Chemical Analysis Report

NW-DIST-2018-05-02-01

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

Event Description: **NW RUN**
Request ID: **RQ-2018-04-30-49**
Customer: **NW-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 11-JUN-2018 11:58

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: Moore Creek above Chamuckla Springs Road **Collection Date/Time: 05/01/2018 10:15**

Field ID: G4NW0355 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989149	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P344507	
	EPA 300.0 Rev. 2.1	Chloride	6.4		mg Cl/L	P344849	
		Sulfate	0.70		mg SO4/L	P344852	
	SM 2120 B	Color (true)	6.0	I	PCU	P344492	
	SM 2320 B-97	Total Alkalinity	2.7		mg CaCO3/L	P345071	
	SM 2540 C-97	TDS	30		mg/L	P345189	
	SM 2540 D-97	TSS	4	I	mg/L	P345182	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345075	
1989154	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P344873	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.15	I	mg N/L	P344575	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.5		mg N/L	P344588	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P344665	
	SM 5310 B-00	Organic Carbon	0.94	I	mg C/L	P345024	
1989159	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344567	

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: McCostill Mill Creek West Ebeneezer Rd **Collection Date/Time: 05/01/2018 10:45**

Field ID: G4NW0320 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989150	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P344507	
	EPA 300.0 Rev. 2.1	Chloride	6.5		mg Cl/L	P344849	
		Sulfate	0.45	I	mg SO4/L	P344852	
	SM 2120 B	Color (true)	2.9	I	PCU	P344492	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P345071	
	SM 2540 C-97	TDS	28		mg/L	P345189	
	SM 2540 D-97	TSS	3	I	mg/L	P345182	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345075	
1989155	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P344873	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P344575	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.3		mg N/L	P344588	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P344665	
	SM 5310 B-00	Organic Carbon	0.53	I	mg C/L	P345024	
1989160	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344568	

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: Big Escambia Creek downstream of Fannie Rd **Collection Date/Time: 05/01/2018 11:15**

Field ID: G4NW0421 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989151	EPA 180.1 Rev. 2.0	Turbidity	3.9	A	NTU	P344508	
	EPA 300.0 Rev. 2.1	Chloride	4.5		mg Cl/L	P344849	
		Sulfate	0.99		mg SO4/L	P344852	

Field ID: G4NW0421 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989151	SM 2120 B	Color (true)	28		PCU	P344492	
	SM 2320 B-97	Total Alkalinity	3.9		mg CaCO3/L	P345071	
	SM 2540 C-97	TDS	49		mg/L	P345189	
	SM 2540 D-97	TSS	2	I	mg/L	P345182	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345075	
1989156	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P344873	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.18	I	mg N/L	P344575	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.52		mg N/L	P344588	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P344665	
	SM 5310 B-00	Organic Carbon	2.1		mg C/L	P345024	
1989161	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P344568	

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: Wiggins Branch below Hwy 29 **Collection Date/Time: 05/01/2018 11:40**

Field ID: G4NW0163 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989152	EPA 180.1 Rev. 2.0	Turbidity	4.4		NTU	P344508	
	EPA 300.0 Rev. 2.1	Chloride	3.8		mg Cl/L	P344849	
		Sulfate	0.93		mg SO4/L	P344852	
	SM 2120 B	Color (true)	50		PCU	P344492	
	SM 2320 B-97	Total Alkalinity	9.8		mg CaCO3/L	P345071	
	SM 2540 C-97	TDS	39		mg/L	P345190	
	SM 2540 D-97	TSS	3	I	mg/L	P345183	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345075	
1989157	EPA 350.1 Rev. 2.0	Ammonia-N	0.055		mg N/L	P344873	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P344575	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P344588	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P344665	
	SM 5310 B-00	Organic Carbon	3.0		mg C/L	P345024	
1989162	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P344568	

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: Mitchell Creek upstream of Hwy 29 **Collection Date/Time: 05/01/2018 12:00**

Field ID: G4NW0116 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989146	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P344507	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P344849	
		Sulfate	0.71		mg SO4/L	P344852	
	SM 2120 B	Color (true)	30		PCU	P344492	
	SM 2320 B-97	Total Alkalinity	1.3	I	mg CaCO3/L	P345071	
	SM 2540 C-97	TDS	15	I	mg/L	P345189	
	SM 2540 D-97	TSS	3	I	mg/L	P345182	

