

Chemical Analysis Report

CEN-DIST-2018-03-16-01

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

Event Description: **Tilden X4 / Starke + D&B**
Request ID: **RQ-2018-03-12-61**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 24-APR-2018 16:30

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

Case Narrative

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

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

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

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

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

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: Lake Tilden @ 140m NW of Center (2875B)

Collection Date/Time: 03/15/2018 10:16

Field ID: G1CE0087

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975463	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P341711	
	EPA 300.0 Rev. 2.1	Chloride	35		mg Cl/L	P342129	
		Sulfate	11		mg SO4/L	P342133	
	SM 2120 B	Color (true)	350		PCU	P341715	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P341963	
	SM 2540 C-97	TDS	144		mg/L	P342004	
	SM 2540 D-97	TSS	5	I	mg/L	P342014	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P342536	
1975467	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P342197	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P341916	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.037		mg N/L	P341815	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P341935	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P342276	
1975471	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.072		mg P/L	P341721	
1975507	EPA 200.7 Rev. 4.4	Calcium	13.6		mg/L	P341799	
		Iron	240		ug/L	P342217	
		Magnesium	5.17		mg/L	P341799	
		Potassium	7.4		mg/L	P341799	
		Sodium	19.9		mg/L	P341799	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P341799	
		Arsenic	1.13		ug/L	P341799	
		Cadmium	0.020	U	ug/L	P341799	
		Chromium	0.56	I	ug/L	P341799	
		Copper	1.37		ug/L	P341799	
		Lead	0.38		ug/L	P341799	
		Nickel	0.44	I	ug/L	P341799	
		Silver	0.010	U	ug/L	P341799	

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: Lake Tilden @ 165m NE of Center (2875B)

Collection Date/Time: 03/15/2018 10:27

Field ID: G1CE0088

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975464	EPA 180.1 Rev. 2.0	Turbidity	3.9		NTU	P341711	
	EPA 300.0 Rev. 2.1	Chloride	34		mg Cl/L	P342129	
		Sulfate	10		mg SO4/L	P342133	
	SM 2120 B	Color (true)	350		PCU	P341715	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P341963	
	SM 2540 C-97	TDS	141		mg/L	P342004	
	SM 2540 D-97	TSS	4	I	mg/L	P342014	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P342536	
1975468	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P342197	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P341916	

Field ID: G1CE0088

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975468	EPA 353.2 Rev. 2.0	NO2NO3-N	0.036		mg N/L	P341815	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P341935	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P342276	
1975472	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.072		mg P/L	P341721	
1975508	EPA 200.7 Rev. 4.4	Calcium	13.8		mg/L	P341799	
		Iron	240		ug/L	P342217	
		Magnesium	5.26		mg/L	P341799	
		Potassium	7.5		mg/L	P341799	
		Sodium	20.0		mg/L	P341799	
		Zinc	5.0	U	ug/L	P341799	
	EPA 200.8 Rev. 5.4	Arsenic	1.13		ug/L	P341799	
		Cadmium	0.020	U	ug/L	P341799	
		Chromium	0.51	I	ug/L	P341799	
		Copper	1.21		ug/L	P341799	
		Lead	0.33		ug/L	P341799	
		Nickel	0.43	I	ug/L	P341799	
		Silver	0.010	U	ug/L	P341799	

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: Lake Tilden @ 150m SE of Center (2875B)

Collection Date/Time: 03/15/2018 10:35

Field ID: G1CE0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975465	EPA 180.1 Rev. 2.0	Turbidity	3.9		NTU	P341711	
	EPA 300.0 Rev. 2.1	Chloride	35		mg Cl/L	P342129	
		Sulfate	11		mg SO4/L	P342133	
		Color (true)	350		PCU	P341715	
	SM 2320 B-97	Total Alkalinity	37		mg CaCO3/L	P341964	
	SM 2540 C-97	TDS	148		mg/L	P342004	
	SM 2540 D-97	TSS	6	I	mg/L	P342014	
1975469	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P342155	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P342197	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P341911	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.036		mg N/L	P341815	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P341935	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P342276	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.072		mg P/L	P341721	
1975509	EPA 200.7 Rev. 4.4	Calcium	13.4		mg/L	P341799	
		Iron	240		ug/L	P342217	
		Magnesium	5.12		mg/L	P341799	
		Potassium	7.4		mg/L	P341799	
		Sodium	19.7		mg/L	P341799	
		Zinc	5.0	U	ug/L	P341799	
	EPA 200.8 Rev. 5.4	Arsenic	1.11		ug/L	P341799	

