper	0.20	U	ug/L	P356049	
		Lead	0.13	I	ug/L	P356049	
		Nickel	0.20	U	ug/L	P356049	
		Silver	0.010	U	ug/L	P356049	

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 EAST

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

Field ID: G2SW0055

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047745	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P355975	
	EPA 300.0 Rev. 2.1	Chloride	4.3		mg Cl/L	P356211	
		Sulfate	0.28	I	mg SO4/L	P356213	
		Color (true)	10		PCU	P355961	
	SM 2320 B-97	Total Alkalinity	71		mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	78		mg/L	P356406	
	SM 2540 D-97	TSS	2	I	mg/L	P356478	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P356131	
2047751	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P356261	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P356093	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P356135	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P356176	
	SM 5310 B-00	Organic Carbon	4.7		mg C/L	P356070	
2047757	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P356026	
2047794	EPA 200.7 Rev. 4.4	Calcium	28.4		mg/L	P356049	
		Iron	180		ug/L	P356049	
		Magnesium	1.41		mg/L	P356049	
		Potassium	0.30	U	mg/L	P356049	
		Sodium	2.8		mg/L	P356049	
		Zinc	6.9	I	ug/L	P356049	
		Arsenic	1.16		ug/L	P356049	
	EPA 200.8 Rev. 5.4	Cadmium	0.020	U	ug/L	P356049	
		Chromium	0.40	U	ug/L	P356049	
		Copper	0.40	I	ug/L	P356049	
		Lead	3.07		ug/L	P356049	
		Nickel	0.20	U	ug/L	P356049	
		Silver	0.010	U	ug/L	P356049	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 12/19/2018.

Sample Location: LAKE WIRE WEST

Collection Date/Time: 12/10/2018 11:00

Field ID: G2SW0056

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047746	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P355976	
	EPA 300.0 Rev. 2.1	Chloride	4.3		mg Cl/L	P356211	
		Sulfate	0.28	I	mg SO4/L	P356213	
	SM 2120 B	Color (true)	10		PCU	P355961	
	SM 2320 B-97	Total Alkalinity	71		mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	90		mg/L	P356406	
	SM 2540 D-97	TSS	2	U	mg/L	P356478	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P356131	
2047752	EPA 350.1 Rev. 2.0	Ammonia-N	0.047		mg N/L	P356261	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P356093	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P356135	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P356176	
	SM 5310 B-00	Organic Carbon	4.7		mg C/L	P356070	
2047758	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P356026	
2047795	EPA 200.7 Rev. 4.4	Calcium	28.1		mg/L	P356049	
		Iron	42	I	ug/L	P356049	
		Magnesium	1.37		mg/L	P356049	
		Potassium	0.30	U	mg/L	P356049	
		Sodium	2.8		mg/L	P356049	
		Zinc	7.0	I	ug/L	P356049	
	EPA 200.8 Rev. 5.4	Arsenic	1.16		ug/L	P356049	
		Cadmium	0.020	U	ug/L	P356049	
		Chromium	0.40	U	ug/L	P356049	
		Copper	0.94		ug/L	P356049	
		Lead	3.13		ug/L	P356049	
		Nickel	0.20	U	ug/L	P356049	
		Silver	0.010	U	ug/L	P356049	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 12/19/2018.

Sample Location: FIELD BLANK_12/10/2018

Collection Date/Time: 12/10/2018 12:05

Field ID: BLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047747	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P355976	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P356211	
		Sulfate	0.20	U	mg SO4/L	P356213	
		Color (true)	2.5	U	PCU	P355961	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P356128	
	SM 2540 C-97	TDS	15	U	mg/L	P356405	
	SM 2540 D-97	TSS	2	U	mg/L	P356477	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P356131	
2047753	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P356261	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P356093	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P356135	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P356176	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P356070	
2047759	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P356026	
2047796	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P356049	
		Iron	30	U	ug/L	P356049	
		Magnesium	0.040	U	mg/L	P356049	
		Potassium	0.30	U	mg/L	P356049	
		Sodium	0.50	U	mg/L	P356049	
		Zinc	5.0	U	ug/L	P356049	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P356049	
		Cadmium	0.020	U	ug/L	P356049	
		Chromium	0.40	U	ug/L	P356049	
		Copper	0.20	U	ug/L	P356049	
		Lead	0.050	U	ug/L	P356049	
		Nickel	0.20	U	ug/L	P356049	
		Silver	0.010	U	ug/L	P356049	

