

Chemical Analysis Report

WAS-SECT-2019-09-25-01

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

Event Description: **Little River**
Request ID: **RQ-2019-07-29-35**
Customer: **WAS-SECT**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 18-OCT-2019 14:48



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: Willacoochee Creek at 161

Collection Date/Time: 09/25/2019 12:54

Field ID: G1WA0087

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2122341	EPA 180.1 Rev. 2.0	Turbidity	15	A	NTU	P371323	
	EPA 300.0 Rev. 2.1	Sulfate	0.34	I	mg SO4/L	P371797	
	SM 2120 B	Color (true)	65		PCU	P371358	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P371879	
	SM 2540 C-97	TDS	42		mg/L	P371955	
	SM 2540 D-97	TSS	12		mg/L	P371816	
	SM 4500 F-C-97	Fluoride	0.063	I	mg F/L	P371882	
2122345	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P371745	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P371541	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.2		mg N/L	P371447	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P371498	
	SM 5310 B-00	Organic Carbon	3.4		mg C/L	P371505	
2122349	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P371334	
2122357	EPA 200.7 Rev. 4.4	Barium	25.0		ug/L	P371400	
		Calcium	4.94		mg/L	P371400	
		Iron	1.21E+03		ug/L	P371400	
		Magnesium	3.11		mg/L	P371400	
		Potassium	0.65	I	mg/L	P371400	
		Sodium	3.5		mg/L	P371400	
		Zinc	5.0	U	ug/L	P371400	
	EPA 200.8 Rev. 5.4	Aluminum	541		ug/L	P371400	
		Antimony	0.050	U	ug/L	P371400	
		Arsenic	0.66		ug/L	P371400	
		Boron**	10.5		ug/L	P371400	
		Cadmium	0.020	U	ug/L	P371400	
		Chromium	0.73	I	ug/L	P371400	
		Copper	0.66	I	ug/L	P371400	
		Lead	0.51		ug/L	P371400	
		Nickel	0.50	U	ug/L	P371400	
		Selenium	0.20	U	ug/L	P371400	
		Silver	0.010	U	ug/L	P371400	
		Thallium	0.10	U	ug/L	P371400	

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: McBride South

Collection Date/Time: 09/25/2019 10:16

Field ID: G1WA0088

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2122342	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P371323	
	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P371797	
	SM 2120 B	Color (true)	9.9	A	PCU	P371358	
	SM 2320 B-97	Total Alkalinity	6.1		mg CaCO3/L	P371879	
	SM 2540 C-97	TDS	29		mg/L	P371955	
	SM 2540 D-97	TSS	9	I	mg/L	P371816	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P371882	
2122346	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P371745	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P371541	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P371447	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P371498	
	SM 5310 B-00	Organic Carbon	6.2		mg C/L	P371505	
2122350	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P371334	
2122358	EPA 200.7 Rev. 4.4	Barium	9.3		ug/L	P371400	
		Calcium	1.81		mg/L	P371400	
		Iron	170		ug/L	P371400	
		Magnesium	1.02		mg/L	P371400	
		Potassium	0.86	I	mg/L	P371400	
		Sodium	5.1		mg/L	P371400	
		Zinc	5.0	U	ug/L	P371400	
	EPA 200.8 Rev. 5.4	Aluminum	13	I	ug/L	P371400	
		Antimony	0.050	U	ug/L	P371400	
		Arsenic	0.55		ug/L	P371400	
		Boron**	18.2		ug/L	P371400	
		Cadmium	0.020	U	ug/L	P371400	
		Chromium	0.40	U	ug/L	P371400	
		Copper	0.45	I	ug/L	P371400	
		Lead	0.20	U	ug/L	P371400	
		Nickel	0.50	U	ug/L	P371400	
		Selenium	0.20	U	ug/L	P371400	
		Silver	0.010	U	ug/L	P371400	
		Thallium	0.10	U	ug/L	P371400	

