

Chemical Analysis Report

WAS-SECT-2019-12-18-02

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

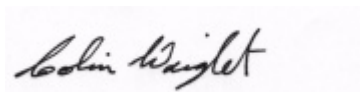
Event Description: **Group 2**
Request ID: **RQ-2019-11-04-27**
Customer: **WAS-SECT**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 15-JAN-2020 08:25

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

Case Narrative

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

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

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

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

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: Richlander Creek at CR 65B

Collection Date/Time: 12/18/2019 12:40

Field ID: G1WA0093

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2145161	EPA 180.1 Rev. 2.0	Turbidity	12	A	NTU	P376170	
	EPA 300.0 Rev. 2.1	Chloride	8.8		mg Cl/L	P376564	
		Sulfate	1.1		mg SO4/L	P376566	
		Color (true)	65	A	PCU	P376195	
	SM 2320 B-97	Total Alkalinity	10		mg CaCO3/L	P376376	
	SM 2540 C-97	TDS	44		mg/L	P376546	
	SM 2540 D-97	TSS	8	I	mg/L	P376535	
	SM 4500 F-C-97	Fluoride	0.056	I	mg F/L	P376673	
2145164	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P376458	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38		mg N/L	P376560	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P376335	
	EPA 365.1 Rev. 2.0	Total-P	0.083		mg P/L	P376267	
	SM 5310 B-00	Organic Carbon	4.9		mg C/L	P376385	
2145167	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P376177	
2145176	EPA 200.7 Rev. 4.4	Barium	15.5		ug/L	P376414	
		Calcium	4.25		mg/L	P376414	
		Iron	1.60E+03		ug/L	P376414	
		Magnesium	1.59		mg/L	P376414	
		Potassium	1.3		mg/L	P376414	
		Sodium	4.5		mg/L	P376414	
		Zinc	5.0	U	ug/L	P376414	
	EPA 200.8 Rev. 5.4	Aluminum	438		ug/L	P376414	
		Antimony	0.050	U	ug/L	P376838	
		Arsenic	0.55		ug/L	P376414	
		Boron**	10.2		ug/L	P376414	
		Cadmium	0.020	U	ug/L	P376414	
		Chromium	0.84	I	ug/L	P376414	
		Copper	0.98		ug/L	P376414	
		Lead	0.44		ug/L	P376414	
		Nickel	0.50	U	ug/L	P376414	
		Selenium	0.20	U	ug/L	P376414	
		Silver	0.010	U	ug/L	P376414	
		Thallium	0.10	U	ug/L	P376414	

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: Double Branch at CR159

Collection Date/Time: 12/18/2019 13:11

Field ID: G1WA0091

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2145162	EPA 180.1 Rev. 2.0	Turbidity	8.5		NTU	P376170	
	EPA 300.0 Rev. 2.1	Chloride	7.0		mg Cl/L	P376564	
		Sulfate	1.8		mg SO4/L	P376566	
		Color (true)	82		PCU	P376195	
	SM 2320 B-97	Total Alkalinity	8.1		mg CaCO3/L	P376376	
	SM 2540 C-97	TDS	41		mg/L	P376546	
	SM 2540 D-97	TSS	3	I	mg/L	P376535	
	SM 4500 F-C-97	Fluoride	0.055	I	mg F/L	P376673	
2145165	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P376458	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.43		mg N/L	P376560	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P376335	
	EPA 365.1 Rev. 2.0	Total-P	0.083		mg P/L	P376267	
	SM 5310 B-00	Organic Carbon	7.6		mg C/L	P376385	
2145168	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P376177	
2145177	EPA 200.7 Rev. 4.4	Barium	13.3		ug/L	P376414	
		Calcium	4.29		mg/L	P376414	
		Iron	830		ug/L	P376414	
		Magnesium	1.49		mg/L	P376414	
		Potassium	0.77	I	mg/L	P376414	
	EPA 200.8 Rev. 5.4	Sodium	3.5		mg/L	P376414	
		Zinc	5.0	U	ug/L	P376414	
		Aluminum	253		ug/L	P376414	
		Antimony	0.050	U	ug/L	P376838	
		Arsenic	0.40		ug/L	P376414	
		Boron**	11.9		ug/L	P376414	
		Cadmium	0.020	U	ug/L	P376414	
		Chromium	0.65	I	ug/L	P376414	
		Copper	0.40	U	ug/L	P376414	
		Lead	0.20	U	ug/L	P376414	
		Nickel	0.50	U	ug/L	P376414	
		Selenium	0.20	U	ug/L	P376414	
		Silver	0.010	U	ug/L	P376414	
		Thallium	0.10	U	ug/L	P376414	