Field ID: G1CE0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975509	EPA 200.8 Rev. 5.4	Cadmium	0.020	U	ug/L	P341799	
		Chromium	0.83	I	ug/L	P341799	
		Copper	1.35		ug/L	P341799	
		Lead	0.40		ug/L	P341799	
		Nickel	0.56	I	ug/L	P341799	
		Silver	0.010	U	ug/L	P341799	

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: Lake Tilden @ 225m S of Center (2875B)

Collection Date/Time: 03/15/2018 10:40

Field ID: G1CE0090

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975466	EPA 180.1 Rev. 2.0	Turbidity	3.9		NTU	P341711	
	EPA 300.0 Rev. 2.1	Chloride	34		mg Cl/L	P342129	
		Sulfate	10		mg SO4/L	P342133	
	SM 2120 B	Color (true)	350		PCU	P341715	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P341964	
	SM 2540 C-97	TDS	152	A	mg/L	P342004	
	SM 2540 D-97	TSS	5	IA	mg/L	P342014	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P342155	
1975470	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P342197	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P341911	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.035		mg N/L	P341815	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P341935	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P342276	
1975474	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.072		mg P/L	P341721	
1975510	EPA 200.7 Rev. 4.4	Calcium	13.6		mg/L	P341799	
		Iron	230		ug/L	P342217	
		Magnesium	5.19		mg/L	P341799	
		Potassium	7.4		mg/L	P341799	
		Sodium	19.8		mg/L	P341799	
		Zinc	5.0	U	ug/L	P341799	
	EPA 200.8 Rev. 5.4	Arsenic	1.10		ug/L	P341799	
		Cadmium	0.020	U	ug/L	P341799	
		Chromium	0.56	I	ug/L	P341799	
		Copper	1.31		ug/L	P341799	
		Lead	0.36		ug/L	P341799	
		Nickel	0.46	I	ug/L	P341799	
		Silver	0.010	U	ug/L	P341799	

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: Lake Starke @ Center (3002D)

Collection Date/Time: 03/15/2018 11:25

Field ID: G2CE0094DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975478	EPA 180.1 Rev. 2.0	Turbidity	8.1		NTU	P341711	
	EPA 300.0 Rev. 2.1	Chloride	29	A	mg Cl/L	P342130	
		Sulfate	22	A	mg SO4/L	P342134	
		Color (true)	18		PCU	P341715	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P341964	
	SM 2540 C-97	TDS	150		mg/L	P342004	
	SM 2540 D-97	TSS	9	I	mg/L	P342014	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P342155	
1975479	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P342202	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P341911	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341816	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P341935	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P342276	
1975480	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341721	

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: Lake Starke @ Center (3002D)

Collection Date/Time: 03/15/2018 11:23

Field ID: G2CE0094

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975475	EPA 180.1 Rev. 2.0	Turbidity	8.0		NTU	P341711	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P342129	
		Sulfate	22		mg SO4/L	P342133	
		Color (true)	18	A	PCU	P341715	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P341964	
	SM 2540 C-97	TDS	139		mg/L	P342004	
	SM 2540 D-97	TSS	10		mg/L	P342014	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P342155	
1975476	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P342202	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P341911	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341816	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P341935	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P342276	
1975477	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341721	

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: Field Blank

Collection Date/Time: 03/15/2018 11:30

Field ID: BLANK_03152018

Matrix: DI-WATER

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975481	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P341711	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P342130	

Field ID: BLANK_03152018

Matrix: DI-WATER

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1975481	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P342134	
	SM 2120 B	Color (true)	2.5	U	PCU	P341715	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P342404	
	SM 2540 C-97	TDS	15	U	mg/L	P342004	
	SM 2540 D-97	TSS	2	U	mg/L	P342014	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342155	
1975482	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P342197	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P341911	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341816	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P341935	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P342276	
1975483	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341721	

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: P341711

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P341799

Component	Result	Code	Units
Calcium	0.075	U	mg/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 200.7 Rev. 4.4
 Batch ID: P342217

