

Chemical Analysis Report

NW-DIST-2019-08-20-02

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

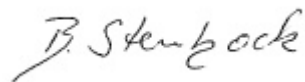
Event Description: **SHOAL RIVER**
Request ID: **RQ-2019-08-12-28**
Customer: **NW-DIST**
Project ID: **SMP**

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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 16-SEP-2019 16:58



Case Narrative

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

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

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

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

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: Yellow River below Nichols Creek Confluence Collection Date/Time: 08/19/2019 09:50

Field ID: G4NW0270

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112772	EPA 180.1 Rev. 2.0	Turbidity	6.6		NTU	P369371	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P369764	
		Sulfate	1.3		mg SO4/L	P369766	
	SM 2120 B	Color (true)	42	A	PCU	P369367	
	SM 2320 B-97	Total Alkalinity	12		mg CaCO3/L	P369865	
	SM 2540 C-97	TDS	38		mg/L	P369732	
	SM 2540 D-97	TSS	7	I	mg/L	P369702	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369868	
2112773	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P369757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P369503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P369471	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P369513	
	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P369458	
2112774	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369411	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Yellow River below Trammel Creek

Collection Date/Time: 08/19/2019 10:50

Field ID: G4NW0311

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112757	EPA 180.1 Rev. 2.0	Turbidity	7.3		NTU	P369370	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P369535	
		Sulfate	1.8		mg SO4/L	P369538	
		Color (true)	30	A	PCU	P369366	
	SM 2320 B-97	Total Alkalinity	27		mg CaCO3/L	P369865	
	SM 2540 C-97	TDS	47		mg/L	P369732	
	SM 2540 D-97	TSS	11		mg/L	P369702	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369868	
2112762	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P369757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P369509	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P369471	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P369512	
	SM 5310 B-00	Organic Carbon	3.4		mg C/L	P369458	
2112767	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369411	
2112785	EPA 200.7 Rev. 4.4	Barium	18.0		ug/L	P369429	
		Calcium	9.51		mg/L	P369429	
		Iron	840		ug/L	P369429	
		Magnesium	2.00		mg/L	P369429	
		Potassium	0.88	I	mg/L	P369429	
		Sodium	2.6		mg/L	P369429	
		Zinc	5.0	U	ug/L	P369429	
	EPA 200.8 Rev. 5.4	Aluminum	222		ug/L	P369429	
		Antimony	0.050	U	ug/L	P369429	
		Arsenic	0.56		ug/L	P369429	
		Boron**	10.9		ug/L	P369429	
		Cadmium	0.020	U	ug/L	P369429	
		Chromium	0.48	I	ug/L	P369429	
		Copper	0.40	U	ug/L	P369429	
		Lead	0.28	I	ug/L	P369429	
		Nickel	0.50	U	ug/L	P369429	
		Selenium	0.20	U	ug/L	P369429	
		Silver	0.010	U	ug/L	P369429	
		Thallium	0.10	U	ug/L	P369429	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