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: McBride West

Collection Date/Time: 09/25/2019 10:56

Field ID: G1WA0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2122343	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P371323	
	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P371797	
	SM 2120 B	Color (true)	10		PCU	P371358	
	SM 2320 B-97	Total Alkalinity	6.2		mg CaCO3/L	P371879	
	SM 2540 C-97	TDS	20	I	mg/L	P371956	
	SM 2540 D-97	TSS	3	I	mg/L	P371817	
	SM 4500 F-C-97	Fluoride	0.039	I	mg F/L	P371882	
2122347	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P371745	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38		mg N/L	P371541	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P371447	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P371498	
	SM 5310 B-00	Organic Carbon	4.5		mg C/L	P371505	
2122351	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P371334	
2122359	EPA 200.7 Rev. 4.4	Barium	9.4		ug/L	P371400	
		Calcium	1.85		mg/L	P371400	
		Iron	180		ug/L	P371400	
		Magnesium	1.03		mg/L	P371400	
		Potassium	0.83	I	mg/L	P371400	
		Sodium	5.0		mg/L	P371400	
		Zinc	5.0	U	ug/L	P371400	
	EPA 200.8 Rev. 5.4	Aluminum	7.4	I	ug/L	P371400	
		Antimony	0.050	U	ug/L	P371400	
		Arsenic	0.58		ug/L	P371400	
		Boron**	16.5		ug/L	P371400	
		Cadmium	0.020	U	ug/L	P371400	
		Chromium	0.40	U	ug/L	P371400	
		Copper	0.73	I	ug/L	P371400	
		Lead	0.20	U	ug/L	P371400	
		Nickel	0.50	U	ug/L	P371400	
		Selenium	0.20	U	ug/L	P371400	
		Silver	0.010	U	ug/L	P371400	
		Thallium	0.10	U	ug/L	P371400	

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: McBride Mid

Collection Date/Time: 09/25/2019 10:36

Field ID: G1WA0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2122344	EPA 180.1 Rev. 2.0	Turbidity	4.6		NTU	P371323	
	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P371797	
	SM 2120 B	Color (true)	9.6		PCU	P371358	
	SM 2320 B-97	Total Alkalinity	6.2		mg CaCO3/L	P371879	
	SM 2540 C-97	TDS	28		mg/L	P371956	
	SM 2540 D-97	TSS	4	I	mg/L	P371817	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P371882	
2122348	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P371746	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.43		mg N/L	P371541	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P371447	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P371498	
	SM 5310 B-00	Organic Carbon	5.1		mg C/L	P371505	
2122352	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P371334	
2122360	EPA 200.7 Rev. 4.4	Barium	9.1		ug/L	P371400	
		Calcium	1.75		mg/L	P371400	
		Iron	180		ug/L	P371400	
		Magnesium	1.0		mg/L	P371400	
		Potassium	0.79	I	mg/L	P371400	
		Sodium	4.9		mg/L	P371400	
		Zinc	5.0	U	ug/L	P371400	
	EPA 200.8 Rev. 5.4	Aluminum	12	I	ug/L	P371400	
		Antimony	0.050	U	ug/L	P371400	
		Arsenic	0.53		ug/L	P371400	
		Boron**	15.9		ug/L	P371400	
		Cadmium	0.020	U	ug/L	P371400	
		Chromium	0.40	U	ug/L	P371400	
		Copper	0.71	I	ug/L	P371400	
		Lead	0.20	U	ug/L	P371400	
		Nickel	0.50	U	ug/L	P371400	
		Selenium	0.20	U	ug/L	P371400	
		Silver	0.010	U	ug/L	P371400	
		Thallium	0.10	U	ug/L	P371400	

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: P371323

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P371400

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: P371400

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 Rev. 2.1

Batch ID: P371797

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P371745

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P371746

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: P371541

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371447

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371498

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371334

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

Reference Method: SM 2120 B
Batch ID: P371358

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P371879

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

Reference Method: SM 2540 C-97
Batch ID: P371955

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P371956

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P371816

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P371817

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P371882

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P371505

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: P371400

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	112		P	85 - 115
Iron	109		P	85 - 115
Magnesium	113		P	85 - 115
Potassium	106		P	85 - 115
Sodium	109		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P371400

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	102		P	85 - 115
Boron	102		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	98.9		P	85 - 115
Copper	101		P	85 - 115
Lead	102		P	85 - 115
Nickel	100		P	85 - 115
Selenium	104		P	85 - 115
Silver	99.6		P	85 - 115
Thallium	104		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P371797