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P341799

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342129

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342130

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342133

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342134

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342197

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342202

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341911

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341916

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341815

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341816

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341935

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341721

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

Reference Method: SM 2120 B
Batch ID: P341715

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P341963

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

Reference Method: SM 2320 B-97
Batch ID: P341964

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

Reference Method: SM 2320 B-97
Batch ID: P342404

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

Reference Method: SM 2540 C-97
Batch ID: P342004

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P342014

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P342155

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P342276

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: P341799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	104		P	85 - 115
Sodium	106		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342217

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	103		P	85 - 115
Copper	103		P	85 - 115
Lead	109		P	85 - 115
Nickel	102		P	85 - 115
Silver	97.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342129

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342130

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342133

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342134

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342197

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341911

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341916

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341815

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341816

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341935

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: P341721

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P341963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.3		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P341964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P342404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.9		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P342155

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.8		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342276

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341799

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974877	Calcium	102		P	80 - 120
1974877	Magnesium	103	105	P/P	80 - 120
1974877	Potassium	100	102	P/P	80 - 120
1974877	Sodium	101	105	P/P	80 - 120
1974877	Zinc	98.1	99.0	P/P	80 - 120
1975361	Calcium	100		P	80 - 120
1975361	Magnesium	104		P	80 - 120
1975361	Potassium	104		P	80 - 120
1975361	Sodium	101		P	80 - 120
1975361	Zinc	103		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342217

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975362	Iron	104	99.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974877	Arsenic	99.7	99.5	P/P	80 - 120
1974877	Cadmium	105	104	P/P	80 - 120
1974877	Chromium	100	101	P/P	80 - 120
1974877	Copper	95.8	96.4	P/P	80 - 120
1974877	Lead	108	108	P/P	80 - 120
1974877	Nickel	95.8	96.2	P/P	80 - 120
1974877	Silver	98.0	98.6	P/P	80 - 120
1975361	Arsenic	101		P	80 - 120
1975361	Cadmium	104		P	80 - 120
1975361	Chromium	100		P	80 - 120
1975361	Copper	97.5		P	80 - 120
1975361	Lead	107		P	80 - 120
1975361	Nickel	96.0		P	80 - 120
1975361	Silver	97.0		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342129

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975282	Chloride	97.2		P	90 - 110
1975391	Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342130

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975478	Chloride	94.3		P	90 - 110
1975860	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975282	Sulfate	102		P	90 - 110
1975391	Sulfate	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975478	Sulfate	94.7		P	90 - 110
1975860	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974646	Ammonia-N	94.2	96.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342202

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975476	Ammonia-N	96.3	94.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975394	Kjeldahl Nitrogen	98.5	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975369	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975476	NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975394	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341721

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975395	O-Phosphate-P	99.6	99.9	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P342155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975943	Fluoride	96.3	96.8	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977936	Fluoride	97.3	97.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342276

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975393	Organic Carbon	104	104	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P341711

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975403	Turbidity	1.90	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974877	Calcium	2.81	Spike	P	0 - 20
1974877	Magnesium	1.08	Spike	P	0 - 20
1974877	Potassium	1.61	Spike	P	0 - 20
1974877	Sodium	2.53	Spike	P	0 - 20
1974877	Zinc	0.988	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975362	Iron	4.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974877	Arsenic	0.169	Spike	P	0 - 20
1974877	Cadmium	0.487	Spike	P	0 - 20
1974877	Chromium	0.586	Spike	P	0 - 20
1974877	Copper	0.536	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974877	Lead	0.200	Spike	P	0 - 20
1974877	Nickel	0.414	Spike	P	0 - 20
1974877	Silver	0.600	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342129

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975282	Chloride	0.508	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975478	Chloride	1.33	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975282	Sulfate	0.995	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975478	Sulfate	1.29	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974646	Ammonia-N	1.79	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975476	Ammonia-N	1.69	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341911

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975479	Kjeldahl Nitrogen	0.325	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975394	Kjeldahl Nitrogen	3.18	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975369	NO2NO3-N	0.218	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975476	NO2NO3-N	0.484	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975394	Total-P	0.634	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975395	O-Phosphate-P	0.301	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P341715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975475	Color (true)	5.96	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P341963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975860	Total Alkalinity	1.30	Sample	P	0 - 1.6

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P341964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975943	Total Alkalinity	0.951	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P342404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976044	Total Alkalinity	0.0545	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P342004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975466	TDS	0.656	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P342155

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975943	Fluoride	0.474	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977936	Fluoride	0.479	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P342276

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1975393	Organic Carbon	0.429	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82668
Included Lab Sample IDs: 1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A82670