Sample Location: Shoal River below Juniper Creek

Collection Date/Time: 08/19/2019 11:45

Field ID: G4NW0024

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112758	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P369371	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P369535	
		Sulfate	1.2		mg SO4/L	P369538	
		Color (true)	38		PCU	P369367	
	SM 2320 B-97	Total Alkalinity	4.8		mg CaCO3/L	P369865	
	SM 2540 C-97	TDS	31		mg/L	P369732	
	SM 2540 D-97	TSS	8	I	mg/L	P369702	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369868	
2112763	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P369757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20		mg N/L	P369509	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.21		mg N/L	P369471	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P369512	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P369458	
2112768	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369411	
2112786	EPA 200.7 Rev. 4.4	Barium	14.4		ug/L	P369429	
		Calcium	1.95		mg/L	P369429	
		Iron	450		ug/L	P369429	
		Magnesium	0.93		mg/L	P369429	
		Potassium	0.47	I	mg/L	P369429	
		Sodium	2.0		mg/L	P369429	
		Zinc	5.0	U	ug/L	P369429	
	EPA 200.8 Rev. 5.4	Aluminum	175		ug/L	P369429	
		Antimony	0.050	U	ug/L	P369429	
		Arsenic	0.28		ug/L	P369429	
		Boron**	9.4		ug/L	P369429	
		Cadmium	0.020	U	ug/L	P369429	
		Chromium	0.40	U	ug/L	P369429	
		Copper	0.47	I	ug/L	P369429	
		Lead	0.26	I	ug/L	P369429	
		Nickel	0.50	U	ug/L	P369429	
		Selenium	0.20	U	ug/L	P369429	
		Silver	0.010	U	ug/L	P369429	
		Thallium	0.10	U	ug/L	P369429	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

Sample Location: Shoal River upstream Bill Dugger Park SR-85 Collection Date/Time: 08/19/2019 12:07

Field ID: G4NW0023

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112759	EPA 180.1 Rev. 2.0	Turbidity	4.7		NTU	P369371	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P369535	
		Sulfate	1.3		mg SO4/L	P369538	
		Color (true)	37		PCU	P369367	
	SM 2320 B-97	Total Alkalinity	5.1		mg CaCO3/L	P369865	
	SM 2540 C-97	TDS	19	I	mg/L	P369732	
	SM 2540 D-97	TSS	9	I	mg/L	P369702	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369868	
2112764	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P369757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P369503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.23		mg N/L	P369471	
	EPA 365.1 Rev. 2.0	Total-P	0.010		mg P/L	P369512	
	SM 5310 B-00	Organic Carbon	2.9		mg C/L	P369458	
2112769	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369411	
2112787	EPA 200.7 Rev. 4.4	Barium	14.9		ug/L	P369429	
		Calcium	2.05		mg/L	P369429	
		Iron	470		ug/L	P369429	
		Magnesium	0.97		mg/L	P369429	
		Potassium	0.48	I	mg/L	P369429	
		Sodium	2.0		mg/L	P369429	
		Zinc	5.0	U	ug/L	P369429	
	EPA 200.8 Rev. 5.4	Aluminum	177		ug/L	P369429	
		Antimony	0.050	U	ug/L	P369429	
		Arsenic	0.29		ug/L	P369429	
		Boron**	9.4		ug/L	P369429	
		Cadmium	0.020	U	ug/L	P369429	
		Chromium	0.40	U	ug/L	P369429	
		Copper	0.40	U	ug/L	P369429	
		Lead	0.25	I	ug/L	P369429	
		Nickel	0.50	U	ug/L	P369429	
		Selenium	0.20	U	ug/L	P369429	
		Silver	0.010	U	ug/L	P369429	
		Thallium	0.10	U	ug/L	P369429	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Shoal River below Titi Creek

Collection Date/Time: 08/19/2019 12:55

Field ID: G4NW0410

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112754	EPA 180.1 Rev. 2.0	Turbidity	4.7	A	NTU	P369370	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P369535	
		Sulfate	1.2		mg SO4/L	P369538	
		Color (true)	38		PCU	P369366	
	SM 2320 B-97	Total Alkalinity	4.9		mg CaCO3/L	P369865	
	SM 2540 C-97	TDS	16	I	mg/L	P369732	
	SM 2540 D-97	TSS	7	I	mg/L	P369702	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369868	
2112755	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P369757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20	I	mg N/L	P369509	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.22		mg N/L	P369471	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P369512	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P369458	
2112756	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369411	
2112784	EPA 200.7 Rev. 4.4	Barium	14.5		ug/L	P369429	
		Calcium	1.93		mg/L	P369429	
		Iron	490		ug/L	P369429	
		Magnesium	0.92		mg/L	P369429	
		Potassium	0.45	I	mg/L	P369429	
		Sodium	2.0		mg/L	P369429	
		Zinc	5.0	U	ug/L	P369429	
	EPA 200.8 Rev. 5.4	Aluminum	181		ug/L	P369429	
		Antimony	0.050	U	ug/L	P369429	
		Arsenic	0.27		ug/L	P369429	
		Boron**	9.5		ug/L	P369429	
		Cadmium	0.020	U	ug/L	P369429	
		Chromium	0.40	U	ug/L	P369429	
		Copper	0.40	U	ug/L	P369429	
		Lead	0.24	I	ug/L	P369429	
		Nickel	0.50	U	ug/L	P369429	
		Selenium	0.20	U	ug/L	P369429	
		Silver	0.010	U	ug/L	P369429	
		Thallium	0.10	U	ug/L	P369429	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