Field ID: G4NW0116 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989146	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345075	
1989147	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P344873	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.14	I	mg N/L	P344574	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P344588	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P344665	
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P345024	
1989148	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344567	
1989186	EPA 200.7 Rev. 4.4	Calcium	0.50		mg/L	P344756	
		Iron	640		ug/L	P344756	
		Magnesium	0.53		mg/L	P344756	
		Potassium	0.30	U	mg/L	P344756	
		Sodium	1.9	I	mg/L	P344756	
		Zinc	5.0	U	ug/L	P344756	
	EPA 200.8 Rev. 5.4	Arsenic	0.19	I	ug/L	P344756	
		Cadmium	0.020	U	ug/L	P344756	
		Chromium	0.40	U	ug/L	P344756	
		Copper	0.20	U	ug/L	P344756	
		Lead	0.13	I	ug/L	P344756	
		Nickel	0.52	I	ug/L	P345682	
		Silver	0.010	U	ug/L	P344756	

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: Little Pine Barren Creek above CR 99 **Collection Date/Time: 05/01/2018 12:30**

Field ID: G4NW0420 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1989153	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P344508	
	EPA 300.0 Rev. 2.1	Chloride	7.2		mg Cl/L	P344849	
		Sulfate	0.47	I	mg SO4/L	P344852	
	SM 2120 B	Color (true)	31		PCU	P344492	
	SM 2320 B-97	Total Alkalinity	5.6		mg CaCO3/L	P345071	
	SM 2540 C-97	TDS	37		mg/L	P345190	
	SM 2540 D-97	TSS	3	I	mg/L	P345183	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345075	
1989158	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P344873	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20		mg N/L	P344575	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.97		mg N/L	P344588	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P344665	
	SM 5310 B-00	Organic Carbon	1.5		mg C/L	P345024	
1989163	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344568	

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

Quality Assurance Report
Method Blank Results

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344507

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344508

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344756

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: P344756

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	1.6		ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345682

Component	Result	Code	Units
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344849

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344852

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344873

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344873

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344574

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344575

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344588

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344665

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344567

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344568

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

Reference Method: SM 2120 B
Batch ID: P344492

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P345071

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P345189

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P345190

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345182

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345183

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P345075

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P345024

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: P344756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	105		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	99.9		P	85 - 115
Sodium	103		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.8		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	95.4		P	85 - 115
Chromium	94.9		P	85 - 115
Copper	96.3		P	85 - 115
Lead	92.4		P	85 - 115
Silver	97.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345682

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344849

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344852

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344873

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344574

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: P344575

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344588

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: P344665

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344665

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344567

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344568

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

Reference Method: SM 2320 B-97
Batch ID: P345071

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P345075

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.1		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345024

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989441	Calcium	101		P	80 - 120
1989441	Iron	103	103	P/P	80 - 120
1989441	Magnesium	101		P	80 - 120
1989441	Potassium	100	99.8	P/P	80 - 120
1989441	Sodium	101	101	P/P	80 - 120
1989441	Zinc	99.4	99.3	P/P	80 - 120
1990383	Calcium	101		P	80 - 120
1990383	Iron	103		P	80 - 120
1990383	Magnesium	104		P	80 - 120
1990383	Potassium	97.6		P	80 - 120
1990383	Sodium	97.7		P	80 - 120
1990383	Zinc	101		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989441	Arsenic	97.6	99.1	P/P	80 - 120
1989441	Cadmium	96.3	100	P/P	80 - 120
1989441	Chromium	98.4	98.2	P/P	80 - 120
1989441	Copper	96.4	96.1	P/P	80 - 120
1989441	Lead	93.9	96.2	P/P	80 - 120
1989441	Silver	98.9	101	P/P	80 - 120
1990383	Arsenic	99.9		P	80 - 120
1990383	Cadmium	99.6		P	80 - 120
1990383	Chromium	101		P	80 - 120
1990383	Copper	102		P	80 - 120
1990383	Lead	97.8		P	80 - 120
1990383	Silver	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989186	Nickel	97.7	99.7	P/P	80 - 120
1990489	Nickel	95.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344849

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989010	Chloride	100		P	90 - 110
1989146	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989010	Sulfate	98.6		P	90 - 110
1989146	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989133	Ammonia-N	99.3	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344574