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P371745

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P371746

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P371541

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371447

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371498

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371334

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

Reference Method: SM 2120 B
Batch ID: P371358

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

Reference Method: SM 2320 B-97
Batch ID: P371879

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

Reference Method: SM 4500 F-C-97
Batch ID: P371882

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P371505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P371400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122104	Barium	103	105	P/P	80 - 120
2122104	Calcium	109	109	P/P	80 - 120
2122104	Iron	106	107	P/P	80 - 120
2122104	Magnesium	109	110	P/P	80 - 120
2122104	Potassium	111	110	P/P	80 - 120
2122104	Sodium	106	108	P/P	80 - 120
2122104	Zinc	101	102	P/P	80 - 120
2122358	Barium	106		P	80 - 120
2122358	Calcium	111		P	80 - 120
2122358	Iron	109		P	80 - 120
2122358	Magnesium	111		P	80 - 120
2122358	Potassium	103		P	80 - 120
2122358	Sodium	108		P	80 - 120
2122358	Zinc	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P371400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122104	Aluminum	102	102	P/P	80 - 120
2122104	Antimony	103	103	P/P	80 - 120
2122104	Arsenic	101	102	P/P	80 - 120
2122104	Boron	100	103	P/P	80 - 120
2122104	Cadmium	100	100	P/P	80 - 120
2122104	Chromium	99.2	100	P/P	80 - 120
2122104	Copper	100	103	P/P	80 - 120
2122104	Lead	103	104	P/P	80 - 120
2122104	Nickel	100	102	P/P	80 - 120
2122104	Selenium	96.0	98.8	P/P	80 - 120
2122104	Silver	100	102	P/P	80 - 120
2122104	Thallium	107	108	P/P	80 - 120
2122358	Aluminum	102		P	80 - 120
2122358	Antimony	104		P	80 - 120
2122358	Arsenic	103		P	80 - 120
2122358	Boron	104		P	80 - 120
2122358	Cadmium	101		P	80 - 120
2122358	Chromium	102		P	80 - 120
2122358	Copper	101		P	80 - 120
2122358	Lead	105		P	80 - 120
2122358	Nickel	101		P	80 - 120
2122358	Selenium	97.5		P	80 - 120
2122358	Silver	101		P	80 - 120
2122358	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P371797

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122386	Sulfate	100		P	90 - 110
2122388	Sulfate	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122347	Ammonia-N	99.1	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371746

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122348	Ammonia-N	92.0	92.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122345	Kjeldahl Nitrogen	101	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122347	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371498

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122200	Total-P	95.1	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122349	O-Phosphate-P	96.1	96.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P371882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122391	Fluoride	95.7	95.7	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P371505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122369	Organic Carbon	101	99.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P371323

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122341	Turbidity	0.678	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P371400

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122104	Barium	1.25	Spike	P	0 - 20
2122104	Calcium	0.0580	Spike	P	0 - 20
2122104	Iron	0.730	Spike	P	0 - 20
2122104	Magnesium	0.826	Spike	P	0 - 20
2122104	Potassium	0.0912	Spike	P	0 - 20
2122104	Sodium	0.823	Spike	P	0 - 20
2122104	Zinc	1.19	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P371400

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122104	Aluminum	0.124	Spike	P	0 - 20
2122104	Antimony	0.268	Spike	P	0 - 20
2122104	Arsenic	1.53	Spike	P	0 - 20
2122104	Boron	2.17	Spike	P	0 - 20
2122104	Cadmium	0.215	Spike	P	0 - 20
2122104	Chromium	1.18	Spike	P	0 - 20
2122104	Copper	2.47	Spike	P	0 - 20
2122104	Lead	0.861	Spike	P	0 - 20
2122104	Nickel	1.94	Spike	P	0 - 20
2122104	Selenium	2.84	Spike	P	0 - 20
2122104	Silver	1.47	Spike	P	0 - 20
2122104	Thallium	1.71	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P371797

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122386	Sulfate	2.19	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P371745

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122347	Ammonia-N	0.100	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371746

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122348	Ammonia-N	0.928	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P371541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122345	Kjeldahl Nitrogen	2.06	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P371447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122347	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122200	Total-P	1.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122349	O-Phosphate-P	0.333	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P371358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122342	Color (true)	2.84	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P371879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122391	Total Alkalinity	1.09	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P371955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122142	TDS	3.80	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P371956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122390	TDS	0.627	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P371882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122391	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P371505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122369	Organic Carbon	1.41	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A94497

Included Lab Sample IDs: 2122341, 2122342, 2122343, 2122344

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94499

Included Lab Sample IDs: 2122349, 2122350, 2122351, 2122352

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	97.1	P/P	90 - 110
O-Phosphate-P	98.1	98.0	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A94510

Included Lab Sample IDs: 2122341, 2122342, 2122343, 2122344

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94552

Included Lab Sample IDs: 2122345, 2122346, 2122347, 2122348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110
NO2NO3-N	98.5	99.5	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A94565

Included Lab Sample IDs: 2122345, 2122346, 2122347, 2122348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	108	P/P	90 - 110
Organic Carbon	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94578

Included Lab Sample IDs: 2122345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94584

Included Lab Sample IDs: 2122346, 2122347, 2122348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	101	P/P	90 - 110
Total-P	99.5	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94637