Sample Location: Yellow River downstream of Gin Hole Landing Collection Date/Time: 08/19/2019 14:35

Field ID: G4NW0494

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112760	EPA 180.1 Rev. 2.0	Turbidity	6.9		NTU	P369371	
	EPA 300.0 Rev. 2.1	Chloride	3.5		mg Cl/L	P369535	
		Sulfate	1.6		mg SO4/L	P369538	
		Color (true)	38		PCU	P369367	
	SM 2320 B-97	Total Alkalinity	13		mg CaCO3/L	P369865	
	SM 2540 C-97	TDS	34		mg/L	P369732	
	SM 2540 D-97	TSS	9	I	mg/L	P369702	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369868	
2112765	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P369757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P369503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P369471	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P369512	
	SM 5310 B-00	Organic Carbon	3.3		mg C/L	P369458	
2112770	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369411	
2112788	EPA 200.7 Rev. 4.4	Barium	15.8		ug/L	P369429	
		Calcium	4.95		mg/L	P369429	
		Iron	600		ug/L	P369429	
		Magnesium	1.33		mg/L	P369429	
		Potassium	0.62	I	mg/L	P369429	
		Sodium	2.4		mg/L	P369429	
		Zinc	5.0	U	ug/L	P369429	
	EPA 200.8 Rev. 5.4	Aluminum	206		ug/L	P369429	
		Antimony	0.050	U	ug/L	P369429	
		Arsenic	0.39		ug/L	P369429	
		Boron**	10.6		ug/L	P369429	
		Cadmium	0.020	U	ug/L	P369429	
		Chromium	0.40	U	ug/L	P369429	
		Copper	0.40	U	ug/L	P369429	
		Lead	0.29	I	ug/L	P369429	
		Nickel	0.50	U	ug/L	P369429	
		Selenium	0.20	U	ug/L	P369429	
		Silver	0.010	U	ug/L	P369429	
		Thallium	0.10	U	ug/L	P369429	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Shoal River near Rattlesnake Bluff

Collection Date/Time: 08/19/2019 14:55

Field ID: G4NW0493

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112761	EPA 180.1 Rev. 2.0	Turbidity	5.5		NTU	P369371	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P369764	
		Sulfate	1.2		mg SO4/L	P369766	
	SM 2120 B	Color (true)	40		PCU	P369367	
	SM 2320 B-97	Total Alkalinity	4.3		mg CaCO3/L	P369865	
	SM 2540 C-97	TDS	28		mg/L	P369732	
	SM 2540 D-97	TSS	7	I	mg/L	P369702	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369868	
2112766	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P369757	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20		mg N/L	P369503	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P369471	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P369513	
	SM 5310 B-00	Organic Carbon	3.0		mg C/L	P369458	
2112771	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369412	
2112789	EPA 200.7 Rev. 4.4	Barium	14.4		ug/L	P369429	
		Calcium	1.91		mg/L	P369429	
		Iron	450		ug/L	P369429	
		Magnesium	0.91		mg/L	P369429	
		Potassium	0.40	I	mg/L	P369429	
		Sodium	2.2		mg/L	P369429	
		Zinc	5.0	U	ug/L	P369429	
	EPA 200.8 Rev. 5.4	Aluminum	157		ug/L	P369429	
		Antimony	0.050	U	ug/L	P369429	
		Arsenic	0.29		ug/L	P369429	
		Boron**	9.9		ug/L	P369429	
		Cadmium	0.020	U	ug/L	P369429	
		Chromium	0.40	U	ug/L	P369429	
		Copper	0.40	U	ug/L	P369429	
		Lead	0.52		ug/L	P369429	
		Nickel	0.50	U	ug/L	P369429	
		Selenium	0.20	U	ug/L	P369429	
		Silver	0.010	U	ug/L	P369429	
		Thallium	0.10	U	ug/L	P369429	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P369370