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989101	Kjeldahl Nitrogen	97.8	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344575

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989154	Kjeldahl Nitrogen	97.7	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989132	NO2NO3-N	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989132	Total-P	97.1	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344567

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989014	O-Phosphate-P	93.8	96.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989160	O-Phosphate-P	97.3	98.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989011	Fluoride	94.5	95.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989013	Organic Carbon	102	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989103	Turbidity	9.11	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989151	Turbidity	4.11	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989441	Calcium	0.751	Spike	P	0 - 20
1989441	Iron	0.0636	Spike	P	0 - 20
1989441	Magnesium	0.0807	Spike	P	0 - 20
1989441	Potassium	0.377	Spike	P	0 - 20
1989441	Sodium	0.225	Spike	P	0 - 20
1989441	Zinc	0.0369	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989441	Arsenic	1.51	Spike	P	0 - 20
1989441	Cadmium	3.80	Spike	P	0 - 20
1989441	Chromium	0.251	Spike	P	0 - 20
1989441	Copper	0.261	Spike	P	0 - 20
1989441	Lead	2.42	Spike	P	0 - 20
1989441	Silver	2.40	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989186	Nickel	1.95	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989010	Chloride	0.535	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P344852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989010	Sulfate	0.907	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989133	Ammonia-N	3.20	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344574

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989101	Kjeldahl Nitrogen	0.597	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989154	Kjeldahl Nitrogen	5.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989132	NO2NO3-N	1.42	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989132	Total-P	1.35	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344567

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989014	O-Phosphate-P	2.34	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989160	O-Phosphate-P	0.921	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P344492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989128	Color (true)	1.07	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989011	Total Alkalinity	0.856	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P345189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989100	TDS	1.23	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P345190

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989208	TDS	5.12	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P345075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989011	Fluoride	0.472	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P345024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989013	Organic Carbon	0.440	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: A83602
Included Lab Sample IDs: 1989146, 1989149, 1989150, 1989151, 1989152, 1989153

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83605
Included Lab Sample IDs: 1989146, 1989149, 1989150, 1989151, 1989152, 1989153

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: A83633
Included Lab Sample IDs: 1989148, 1989159, 1989160, 1989161, 1989162, 1989163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	95.7	95.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83633
Included Lab Sample IDs: 1989148, 1989159, 1989160, 1989161, 1989162, 1989163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	95.7	P/P	90 - 110
O-Phosphate-P	99.7	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83635
Included Lab Sample IDs: 1989147, 1989157

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83636
Included Lab Sample IDs: 1989154, 1989155, 1989156, 1989158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83682
Included Lab Sample IDs: 1989147, 1989154, 1989155, 1989156, 1989157, 1989158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.1	97.7	P/P	90 - 110
Kjeldahl Nitrogen	97.4	97.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83732
Included Lab Sample IDs: 1989146, 1989149, 1989150, 1989151, 1989152, 1989153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	104	P/P	90 - 110
Chloride	103	103	P/P	90 - 110
Chloride	93.1	103	P/P	90 - 110
Sulfate	102	102	P/P	90 - 110
Sulfate	102	104	P/P	90 - 110
Sulfate	91.6	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83734
Included Lab Sample IDs: 1989147, 1989154, 1989155, 1989156, 1989157, 1989158