Ref. Method and Comment:

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

EPA 353.2 Rev. 2.0: The result was confirmed on 12/12/2018.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355975

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355976

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356049

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: P356049

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: P356211

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356213

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356261

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356093

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356135

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356176

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356026

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

Reference Method: SM 2120 B
Batch ID: P355960

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P355961

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P356128

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-97
Batch ID: P356405

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P356406

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P356477

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356478

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P356070

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: P356049

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	104		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	109		P	85 - 115
Sodium	112		P	85 - 115
Zinc	96.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356049

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356213

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356261

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356093

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356135

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356176

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356026

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

Reference Method: SM 2120 B
Batch ID: P355960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.4		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P355961

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P356128

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.5		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356070

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356049

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047670	Calcium	105		P	80 - 120
2047670	Iron	105		P	80 - 120
2047670	Magnesium	107		P	80 - 120
2047670	Potassium	110		P	80 - 120
2047670	Sodium	107		P	80 - 120
2047670	Zinc	97.7		P	80 - 120
2047793	Calcium	100		P	80 - 120
2047793	Iron	106	106	P/P	80 - 120
2047793	Magnesium	109	109	P/P	80 - 120
2047793	Potassium	112	113	P/P	80 - 120
2047793	Sodium	114	116	P/P	80 - 120
2047793	Zinc	98.6	96.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356049

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047670	Arsenic	104		P	80 - 120
2047670	Cadmium	104		P	80 - 120
2047670	Chromium	102		P	80 - 120
2047670	Copper	103		P	80 - 120
2047670	Lead	102		P	80 - 120
2047670	Nickel	101		P	80 - 120
2047670	Silver	100		P	80 - 120
2047793	Arsenic	107	107	P/P	80 - 120
2047793	Cadmium	106	105	P/P	80 - 120
2047793	Chromium	104	104	P/P	80 - 120
2047793	Copper	105	104	P/P	80 - 120
2047793	Lead	105	105	P/P	80 - 120
2047793	Nickel	104	104	P/P	80 - 120
2047793	Silver	104	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047650	Chloride	93.2		P	90 - 110
2047766	Chloride	95.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356213

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047650	Sulfate	93.0		P	90 - 110
2047766	Sulfate	93.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356261

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047698	Ammonia-N	97.1	97.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356093

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047749	Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047704	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356176

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047751	Total-P	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047755	O-Phosphate-P	94.4	95.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047779	Fluoride	99.7	98.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356070

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047668	Organic Carbon	102	103	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355975

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047707	Turbidity	2.82	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047778	Turbidity	2.75	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047793	Calcium	1.38	Spike	P	0 - 20
2047793	Iron	0.628	Spike	P	0 - 20
2047793	Magnesium	0.561	Spike	P	0 - 20
2047793	Potassium	0.613	Spike	P	0 - 20
2047793	Sodium	1.01	Spike	P	0 - 20
2047793	Zinc	2.51	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047793	Arsenic	0.380	Spike	P	0 - 20
2047793	Cadmium	0.795	Spike	P	0 - 20
2047793	Chromium	0.255	Spike	P	0 - 20
2047793	Copper	0.637	Spike	P	0 - 20
2047793	Lead	0.387	Spike	P	0 - 20
2047793	Nickel	0.0109	Spike	P	0 - 20
2047793	Silver	0.229	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047650	Chloride	0.647	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047650	Sulfate	1.56	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356261