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: Lewis Creek Upstream of 157

Collection Date/Time: 12/18/2019 13:41

Field ID: G1WA0075

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2145163	EPA 180.1 Rev. 2.0	Turbidity	4.5		NTU	P376171	
	EPA 300.0 Rev. 2.1	Chloride	9.0		mg Cl/L	P376564	
		Sulfate	0.63		mg SO4/L	P376566	
	SM 2120 B	Color (true)	44		PCU	P376195	
	SM 2320 B-97	Total Alkalinity	12		mg CaCO3/L	P376376	
	SM 2540 C-97	TDS	46		mg/L	P376546	
	SM 2540 D-97	TSS	6	I	mg/L	P376535	
	SM 4500 F-C-97	Fluoride	0.062	I	mg F/L	P376673	
2145166	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P376458	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P376560	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P376336	
	EPA 365.1 Rev. 2.0	Total-P	0.047		mg P/L	P376267	
	SM 5310 B-00	Organic Carbon	6.6		mg C/L	P376385	
2145169	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P376177	
2145178	EPA 200.7 Rev. 4.4	Barium	14.8		ug/L	P376414	
		Calcium	4.35		mg/L	P376414	
		Iron	1.44E+03		ug/L	P376414	
		Magnesium	1.92		mg/L	P376414	
		Potassium	0.88	I	mg/L	P376414	
	EPA 200.8 Rev. 5.4	Sodium	5.1		mg/L	P376414	
		Zinc	5.0	U	ug/L	P376414	
		Aluminum	99		ug/L	P376414	
		Antimony	0.050	U	ug/L	P376838	
		Arsenic	0.63		ug/L	P376414	
		Boron**	14.6		ug/L	P376414	
		Cadmium	0.020	U	ug/L	P376414	
		Chromium	0.40	U	ug/L	P376414	
		Copper	0.40	U	ug/L	P376414	
		Lead	0.20	U	ug/L	P376414	
		Nickel	0.50	U	ug/L	P376414	
		Selenium	0.20	U	ug/L	P376414	
		Silver	0.010	U	ug/L	P376414	
		Thallium	0.10	U	ug/L	P376414	

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: P376170

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P376171

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P376414

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: P376414

Component	Result	Code	Units
Aluminum	5.0	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 200.8 Rev. 5.4
Batch ID: P376838

Component	Result	Code	Units
Antimony	0.050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376564

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376566

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376566

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P376458

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P376560

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376335

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376336

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376267

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P376177

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

Reference Method: SM 2120 B
Batch ID: P376195

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P376376

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P376546

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P376535

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P376673

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P376385

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: P376414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	107		P	85 - 115
Iron	107		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	102		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P376414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.8		P	85 - 115
Arsenic	104		P	85 - 115
Boron	97.3		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	97.9		P	85 - 115
Copper	99.9		P	85 - 115
Lead	110		P	85 - 115
Nickel	100		P	85 - 115
Selenium	101		P	85 - 115
Silver	100		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P376838

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P376564

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P376566

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P376458

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P376560

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P376560

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376335

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376336

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376267

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P376177

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

Reference Method: SM 2120 B
Batch ID: P376195

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

Reference Method: SM 2320 B-97
Batch ID: P376376

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P376673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P376385

