

Chemical Analysis Report

CEN-DIST-2018-03-07-01

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

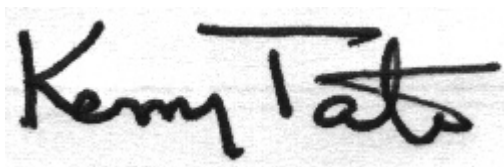
Event Description: **Dead River X4 + D&B**
Request ID: **RQ-2018-02-26-59**
Customer: **CEN-DIST**
Project ID: **SMP**

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

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 19-APR-2018 14:21

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

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: Dead River @ 100m from Lake Harris (2817C) Collection Date/Time: 03/06/2018 12:14

Field ID: G1CE0099

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972512	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P341133	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P341420	
		Sulfate	9.3		mg SO4/L	P341425	
		Color (true)	27		PCU	P341126	
	SM 2320 B-97	Total Alkalinity	95		mg CaCO3/L	P341521	
	SM 2540 C-97	TDS	170	A	mg/L	P341591	
	SM 2540 D-97	TSS	4	IA	mg/L	P341608	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P341524	
1972516	EPA 350.1 Rev. 2.0	Ammonia-N	0.18		mg N/L	P341494	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P341602	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.025		mg N/L	P341285	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P341314	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P341326	
1972520	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341141	
1972546	EPA 200.7 Rev. 4.4	Calcium	35.6		mg/L	P341196	
		Iron	31	I	ug/L	P341196	
		Magnesium	7.75		mg/L	P341196	
		Potassium	4.0		mg/L	P341196	
		Sodium	12.8		mg/L	P341196	
		Zinc	5.0	U	ug/L	P341196	
	EPA 200.8 Rev. 5.4	Arsenic	1.41		ug/L	P341196	
		Cadmium	0.020	U	ug/L	P341196	
		Chromium	0.40	U	ug/L	P341196	
		Copper	0.20	U	ug/L	P341196	
		Lead	0.12	I	ug/L	P341196	
		Nickel	0.20	U	ug/L	P341196	
		Silver	0.010	U	ug/L	P341196	

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: Dead River @ Power Lines (2817C) Collection Date/Time: 03/06/2018 12:21

Field ID: G1CE0056

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972513	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P341133	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P341420	
		Sulfate	8.2		mg SO4/L	P341425	
		Color (true)	28		PCU	P341126	
	SM 2320 B-97	Total Alkalinity	97		mg CaCO3/L	P341521	
	SM 2540 C-97	TDS	161		mg/L	P341591	
	SM 2540 D-97	TSS	3	I	mg/L	P341608	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P341524	
1972517	EPA 350.1 Rev. 2.0	Ammonia-N	0.20		mg N/L	P341494	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P341602	

Field ID: G1CE0056

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972517	EPA 353.2 Rev. 2.0	NO2NO3-N	0.027		mg N/L	P341285	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P341314	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P341326	
1972521	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341141	
1972547	EPA 200.7 Rev. 4.4	Calcium	34.0		mg/L	P341196	
		Iron	30	I	ug/L	P341196	
		Magnesium	7.22		mg/L	P341196	
		Potassium	3.6		mg/L	P341196	
		Sodium	12.1		mg/L	P341196	
		Zinc	5.0	U	ug/L	P341196	
	EPA 200.8 Rev. 5.4	Arsenic	1.34		ug/L	P341196	
		Cadmium	0.020	U	ug/L	P341196	
		Chromium	0.40	U	ug/L	P341196	
		Copper	0.20	U	ug/L	P341196	
		Lead	0.10	I	ug/L	P341196	
		Nickel	0.20	U	ug/L	P341196	
		Silver	0.010	U	ug/L	P341196	

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: Dead River @ Power Lines (2817C)

Collection Date/Time: 03/06/2018 12:23

Field ID: G1CE0056DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972524	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P341134	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P341420	
		Sulfate	8.0		mg SO4/L	P341425	
		Color (true)	28	A	PCU	P341127	
	SM 2320 B-97	Total Alkalinity	95		mg CaCO3/L	P341521	
	SM 2540 C-97	TDS	149		mg/L	P341591	
	SM 2540 D-97	TSS	3	I	mg/L	P341608	
1972526	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P341524	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.21		mg N/L	P341494	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P341602	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P341285	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P341315	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P341326	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341141	
1972550	EPA 200.7 Rev. 4.4	Calcium	33.9		mg/L	P341196	
		Iron	30	U	ug/L	P341196	
		Magnesium	7.15		mg/L	P341196	
		Potassium	3.6		mg/L	P341196	
		Sodium	12.0		mg/L	P341196	
		Zinc	5.0	U	ug/L	P341196	
	EPA 200.8 Rev. 5.4	Arsenic	1.31		ug/L	P341196	