Included Lab Sample IDs: 2122345, 2122346, 2122347, 2122348

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94640

Included Lab Sample IDs: 2122357, 2122358, 2122359, 2122360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	104	104	P/P	90 - 110
Calcium	104	103	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	103	103	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94667

Included Lab Sample IDs: 2122345, 2122346, 2122347, 2122348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.2	96.3	P/P	90 - 110
Ammonia-N	98.9	96.2	P/P	90 - 110
Ammonia-N	99.7	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94686

Included Lab Sample IDs: 2122341, 2122342, 2122343, 2122344

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	101	102	P/P	90 - 110
Sulfate	102	103	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A94719

Included Lab Sample IDs: 2122341, 2122342, 2122343, 2122344

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

Reference Method: SM 4500 F-C-97

Run ID: A94719

Included Lab Sample IDs: 2122341, 2122342, 2122343, 2122344

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94947

Included Lab Sample IDs: 2122357, 2122358, 2122359, 2122360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	102	P/P	90 - 110
Antimony	101	101	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Boron	104	99.9	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	98.6	100	P/P	90 - 110
Copper	102	100	P/P	90 - 110
Lead	105	105	P/P	90 - 110
Nickel	101	100	P/P	90 - 110
Silver	98.9	97.6	P/P	90 - 110
Thallium	99.3	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94978

Included Lab Sample IDs: 2122357, 2122358, 2122359, 2122360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	96.1	101	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 SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.678	
EPA 200.7 Rev. 4.4	Barium	104	103	105	106			1.25
	Calcium	112	109	109	111			0.0580
	Iron	109	106	107	109			0.730
	Magnesium	113	109	110	111			0.826
	Potassium	106	111	110	103			0.0912
	Sodium	109	106	108	108			0.823
	Zinc	102	101	102	106			1.19
EPA 200.8 Rev. 5.4	Aluminum	101	102	102	102			0.124
	Antimony	102	103	103	104			0.268
	Arsenic	102	101	102	103			1.53
	Boron	102	100	103	104			2.17
	Cadmium	97.0	100	100	101			0.215
	Chromium	98.9	99.2	100	102			1.18
	Copper	101	100	103	101			2.47
	Lead	102	103	104	105			0.861
	Nickel	100	100	102	101			1.94
	Selenium	104	96.0	98.8	97.5			2.84
	Silver	99.6	100	102	101			1.47
	Thallium	104	107	108	107			1.71
EPA 300.0 Rev. 2.1	Sulfate	101	100	101			2.19	
EPA 350.1 Rev. 2.0	Ammonia-N	97.3	99.1	99.2				0.100
	Ammonia-N	96.1	92.0	92.9				0.928
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.8	101	98.2				2.06
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	102	102				0.0
EPA 365.1 Rev. 2.0	Total-P	101	95.1	96.2				1.04
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.1	96.5				0.333
SM 2120 B	Color (true)	101					2.84	
SM 2320 B-97	Total Alkalinity	103					1.09	
SM 2540 C-97	TDS						3.80	
	TDS						0.627	
SM 4500 F-C-97	Fluoride	95.5	95.7	95.7				0.0
SM 5310 B-00	Organic Carbon	98.6	101	99.2				1.41

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2122341, 2122342, 2122343, 2122344
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2122357, 2122358, 2122359, 2122360
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2122357, 2122358, 2122359, 2122360
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2122341, 2122342, 2122343, 2122344
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2122345, 2122346, 2122347, 2122348
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2122345, 2122346, 2122347, 2122348
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2122345, 2122346, 2122347, 2122348
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2122345, 2122346, 2122347, 2122348
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2122349, 2122350, 2122351, 2122352

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2120 B / E31780	True Color measured at 450 nm	2122341, 2122342, 2122343, 2122344
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2122341, 2122342, 2122343, 2122344
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2122341, 2122342, 2122343, 2122344
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2122341, 2122342, 2122343, 2122344
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2122341, 2122342, 2122343, 2122344
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2122345, 2122346, 2122347, 2122348