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P376414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145123	Barium	99.1		P	80 - 120
2145123	Calcium	107		P	80 - 120
2145123	Iron	105		P	80 - 120
2145123	Magnesium	102		P	80 - 120
2145123	Potassium	104		P	80 - 120
2145123	Sodium	104		P	80 - 120
2145123	Zinc	101		P	80 - 120
2145245	Barium	102	105	P/P	80 - 120
2145245	Calcium	109	109	P/P	80 - 120
2145245	Iron	107	107	P/P	80 - 120
2145245	Magnesium	108	109	P/P	80 - 120
2145245	Potassium	107	109	P/P	80 - 120
2145245	Sodium	105		P	80 - 120
2145245	Zinc	105	109	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P376414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145123	Aluminum	95.1		P	80 - 120
2145123	Arsenic	101		P	80 - 120
2145123	Boron	93.0		P	80 - 120
2145123	Cadmium	101		P	80 - 120
2145123	Chromium	98.9		P	80 - 120
2145123	Copper	93.9		P	80 - 120
2145123	Lead	108		P	80 - 120
2145123	Nickel	94.9		P	80 - 120
2145123	Selenium	97.4		P	80 - 120
2145123	Silver	101		P	80 - 120
2145123	Thallium	106		P	80 - 120
2145245	Aluminum	96.3	94.9	P/P	80 - 120
2145245	Arsenic	102	99.6	P/P	80 - 120
2145245	Boron	98.5	98.1	P/P	80 - 120
2145245	Cadmium	103	97.9	P/P	80 - 120
2145245	Chromium	101	99.5	P/P	80 - 120
2145245	Copper	98.6	96.3	P/P	80 - 120
2145245	Lead	110	110	P/P	80 - 120
2145245	Nickel	101	95.8	P/P	80 - 120
2145245	Selenium	93.9	95.2	P/P	80 - 120
2145245	Silver	99.5	99.8	P/P	80 - 120
2145245	Thallium	107	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P376838

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145120	Antimony	108	107	P/P	80 - 120
2145223	Antimony	107		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145161	Chloride	98.1	97.3	P/P	90 - 110
2145253	Chloride	97.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145161	Sulfate	98.7	98.1	P/P	90 - 110
2145253	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P376458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145132	Ammonia-N	99.1	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P376560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145132	Kjeldahl Nitrogen	105	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376335

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145131	NO2NO3-N	97.0	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145166	NO2NO3-N	98.0	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145131	Total-P	103	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P376177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145106	O-Phosphate-P	93.7	95.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P376673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145099	Fluoride	98.2	98.2	P/P	89 - 106

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-00

Batch ID: P376385

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2145130	Organic Carbon	98.6	96.0	P/P	85 - 115

Quality Assurance Report

Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P376170

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145161	Turbidity	1.69	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P376171

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145333	Turbidity	4.06	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P376414

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145245	Barium	2.94	Spike	P	0 - 20
2145245	Calcium	0.0884	Spike	P	0 - 20
2145245	Iron	0.0965	Spike	P	0 - 20
2145245	Magnesium	0.708	Spike	P	0 - 20
2145245	Potassium	1.74	Spike	P	0 - 20
2145245	Sodium	1.24	Spike	P	0 - 20
2145245	Zinc	3.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P376414

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145245	Aluminum	1.30	Spike	P	0 - 20
2145245	Arsenic	2.12	Spike	P	0 - 20
2145245	Boron	0.312	Spike	P	0 - 20
2145245	Cadmium	4.93	Spike	P	0 - 20
2145245	Chromium	1.49	Spike	P	0 - 20
2145245	Copper	2.39	Spike	P	0 - 20
2145245	Lead	0.0571	Spike	P	0 - 20
2145245	Nickel	5.40	Spike	P	0 - 20
2145245	Selenium	1.33	Spike	P	0 - 20
2145245	Silver	0.299	Spike	P	0 - 20
2145245	Thallium	0.677	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P376838

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145120	Antimony	1.19	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P376564

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145161	Chloride	0.624	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145161	Sulfate	0.547	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P376458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145132	Ammonia-N	1.27	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P376560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145132	Kjeldahl Nitrogen	6.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376335

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145131	NO2NO3-N	1.03	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145166	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145131	Total-P	5.29	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P376177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145106	O-Phosphate-P	1.57	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
 Batch ID: P376195

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145161	Color (true)	2.12	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P376376

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145099	Total Alkalinity	0.105	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
 Batch ID: P376546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145206	TDS	0.490	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P376673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145099	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
 Batch ID: P376385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2145130	Organic Carbon	1.33	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: A96471

Included Lab Sample IDs: 2145161, 2145162, 2145163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105
Turbidity	101	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A96476

Included Lab Sample IDs: 2145167, 2145168, 2145169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.4	97.1	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A96487

Included Lab Sample IDs: 2145161, 2145162, 2145163

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A96537

Included Lab Sample IDs: 2145164, 2145165

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A96541

Included Lab Sample IDs: 2145164, 2145165, 2145166

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A96548

Included Lab Sample IDs: 2145166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.2	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A96559

Included Lab Sample IDs: 2145161, 2145162, 2145163

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

Reference Method: SM 5310 B-00

Run ID: A96561

Included Lab Sample IDs: 2145164, 2145165, 2145166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A96561