Field ID: G1CE0056DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972550	EPA 200.8 Rev. 5.4	Cadmium	0.020	U	ug/L	P341196	
		Chromium	0.40	U	ug/L	P341196	
		Copper	0.20	U	ug/L	P341196	
		Lead	0.10	I	ug/L	P341196	
		Nickel	0.20	U	ug/L	P341196	
		Silver	0.010	U	ug/L	P341196	

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: Dead River @ 50m from S of US 441 (2817C) Collection Date/Time: 03/06/2018 12:37

Field ID: G1CE0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972514	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P341133	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P341420	
		Sulfate	8.0		mg SO4/L	P341425	
		Color (true)	29		PCU	P341126	
	SM 2320 B-97	Total Alkalinity	97		mg CaCO3/L	P341521	
	SM 2540 C-97	TDS	154		mg/L	P341591	
	SM 2540 D-97	TSS	4	I	mg/L	P341608	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P341524	
1972518	EPA 350.1 Rev. 2.0	Ammonia-N	0.24		mg N/L	P341565	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P341602	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.030		mg N/L	P341285	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P341314	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P341326	
1972522	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341141	
1972548	EPA 200.7 Rev. 4.4	Calcium	34.7		mg/L	P341196	
		Iron	33	I	ug/L	P341196	
		Magnesium	7.37		mg/L	P341196	
		Potassium	3.7		mg/L	P341196	
		Sodium	12.4		mg/L	P341196	
		Zinc	5.0	U	ug/L	P341196	
	EPA 200.8 Rev. 5.4	Arsenic	1.36		ug/L	P341196	
		Cadmium	0.020	U	ug/L	P341196	
		Chromium	0.40	U	ug/L	P341196	
		Copper	0.23	I	ug/L	P341196	
		Lead	0.12	I	ug/L	P341196	
		Nickel	0.20	U	ug/L	P341196	
		Silver	0.010	U	ug/L	P341196	

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: Dead River @ 150m from Lake Eustis (2817C) Collection Date/Time: 03/06/2018 12:50

Field ID: G1CE0101

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972515	EPA 180.1 Rev. 2.0	Turbidity	2.6	A	NTU	P341134	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P341420	
		Sulfate	8.7		mg SO4/L	P341425	
	SM 2120 B	Color (true)	28		PCU	P341126	
	SM 2320 B-97	Total Alkalinity	95		mg CaCO3/L	P341521	
	SM 2540 C-97	TDS	154		mg/L	P341591	
	SM 2540 D-97	TSS	4	I	mg/L	P341608	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P341524	
1972519	EPA 350.1 Rev. 2.0	Ammonia-N	0.23		mg N/L	P341565	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P341602	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.030		mg N/L	P341285	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P341314	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P341326	
1972523	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341141	
1972549	EPA 200.7 Rev. 4.4	Calcium	35.4		mg/L	P341196	
		Iron	35	I	ug/L	P341196	
		Magnesium	7.57		mg/L	P341196	
		Potassium	3.8		mg/L	P341196	
		Sodium	12.6		mg/L	P341196	
		Zinc	5.0	U	ug/L	P341196	
	EPA 200.8 Rev. 5.4	Arsenic	1.38		ug/L	P341196	
		Cadmium	0.020	U	ug/L	P341196	
		Chromium	0.40	U	ug/L	P341196	
		Copper	0.27	I	ug/L	P341196	
		Lead	0.14	I	ug/L	P341196	
		Nickel	0.20	U	ug/L	P341196	
		Silver	0.010	U	ug/L	P341196	

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: FIELD BLANK

Collection Date/Time: 03/06/2018 13:10

Field ID: BLANK_03062018

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972525	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P341134	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P341420	
		Sulfate	0.20	U	mg SO4/L	P341425	
	SM 2120 B	Color (true)	2.5	U	PCU	P341127	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P341522	
	SM 2540 C-97	TDS	15	U	mg/L	P341589	
	SM 2540 D-97	TSS	2	U	mg/L	P341606	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P341525	
1972527	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P341494	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P341430	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P341285	