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83735
Included Lab Sample IDs: 1989147, 1989154, 1989155, 1989156, 1989157, 1989158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83752
Included Lab Sample IDs: 1989186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	100	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	99.1	98.5	P/P	90 - 110
Sodium	99.8	98.3	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83798
Included Lab Sample IDs: 1989147, 1989154, 1989155, 1989156, 1989157, 1989158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.1	99.6	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A83812
Included Lab Sample IDs: 1989146, 1989149, 1989150, 1989151, 1989152, 1989153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.1	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83812
Included Lab Sample IDs: 1989146, 1989149, 1989150, 1989151, 1989152, 1989153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83960
Included Lab Sample IDs: 1989186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.3	99.9	P/P	90 - 110
Cadmium	99.6	101	P/P	90 - 110
Chromium	99.2	100	P/P	90 - 110
Copper	101	102	P/P	90 - 110
Lead	99.6	100	P/P	90 - 110
Silver	101	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84121
Included Lab Sample IDs: 1989186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	102	97.8	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 180.1 Rev. 2.0	Turbidity						9.11	
	Turbidity						4.11	
EPA 200.7 Rev. 4.4	Calcium	102	101	101				0.751
	Iron	105	103	103	103			0.0636
	Magnesium	102	101	104				0.0807
	Potassium	99.9	100	99.8	97.6			0.377
	Sodium	103	101	101	97.7			0.225
	Zinc	101	99.4	99.3	101			0.0369
EPA 200.8 Rev. 5.4	Arsenic	96.8	97.6	99.1	99.9			1.51
	Cadmium	95.4	96.3	100	99.6			3.80
	Chromium	94.9	98.4	98.2	101			0.251
	Copper	96.3	96.4	96.1	102			0.261
	Lead	92.4	93.9	96.2	97.8			2.42
	Nickel	101	97.7	99.7	95.5			1.95
	Silver	97.8	98.9	101	100			2.40
EPA 300.0 Rev. 2.1	Chloride	101	100	101			0.535	
	Sulfate	102	98.6	102			0.907	
EPA 350.1 Rev. 2.0	Ammonia-N	106	99.3	104				3.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	97.8	97.0				0.597
	Kjeldahl Nitrogen	96.6	97.7	104				5.35
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	103				1.42
EPA 365.1 Rev. 2.0	Total-P	97.7	97.1	98.5				1.35
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.5	93.8	96.3				2.34
	O-Phosphate-P	101	97.3	98.2				0.921
SM 2120 B	Color (true)						1.07	
SM 2320 B-97	Total Alkalinity	105					0.856	
SM 2540 C-97	TDS						1.23	
	TDS						5.12	
SM 4500 F-C-97	Fluoride	95.1	94.5	95.0				0.472
SM 5310 B-00	Organic Carbon	100	102	103				0.440

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1989186
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1989186
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1989147, 1989154, 1989155, 1989156, 1989157, 1989158
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1989147, 1989154, 1989155, 1989156, 1989157, 1989158
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1989147, 1989154, 1989155, 1989156, 1989157, 1989158
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1989147, 1989154, 1989155, 1989156, 1989157, 1989158
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1989148, 1989159, 1989160, 1989161, 1989162, 1989163

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2120 B / E31780	True Color measured at 450 nm	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1989147, 1989154, 1989155, 1989156, 1989157, 1989158