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P369371

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P369429

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: P369429

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: P369535

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369538

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369764

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369766

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369757

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369503

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369509

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369471

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369512

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369513

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369411

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369412

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

Reference Method: SM 2120 B
Batch ID: P369366

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P369367

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P369865

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P369732

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P369702

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P369868

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P369458

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: P369429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	101		P	85 - 115
Iron	107		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	110		P	85 - 115
Sodium	104		P	85 - 115
Zinc	99.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P369429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	97.8		P	85 - 115
Arsenic	101		P	85 - 115
Boron	109		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	99.6		P	85 - 115
Copper	99.6		P	85 - 115
Lead	101		P	85 - 115
Nickel	101		P	85 - 115
Selenium	104		P	85 - 115
Silver	106		P	85 - 115
Thallium	99.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369535

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369538

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369764

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369766

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369757

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369503

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369509

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369471

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369512

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369513

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: P369411

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369412

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

Reference Method: SM 2120 B
Batch ID: P369366

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2120 B
Batch ID: P369367

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

Reference Method: SM 2320 B-97
Batch ID: P369865

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P369868

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P369458

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P369429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112740	Barium	101	102	P/P	80 - 120
2112740	Calcium	96.1		P	80 - 120
2112740	Iron	107	107	P/P	80 - 120
2112740	Magnesium	108	110	P/P	80 - 120
2112740	Potassium	110	112	P/P	80 - 120
2112740	Sodium	99.2		P	80 - 120
2112740	Zinc	98.5	99.8	P/P	80 - 120
2112836	Barium	100		P	80 - 120
2112836	Calcium	92.1		P	80 - 120
2112836	Iron	104		P	80 - 120
2112836	Magnesium	105		P	80 - 120
2112836	Potassium	106		P	80 - 120
2112836	Sodium	97.5		P	80 - 120
2112836	Zinc	99.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P369429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112740	Aluminum	102	102	P/P	80 - 120
2112740	Antimony	99.0	98.5	P/P	80 - 120
2112740	Arsenic	101	102	P/P	80 - 120
2112740	Boron	109	107	P/P	80 - 120
2112740	Cadmium	101	102	P/P	80 - 120
2112740	Chromium	100	101	P/P	80 - 120
2112740	Copper	99.4	100	P/P	80 - 120
2112740	Lead	102	101	P/P	80 - 120
2112740	Nickel	101	102	P/P	80 - 120
2112740	Selenium	101	102	P/P	80 - 120
2112740	Silver	108	106	P/P	80 - 120
2112740	Thallium	101	102	P/P	80 - 120
2112836	Aluminum	102		P	80 - 120
2112836	Antimony	98.2		P	80 - 120
2112836	Arsenic	104		P	80 - 120
2112836	Boron	112		P	80 - 120
2112836	Cadmium	104		P	80 - 120
2112836	Chromium	101		P	80 - 120
2112836	Copper	100		P	80 - 120
2112836	Lead	105		P	80 - 120
2112836	Nickel	104		P	80 - 120
2112836	Selenium	106		P	80 - 120
2112836	Silver	106		P	80 - 120
2112836	Thallium	111		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369535