Field ID: BLANK_03062018

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1972527	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P341315	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P341579	
1972529	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P341141	
1972551	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P341196	
		Iron	30	U	ug/L	P341564	
		Magnesium	0.040	U	mg/L	P341196	
		Potassium	0.30	U	mg/L	P341196	
		Sodium	0.50	U	mg/L	P341196	
		Zinc	5.0	U	ug/L	P341196	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P341196	
		Cadmium	0.020	U	ug/L	P341196	
		Chromium	0.40	U	ug/L	P341564	
		Copper	1.44		ug/L	P341564	
		Lead	0.050	U	ug/L	P341196	
		Nickel	0.20	U	ug/L	P341564	
		Silver	0.010	U	ug/L	P341196	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 03/16/2018.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P341133

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P341134

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P341196

Component	Result	Code	Units
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 200.7 Rev. 4.4

Batch ID: P341564

Component	Result	Code	Units
Iron	30	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341196

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341564

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341420

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341425

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341494

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341565

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341430

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341602

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341285

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341314

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341315

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341141

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

Reference Method: SM 2120 B
Batch ID: P341126

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P341127

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P341521

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

Reference Method: SM 2320 B-97
Batch ID: P341522

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

Reference Method: SM 2540 C-97
Batch ID: P341589

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P341591

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341606

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341608

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P341524

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P341525

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P341326

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P341579

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: P341196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	110		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	107		P	85 - 115
Sodium	101		P	85 - 115
Zinc	103		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341564

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	108		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	102		P	85 - 115
Copper	101		P	85 - 115
Lead	110		P	85 - 115
Nickel	101		P	85 - 115
Silver	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341564

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	97.9		P	85 - 115
Copper	95.1		P	85 - 115
Nickel	95.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341420

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341425

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341494

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341565

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341430

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341602

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341285

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: P341314

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: P341315

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341141

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

Reference Method: SM 2320 B-97
Batch ID: P341521

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.2		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P341522

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.8		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P341524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.7		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P341525

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.3		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P341326

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P341579

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972378	Calcium	106		P	80 - 120
1972378	Iron	110		P	80 - 120
1972378	Magnesium	106		P	80 - 120
1972378	Potassium	105		P	80 - 120
1972378	Sodium	102		P	80 - 120
1972378	Zinc	102		P	80 - 120
1972688	Calcium	102		P	80 - 120
1972688	Iron	109	107	P/P	80 - 120
1972688	Magnesium	101		P	80 - 120
1972688	Potassium	107	104	P/P	80 - 120
1972688	Sodium	98.5		P	80 - 120
1972688	Zinc	99.4	97.6	P/P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974148	Iron	109	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972378	Arsenic	105		P	80 - 120
1972378	Cadmium	103		P	80 - 120
1972378	Chromium	103		P	80 - 120
1972378	Copper	99.9		P	80 - 120
1972378	Lead	112		P	80 - 120
1972378	Nickel	99.3		P	80 - 120
1972378	Silver	105		P	80 - 120
1972688	Arsenic	103	101	P/P	80 - 120
1972688	Cadmium	107	106	P/P	80 - 120
1972688	Chromium	103	100	P/P	80 - 120
1972688	Copper	97.5	96.3	P/P	80 - 120
1972688	Lead	112	110	P/P	80 - 120
1972688	Nickel	98.6	97.0	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972688	Silver	107	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974148	Chromium	100	99.7	P/P	80 - 120
1974148	Copper	98.4	97.9	P/P	80 - 120
1974148	Nickel	97.6	97.0	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341420

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972433	Chloride	98.9		P	90 - 110
1972454	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972433	Sulfate	99.0		P	90 - 110
1972454	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341494

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972466	Ammonia-N	95.7	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341565

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972712	Ammonia-N	97.0	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972907	Kjeldahl Nitrogen	105	95.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972516	Kjeldahl Nitrogen	107	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341285

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972475	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341314

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972519	Total-P	98.4	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972591	Total-P	98.0	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972714	O-Phosphate-P	97.0	96.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P341524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972840	Fluoride	96.4	97.0	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P341525

