

Chemical Analysis Report

WAS-SECT-2018-12-27-01

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

Event Description: **Merrits Mill Pond BMAP**

Request ID: **RQ-2018-12-24-28**

Customer: **WAS-SECT**

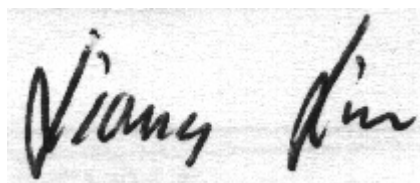
Project ID: **BMAP**

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 15-JAN-2019 14:14

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

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

**Sample Location: MERRITT'S MILL POND 500 METERS
UPSTREAM OF DAM**

Collection Date/Time: 12/27/2018 10:55

Field ID: G2WA0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2050990	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P356672	
	EPA 300.0 Rev. 2.1	Chloride	5.2	A	mg Cl/L	P356869	
		Sulfate	1.7	A	mg SO4/L	P356873	
		Color (true)	2.5	U	PCU	P356649	
	SM 2320 B-97	Total Alkalinity	127		mg CaCO3/L	P356933	
	SM 2540 C-97	TDS	157		mg/L	P356782	
	SM 2540 D-97	TSS	2	U	mg/L	P356763	
	SM 4500 F-C-97	Fluoride	0.047	I	mg F/L	P356938	
2050993	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P356751	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.10	I	mg N/L	P356757	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.8		mg N/L	P356736	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P356768	
	SM 5310 B-00	Organic Carbon	0.53	I	mg C/L	P356741	
2050996	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P356652	
2051002	EPA 200.7 Rev. 4.4	Barium	7.0		ug/L	P356780	
		Calcium	51.6		mg/L	P356780	
		Iron	30	U	ug/L	P356780	
		Magnesium	3.32		mg/L	P356780	
		Potassium	0.39	I	mg/L	P356780	
		Sodium	2.2		mg/L	P356780	
		Zinc	5.0	U	ug/L	P356780	
	EPA 200.8 Rev. 5.4	Aluminum	11	I	ug/L	P356780	
		Antimony	0.050	U	ug/L	P356780	
		Arsenic	0.36		ug/L	P356780	
		Boron**	9.5		ug/L	P356780	
		Cadmium	0.020	U	ug/L	P356780	
		Chromium	1.1	I	ug/L	P356780	
		Copper	0.20	U	ug/L	P356780	
		Lead	0.050	U	ug/L	P356780	
		Nickel	0.20	U	ug/L	P356780	
		Selenium	0.20	U	ug/L	P356780	
		Silver	0.010	U	ug/L	P356780	
		Thallium	0.10	U	ug/L	P356780	

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: MERRITT'S MILL POND MID UNDER POWERLINES

Collection Date/Time: 12/27/2018 11:10

Field ID: G2WA0008

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2050991	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P356672	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P356869	
		Sulfate	1.7		mg SO4/L	P356873	
		Color (true)	2.5	U	PCU	P356650	
	SM 2320 B-97	Total Alkalinity	126		mg CaCO3/L	P356933	
	SM 2540 C-97	TDS	158		mg/L	P356782	
	SM 2540 D-97	TSS	2	U	mg/L	P356763	
	SM 4500 F-C-97	Fluoride	0.046	I	mg F/L	P356938	
2050994	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P356751	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.11	I	mg N/L	P356757	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.9		mg N/L	P356736	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P356768	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P356741	
2050997	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P356652	
2051003	EPA 200.7 Rev. 4.4	Barium	6.9		ug/L	P356780	
		Calcium	51.2		mg/L	P356780	
		Iron	30	U	ug/L	P356780	
		Magnesium	3.28		mg/L	P356780	
		Potassium	0.39	I	mg/L	P356780	
		Sodium	2.1		mg/L	P356780	
		Zinc	5.0	U	ug/L	P356780	
	EPA 200.8 Rev. 5.4	Aluminum	7.6	I	ug/L	P356780	
		Antimony	0.050	U	ug/L	P356780	
		Arsenic	0.34		ug/L	P356780	
		Boron**	9.7		ug/L	P356780	
		Cadmium	0.020	U	ug/L	P356780	
		Chromium	1.4	I	ug/L	P356780	
		Copper	0.22	I	ug/L	P356780	
		Lead	0.050	U	ug/L	P356780	
		Nickel	0.20	U	ug/L	P356780	
		Selenium	0.20	U	ug/L	P356780	
		Silver	0.010	U	ug/L	P356780	
		Thallium	0.10	U	ug/L	P356780	