Included Lab Sample IDs: 1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.7	98.9	P/P	85 - 115
Color (true)	98.9	99.6	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A82677

Included Lab Sample IDs: 1975471, 1975472, 1975473, 1975474, 1975477, 1975480, 1975483

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82728

Included Lab Sample IDs: 1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82750

Included Lab Sample IDs: 1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A82770

Included Lab Sample IDs: 1975507, 1975508, 1975509, 1975510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	96.6	P/P	90 - 110
Calcium	96.6	99.2	P/P	90 - 110
Magnesium	102	98.8	P/P	90 - 110
Magnesium	98.8	100	P/P	90 - 110
Potassium	97.1	97.1	P/P	90 - 110
Potassium	99.3	97.1	P/P	90 - 110
Sodium	97.0	98.5	P/P	90 - 110
Sodium	99.7	97.0	P/P	90 - 110
Zinc	101	100	P/P	90 - 110
Zinc	102	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A82772

Included Lab Sample IDs: 1975463, 1975464, 1975465, 1975466, 1975475, 1975478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.9	100	P/P	90 - 110
Total Alkalinity	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82783

Included Lab Sample IDs: 1975467, 1975468, 1975469, 1975470

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A82794

Included Lab Sample IDs: 1975507, 1975508, 1975509, 1975510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.1	99.5	P/P	90 - 110
Cadmium	98.3	101	P/P	90 - 110
Chromium	99.0	101	P/P	90 - 110
Copper	95.8	99.1	P/P	90 - 110
Lead	105	108	P/P	90 - 110
Nickel	96.0	98.6	P/P	90 - 110
Silver	99.8	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82796

Included Lab Sample IDs: 1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	98.6	P/P	90 - 110
Kjeldahl Nitrogen	97.2	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82807

Included Lab Sample IDs: 1975476, 1975479, 1975482

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.8	P/P	90 - 110
Total-P	99.0	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82826

Included Lab Sample IDs: 1975465, 1975466, 1975475, 1975478, 1975481

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A82842

Included Lab Sample IDs: 1975507, 1975508

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A82842

Included Lab Sample IDs: 1975507, 1975508

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82853

Included Lab Sample IDs: 1975467, 1975468, 1975469, 1975470, 1975482

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82854

Included Lab Sample IDs: 1975476, 1975479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.7	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A82877

Included Lab Sample IDs: 1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	103	P/P	90 - 110
Organic Carbon	103	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A82905

Included Lab Sample IDs: 1975507, 1975508, 1975509, 1975510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	99.8	100	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82926

Included Lab Sample IDs: 1975481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.4	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82967

Included Lab Sample IDs: 1975463, 1975464

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	100	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					1.90	
EPA 200.7 Rev. 4.4	Calcium	104	100	102			2.81
	Iron	103	104	99.2			4.24
	Magnesium	110	104	103	105		1.08
	Potassium	104	104	100	102		1.61
	Sodium	106	101	101	105		2.53
	Zinc	103	103	98.1	99.0		0.988
EPA 200.8 Rev. 5.4	Arsenic	102	101	99.7	99.5		0.169
	Cadmium	102	104	105	104		0.487
	Chromium	103	100	101	100		0.586
	Copper	103	97.5	95.8	96.4		0.536
	Lead	109	107	108	108		0.200
	Nickel	102	96.0	95.8	96.2		0.414
	Silver	97.8	97.0	98.0	98.6		0.600
EPA 300.0 Rev. 2.1	Chloride	98.0	97.2	97.5		0.508	
	Chloride	99.3	94.3	101		1.33	
	Sulfate	101	102	99.5		0.995	
	Sulfate	102	94.7	104		1.29	
EPA 350.1 Rev. 2.0	Ammonia-N	94.8	94.2	96.0			1.79
	Ammonia-N	94.7	96.3	94.6			1.69
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106					0.325
	Kjeldahl Nitrogen	99.4	98.5	102			3.18
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	102				0.218
	NO ₂ NO ₃ -N	99.5	103	104			0.484
EPA 365.1 Rev. 2.0	Total-P	101	101	102			0.634
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	99.6	99.9			0.301
SM 2120 B	Color (true)					5.96	
SM 2320 B-97	Total Alkalinity	99.3				1.30	
	Total Alkalinity	99.0				0.951	
	Total Alkalinity	98.9				0.0545	
SM 2540 C-97	TDS					0.656	
SM 4500 F-C-97	Fluoride	97.8	96.3	96.8			0.474
	Fluoride	95.6	97.3	97.8			0.479
SM 5310 B-00	Organic Carbon	101	104	104			0.429