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972878	Fluoride	93.3	95.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P341326

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972416	Organic Carbon	113		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P341579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972591	Organic Carbon	98.0	99.2	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P341133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972459	Turbidity	0.137	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P341134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972515	Turbidity	8.30	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972688	Calcium	0.775	Spike	P	0 - 20
1972688	Iron	1.12	Spike	P	0 - 20
1972688	Magnesium	1.62	Spike	P	0 - 20
1972688	Potassium	1.78	Spike	P	0 - 20
1972688	Sodium	0.602	Spike	P	0 - 20
1972688	Zinc	1.41	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974148	Iron	0.799	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972688	Arsenic	2.07	Spike	P	0 - 20
1972688	Cadmium	1.30	Spike	P	0 - 20
1972688	Chromium	2.94	Spike	P	0 - 20
1972688	Copper	1.18	Spike	P	0 - 20
1972688	Lead	1.73	Spike	P	0 - 20
1972688	Nickel	1.70	Spike	P	0 - 20
1972688	Silver	1.95	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974148	Chromium	0.270	Spike	P	0 - 20
1974148	Copper	0.484	Spike	P	0 - 20
1974148	Nickel	0.563	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972433	Chloride	0.0511	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972433	Sulfate	0.500	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341494

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972466	Ammonia-N	2.54	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972712	Ammonia-N	1.16	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972907	Kjeldahl Nitrogen	7.05	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972516	Kjeldahl Nitrogen	3.70	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972475	NO2NO3-N	0.735	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972519	Total-P	0.0240	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P341315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972591	Total-P	3.81	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P341141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972714	O-Phosphate-P	0.412	Spike	P	0 - 20

Reference Method: SM 2120 B

Batch ID: P341126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972459	Color (true)	3.27	Sample	P	0 - 20

Reference Method: SM 2120 B

Batch ID: P341127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972524	Color (true)	3.30	Sample	P	0 - 20

Reference Method: SM 2320 B-97

Batch ID: P341521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972840	Total Alkalinity	0.318	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97

Batch ID: P341522

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972878	Total Alkalinity	0.748	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97

Batch ID: P341589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972354	TDS	3.06	Sample	P	0 - 10

Reference Method: SM 2540 C-97

Batch ID: P341591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972512	TDS	7.06	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P341524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972840	Fluoride	0.477	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P341525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972878	Fluoride	1.95	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P341326

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972416	Organic Carbon	0.235	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P341579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972591	Organic Carbon	0.708	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A82485
Included Lab Sample IDs: 1972512, 1972513, 1972514, 1972515, 1972524, 1972525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115
Color (true)	98.3	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82487
Included Lab Sample IDs: 1972512, 1972513, 1972514, 1972515, 1972524, 1972525

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A82489
Included Lab Sample IDs: 1972520, 1972521, 1972522, 1972523, 1972528, 1972529

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A82489

Included Lab Sample IDs: 1972520, 1972521, 1972522, 1972523, 1972528, 1972529

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82509

Included Lab Sample IDs: 1972512, 1972513, 1972514, 1972515, 1972524, 1972525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.7	95.4	P/P	90 - 110
Chloride	96.7	95.7	P/P	90 - 110
Sulfate	97.2	97.2	P/P	90 - 110
Sulfate	97.2	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82523

Included Lab Sample IDs: 1972516, 1972517, 1972518, 1972519, 1972526, 1972527

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

Reference Method: SM 5310 B-00

Run ID: A82537

Included Lab Sample IDs: 1972516, 1972517, 1972518, 1972519, 1972526

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	97.7	P/P	90 - 110
Organic Carbon	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82550

Included Lab Sample IDs: 1972516, 1972517, 1972518, 1972519, 1972526, 1972527

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	99.8	P/P	90 - 110
Total-P	99.8	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A82562

Included Lab Sample IDs: 1972546, 1972547, 1972548, 1972549, 1972550, 1972551

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	100	P/P	90 - 110
Calcium	103	101	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Magnesium	101	100	P/P	90 - 110
Magnesium	103	101	P/P	90 - 110
Potassium	98.4	98.5	P/P	90 - 110
Potassium	99.8	98.4	P/P	90 - 110
Sodium	98.4	97.5	P/P	90 - 110
Sodium	99.6	98.4	P/P	90 - 110
Zinc	103	99.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A82562

