Chemical Analysis Report

TLH-ROC-2019-07-29-02

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

Event Description: **Run 2**
Request ID: **RQ-2019-07-01-50**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 23-AUG-2019 10:33

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Waccasassa River @ Otter Creek **Collection Date/Time: 07/29/2019 12:55**

Field ID: G1TLHR0101 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2106630	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P368157	
	EPA 300.0	Bromide	0.15		mg Br/L	P368406	
	SM 2320 B-97	Total Alkalinity	90		mg CaCO3/L	P368375	
	SM 2540 D-97	TSS	3	I	mg/L	P368355	
	SM 4500 F-C-97	Fluoride	0.094	I	mg F/L	P368378	
2106632	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P368681	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P368286	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.056		mg N/L	P368134	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P368142	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P368262	
2106634	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P368215	
2106651	EPA 200.7 Rev. 4.4	Iron	860		ug/L	P368250	
		Manganese	23.2		ug/L	P368250	
		Zinc	5.0	U	ug/L	P368250	
	EPA 200.8 Rev. 5.4	Aluminum	118		ug/L	P368250	
		Antimony	0.050	U	ug/L	P368250	
		Arsenic	0.90		ug/L	P368250	
		Cadmium	0.020	U	ug/L	P368250	
		Chromium	0.66	I	ug/L	P368250	
		Copper	0.40	U	ug/L	P368250	
		Lead	0.20	U	ug/L	P368250	
		Nickel	0.50	U	ug/L	P368250	
		Selenium	0.20	U	ug/L	P368250	
		Silver	0.010	U	ug/L	P368250	
		Thallium	0.10	U	ug/L	P368250	

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: Waccasassa River @ Boat Ramp **Collection Date/Time: 07/29/2019 13:05**

Field ID: G1TLHR0032 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2106631	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P368157	
	EPA 300.0	Bromide	0.047		mg Br/L	P368406	
	SM 2320 B-97	Total Alkalinity	83	A	mg CaCO3/L	P368375	
	SM 2540 D-97	TSS	2	U	mg/L	P368355	
	SM 4500 F-C-97	Fluoride	0.092	I	mg F/L	P368378	
2106633	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P368681	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P368286	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.077		mg N/L	P368134	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P368142	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P368262	
2106635	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P368215	
2106652	EPA 200.7 Rev. 4.4	Iron	790		ug/L	P368250	
		Manganese	18.5		ug/L	P368250	
		Zinc	5.0	U	ug/L	P368250	
	EPA 200.8 Rev. 5.4	Aluminum	91		ug/L	P368250	
		Antimony	0.050	U	ug/L	P368250	
		Arsenic	0.67		ug/L	P368250	
		Cadmium	0.020	U	ug/L	P368250	
		Chromium	0.54	I	ug/L	P368250	
		Copper	0.40	U	ug/L	P368250	
		Lead	0.20	U	ug/L	P368250	
		Nickel	0.50	U	ug/L	P368250	
		Selenium	0.20	U	ug/L	P368250	
		Silver	0.010	U	ug/L	P368250	
		Thallium	0.10	U	ug/L	P368250	

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: Steinhatchee River @ S Canal Rd **Collection Date/Time: 07/29/2019 14:50**