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112376	Chloride	98.2		P	90 - 110
2112635	Chloride	98.8		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369538

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112376	Sulfate	101		P	90 - 110
2112635	Sulfate	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112761	Chloride	102	104	P/P	90 - 110
2113043	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369766

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112761	Sulfate	102	104	P/P	90 - 110
2113043	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112804	Ammonia-N	97.0	94.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369509

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112703	Kjeldahl Nitrogen	94.7	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369471

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112755	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112703	Total-P	102	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369513

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112766	Total-P	101	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112768	O-Phosphate-P	98.9	99.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112771	O-Phosphate-P	99.5	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P369868

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112811	Fluoride	96.9	96.9	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P369458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112763	Organic Carbon	96.9	96.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P369370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112754	Turbidity	10.9	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P369371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112797	Turbidity	10.4	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P369429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112740	Barium	0.581	Spike	P	0 - 20
2112740	Calcium	0.163	Spike	P	0 - 20
2112740	Iron	0.567	Spike	P	0 - 20
2112740	Magnesium	0.756	Spike	P	0 - 20
2112740	Potassium	1.09	Spike	P	0 - 20
2112740	Sodium	0.365	Spike	P	0 - 20
2112740	Zinc	1.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P369429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112740	Aluminum	0.498	Spike	P	0 - 20
2112740	Antimony	0.493	Spike	P	0 - 20
2112740	Arsenic	0.443	Spike	P	0 - 20
2112740	Boron	1.26	Spike	P	0 - 20
2112740	Cadmium	0.483	Spike	P	0 - 20
2112740	Chromium	0.672	Spike	P	0 - 20
2112740	Copper	0.757	Spike	P	0 - 20
2112740	Lead	0.558	Spike	P	0 - 20
2112740	Nickel	0.781	Spike	P	0 - 20
2112740	Selenium	0.890	Spike	P	0 - 20
2112740	Silver	1.34	Spike	P	0 - 20
2112740	Thallium	1.18	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369535

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112376	Chloride	0.185	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112761	Chloride	1.84	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P369766

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112761	Sulfate	2.42	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112804	Ammonia-N	1.98	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369503

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112809	Kjeldahl Nitrogen	2.91	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369509

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112703	Kjeldahl Nitrogen	2.82	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112755	NO2NO3-N	0.913	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112703	Total-P	5.44	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112766	Total-P	2.74	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112768	O-Phosphate-P	0.906	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112771	O-Phosphate-P	0.302	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P369366

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112757	Color (true)	1.52	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P369367

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112772	Color (true)	0.186	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P369865

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112811	Total Alkalinity	0.141	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P369732

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112913	TDS	7.25	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P369868

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112811	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P369458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112763	Organic Carbon	0.316	Spike	P	0 - 20

Quality Assurance Report

Precision

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A93656

Included Lab Sample IDs: 2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	90 - 115
Color (true)	103	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A93657

Included Lab Sample IDs: 2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	102	P/P	95 - 105
Turbidity	102	102	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A93683

Included Lab Sample IDs: 2112756, 2112767, 2112768, 2112769, 2112770, 2112771, 2112774

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

Reference Method: SM 5310 B-00

Run ID: A93704

Included Lab Sample IDs: 2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	98.3	P/P	90 - 110
Organic Carbon	99.8	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93712

Included Lab Sample IDs: 2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A93717

Included Lab Sample IDs: 2112754, 2112757, 2112758, 2112759, 2112760

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.5	99.4	P/P	90 - 110
Chloride	99.4	98.8	P/P	90 - 110
Sulfate	103	104	P/P	90 - 110
Sulfate	104	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A93732

Included Lab Sample IDs: 2112784, 2112785, 2112786, 2112787, 2112788, 2112789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	100	P/P	90 - 110
Calcium	102	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A93732

Included Lab Sample IDs: 2112784, 2112785, 2112786, 2112787, 2112788, 2112789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	101	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	107	107	P/P	90 - 110
Zinc	96.2	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A93762