Included Lab Sample IDs: 1972546, 1972547, 1972548, 1972549, 1972550, 1972551

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82584

Included Lab Sample IDs: 1972516, 1972517, 1972526, 1972527

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

Reference Method: SM 2320 B-97

Run ID: A82604

Included Lab Sample IDs: 1972512, 1972513, 1972514, 1972515, 1972524, 1972525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.9	99.6	P/P	90 - 110
Total Alkalinity	99.6	97.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82604

Included Lab Sample IDs: 1972512, 1972513, 1972514, 1972515, 1972524, 1972525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	98.1	P/P	90 - 110
Fluoride	98.6	98.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82613

Included Lab Sample IDs: 1972518, 1972519

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82615

Included Lab Sample IDs: 1972527

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.4	94.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A82618

Included Lab Sample IDs: 1972546, 1972547, 1972548, 1972549, 1972550, 1972551

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	102	P/P	90 - 110
Arsenic	102	97.2	P/P	90 - 110
Cadmium	98.2	98.5	P/P	90 - 110
Cadmium	98.5	96.0	P/P	90 - 110
Chromium	97.2	96.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A82618

Included Lab Sample IDs: 1972546, 1972547, 1972548, 1972549, 1972550, 1972551

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	99.5	94.8	P/P	90 - 110
Lead	105	106	P/P	90 - 110
Lead	106	103	P/P	90 - 110
Nickel	100	95.6	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Silver	101	98.6	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A82620

Included Lab Sample IDs: 1972527

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A82648

Included Lab Sample IDs: 1972551

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82661

Included Lab Sample IDs: 1972516, 1972517, 1972518, 1972519, 1972526

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.4	94.9	P/P	90 - 110
Kjeldahl Nitrogen	94.9	99.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A82671

Included Lab Sample IDs: 1972551

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	96.0	97.6	P/P	90 - 110
Copper	96.0	97.8	P/P	90 - 110
Nickel	95.6	96.9	P/P	90 - 110

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

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements. Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				0.137	
	Turbidity				8.30	
EPA 200.7 Rev. 4.4	Calcium	107	106 102			0.775

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision	MS
			LCS	SMP	MS		
EPA 200.7 Rev. 4.4	Iron	110	110	109	107		1.12
	Iron	108	109	108			0.799
	Magnesium	106	106	101			1.62
	Potassium	107	105	107	104		1.78
	Sodium	101	102	98.5			0.602
	Zinc	103	102	99.4	97.6		1.41
EPA 200.8 Rev. 5.4	Arsenic	103	105	103	101		2.07
	Cadmium	103	103	107	106		1.30
	Chromium	102	103	103	100		2.94
	Chromium	97.9	100	99.7			0.270
	Copper	101	99.9	97.5	96.3		1.18
	Copper	95.1	98.4	97.9			0.484
	Lead	110	112	112	110		1.73
	Nickel	101	99.3	98.6	97.0		1.70
	Nickel	95.0	97.6	97.0			0.563
	Silver	105	105	107	105		1.95
EPA 300.0 Rev. 2.1	Chloride	101	98.9	102		0.0511	
	Sulfate	104	99.0	103		0.500	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	95.7	98.6			2.54
	Ammonia-N	97.9	97.0	98.4			1.16
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	105	95.6			7.05
	Kjeldahl Nitrogen	96.3	107	99.3			3.70
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	102			0.735
EPA 365.1 Rev. 2.0	Total-P	102	98.4	98.4			0.0240
	Total-P	103	98.0	102			3.81
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	97.0	96.3			0.412
SM 2120 B	Color (true)					3.27	
	Color (true)					3.30	
SM 2320 B-97	Total Alkalinity	99.2				0.318	
	Total Alkalinity	98.8				0.748	
SM 2540 C-97	TDS					3.06	
	TDS					7.06	
SM 4500 F-C-97	Fluoride	95.7	96.4	97.0			0.477
	Fluoride	95.3	93.3	95.4			1.95
SM 5310 B-00	Organic Carbon	98.2	113				0.235
	Organic Carbon	98.0	98.0	99.2			0.708