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1975507, 1975508, 1975509, 1975510
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1975507, 1975508, 1975509, 1975510
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482

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	1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1975471, 1975472, 1975473, 1975474, 1975477, 1975480, 1975483
SM 2120 B / E31780	True Color measured at 450 nm	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1975467, 1975468, 1975469, 1975470, 1975476, 1975479, 1975482

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	03/16/2018			03/16/2018 15:05	DeAsia Armster	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
EPA 200.7 Rev. 4.4	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/21/2018 16:20	Betina Topolski	1975507
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/21/2018 16:28	Betina Topolski	1975508
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/21/2018 16:35	Betina Topolski	1975509
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/21/2018 17:07	Betina Topolski	1975510
	03/16/2018	03/27/2018 11:10	Vijayalakshmi Reddy	03/28/2018 12:58	Betina Topolski	1975507
	03/16/2018	03/27/2018 11:10	Vijayalakshmi Reddy	03/28/2018 13:03	Betina Topolski	1975508
	03/16/2018	03/27/2018 11:10	Vijayalakshmi Reddy	03/28/2018 13:09	Betina Topolski	1975509
	03/16/2018	03/27/2018 11:10	Vijayalakshmi Reddy	03/28/2018 13:14	Betina Topolski	1975510
EPA 200.8 Rev. 5.4	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/22/2018 16:41	Nadine Brooks	1975507
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/22/2018 16:51	Nadine Brooks	1975508
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/22/2018 17:00	Nadine Brooks	1975509
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/22/2018 17:10	Nadine Brooks	1975510
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/23/2018 15:47	Nadine Brooks	1975507
	03/16/2018	03/20/2018 12:50	Vijayalakshmi Reddy	03/23/2018 15:55	Nadine Brooks	1975508
EPA 300.0 Rev. 2.1	03/16/2018			03/22/2018 04:16	Julia Storbeck	1975463
	03/16/2018			03/22/2018 04:28	Julia Storbeck	1975464
	03/16/2018			03/22/2018 05:04	Julia Storbeck	1975465
	03/16/2018			03/22/2018 05:16	Julia Storbeck	1975466
	03/16/2018			03/22/2018 05:28	Julia Storbeck	1975475
	03/16/2018			03/22/2018 06:51	Julia Storbeck	1975478
	03/16/2018			03/22/2018 07:39	Julia Storbeck	1975481
EPA 350.1 Rev. 2.0	03/16/2018			03/26/2018 12:28	Ping Hua	1975467
	03/16/2018			03/26/2018 12:29	Ping Hua	1975468
	03/16/2018			03/26/2018 12:31	Ping Hua	1975469
	03/16/2018			03/26/2018 12:32	Ping Hua	1975470
	03/16/2018			03/26/2018 12:34	Ping Hua	1975482
	03/16/2018			03/26/2018 13:45	Ping Hua	1975476
	03/16/2018			03/26/2018 13:50	Ping Hua	1975479
EPA 351.2 Rev. 2.0	03/16/2018	03/21/2018 11:00	Adrian Shelby	03/22/2018 13:45	Joseph Suarez	1975467
	03/16/2018	03/21/2018 11:00	Adrian Shelby	03/22/2018 13:46	Joseph Suarez	1975468
	03/16/2018	03/21/2018 11:00	Adrian Shelby	03/22/2018 14:24	Joseph Suarez	1975469
	03/16/2018	03/21/2018 11:00	Adrian Shelby	03/22/2018 14:25	Joseph Suarez	1975470
	03/16/2018	03/21/2018 11:00	Adrian Shelby	03/22/2018 14:27	Joseph Suarez	1975476
	03/16/2018	03/21/2018 11:00	Adrian Shelby	03/22/2018 14:29	Joseph Suarez	1975479
	03/16/2018	03/21/2018 11:00	Adrian Shelby	03/22/2018 14:33	Joseph Suarez	1975482
EPA 353.2 Rev. 2.0	03/16/2018			03/20/2018 11:17	Beverly Y. Sanders	1975467
	03/16/2018			03/20/2018 11:18	Beverly Y. Sanders	1975468
	03/16/2018			03/20/2018 11:20	Beverly Y. Sanders	1975469