Included Lab Sample IDs: 2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	101	P/P	90 - 110
Kjeldahl Nitrogen	99.5	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93776

Included Lab Sample IDs: 2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	P/P	90 - 110
Total-P	99.2	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A93816

Included Lab Sample IDs: 2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	103	P/P	90 - 110
Ammonia-N	103	105	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A93819

Included Lab Sample IDs: 2112761, 2112772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	103	P/P	90 - 110
Sulfate	101	104	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A93845

Included Lab Sample IDs: 2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772

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

Reference Method: SM 4500 F-C-97

Run ID: A93845

Included Lab Sample IDs: 2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94112

Included Lab Sample IDs: 2112784, 2112785, 2112786, 2112787, 2112788, 2112789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	104	105	P/P	90 - 110
Antimony	97.3	96.8	P/P	90 - 110
Arsenic	103	104	P/P	90 - 110
Boron	107	110	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110
Chromium	104	104	P/P	90 - 110
Copper	104	105	P/P	90 - 110
Lead	104	105	P/P	90 - 110
Nickel	104	105	P/P	90 - 110
Silver	106	106	P/P	90 - 110
Thallium	97.9	97.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94138

Included Lab Sample IDs: 2112784, 2112785, 2112786, 2112787, 2112788, 2112789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	103	105	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					10.9	
	Turbidity					10.4	
EPA 200.7 Rev. 4.4	Barium	103	101	102	100		0.581
	Calcium	101	96.1	92.1			0.163
	Iron	107	107	107	104		0.567
	Magnesium	112	108	110	105		0.756
	Potassium	110	110	112	106		1.09
	Sodium	104	99.2	97.5			0.365
	Zinc	99.0	98.5	99.8	99.9		1.24
EPA 200.8 Rev. 5.4	Aluminum	102	102	102	102		0.498
	Antimony	97.8	99.0	98.5	98.2		0.493
	Arsenic	101	101	102	104		0.443
	Boron	109	109	107	112		1.26
	Cadmium	101	101	102	104		0.483
	Chromium	99.6	100	101	101		0.672
	Copper	99.6	99.4	100	100		0.757
	Lead	101	102	101	105		0.558
	Nickel	101	101	102	104		0.781
	Selenium	104	101	102	106		0.890
	Silver	106	108	106	106		1.34
	Thallium	99.0	101	102	111		1.18
EPA 300.0 Rev. 2.1	Chloride	98.3	98.2	98.8		0.185	
	Chloride	101	102	104	102		1.84
	Sulfate	101	101	103			
	Sulfate	101	102	104	102		2.42
EPA 350.1 Rev. 2.0	Ammonia-N	94.8	97.0	94.9			1.98
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104					2.91
	Kjeldahl Nitrogen	106	94.7	100			2.82
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102				0.913
EPA 365.1 Rev. 2.0	Total-P	102	102	109			5.44
	Total-P	101	101	104			2.74
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	98.9	99.8			0.906
	O-Phosphate-P	102	99.5	99.2			0.302
SM 2120 B	Color (true)	101				1.52	
	Color (true)	101				0.186	
SM 2320 B-97	Total Alkalinity	105				0.141	
SM 2540 C-97	TDS					7.25	
SM 4500 F-C-97	Fluoride	98.5	96.9	96.9			0.0
SM 5310 B-00	Organic Carbon	97.4	96.9	96.5			0.316

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2112784, 2112785, 2112786, 2112787, 2112788, 2112789
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2112784, 2112785, 2112786, 2112787, 2112788, 2112789
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2112756, 2112767, 2112768, 2112769, 2112770, 2112771, 2112774
SM 2120 B / E31780	True Color measured at 450 nm	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2112755, 2112762, 2112763, 2112764, 2112765, 2112766, 2112773