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047698	Ammonia-N	0.317	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356093

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047749	Kjeldahl Nitrogen	2.08	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047704	NO2NO3-N	0.327	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047751	Total-P	0.426	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047755	O-Phosphate-P	1.05	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047650	Color (true)	1.20	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355961

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047766	Color (true)	2.89	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356128

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047779	Total Alkalinity	0.672	Sample	P	0 - 1.6

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P356405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047650	TDS	5.62	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P356406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047766	TDS	9.01	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047779	Fluoride	0.470	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P356070

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047668	Organic Carbon	0.438	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: A88283

Included Lab Sample IDs: 2047742, 2047743, 2047744, 2047745, 2047746, 2047747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.9	P/P	85 - 115
Color (true)	99.9	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88286

Included Lab Sample IDs: 2047742, 2047743, 2047744, 2047745, 2047746, 2047747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105
Turbidity	100	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88299

Included Lab Sample IDs: 2047754, 2047755, 2047756, 2047757, 2047758, 2047759

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110
O-Phosphate-P	98.9	98.3	P/P	90 - 110
O-Phosphate-P	99.4	98.9	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A88317

Included Lab Sample IDs: 2047748, 2047749, 2047750, 2047751, 2047752, 2047753

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	104	P/P	90 - 110
Organic Carbon	99.1	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88324

Included Lab Sample IDs: 2047742, 2047743, 2047744, 2047745, 2047746, 2047747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.4	99.7	P/P	90 - 110
Chloride	99.8	99.4	P/P	90 - 110
Sulfate	98.5	98.8	P/P	90 - 110
Sulfate	98.7	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88336

Included Lab Sample IDs: 2047791, 2047792, 2047793, 2047794, 2047795, 2047796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	99.4	P/P	90 - 110
Calcium	99.4	96.6	P/P	90 - 110
Iron	98.2	95.9	P/P	90 - 110
Iron	99.4	98.2	P/P	90 - 110
Magnesium	100	99.5	P/P	90 - 110
Magnesium	99.5	97.4	P/P	90 - 110
Potassium	105	106	P/P	90 - 110
Potassium	106	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88336

Included Lab Sample IDs: 2047791, 2047792, 2047793, 2047794, 2047795, 2047796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	107	107	P/P	90 - 110
Sodium	107	106	P/P	90 - 110
Zinc	95.3	99.8	P/P	90 - 110
Zinc	97.2	95.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A88339

Included Lab Sample IDs: 2047742, 2047743, 2047744, 2047745, 2047746, 2047747

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88339

Included Lab Sample IDs: 2047742, 2047743, 2047744, 2047745, 2047746, 2047747

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88340

Included Lab Sample IDs: 2047748, 2047749, 2047750, 2047751, 2047752, 2047753

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88381

Included Lab Sample IDs: 2047748, 2047749, 2047750, 2047751, 2047752, 2047753

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88384

Included Lab Sample IDs: 2047791, 2047792, 2047793, 2047794, 2047795, 2047796

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88384

Included Lab Sample IDs: 2047791, 2047792, 2047793, 2047794, 2047795, 2047796

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88391

Included Lab Sample IDs: 2047748, 2047749, 2047750, 2047751, 2047752, 2047753

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	103	P/P	90 - 110
Ammonia-N	100	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88425