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	05/02/2018			05/02/2018 17:27	William L. Brown IV	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
EPA 200.7 Rev. 4.4	05/02/2018	05/07/2018 13:19	Allison Taylor	05/08/2018 12:08	Betina Topolski	1989186
EPA 200.8 Rev. 5.4	05/02/2018	05/07/2018 13:19	Allison Taylor	05/16/2018 17:53	Robert K Palmer	1989186
	05/02/2018	05/22/2018 11:53	Allison Taylor	05/23/2018 12:34	Nadine Brooks	1989186
EPA 300.0 Rev. 2.1	05/02/2018			05/08/2018 01:12	Lipi Saha	1989146
	05/02/2018			05/08/2018 04:12	Lipi Saha	1989149
	05/02/2018			05/08/2018 04:24	Lipi Saha	1989150
	05/02/2018			05/08/2018 04:36	Lipi Saha	1989151
	05/02/2018			05/08/2018 04:48	Lipi Saha	1989152
	05/02/2018			05/08/2018 05:24	Lipi Saha	1989153
EPA 350.1 Rev. 2.0	05/02/2018			05/07/2018 13:51	Ping Hua	1989147
	05/02/2018			05/07/2018 13:52	Ping Hua	1989154
	05/02/2018			05/07/2018 13:54	Ping Hua	1989155
	05/02/2018			05/07/2018 14:03	Ping Hua	1989156
	05/02/2018			05/07/2018 14:04	Ping Hua	1989157
	05/02/2018			05/07/2018 14:06	Ping Hua	1989158
EPA 351.2 Rev. 2.0	05/02/2018	05/03/2018 13:30	Adrian Shelby	05/04/2018 15:22	Joseph Suarez	1989147
	05/02/2018	05/03/2018 13:30	Adrian Shelby	05/04/2018 15:26	Joseph Suarez	1989154
	05/02/2018	05/03/2018 13:30	Adrian Shelby	05/04/2018 15:34	Joseph Suarez	1989155
	05/02/2018	05/03/2018 13:30	Adrian Shelby	05/04/2018 15:36	Joseph Suarez	1989156
	05/02/2018	05/03/2018 13:30	Adrian Shelby	05/04/2018 15:37	Joseph Suarez	1989157
	05/02/2018	05/03/2018 13:30	Adrian Shelby	05/04/2018 15:39	Joseph Suarez	1989158
EPA 353.2 Rev. 2.0	05/02/2018			05/03/2018 13:04	Lauren Bottorf	1989147
	05/02/2018			05/03/2018 13:09	Lauren Bottorf	1989157
	05/02/2018			05/03/2018 15:18	Lauren Bottorf	1989154
	05/02/2018			05/03/2018 15:20	Lauren Bottorf	1989155
	05/02/2018			05/03/2018 15:21	Lauren Bottorf	1989156
	05/02/2018			05/03/2018 15:22	Lauren Bottorf	1989158
EPA 365.1 Rev. 2.0	05/02/2018	05/04/2018 13:37	Sima Feizi	05/08/2018 10:46	Beverly Y. Sanders	1989147, 1989154
	05/02/2018	05/04/2018 13:37	Sima Feizi	05/08/2018 10:47	Beverly Y. Sanders	1989155
	05/02/2018	05/04/2018 13:37	Sima Feizi	05/08/2018 10:48	Beverly Y. Sanders	1989156
	05/02/2018	05/04/2018 13:37	Sima Feizi	05/08/2018 10:49	Beverly Y. Sanders	1989157
	05/02/2018	05/04/2018 13:37	Sima Feizi	05/08/2018 10:50	Beverly Y. Sanders	1989158
EPA 365.1 Rev. 2.0 dissolved	05/02/2018			05/02/2018 14:43	Megan Treadwell	1989160
	05/02/2018			05/02/2018 15:09	Megan Treadwell	1989148
	05/02/2018			05/02/2018 15:10	Megan Treadwell	1989159
	05/02/2018			05/02/2018 15:11	Megan Treadwell	1989161
	05/02/2018			05/02/2018 16:58	Megan Treadwell	1989162
	05/02/2018			05/02/2018 16:59	Megan Treadwell	1989163

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2120 B	05/02/2018			05/02/2018 15:46	Tanya Welborn	1989146
	05/02/2018			05/02/2018 15:47	Tanya Welborn	1989149, 1989150
	05/02/2018			05/02/2018 15:48	Tanya Welborn	1989151
	05/02/2018			05/02/2018 15:49	Tanya Welborn	1989152
	05/02/2018			05/02/2018 15:50	Tanya Welborn	1989153
SM 2320 B-97	05/02/2018			05/10/2018 01:43	Dale L. Simmons	1989146
	05/02/2018			05/10/2018 01:55	Dale L. Simmons	1989149
	05/02/2018			05/10/2018 02:04	Dale L. Simmons	1989150
	05/02/2018			05/10/2018 02:15	Dale L. Simmons	1989151
	05/02/2018			05/10/2018 02:25	Dale L. Simmons	1989152
	05/02/2018			05/10/2018 02:36	Dale L. Simmons	1989153
SM 2540 C-97	05/02/2018			05/05/2018 23:12	Yijie Li	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
SM 2540 D-97	05/02/2018			05/05/2018 23:12	Yijie Li	1989146, 1989149, 1989150, 1989151, 1989152, 1989153
SM 4500 F-C-97	05/02/2018			05/10/2018 01:43	Dale L. Simmons	1989146
	05/02/2018			05/10/2018 01:55	Dale L. Simmons	1989149
	05/02/2018			05/10/2018 02:04	Dale L. Simmons	1989150
	05/02/2018			05/10/2018 02:15	Dale L. Simmons	1989151
	05/02/2018			05/10/2018 02:25	Dale L. Simmons	1989152
	05/02/2018			05/10/2018 02:36	Dale L. Simmons	1989153
SM 5310 B-00	05/02/2018			05/10/2018 02:43	Megan Treadwell	1989147
	05/02/2018			05/10/2018 02:56	Megan Treadwell	1989154
	05/02/2018			05/10/2018 03:08	Megan Treadwell	1989155
	05/02/2018			05/10/2018 03:20	Megan Treadwell	1989156
	05/02/2018			05/10/2018 03:32	Megan Treadwell	1989157
	05/02/2018			05/10/2018 03:45	Megan Treadwell	1989158