Field ID: G1TLHR0064 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2106639	EPA 180.1 Rev. 2.0	Turbidity	12	A	NTU	P368157	
	EPA 300.0 Rev. 2.1	Chloride	5.3		mg Cl/L	P368401	
		Sulfate	1.1		mg SO4/L	P368403	
	SM 2120 B	Color (true)	460		PCU	P368172	
	SM 2320 B-97	Total Alkalinity	65		mg CaCO3/L	P368559	
	SM 2540 C-97	TDS	170		mg/L	P368578	
	SM 2540 D-97	TSS	18		mg/L	P368352	
	SM 4500 F-C-97	Fluoride	0.081	I	mg F/L	P368562	
2106640	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P368681	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P368288	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.045		mg N/L	P368135	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P368212	
	SM 5310 B-00	Organic Carbon	38		mg C/L	P368262	
2106641	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.088		mg P/L	P368215	
2106653	EPA 200.7 Rev. 4.4	Barium	8.5		ug/L	P368250	
		Calcium	30.8		mg/L	P368250	
		Iron	1.31E+03		ug/L	P368250	
		Magnesium	3.62		mg/L	P368250	
		Potassium	0.30	U	mg/L	P368250	
		Sodium	3.1		mg/L	P368250	
		Zinc	5.0	U	ug/L	P368250	
	EPA 200.8 Rev. 5.4	Aluminum	462		ug/L	P368250	
		Antimony	0.050	U	ug/L	P368250	
		Arsenic	0.41		ug/L	P368250	
		Boron**	14.6		ug/L	P368250	
		Cadmium	0.020	U	ug/L	P368250	
		Chromium	0.89	I	ug/L	P368250	
		Copper	0.40	U	ug/L	P368250	
		Lead	0.44		ug/L	P368250	
		Nickel	0.50	U	ug/L	P368250	
		Selenium	0.20	U	ug/L	P368250	
		Silver	0.010	U	ug/L	P368250	
		Thallium	0.10	U	ug/L	P368250	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Steinhatchee River 40m N of Yearling Rd **Collection Date/Time: 07/29/2019 15:05**

Field ID: G1TLHR0065 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2106636	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P368157	
	EPA 300.0 Rev. 2.1	Chloride	5.4		mg Cl/L	P368401	
		Sulfate	0.88		mg SO4/L	P368403	
	SM 2120 B	Color (true)	380		PCU	P368172	
	SM 2320 B-97	Total Alkalinity	74		mg CaCO3/L	P368559	
	SM 2540 C-97	TDS	169		mg/L	P368578	
	SM 2540 D-97	TSS	15		mg/L	P368352	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P368562	
2106637	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P368681	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P368288	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.048		mg N/L	P368134	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P368142	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P368262	
2106638	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P368215	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P368157

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368250

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/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: P368250

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0
Batch ID: P368406

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368401

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368403

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: P368681

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368286

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368288

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368134

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368135

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368142

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368212

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368215

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

Reference Method: SM 2120 B
Batch ID: P368172

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P368375

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

Reference Method: SM 2320 B-97
Batch ID: P368559

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

Reference Method: SM 2540 C-97
Batch ID: P368578

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P368352

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P368355

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P368378

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P368562

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P368262

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: P368250

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.3		P	85 - 115
Calcium	105		P	85 - 115
Iron	103		P	85 - 115
Magnesium	110		P	85 - 115
Manganese	100		P	85 - 115
Potassium	107		P	85 - 115
Sodium	107		P	85 - 115
Zinc	97.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P368250

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	95.8		P	85 - 115
Arsenic	99.7		P	85 - 115
Boron	103		P	85 - 115
Cadmium	98.8		P	85 - 115
Chromium	94.4		P	85 - 115
Copper	97.1		P	85 - 115
Lead	94.5		P	85 - 115
Nickel	96.4		P	85 - 115
Selenium	100		P	85 - 115
Silver	96.3		P	85 - 115
Thallium	97.3		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P368406

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368401

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368403

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.6		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368286

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368288

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368134

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368135

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: P368142

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368212

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: P368215

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

Reference Method: SM 2120 B
Batch ID: P368172

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

Reference Method: SM 2320 B-97
Batch ID: P368375

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P368559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P368378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P368562