Included Lab Sample IDs: 2047748, 2047749, 2047750, 2047751, 2047752, 2047753

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.0	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					2.82	
	Turbidity					2.75	
EPA 200.7 Rev. 4.4	Calcium	100	105	100			1.38
	Iron	104	105	106	106		0.628
	Magnesium	108	107	109	109		0.561
	Potassium	109	110	112	113		0.613
	Sodium	112	116	107	114		1.01
	Zinc	96.5	97.7	98.6	96.2		2.51
EPA 200.8 Rev. 5.4	Arsenic	105	104	107	107		0.380
	Cadmium	105	104	106	105		0.795
	Chromium	103	102	104	104		0.255
	Copper	103	103	105	104		0.637
	Lead	103	102	105	105		0.387
	Nickel	104	101	104	104		0.0109
	Silver	103	100	104	104		0.229
EPA 300.0 Rev. 2.1	Chloride	98.3	93.2	95.6		0.647	
	Sulfate	96.6	93.0	93.7		1.56	
EPA 350.1 Rev. 2.0	Ammonia-N	101	97.1	97.6			0.317
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	104	101			2.08
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	102			0.327
EPA 365.1 Rev. 2.0	Total-P	99.3	104	104			0.426
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	94.4	95.4			1.05
SM 2120 B	Color (true)	99.4				1.20	
	Color (true)	100				2.89	
SM 2320 B-97	Total Alkalinity	99.5				0.672	
SM 2540 C-97	TDS					5.62	
	TDS					9.01	
SM 4500 F-C-97	Fluoride	99.0	99.7	98.9			0.470
SM 5310 B-00	Organic Carbon	96.7	102	103			0.438

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2047791, 2047792, 2047793, 2047794, 2047795, 2047796
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2047791, 2047792, 2047793, 2047794, 2047795, 2047796
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2047748, 2047749, 2047750, 2047751, 2047752, 2047753
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2047748, 2047749, 2047750, 2047751, 2047752, 2047753
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2047748, 2047749, 2047750, 2047751, 2047752, 2047753
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2047748, 2047749, 2047750, 2047751, 2047752, 2047753
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2047754, 2047755, 2047756, 2047757, 2047758, 2047759
SM 2120 B / E31780	True Color measured at 450 nm	2047742, 2047743, 2047744, 2047745, 2047746, 2047747

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2047748, 2047749, 2047750, 2047751, 2047752, 2047753

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	12/11/2018			12/11/2018 16:59	Megan Treadwell	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
EPA 200.7 Rev. 4.4	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/13/2018 19:26	Betina Topolski	2047796
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/13/2018 20:38	Betina Topolski	2047791
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/13/2018 20:45	Betina Topolski	2047792
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/13/2018 20:52	Betina Topolski	2047793
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/13/2018 21:15	Betina Topolski	2047794
EPA 200.8 Rev. 5.4	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/13/2018 21:22	Betina Topolski	2047795
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/15/2018 08:43	Allison Taylor	2047796
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/15/2018 10:43	Allison Taylor	2047791
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/15/2018 10:53	Allison Taylor	2047792
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/15/2018 11:02	Allison Taylor	2047793
EPA 300.0 Rev. 2.1	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/15/2018 11:30	Allison Taylor	2047794
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/15/2018 11:39	Allison Taylor	2047795
	12/11/2018			12/14/2018 23:48	Lipi Saha	2047742
	12/11/2018			12/15/2018 00:00	Lipi Saha	2047743
	12/11/2018			12/15/2018 00:37	Lipi Saha	2047744
EPA 350.1 Rev. 2.0	12/11/2018			12/15/2018 00:49	Lipi Saha	2047745
	12/11/2018			12/15/2018 01:01	Lipi Saha	2047746
	12/11/2018			12/15/2018 01:13	Lipi Saha	2047747
	12/11/2018			12/14/2018 11:10	Ping Hua	2047748
	12/11/2018			12/14/2018 11:11	Ping Hua	2047749
EPA 351.2 Rev. 2.0	12/11/2018			12/14/2018 11:13	Ping Hua	2047750
	12/11/2018			12/14/2018 11:14	Ping Hua	2047751
	12/11/2018			12/14/2018 11:22	Ping Hua	2047752
	12/11/2018			12/14/2018 11:25	Ping Hua	2047753
	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/17/2018 10:59	Chelsea Hernandez	2047748
EPA 353.2 Rev. 2.0	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/17/2018 11:00	Chelsea Hernandez	2047749
	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/17/2018 11:05	Chelsea Hernandez	2047750
	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/17/2018 11:06	Chelsea Hernandez	2047751
	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/17/2018 11:08	Chelsea Hernandez	2047752
	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/17/2018 11:09	Chelsea Hernandez	2047753
EPA 365.1 Rev. 2.0	12/11/2018			12/12/2018 10:56	Beverly Y. Sanders	2047753
	12/11/2018			12/12/2018 11:01	Beverly Y. Sanders	2047749
	12/11/2018			12/12/2018 11:02	Beverly Y. Sanders	2047750
	12/11/2018			12/12/2018 11:03	Beverly Y. Sanders	2047751
	12/11/2018			12/12/2018 11:04	Beverly Y. Sanders	2047752
EPA 365.1 Rev. 2.0	12/11/2018			12/12/2018 12:02	Beverly Y. Sanders	2047748
	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 17:17	Beverly Y. Sanders	2047748
	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 17:18	Beverly Y. Sanders	2047749