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/25/2019			09/25/2019 16:25	Samantha Davila	2122341, 2122342, 2122343, 2122344
EPA 200.7 Rev. 4.4	09/25/2019	09/26/2019 15:30	Elliott D. Healy	09/30/2019 17:40	Alexander Thompson	2122357
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	09/30/2019 17:48	Alexander Thompson	2122358
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	09/30/2019 18:07	Alexander Thompson	2122359
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	09/30/2019 18:15	Alexander Thompson	2122360
EPA 200.8 Rev. 5.4	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/14/2019 13:10	Robert K Palmer	2122357
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/14/2019 13:20	Robert K Palmer	2122359
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/14/2019 13:30	Robert K Palmer	2122360
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/14/2019 13:39	Robert K Palmer	2122358
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/15/2019 19:27	Robert K Palmer	2122357
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/15/2019 19:33	Robert K Palmer	2122359
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/15/2019 19:39	Robert K Palmer	2122360
	09/25/2019	09/26/2019 15:30	Elliott D. Healy	10/15/2019 19:45	Robert K Palmer	2122358
EPA 300.0 Rev. 2.1	09/25/2019			10/03/2019 03:02	Julia Storbeck	2122341
	09/25/2019			10/03/2019 03:38	Julia Storbeck	2122342
	09/25/2019			10/03/2019 03:50	Julia Storbeck	2122343
	09/25/2019			10/03/2019 04:02	Julia Storbeck	2122344
EPA 350.1 Rev. 2.0	09/25/2019			10/02/2019 13:08	Ping Hua	2122347
	09/25/2019			10/02/2019 13:29	Ping Hua	2122345
	09/25/2019			10/02/2019 13:31	Ping Hua	2122346
	09/25/2019			10/02/2019 13:41	Ping Hua	2122348
EPA 351.2 Rev. 2.0	09/25/2019	09/30/2019 13:30	Jhamieka S. Greenwood	10/01/2019 13:53	Julia Storbeck	2122345
	09/25/2019	09/30/2019 13:30	Jhamieka S. Greenwood	10/01/2019 14:05	Julia Storbeck	2122346
	09/25/2019	09/30/2019 13:30	Jhamieka S. Greenwood	10/01/2019 14:07	Julia Storbeck	2122347
	09/25/2019	09/30/2019 13:30	Jhamieka S. Greenwood	10/01/2019 14:09	Julia Storbeck	2122348
EPA 353.2 Rev. 2.0	09/25/2019			09/27/2019 09:51	Beverly Y. Sanders	2122346
	09/25/2019			09/27/2019 09:52	Beverly Y. Sanders	2122347
	09/25/2019			09/27/2019 09:53	Beverly Y. Sanders	2122348
	09/25/2019			09/27/2019 11:32	Beverly Y. Sanders	2122345
EPA 365.1 Rev. 2.0	09/25/2019	09/27/2019 15:05	Lipi Saha	09/30/2019 10:13	Lipi Saha	2122345
	09/25/2019	09/27/2019 15:05	Lipi Saha	09/30/2019 11:57	Lipi Saha	2122346
	09/25/2019	09/27/2019 15:05	Lipi Saha	09/30/2019 11:58	Lipi Saha	2122347
	09/25/2019	09/27/2019 15:05	Lipi Saha	09/30/2019 12:06	Lipi Saha	2122348
EPA 365.1 Rev. 2.0 dissolved	09/25/2019			09/25/2019 17:47	Ping Hua	2122349
	09/25/2019			09/25/2019 18:22	Ping Hua	2122350, 2122351
	09/25/2019			09/25/2019 18:23	Ping Hua	2122352
SM 2120 B	09/25/2019			09/25/2019 17:33	Madeline Funaro	2122341
	09/25/2019			09/25/2019 17:35	Madeline Funaro	2122342, 2122343
	09/25/2019			09/25/2019 17:36	Madeline Funaro	2122344
SM 2320 B-97	09/25/2019			10/02/2019 06:04	Dale L. Simmons	2122341

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2320 B-97	09/25/2019			10/02/2019 06:16	Dale L. Simmons	2122342
	09/25/2019			10/02/2019 06:28	Dale L. Simmons	2122343
	09/25/2019			10/02/2019 06:40	Dale L. Simmons	2122344
SM 2540 C-97	09/25/2019			09/27/2019 14:08	Yijie Li	2122341, 2122342, 2122343, 2122344
SM 2540 D-97	09/25/2019			09/27/2019 14:08	Yijie Li	2122341, 2122342, 2122343, 2122344
SM 4500 F-C-97	09/25/2019			10/02/2019 06:04	Dale L. Simmons	2122341
	09/25/2019			10/02/2019 06:16	Dale L. Simmons	2122342
	09/25/2019			10/02/2019 06:28	Dale L. Simmons	2122343
	09/25/2019			10/02/2019 06:40	Dale L. Simmons	2122344
SM 5310 B-00	09/25/2019			09/28/2019 00:06	Madeline Funaro	2122345
	09/25/2019			09/28/2019 00:18	Madeline Funaro	2122346
	09/25/2019			09/28/2019 00:57	Madeline Funaro	2122347
	09/25/2019			09/28/2019 01:13	Madeline Funaro	2122348