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.4		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P368262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106787	Barium	99.7	100	P/P	80 - 120
2106787	Calcium	104	104	P/P	80 - 120
2106787	Iron	103	103	P/P	80 - 120
2106787	Magnesium	108	108	P/P	80 - 120
2106787	Manganese	99.4	100	P/P	80 - 120
2106787	Potassium	107	106	P/P	80 - 120
2106787	Sodium	101	102	P/P	80 - 120
2106787	Zinc	97.8	98.6	P/P	80 - 120
2107130	Barium	96.4		P	80 - 120
2107130	Calcium	99.0		P	80 - 120
2107130	Iron	101		P	80 - 120
2107130	Magnesium	103		P	80 - 120
2107130	Manganese	97.4		P	80 - 120
2107130	Potassium	107		P	80 - 120
2107130	Sodium	107		P	80 - 120
2107130	Zinc	96.1		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P368250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106787	Aluminum	99.3	99.1	P/P	80 - 120
2106787	Antimony	96.1	94.8	P/P	80 - 120
2106787	Arsenic	101	100	P/P	80 - 120
2106787	Boron	102	101	P/P	80 - 120
2106787	Cadmium	100	99.6	P/P	80 - 120
2106787	Chromium	95.3	93.9	P/P	80 - 120
2106787	Copper	97.3	96.7	P/P	80 - 120
2106787	Lead	96.0	95.7	P/P	80 - 120
2106787	Nickel	96.0	96.5	P/P	80 - 120
2106787	Selenium	100	99.8	P/P	80 - 120
2106787	Silver	95.6	95.1	P/P	80 - 120
2106787	Thallium	99.7	100	P/P	80 - 120
2107130	Aluminum	101		P	80 - 120
2107130	Antimony	96.8		P	80 - 120
2107130	Arsenic	101		P	80 - 120
2107130	Boron	106		P	80 - 120
2107130	Cadmium	101		P	80 - 120
2107130	Chromium	93.4		P	80 - 120
2107130	Copper	96.7		P	80 - 120
2107130	Lead	94.6		P	80 - 120
2107130	Nickel	93.9		P	80 - 120
2107130	Selenium	102		P	80 - 120
2107130	Silver	96.2		P	80 - 120
2107130	Thallium	98.8		P	80 - 120

Reference Method: EPA 300.0
Batch ID: P368406

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106270	Bromide	96.8	96.6	P/P	90 - 110
2106631	Bromide	98.1		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106563	Chloride	98.2		P	90 - 110
2106794	Chloride	99.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106563	Sulfate	103		P	90 - 110
2106794	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106559	Ammonia-N	99.7	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368286

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106541	Kjeldahl Nitrogen	105	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106549	NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106640	NO2NO3-N	95.5	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106549	Total-P	98.7	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106670	Total-P	102	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106755	O-Phosphate-P	96.4	96.8	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P368378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106631	Fluoride	98.4	98.4	P/P	89 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P368562

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106837	Fluoride	98.1	97.4	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P368262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2106624	Organic Carbon	98.2	94.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P368157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106639	Turbidity	0.866	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106787	Barium	0.235	Spike	P	0 - 20
2106787	Calcium	0.241	Spike	P	0 - 20
2106787	Iron	0.178	Spike	P	0 - 20
2106787	Magnesium	0.315	Spike	P	0 - 20
2106787	Manganese	0.574	Spike	P	0 - 20
2106787	Potassium	0.786	Spike	P	0 - 20
2106787	Sodium	0.547	Spike	P	0 - 20
2106787	Zinc	0.796	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P368250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106787	Aluminum	0.257	Spike	P	0 - 20
2106787	Antimony	1.38	Spike	P	0 - 20
2106787	Arsenic	0.771	Spike	P	0 - 20
2106787	Boron	0.695	Spike	P	0 - 20
2106787	Cadmium	0.439	Spike	P	0 - 20
2106787	Chromium	1.43	Spike	P	0 - 20
2106787	Copper	0.612	Spike	P	0 - 20
2106787	Lead	0.234	Spike	P	0 - 20
2106787	Nickel	0.494	Spike	P	0 - 20
2106787	Selenium	0.382	Spike	P	0 - 20
2106787	Silver	0.567	Spike	P	0 - 20
2106787	Thallium	0.434	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P368406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106270	Bromide	0.0964	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106563	Chloride	0.162	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106563	Sulfate	0.380	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106559	Ammonia-N	0.0679	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106541	Kjeldahl Nitrogen	1.27	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P368288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106679	Kjeldahl Nitrogen	2.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106549	NO2NO3-N	0.173	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106640	NO2NO3-N	0.853	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106549	Total-P	1.17	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106670	Total-P	4.43	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368215