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	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 17:19	Beverly Y. Sanders	2047750
	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 17:20	Beverly Y. Sanders	2047751, 2047752
	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 17:21	Beverly Y. Sanders	2047753
EPA 365.1 Rev. 2.0 dissolved	12/11/2018			12/11/2018 16:27	Jhamieka S. Greenwood	2047755
	12/11/2018			12/11/2018 16:54	Jhamieka S. Greenwood	2047754, 2047756
	12/11/2018			12/11/2018 16:55	Jhamieka S. Greenwood	2047757
	12/11/2018			12/11/2018 16:56	Jhamieka S. Greenwood	2047758
	12/11/2018			12/11/2018 17:04	Jhamieka S. Greenwood	2047759
SM 2120 B	12/11/2018			12/11/2018 16:43	Chelsea Hernandez	2047742
	12/11/2018			12/11/2018 16:44	Chelsea Hernandez	2047743, 2047744
	12/11/2018			12/11/2018 16:48	Chelsea Hernandez	2047745
	12/11/2018			12/11/2018 16:49	Chelsea Hernandez	2047746
SM 2320 B-97	12/11/2018			12/11/2018 16:50	Chelsea Hernandez	2047747
	12/11/2018			12/12/2018 19:36	Lauren Bottorf	2047742
	12/11/2018			12/12/2018 19:46	Lauren Bottorf	2047743
	12/11/2018			12/12/2018 19:56	Lauren Bottorf	2047744
	12/11/2018			12/12/2018 20:06	Lauren Bottorf	2047745
	12/11/2018			12/12/2018 20:16	Lauren Bottorf	2047746
SM 2540 C-97	12/11/2018			12/12/2018 20:29	Lauren Bottorf	2047747
	12/11/2018			12/13/2018 23:45	Yijie Li	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
SM 2540 D-97	12/11/2018			12/13/2018 23:45	Yijie Li	2047742, 2047743, 2047744, 2047745, 2047746, 2047747
SM 4500 F-C-97	12/11/2018			12/12/2018 19:36	Lauren Bottorf	2047742
	12/11/2018			12/12/2018 19:46	Lauren Bottorf	2047743
	12/11/2018			12/12/2018 19:56	Lauren Bottorf	2047744
	12/11/2018			12/12/2018 20:06	Lauren Bottorf	2047745
	12/11/2018			12/12/2018 20:16	Lauren Bottorf	2047746
	12/11/2018			12/12/2018 20:29	Lauren Bottorf	2047747
SM 5310 B-00	12/11/2018			12/12/2018 05:44	Megan Treadwell	2047748
	12/11/2018			12/12/2018 06:10	Megan Treadwell	2047749
	12/11/2018			12/12/2018 06:23	Megan Treadwell	2047750
	12/11/2018			12/12/2018 06:59	Megan Treadwell	2047751
	12/11/2018			12/12/2018 07:11	Megan Treadwell	2047752
	12/11/2018			12/12/2018 07:24	Megan Treadwell	2047753