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: MERRITT'S MILL POND 600 METERS
DOWNSTREAM OF JACKSON BLUE SPRING**

Collection Date/Time: 12/27/2018 11:30

Field ID: G2WA0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2050992	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P356672	
	EPA 300.0 Rev. 2.1	Chloride	4.7		mg Cl/L	P356869	
		Sulfate	1.6		mg SO4/L	P356873	
		Color (true)	2.5	U	PCU	P356649	
	SM 2320 B-97	Total Alkalinity	122		mg CaCO3/L	P356933	
	SM 2540 C-97	TDS	153		mg/L	P356782	
	SM 2540 D-97	TSS	2	U	mg/L	P356763	
	SM 4500 F-C-97	Fluoride	0.040	I	mg F/L	P356938	
2050995	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P356751	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P356757	
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.4		mg N/L	P356736	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P356770	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P356741	
2050998	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P356652	
2051004	EPA 200.7 Rev. 4.4	Barium	6.2		ug/L	P356780	
		Calcium	52.0		mg/L	P356780	
		Iron	30	U	ug/L	P356780	
		Magnesium	2.76		mg/L	P356780	
		Potassium	0.41	I	mg/L	P356780	
		Sodium	1.8	I	mg/L	P356780	
		Zinc	5.0	U	ug/L	P356780	
	EPA 200.8 Rev. 5.4	Aluminum	5.7	I	ug/L	P356780	
		Antimony	0.050	U	ug/L	P356780	
		Arsenic	0.32		ug/L	P356780	
		Boron**	9.2		ug/L	P356780	
		Cadmium	0.020	U	ug/L	P356780	
		Chromium	1.3	I	ug/L	P356780	
		Copper	0.20	U	ug/L	P356780	
		Lead	0.050	U	ug/L	P356780	
		Nickel	0.20	U	ug/L	P356780	
		Selenium	0.22	I	ug/L	P356780	
		Silver	0.010	U	ug/L	P356780	
		Thallium	0.12	I	ug/L	P356780	

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356672

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356780

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
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: P356780

Component	Result	Code	Units
Aluminum	3.0	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	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	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 Rev. 2.1
Batch ID: P356869

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356873

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356751

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: P356757

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356736

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356768

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356770

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356652

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

Reference Method: SM 2120 B
Batch ID: P356649

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P356650

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P356933

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

Reference Method: SM 2540 C-97
Batch ID: P356782

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P356763

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356938

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P356741

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: P356780

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.6		P	85 - 115
Calcium	101		P	85 - 115
Iron	105		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	98.9		P	85 - 115
Sodium	97.8		P	85 - 115
Zinc	98.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P356780

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	105		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	109		P	85 - 115
Boron	105		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	105		P	85 - 115
Copper	106		P	85 - 115
Lead	104		P	85 - 115
Nickel	109		P	85 - 115
Selenium	106		P	85 - 115
Silver	98.8		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P356869

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P356873

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P356751

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P356757

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356736

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356768

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356770

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356652

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

Reference Method: SM 2120 B
Batch ID: P356649

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

Reference Method: SM 2120 B
Batch ID: P356650

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

Reference Method: SM 2320 B-97
Batch ID: P356933

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P356938

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

Reference Method: SM 5310 B-00
Batch ID: P356741

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P356780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2051003	Barium	99.0	97.7	P/P	80 - 120
2051003	Calcium	95.9		P	80 - 120
2051003	Iron	107	106	P/P	80 - 120
2051003	Magnesium	110	108	P/P	80 - 120
2051003	Potassium	104	102	P/P	80 - 120
2051003	Sodium	104	102	P/P	80 - 120
2051003	Zinc	99.4	98.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P356780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2051003	Aluminum	103	104	P/P	80 - 120
2051003	Antimony	103	104	P/P	80 - 120
2051003	Arsenic	107	109	P/P	80 - 120
2051003	Boron	103	106	P/P	80 - 120
2051003	Cadmium	107	108	P/P	80 - 120
2051003	Chromium	101	104	P/P	80 - 120
2051003	Copper	102	103	P/P	80 - 120
2051003	Lead	104	105	P/P	80 - 120
2051003	Nickel	104	105	P/P	80 - 120
2051003	Selenium	105	107	P/P	80 - 120
2051003	Silver	106	103	P/P	80 - 120
2051003	Thallium	102	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P356869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050990	Chloride	96.4		P	90 - 110
2051275	Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P356873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050990	Sulfate	96.6		P	90 - 110
2051275	Sulfate	98.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P356751