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	08/20/2019			08/20/2019 16:54	Rosalyn Ballman	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
EPA 200.7 Rev. 4.4	08/20/2019	08/21/2019 15:30	Elliott D. Healy	08/22/2019 15:57	Alexander Thompson	2112784
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	08/22/2019 16:02	Alexander Thompson	2112785
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	08/22/2019 16:08	Alexander Thompson	2112786
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	08/22/2019 16:14	Alexander Thompson	2112787
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	08/22/2019 16:19	Alexander Thompson	2112788
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	08/22/2019 16:25	Alexander Thompson	2112789
EPA 200.8 Rev. 5.4	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/10/2019 18:30	Robert K Palmer	2112784
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/10/2019 18:40	Robert K Palmer	2112785
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/10/2019 18:50	Robert K Palmer	2112786
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/10/2019 19:00	Robert K Palmer	2112787
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/10/2019 19:10	Robert K Palmer	2112788
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/10/2019 19:19	Robert K Palmer	2112789
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/11/2019 18:27	Robert K Palmer	2112784
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/11/2019 18:33	Robert K Palmer	2112785
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/11/2019 18:40	Robert K Palmer	2112786
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/11/2019 18:47	Robert K Palmer	2112787
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/11/2019 18:53	Robert K Palmer	2112788
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/11/2019 19:00	Robert K Palmer	2112789
EPA 300.0 Rev. 2.1	08/20/2019			08/22/2019 14:24	Julia Storbeck	2112754
	08/20/2019			08/22/2019 14:36	Julia Storbeck	2112757
	08/20/2019			08/22/2019 15:12	Julia Storbeck	2112758
	08/20/2019			08/22/2019 15:25	Julia Storbeck	2112759
	08/20/2019			08/22/2019 15:37	Julia Storbeck	2112760
	08/20/2019			08/26/2019 23:33	Jhamieka S. Greenwood	2112761
	08/20/2019			08/27/2019 00:34	Jhamieka S. Greenwood	2112772
EPA 350.1 Rev. 2.0	08/20/2019			08/27/2019 12:14	Ping Hua	2112755
	08/20/2019			08/27/2019 12:16	Ping Hua	2112762
	08/20/2019			08/27/2019 12:17	Ping Hua	2112763
	08/20/2019			08/27/2019 12:19	Ping Hua	2112764
	08/20/2019			08/27/2019 12:26	Ping Hua	2112765
	08/20/2019			08/27/2019 12:28	Ping Hua	2112766
	08/20/2019			08/27/2019 12:29	Ping Hua	2112773
EPA 351.2 Rev. 2.0	08/20/2019	08/22/2019 11:15	Sima Feizi	08/23/2019 14:16	Joseph Suarez	2112755
	08/20/2019	08/22/2019 11:15	Sima Feizi	08/23/2019 14:17	Joseph Suarez	2112762
	08/20/2019	08/22/2019 11:15	Sima Feizi	08/23/2019 14:19	Joseph Suarez	2112763
	08/20/2019	08/22/2019 12:30	Sima Feizi	08/23/2019 14:30	Joseph Suarez	2112764
	08/20/2019	08/22/2019 12:30	Sima Feizi	08/23/2019 14:31	Joseph Suarez	2112765
	08/20/2019	08/22/2019 12:30	Sima Feizi	08/23/2019 14:33	Joseph Suarez	2112766