Included Lab Sample IDs: 2145164, 2145165, 2145166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.2	94.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A96586

Included Lab Sample IDs: 2145164, 2145165, 2145166

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A96634

Included Lab Sample IDs: 2145161, 2145162, 2145163

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A96635

Included Lab Sample IDs: 2145176, 2145177, 2145178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.4	98.9	P/P	90 - 110
Calcium	105	103	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Sodium	104	102	P/P	90 - 110
Zinc	99.3	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A96662

Included Lab Sample IDs: 2145164, 2145165, 2145166

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96700

Included Lab Sample IDs: 2145176, 2145177, 2145178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.1	95.0	P/P	90 - 110
Arsenic	98.7	99.7	P/P	90 - 110
Boron	94.3	92.7	P/P	90 - 110
Cadmium	98.6	99.6	P/P	90 - 110
Chromium	98.3	99.0	P/P	90 - 110
Copper	96.1	96.5	P/P	90 - 110
Lead	104	104	P/P	90 - 110
Nickel	95.4	96.4	P/P	90 - 110
Selenium	97.9	98.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96700

Included Lab Sample IDs: 2145176, 2145177, 2145178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	94.9	94.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A96714

Included Lab Sample IDs: 2145161, 2145162, 2145163

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96742

Included Lab Sample IDs: 2145176, 2145177, 2145178

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96843

Included Lab Sample IDs: 2145176, 2145177, 2145178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	98.9	97.2	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					1.69	
	Turbidity					4.06	
EPA 200.7 Rev. 4.4	Barium	100	99.1	102	105		2.94
	Calcium	107	107	109	109		0.0884
	Iron	107	105	107	107		0.0965
	Magnesium	107	102	108	109		0.708
	Potassium	103	104	107	109		1.74
	Sodium	102	104	105			1.24
	Zinc	102	101	105	109		3.24
EPA 200.8 Rev. 5.4	Aluminum	98.8	95.1	96.3	94.9		1.30
	Antimony	106	108	107	107		1.19
	Arsenic	104	101	102	99.6		2.12
	Boron	97.3	93.0	98.5	98.1		0.312
	Cadmium	102	101	103	97.9		4.93
	Chromium	97.9	98.9	101	99.5		1.49
	Copper	99.9	93.9	98.6	96.3		2.39
	Lead	110	108	110	110		0.0571
	Nickel	100	94.9	101	95.8		5.40
	Selenium	101	97.4	93.9	95.2		1.33
	Silver	100	99.5	99.8	101		0.299
	Thallium	107	106	107	108		0.677
EPA 300.0 Rev. 2.1	Chloride	99.2	98.1	97.3	97.6		0.624
	Sulfate	98.5	98.7	98.1	98.4		0.547
EPA 350.1 Rev. 2.0	Ammonia-N	97.1	99.1	101			1.27
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	105	96.8			6.45
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	97.0	98.0			1.03
	NO ₂ NO ₃ -N	101	98.0	98.0			0.0
EPA 365.1 Rev. 2.0	Total-P	102	103	97.6			5.29
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	93.7	95.3			1.57
SM 2120 B	Color (true)	101				2.12	
SM 2320 B-97	Total Alkalinity	102				0.105	
SM 2540 C-97	TDS					0.490	
SM 4500 F-C-97	Fluoride	99.9	98.2	98.2			0.0
SM 5310 B-00	Organic Carbon	95.0	98.6	96.0			1.33

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2145161, 2145162, 2145163
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2145176, 2145177, 2145178
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2145176, 2145177, 2145178
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2145161, 2145162, 2145163
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2145161, 2145162, 2145163
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2145164, 2145165, 2145166
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2145164, 2145165, 2145166
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2145164, 2145165, 2145166

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	2145164, 2145165, 2145166
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2145167, 2145168, 2145169
SM 2120 B / E31780	True Color measured at 450 nm	2145161, 2145162, 2145163
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2145161, 2145162, 2145163
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2145161, 2145162, 2145163
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2145161, 2145162, 2145163
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2145161, 2145162, 2145163
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2145164, 2145165, 2145166