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050911	Ammonia-N	104	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P356757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050993	Kjeldahl Nitrogen	107	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356736

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050911	NO2NO3-N	98.2	98.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050923	Total-P	97.9	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356770

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050995	Total-P	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356652

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050924	O-Phosphate-P	94.2	94.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2051828	Fluoride	93.4	95.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050651	Organic Carbon	101	97.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050910	Turbidity	5.49	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2051003	Barium	1.25	Spike	P	0 - 20
2051003	Calcium	2.12	Spike	P	0 - 20
2051003	Iron	0.601	Spike	P	0 - 20
2051003	Magnesium	0.847	Spike	P	0 - 20
2051003	Potassium	2.30	Spike	P	0 - 20
2051003	Sodium	1.04	Spike	P	0 - 20
2051003	Zinc	0.744	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2051003	Aluminum	1.30	Spike	P	0 - 20
2051003	Antimony	0.818	Spike	P	0 - 20
2051003	Arsenic	1.10	Spike	P	0 - 20
2051003	Boron	3.04	Spike	P	0 - 20
2051003	Cadmium	0.699	Spike	P	0 - 20
2051003	Chromium	2.60	Spike	P	0 - 20
2051003	Copper	1.65	Spike	P	0 - 20
2051003	Lead	0.593	Spike	P	0 - 20
2051003	Nickel	1.04	Spike	P	0 - 20
2051003	Selenium	2.49	Spike	P	0 - 20
2051003	Silver	2.64	Spike	P	0 - 20
2051003	Thallium	1.94	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050990	Chloride	0.973	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050990	Sulfate	0.668	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356751

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050911	Ammonia-N	1.96	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050993	Kjeldahl Nitrogen	2.88	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050911	NO2NO3-N	0.425	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050923	Total-P	5.45	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050995	Total-P	1.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050924	O-Phosphate-P	0.635	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P356649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050917	Color (true)	0.609	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P356650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050922	Color (true)	0.237	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P356933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2051828	Total Alkalinity	0.0128	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050917	TDS	3.59	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2051828	Fluoride	1.96	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P356741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050651	Organic Carbon	2.69	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: A88537

Included Lab Sample IDs: 2050990, 2050991, 2050992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.2	P/P	90 - 115
Color (true)	98.8	100	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88538

Included Lab Sample IDs: 2050996, 2050997, 2050998

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.8	97.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88548

Included Lab Sample IDs: 2050990, 2050991, 2050992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88590

Included Lab Sample IDs: 2050993, 2050994, 2050995

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

Reference Method: SM 5310 B-00

Run ID: A88596

Included Lab Sample IDs: 2050993, 2050994, 2050995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88604

Included Lab Sample IDs: 2050993, 2050994, 2050995

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88626

Included Lab Sample IDs: 2050990, 2050991, 2050992

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88643

Included Lab Sample IDs: 2050993, 2050994, 2050995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.4	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88662

Included Lab Sample IDs: 2050993, 2050994, 2050995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.5	P/P	90 - 110
Total-P	99.5	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88663

Included Lab Sample IDs: 2051002, 2051003, 2051004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.4	96.8	P/P	90 - 110
Barium	99.8	99.4	P/P	95 - 105
Calcium	99.5	99.7	P/P	95 - 105
Calcium	99.7	98.3	P/P	90 - 110
Iron	101	99.1	P/P	90 - 110
Iron	101	101	P/P	95 - 105
Magnesium	101	100	P/P	95 - 105
Magnesium	100	98.7	P/P	90 - 110
Potassium	97.4	96.4	P/P	90 - 110
Potassium	97.6	97.4	P/P	95 - 105
Sodium	96.3	96.6	P/P	95 - 105
Sodium	96.6	95.4	P/P	90 - 110
Zinc	99.8	98.1	P/P	90 - 110
Zinc	99.9	99.8	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88679