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 353.2 Rev. 2.0	03/16/2018			03/20/2018 11:21	Beverly Y. Sanders	1975470
	03/16/2018			03/20/2018 11:28	Beverly Y. Sanders	1975476
	03/16/2018			03/20/2018 11:34	Beverly Y. Sanders	1975482
	03/16/2018			03/20/2018 11:44	Beverly Y. Sanders	1975479
EPA 365.1 Rev. 2.0	03/16/2018	03/21/2018 12:08	Sima Feizi	03/22/2018 11:30	Lipi Saha	1975467
	03/16/2018	03/21/2018 12:08	Sima Feizi	03/22/2018 11:31	Lipi Saha	1975468
	03/16/2018	03/21/2018 12:08	Sima Feizi	03/22/2018 11:32	Lipi Saha	1975469
	03/16/2018	03/21/2018 12:08	Sima Feizi	03/22/2018 11:34	Lipi Saha	1975470
	03/16/2018	03/21/2018 12:08	Sima Feizi	03/22/2018 16:56	Lipi Saha	1975476
	03/16/2018	03/21/2018 12:08	Sima Feizi	03/22/2018 17:04	Lipi Saha	1975479
	03/16/2018	03/21/2018 12:08	Sima Feizi	03/22/2018 17:05	Lipi Saha	1975482
EPA 365.1 Rev. 2.0 dissolved	03/16/2018			03/16/2018 14:46	Megan Treadwell	1975471, 1975472
	03/16/2018			03/16/2018 14:47	Megan Treadwell	1975473
	03/16/2018			03/16/2018 14:48	Megan Treadwell	1975474
	03/16/2018			03/16/2018 14:49	Megan Treadwell	1975477
	03/16/2018			03/16/2018 14:56	Megan Treadwell	1975483
	03/16/2018			03/16/2018 14:57	Megan Treadwell	1975480
SM 2120 B	03/16/2018			03/16/2018 16:28	Tanya Welborn	1975475
	03/16/2018			03/16/2018 16:29	Tanya Welborn	1975478
	03/16/2018			03/16/2018 16:30	Tanya Welborn	1975481
	03/16/2018			03/16/2018 16:37	Tanya Welborn	1975463, 1975464
	03/16/2018			03/16/2018 16:38	Tanya Welborn	1975465
	03/16/2018			03/16/2018 16:39	Tanya Welborn	1975466
SM 2320 B-97	03/16/2018			03/22/2018 03:18	Dale L. Simmons	1975463
	03/16/2018			03/22/2018 03:29	Dale L. Simmons	1975464
	03/16/2018			03/22/2018 05:36	Dale L. Simmons	1975465
	03/16/2018			03/22/2018 05:47	Dale L. Simmons	1975466
	03/16/2018			03/22/2018 05:57	Dale L. Simmons	1975475
	03/16/2018			03/22/2018 06:07	Dale L. Simmons	1975478
SM 2540 C-97	03/16/2018			03/28/2018 15:40	Dale L. Simmons	1975481
	03/16/2018			03/20/2018 12:16	Yijie Li	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
SM 2540 D-97	03/16/2018			03/20/2018 12:16	Yijie Li	1975463, 1975464, 1975465, 1975466, 1975475, 1975478, 1975481
SM 4500 F-C-97	03/16/2018			03/24/2018 07:53	Dale L. Simmons	1975465
	03/16/2018			03/24/2018 07:56	Dale L. Simmons	1975466
	03/16/2018			03/24/2018 08:00	Dale L. Simmons	1975475
	03/16/2018			03/24/2018 08:04	Dale L. Simmons	1975478
	03/16/2018			03/24/2018 08:11	Dale L. Simmons	1975481
	03/16/2018			03/31/2018 03:48	Lauren Bottorf	1975463

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	03/16/2018			03/31/2018 03:51	Lauren Bottorf	1975464
SM 5310 B-00	03/16/2018			03/27/2018 06:16	Julia Storbeck	1975467
	03/16/2018			03/27/2018 06:30	Julia Storbeck	1975468
	03/16/2018			03/27/2018 06:45	Julia Storbeck	1975469
	03/16/2018			03/27/2018 06:58	Julia Storbeck	1975470
	03/16/2018			03/27/2018 07:41	Julia Storbeck	1975476
	03/16/2018			03/27/2018 07:57	Julia Storbeck	1975479
	03/16/2018			03/27/2018 08:14	Julia Storbeck	1975482