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106755	O-Phosphate-P	0.396	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P368172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106794	Color (true)	1.12	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P368375

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106631	Total Alkalinity	0.0102	Sample	P	0 - 2.8

Reference Method: SM 2320 B-97
Batch ID: P368559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106837	Total Alkalinity	0.515	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P368578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106794	TDS	1.83	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P368378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106631	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
Batch ID: P368562

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106837	Fluoride	0.473	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P368262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2106624	Organic Carbon	3.81	Spike	P	0 - 20

Quality Assurance Report
Precision

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A93127
Included Lab Sample IDs: 2106632, 2106633, 2106637, 2106640

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A93137
Included Lab Sample IDs: 2106630, 2106631, 2106636, 2106639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A93142
Included Lab Sample IDs: 2106636, 2106639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	105	P/P	90 - 115

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A93147
Included Lab Sample IDs: 2106636, 2106639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.2	98.0	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A93165
Included Lab Sample IDs: 2106634, 2106635, 2106638, 2106641

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

Reference Method: SM 5310 B-00
Run ID: A93180
Included Lab Sample IDs: 2106632, 2106633, 2106637, 2106640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	96.4	P/P	90 - 110
Organic Carbon	99.4	95.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93183
Included Lab Sample IDs: 2106637

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93186
Included Lab Sample IDs: 2106632, 2106633

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93186
Included Lab Sample IDs: 2106632, 2106633

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93217
Included Lab Sample IDs: 2106640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	99.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A93228
Included Lab Sample IDs: 2106630, 2106631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A93228
Included Lab Sample IDs: 2106630, 2106631

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

Reference Method: EPA 300.0
Run ID: A93239
Included Lab Sample IDs: 2106630, 2106631

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A93244
Included Lab Sample IDs: 2106632, 2106633, 2106637, 2106640

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A93246
Included Lab Sample IDs: 2106651, 2106652, 2106653

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	101	P/P	90 - 110
Calcium	101	99.9	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Manganese	103	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A93246
Included Lab Sample IDs: 2106651, 2106652, 2106653

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Potassium	100	102	P/P	90 - 110
Sodium	102	103	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A93315
Included Lab Sample IDs: 2106636, 2106639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A93315
Included Lab Sample IDs: 2106636, 2106639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A93358
Included Lab Sample IDs: 2106632, 2106633, 2106637, 2106640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A93385
Included Lab Sample IDs: 2106651, 2106652, 2106653

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	103	P/P	90 - 110
Aluminum	103	101	P/P	90 - 110
Antimony	93.8	94.0	P/P	90 - 110
Antimony	94.0	92.9	P/P	90 - 110
Arsenic	99.3	99.4	P/P	90 - 110
Arsenic	100	99.3	P/P	90 - 110
Boron	101	104	P/P	90 - 110
Cadmium	99.4	98.3	P/P	90 - 110
Cadmium	99.4	99.4	P/P	90 - 110
Chromium	95.3	94.3	P/P	90 - 110
Chromium	96.0	95.3	P/P	90 - 110
Lead	96.2	96.5	P/P	90 - 110
Lead	97.4	96.2	P/P	90 - 110
Nickel	97.4	96.3	P/P	90 - 110
Nickel	98.4	97.4	P/P	90 - 110
Selenium	101	99.9	P/P	90 - 110
Selenium	99.9	100	P/P	90 - 110
Silver	94.3	94.4	P/P	90 - 110
Silver	95.5	94.3	P/P	90 - 110
Thallium	93.8	93.2	P/P	90 - 110
Thallium	95.5	93.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A93703
Included Lab Sample IDs: 2106651, 2106652, 2106653