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 351.2 Rev. 2.0	08/20/2019	08/22/2019 12:30	Sima Feizi	08/23/2019 14:34	Joseph Suarez	2112773
EPA 353.2 Rev. 2.0	08/20/2019			08/22/2019 08:52	Beverly Y. Sanders	2112755
	08/20/2019			08/22/2019 08:58	Beverly Y. Sanders	2112762
	08/20/2019			08/22/2019 08:59	Beverly Y. Sanders	2112763
	08/20/2019			08/22/2019 09:01	Beverly Y. Sanders	2112764
	08/20/2019			08/22/2019 09:02	Beverly Y. Sanders	2112765
	08/20/2019			08/22/2019 09:03	Beverly Y. Sanders	2112766
	08/20/2019			08/22/2019 09:04	Beverly Y. Sanders	2112773
EPA 365.1 Rev. 2.0	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 11:53	Lipi Saha	2112755
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 12:01	Lipi Saha	2112762
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 12:02	Lipi Saha	2112763
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 12:03	Lipi Saha	2112764
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 12:04	Lipi Saha	2112765
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 12:06	Lipi Saha	2112766
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 12:07	Lipi Saha	2112773
EPA 365.1 Rev. 2.0 dissolved	08/20/2019			08/20/2019 15:42	Jhamieka S. Greenwood	2112768
	08/20/2019			08/20/2019 15:47	Jhamieka S. Greenwood	2112771
	08/20/2019			08/20/2019 16:19	Jhamieka S. Greenwood	2112756
	08/20/2019			08/20/2019 16:20	Jhamieka S. Greenwood	2112767
	08/20/2019			08/20/2019 16:21	Jhamieka S. Greenwood	2112769, 2112770
	08/20/2019			08/20/2019 16:27	Jhamieka S. Greenwood	2112774
SM 2120 B	08/20/2019			08/20/2019 16:40	Madeline Funaro	2112754
	08/20/2019			08/20/2019 16:42	Madeline Funaro	2112757
	08/20/2019			08/20/2019 16:45	Madeline Funaro	2112758
	08/20/2019			08/20/2019 16:46	Madeline Funaro	2112759
	08/20/2019			08/20/2019 16:47	Madeline Funaro	2112760
	08/20/2019			08/20/2019 16:48	Madeline Funaro	2112761
	08/20/2019			08/20/2019 16:49	Madeline Funaro	2112772
SM 2320 B-97	08/20/2019			08/28/2019 03:59	Dale L. Simmons	2112754
	08/20/2019			08/28/2019 04:12	Dale L. Simmons	2112757
	08/20/2019			08/28/2019 04:26	Dale L. Simmons	2112758
	08/20/2019			08/28/2019 04:40	Dale L. Simmons	2112759
	08/20/2019			08/28/2019 04:52	Dale L. Simmons	2112760
	08/20/2019			08/28/2019 05:05	Dale L. Simmons	2112761
	08/20/2019			08/28/2019 05:17	Dale L. Simmons	2112772
SM 2540 C-97	08/20/2019			08/21/2019 14:21	Yijie Li	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
SM 2540 D-97	08/20/2019			08/21/2019 14:21	Yijie Li	2112754, 2112757, 2112758, 2112759, 2112760, 2112761, 2112772
SM 4500 F-C-97	08/20/2019			08/28/2019 03:59	Dale L. Simmons	2112754

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	08/20/2019			08/28/2019 04:12	Dale L. Simmons	2112757
	08/20/2019			08/28/2019 04:26	Dale L. Simmons	2112758
	08/20/2019			08/28/2019 04:40	Dale L. Simmons	2112759
	08/20/2019			08/28/2019 04:52	Dale L. Simmons	2112760
	08/20/2019			08/28/2019 05:05	Dale L. Simmons	2112761
	08/20/2019			08/28/2019 05:17	Dale L. Simmons	2112772
SM 5310 B-00	08/20/2019			08/21/2019 13:52	Madeline Funaro	2112763
	08/20/2019			08/21/2019 14:41	Madeline Funaro	2112764
	08/20/2019			08/21/2019 16:06	Madeline Funaro	2112755
	08/20/2019			08/21/2019 16:18	Madeline Funaro	2112762
	08/20/2019			08/21/2019 16:31	Madeline Funaro	2112765
	08/20/2019			08/21/2019 16:43	Madeline Funaro	2112766
	08/20/2019			08/21/2019 16:55	Madeline Funaro	2112773