Included Lab Sample IDs: 2051002, 2051003, 2051004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	105	P/P	90 - 110
Aluminum	105	105	P/P	90 - 110
Antimony	103	104	P/P	90 - 110
Antimony	104	106	P/P	90 - 110
Arsenic	106	106	P/P	90 - 110
Arsenic	106	106	P/P	90 - 110
Boron	103	104	P/P	90 - 110
Boron	99.9	103	P/P	90 - 110
Cadmium	102	104	P/P	90 - 110
Cadmium	104	105	P/P	90 - 110
Chromium	104	104	P/P	90 - 110
Chromium	104	106	P/P	90 - 110
Copper	106	106	P/P	90 - 110
Copper	106	107	P/P	90 - 110
Lead	104	105	P/P	90 - 110
Lead	105	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88679

Included Lab Sample IDs: 2051002, 2051003, 2051004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	105	107	P/P	90 - 110
Nickel	106	105	P/P	90 - 110
Selenium	102	105	P/P	90 - 110
Selenium	105	105	P/P	90 - 110
Silver	101	103	P/P	90 - 110
Silver	100	101	P/P	90 - 110
Thallium	95.3	96.8	P/P	90 - 110
Thallium	95.5	95.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A88689

Included Lab Sample IDs: 2050990, 2050991, 2050992

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

Reference Method: SM 4500 F-C-97

Run ID: A88689

Included Lab Sample IDs: 2050990, 2050991, 2050992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	96.7	95.3	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		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					5.49	
EPA 200.7 Rev. 4.4	Barium	98.6	99.0	97.7			1.25
	Calcium	101	95.9				2.12
	Iron	105	107	106			0.601
	Magnesium	106	110	108			0.847
	Potassium	98.9	104	102			2.30
	Sodium	97.8	104	102			1.04
	Zinc	98.6	99.4	98.7			0.744
EPA 200.8 Rev. 5.4	Aluminum	105	103	104			1.30
	Antimony	102	103	104			0.818
	Arsenic	109	107	109			1.10
	Boron	105	103	106			3.04
	Cadmium	105	107	108			0.699
	Chromium	105	101	104			2.60
	Copper	106	102	103			1.65
	Lead	104	104	105			0.593
	Nickel	109	104	105			1.04
	Selenium	106	105	107			2.49
	Silver	98.8	106	103			2.64
	Thallium	100	102	104			1.94
EPA 300.0 Rev. 2.1	Chloride	98.2	96.4	97.5		0.973	
	Sulfate	97.2	96.6	98.3		0.668	
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	104	102			1.96
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.2	107	104			2.88
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.0	98.2	98.7			0.425
EPA 365.1 Rev. 2.0	Total-P	99.8	97.9	103			5.45
	Total-P	105	103	102			1.31
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	94.2	94.8			0.635
SM 2120 B	Color (true)	100				0.609	
	Color (true)	100				0.237	
SM 2320 B-97	Total Alkalinity	101				0.0128	
SM 2540 C-97	TDS					3.59	
SM 4500 F-C-97	Fluoride	95.1	93.4	95.7			1.96
SM 5310 B-00	Organic Carbon	96.9	101	97.9			2.69

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2050990, 2050991, 2050992
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2051002, 2051003, 2051004
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2051002, 2051003, 2051004
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2050990, 2050991, 2050992
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2050990, 2050991, 2050992
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2050993, 2050994, 2050995
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2050993, 2050994, 2050995
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2050993, 2050994, 2050995

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2050993, 2050994, 2050995
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2050996, 2050997, 2050998
SM 2120 B / E31780	True Color measured at 450 nm	2050990, 2050991, 2050992
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2050990, 2050991, 2050992
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2050990, 2050991, 2050992
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2050990, 2050991, 2050992
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2050990, 2050991, 2050992
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2050993, 2050994, 2050995