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	12/18/2019			12/19/2019 14:53	Yen Ta	2145161, 2145162, 2145163
EPA 200.7 Rev. 4.4	12/18/2019	12/26/2019 14:00	Elliott D. Healy	12/30/2019 13:38	Betina Topolski	2145176
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	12/30/2019 13:46	Betina Topolski	2145177
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	12/30/2019 13:54	Betina Topolski	2145178
EPA 200.8 Rev. 5.4	12/18/2019	01/09/2020 14:15	Elliott D. Healy	01/13/2020 18:51	Justin Cutchin	2145176
	12/18/2019	01/09/2020 14:15	Elliott D. Healy	01/13/2020 19:01	Justin Cutchin	2145177
	12/18/2019	01/09/2020 14:15	Elliott D. Healy	01/13/2020 19:11	Justin Cutchin	2145178
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	01/03/2020 21:19	Martin Acosta	2145176
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	01/03/2020 21:29	Martin Acosta	2145177
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	01/03/2020 21:38	Martin Acosta	2145178
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	01/07/2020 22:00	Alexander Thompson	2145176
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	01/07/2020 22:07	Alexander Thompson	2145177
	12/18/2019	12/26/2019 14:00	Elliott D. Healy	01/07/2020 22:14	Alexander Thompson	2145178
EPA 300.0 Rev. 2.1	12/18/2019			12/31/2019 00:25	Irina Carbone	2145161
	12/18/2019			12/31/2019 01:25	Irina Carbone	2145162
	12/18/2019			12/31/2019 01:37	Irina Carbone	2145163
EPA 350.1 Rev. 2.0	12/18/2019			12/26/2019 13:55	Ping Hua	2145164
	12/18/2019			12/26/2019 13:57	Ping Hua	2145165
	12/18/2019			12/26/2019 13:58	Ping Hua	2145166
EPA 351.2 Rev. 2.0	12/18/2019	12/30/2019 12:00	Sima Feizi	01/02/2020 19:32	Virginia P. Brown	2145164
	12/18/2019	12/30/2019 12:00	Sima Feizi	01/02/2020 19:33	Virginia P. Brown	2145165
	12/18/2019	12/30/2019 12:00	Sima Feizi	01/02/2020 19:35	Virginia P. Brown	2145166
EPA 353.2 Rev. 2.0	12/18/2019			12/23/2019 11:35	Beverly Y. Sanders	2145164
	12/18/2019			12/23/2019 11:36	Beverly Y. Sanders	2145165
	12/18/2019			12/23/2019 11:43	Beverly Y. Sanders	2145166
EPA 365.1 Rev. 2.0	12/18/2019	12/20/2019 13:10	Yen Ta	12/23/2019 12:06	Benjamin T. Nordmann	2145164
	12/18/2019	12/20/2019 13:10	Yen Ta	12/23/2019 12:07	Benjamin T. Nordmann	2145165
	12/18/2019	12/20/2019 13:10	Yen Ta	12/23/2019 15:06	Benjamin T. Nordmann	2145166
EPA 365.1 Rev. 2.0 dissolved	12/18/2019			12/19/2019 15:40	Samantha Davila	2145167
	12/18/2019			12/19/2019 15:41	Samantha Davila	2145168
	12/18/2019			12/19/2019 15:42	Samantha Davila	2145169
SM 2120 B	12/18/2019			12/19/2019 17:08	Madeline Funaro	2145161, 2145162
	12/18/2019			12/19/2019 17:09	Madeline Funaro	2145163
SM 2320 B-97	12/18/2019			12/24/2019 16:10	Dale L. Simmons	2145161
	12/18/2019			12/24/2019 16:22	Dale L. Simmons	2145162
	12/18/2019			12/24/2019 16:33	Dale L. Simmons	2145163
SM 2540 C-97	12/18/2019			12/23/2019 16:45	Yijie Li	2145161, 2145162, 2145163
SM 2540 D-97	12/18/2019			12/23/2019 16:45	Yijie Li	2145161, 2145162, 2145163
SM 4500 F-C-97	12/18/2019			01/07/2020 03:36	Dale L. Simmons	2145161
	12/18/2019			01/07/2020 03:40	Dale L. Simmons	2145162

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-97	12/18/2019			01/07/2020 03:44	Dale L. Simmons	2145163
SM 5310 B-00	12/18/2019			12/24/2019 01:37	Madeline Funaro	2145164
	12/18/2019			12/24/2019 01:50	Madeline Funaro	2145165
	12/18/2019			12/24/2019 02:03	Madeline Funaro	2145166