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	98.6	98.7	P/P	90 - 110
Copper	99.5	98.6	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						0.866	
EPA 200.7 Rev. 4.4	Barium	99.3	99.7	100	96.4			0.235
	Calcium	105	104	104	99.0			0.241
	Iron	103	103	103	101			0.178
	Magnesium	110	108	108	103			0.315
	Manganese	100	99.4	100	97.4			0.574
	Potassium	107	107	106	107			0.786
	Sodium	107	101	102	107			0.547
	Zinc	97.3	97.8	98.6	96.1			0.796
EPA 200.8 Rev. 5.4	Aluminum	100	99.3	99.1	101			0.257
	Antimony	95.8	96.1	94.8	96.8			1.38
	Arsenic	99.7	101	100	101			0.771
	Boron	103	102	101	106			0.695
	Cadmium	98.8	100	99.6	101			0.439
	Chromium	94.4	95.3	93.9	93.4			1.43
	Copper	97.1	97.3	96.7	96.7			0.612
	Lead	94.5	96.0	95.7	94.6			0.234
	Nickel	96.4	96.0	96.5	93.9			0.494
	Selenium	100	100	99.8	102			0.382
	Silver	96.3	95.6	95.1	96.2			0.567
	Thallium	97.3	99.7	100	98.8			0.434
EPA 300.0	Bromide	100	96.8	96.6	98.1			0.0964
EPA 300.0 Rev. 2.1	Chloride	96.6	98.2	99.0			0.162	
	Sulfate	101	103	101			0.380	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	99.7	99.6				0.0679
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.2	105	107				1.27
	Kjeldahl Nitrogen	104						2.62
EPA 353.2 Rev. 2.0	NO2NO3-N	101	99.0					0.173
	NO2NO3-N	102	95.5	94.5				0.853
EPA 365.1 Rev. 2.0	Total-P	99.0	98.7	97.6				1.17
	Total-P	99.3	102	97.7				4.43
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	96.4	96.8				0.396
SM 2120 B	Color (true)	101					1.12	
SM 2320 B-97	Total Alkalinity	103					0.0102	
	Total Alkalinity	104					0.515	
SM 2540 C-97	TDS						1.83	
SM 4500 F-C-97	Fluoride	98.2	98.4	98.4				0.0
	Fluoride	96.4	98.1	97.4				0.473
SM 5310 B-00	Organic Carbon	97.8	98.2	94.0				3.81

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2106630, 2106631, 2106636, 2106639
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2106651, 2106652, 2106653
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2106651, 2106652, 2106653
EPA 300.0 / E31780	Bromide in aqueous matrices	2106630, 2106631
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2106636, 2106639
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2106636, 2106639

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2106632, 2106633, 2106637, 2106640
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2106632, 2106633, 2106637, 2106640
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2106632, 2106633, 2106637, 2106640
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2106632, 2106633, 2106637, 2106640
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2106634, 2106635, 2106638, 2106641
SM 2120 B / E31780	True Color measured at 450 nm	2106636, 2106639
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2106630, 2106631, 2106636, 2106639
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2106636, 2106639
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2106630, 2106631, 2106636, 2106639
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2106630, 2106631, 2106636, 2106639
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2106632, 2106633, 2106637, 2106640