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	12/27/2018			12/27/2018 14:17	Blanca Fach	2050990, 2050991, 2050992
EPA 200.7 Rev. 4.4	12/27/2018	01/03/2019 15:55	Elliott D. Healy	01/04/2019 11:29	Betina Topolski	2051002
	12/27/2018	01/03/2019 15:55	Elliott D. Healy	01/04/2019 11:53	Betina Topolski	2051003
	12/27/2018	01/03/2019 15:55	Elliott D. Healy	01/04/2019 12:11	Betina Topolski	2051004
EPA 200.8 Rev. 5.4	12/27/2018	01/03/2019 15:55	Elliott D. Healy	01/07/2019 16:47	Allison Taylor	2051002
	12/27/2018	01/03/2019 15:55	Elliott D. Healy	01/07/2019 17:25	Allison Taylor	2051003
	12/27/2018	01/03/2019 15:55	Elliott D. Healy	01/07/2019 17:53	Allison Taylor	2051004
EPA 300.0 Rev. 2.1	12/27/2018			01/04/2019 20:19	Lipi Saha	2050990
	12/27/2018			01/04/2019 21:55	Lipi Saha	2050991
	12/27/2018			01/04/2019 22:31	Lipi Saha	2050992
EPA 350.1 Rev. 2.0	12/27/2018			01/02/2019 12:45	Ping Hua	2050993
	12/27/2018			01/02/2019 12:47	Ping Hua	2050994
	12/27/2018			01/02/2019 12:48	Ping Hua	2050995
EPA 351.2 Rev. 2.0	12/27/2018	01/03/2019 11:20	Adrian Shelby	01/04/2019 11:47	Joseph Suarez	2050993
	12/27/2018	01/03/2019 11:20	Adrian Shelby	01/04/2019 11:51	Joseph Suarez	2050994
	12/27/2018	01/03/2019 11:20	Adrian Shelby	01/04/2019 11:53	Joseph Suarez	2050995
EPA 353.2 Rev. 2.0	12/27/2018			01/02/2019 15:38	Lauren Bottorf	2050993
	12/27/2018			01/02/2019 15:40	Lauren Bottorf	2050994
	12/27/2018			01/02/2019 15:41	Lauren Bottorf	2050995
EPA 365.1 Rev. 2.0	12/27/2018	01/03/2019 13:10	Sima Feizi	01/04/2019 15:43	Beverly Y. Sanders	2050993
	12/27/2018	01/03/2019 13:10	Sima Feizi	01/04/2019 15:44	Beverly Y. Sanders	2050994
	12/27/2018	01/03/2019 13:10	Sima Feizi	01/04/2019 16:00	Beverly Y. Sanders	2050995
EPA 365.1 Rev. 2.0 dissolved	12/27/2018			12/27/2018 14:46	Jhamieka S. Greenwood	2050996
	12/27/2018			12/27/2018 14:47	Jhamieka S. Greenwood	2050997
	12/27/2018			12/27/2018 14:48	Jhamieka S. Greenwood	2050998
SM 2120 B	12/27/2018			12/27/2018 15:00	Chelsea Hernandez	2050992
	12/27/2018			12/27/2018 15:05	Chelsea Hernandez	2050990
	12/27/2018			12/27/2018 15:08	Chelsea Hernandez	2050991
SM 2320 B-97	12/27/2018			01/08/2019 08:04	Dale L. Simmons	2050990
	12/27/2018			01/08/2019 08:15	Dale L. Simmons	2050991
	12/27/2018			01/08/2019 08:25	Dale L. Simmons	2050992
SM 2540 C-97	12/27/2018			12/28/2018 17:03	Yijie Li	2050990, 2050991, 2050992
SM 2540 D-97	12/27/2018			12/28/2018 17:03	Yijie Li	2050990, 2050991, 2050992
SM 4500 F-C-97	12/27/2018			01/08/2019 08:04	Dale L. Simmons	2050990
	12/27/2018			01/08/2019 08:15	Dale L. Simmons	2050991
	12/27/2018			01/08/2019 08:25	Dale L. Simmons	2050992
SM 5310 B-00	12/27/2018			01/02/2019 07:36	Megan Treadwell	2050993
	12/27/2018			01/02/2019 07:49	Megan Treadwell	2050994
	12/27/2018			01/02/2019 08:01	Megan Treadwell	2050995