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	07/29/2019			07/30/2019 17:05	Adrian Shelby	2106630, 2106631, 2106636, 2106639
EPA 200.7 Rev. 4.4	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/02/2019 14:00	Betina Topolski	2106651
	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/02/2019 14:07	Betina Topolski	2106652
	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/02/2019 14:14	Betina Topolski	2106653
EPA 200.8 Rev. 5.4	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/08/2019 23:28	Robert K Palmer	2106651
	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/08/2019 23:38	Robert K Palmer	2106652
	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/09/2019 00:17	Robert K Palmer	2106653
	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/21/2019 19:01	Martin Acosta	2106651
	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/21/2019 19:39	Martin Acosta	2106652
	07/29/2019	07/31/2019 18:00	Elliott D. Healy	08/21/2019 19:49	Martin Acosta	2106653
EPA 300.0	07/29/2019			08/01/2019 20:10	Jhamieka S. Greenwood	2106631
	07/29/2019			08/01/2019 23:01	Jhamieka S. Greenwood	2106630
EPA 300.0 Rev. 2.1	07/29/2019			07/31/2019 20:04	Jhamieka S. Greenwood	2106636
	07/29/2019			07/31/2019 20:16	Jhamieka S. Greenwood	2106639
EPA 350.1 Rev. 2.0	07/29/2019			08/07/2019 14:46	Ping Hua	2106632
	07/29/2019			08/07/2019 14:48	Ping Hua	2106633
	07/29/2019			08/07/2019 14:49	Ping Hua	2106637
	07/29/2019			08/07/2019 14:51	Ping Hua	2106640
EPA 351.2 Rev. 2.0	07/29/2019	08/01/2019 11:45	Adrian Shelby	08/02/2019 15:49	Joseph Suarez	2106632
	07/29/2019	08/01/2019 11:45	Adrian Shelby	08/02/2019 15:51	Joseph Suarez	2106633
	07/29/2019	08/01/2019 18:00	Adrian Shelby	08/02/2019 16:27	Joseph Suarez	2106637
	07/29/2019	08/01/2019 18:00	Adrian Shelby	08/02/2019 16:28	Joseph Suarez	2106640
EPA 353.2 Rev. 2.0	07/29/2019			07/30/2019 12:00	Beverly Y. Sanders	2106632
	07/29/2019			07/30/2019 12:01	Beverly Y. Sanders	2106633
	07/29/2019			07/30/2019 12:02	Beverly Y. Sanders	2106637
	07/29/2019			07/30/2019 12:09	Beverly Y. Sanders	2106640
EPA 365.1 Rev. 2.0	07/29/2019	07/30/2019 12:01	Vijayalakshmi Reddy	08/01/2019 09:02	Lipi Saha	2106637
	07/29/2019	07/30/2019 12:01	Vijayalakshmi Reddy	08/01/2019 10:26	Lipi Saha	2106632
	07/29/2019	07/30/2019 12:01	Vijayalakshmi Reddy	08/01/2019 10:27	Lipi Saha	2106633
	07/29/2019	07/31/2019 12:24	Vijayalakshmi Reddy	08/01/2019 14:09	Lipi Saha	2106640
EPA 365.1 Rev. 2.0 dissolved	07/29/2019			07/30/2019 16:58	Jhamieka S. Greenwood	2106634
	07/29/2019			07/30/2019 16:59	Jhamieka S. Greenwood	2106635
	07/29/2019			07/30/2019 17:00	Jhamieka S. Greenwood	2106638
	07/29/2019			07/30/2019 17:01	Jhamieka S. Greenwood	2106641
SM 2120 B	07/29/2019			07/30/2019 18:16	Madeline Funaro	2106636
	07/29/2019			07/30/2019 18:17	Madeline Funaro	2106639
SM 2320 B-97	07/29/2019			08/02/2019 03:02	Dale L. Simmons	2106631
	07/29/2019			08/02/2019 07:01	Dale L. Simmons	2106630
	07/29/2019			08/06/2019 00:16	Dale L. Simmons	2106636
	07/29/2019			08/06/2019 00:28	Dale L. Simmons	2106639

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2540 C-97	07/29/2019			07/31/2019 17:30	Blanca Fach	2106636, 2106639
SM 2540 D-97	07/29/2019			07/31/2019 16:50	Blanca Fach	2106630, 2106631, 2106636, 2106639
SM 4500 F-C-97	07/29/2019			08/02/2019 02:52	Dale L. Simmons	2106631
	07/29/2019			08/02/2019 07:01	Dale L. Simmons	2106630
	07/29/2019			08/06/2019 00:16	Dale L. Simmons	2106636
	07/29/2019			08/06/2019 00:28	Dale L. Simmons	2106639
SM 5310 B-00	07/29/2019			07/31/2019 14:32	Lauren Lees	2106637
	07/29/2019			07/31/2019 15:11	Lauren Lees	2106632
	07/29/2019			07/31/2019 15:49	Lauren Lees	2106633
	07/29/2019			07/31/2019 16:01	Lauren Lees	2106640