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1972546, 1972547, 1972548, 1972549, 1972550, 1972551
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1972546, 1972547, 1972548, 1972549, 1972550, 1972551
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1972516, 1972517, 1972518, 1972519, 1972526, 1972527
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1972516, 1972517, 1972518, 1972519, 1972526, 1972527

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1972516, 1972517, 1972518, 1972519, 1972526, 1972527
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1972516, 1972517, 1972518, 1972519, 1972526, 1972527
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1972520, 1972521, 1972522, 1972523, 1972528, 1972529
SM 2120 B / E31780	True Color measured at 450 nm	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1972516, 1972517, 1972518, 1972519, 1972526, 1972527

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	03/07/2018			03/07/2018 15:18	DeAsia Armster	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
EPA 200.7 Rev. 4.4	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/12/2018 17:17	Betina Topolski	1972551
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/12/2018 18:58	Betina Topolski	1972546
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/12/2018 19:05	Betina Topolski	1972547
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/12/2018 19:13	Betina Topolski	1972548
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/12/2018 19:20	Betina Topolski	1972549
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/12/2018 19:27	Betina Topolski	1972550
	03/07/2018	03/14/2018 17:50	Elliott D. Healy	03/15/2018 13:48	Betina Topolski	1972551
EPA 200.8 Rev. 5.4	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/14/2018 16:39	Nadine Brooks	1972551
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/14/2018 18:43	Nadine Brooks	1972546
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/14/2018 18:52	Nadine Brooks	1972547
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/14/2018 19:01	Nadine Brooks	1972548
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/14/2018 19:10	Nadine Brooks	1972549
	03/07/2018	03/08/2018 15:55	Elliott D. Healy	03/14/2018 19:19	Nadine Brooks	1972550
	03/07/2018	03/14/2018 17:50	Elliott D. Healy	03/16/2018 18:30	Nadine Brooks	1972551
EPA 300.0 Rev. 2.1	03/07/2018			03/09/2018 01:57	Julia Storbeck	1972512
	03/07/2018			03/09/2018 02:09	Julia Storbeck	1972513
	03/07/2018			03/09/2018 02:21	Julia Storbeck	1972514
	03/07/2018			03/09/2018 02:57	Julia Storbeck	1972515
	03/07/2018			03/09/2018 03:08	Julia Storbeck	1972524
	03/07/2018			03/09/2018 03:20	Julia Storbeck	1972525
EPA 350.1 Rev. 2.0	03/07/2018			03/12/2018 17:36	Ping Hua	1972517
	03/07/2018			03/12/2018 17:48	Ping Hua	1972527
	03/07/2018			03/12/2018 19:03	Ping Hua	1972516
	03/07/2018			03/12/2018 19:06	Ping Hua	1972526
	03/07/2018			03/13/2018 16:40	Ping Hua	1972518
	03/07/2018			03/13/2018 16:42	Ping Hua	1972519
EPA 351.2 Rev. 2.0	03/07/2018	03/13/2018 10:30	Adrian Shelby	03/14/2018 14:11	Joseph Suarez	1972527
	03/07/2018	03/15/2018 14:00	Adrian Shelby	03/16/2018 11:43	Joseph Suarez	1972516
	03/07/2018	03/15/2018 14:00	Adrian Shelby	03/16/2018 11:51	Joseph Suarez	1972517
	03/07/2018	03/15/2018 14:00	Adrian Shelby	03/16/2018 11:53	Joseph Suarez	1972518
	03/07/2018	03/15/2018 14:00	Adrian Shelby	03/16/2018 11:54	Joseph Suarez	1972519
	03/07/2018	03/15/2018 14:00	Adrian Shelby	03/16/2018 11:56	Joseph Suarez	1972526
EPA 353.2 Rev. 2.0	03/07/2018			03/09/2018 10:33	Beverly Y. Sanders	1972527
	03/07/2018			03/09/2018 10:36	Beverly Y. Sanders	1972516
	03/07/2018			03/09/2018 10:37	Beverly Y. Sanders	1972517
	03/07/2018			03/09/2018 10:39	Beverly Y. Sanders	1972518
	03/07/2018			03/09/2018 10:40	Beverly Y. Sanders	1972519
	03/07/2018			03/09/2018 10:41	Beverly Y. Sanders	1972526

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 365.1 Rev. 2.0	03/07/2018	03/09/2018 14:10	Sima Feizi	03/12/2018 12:40	Beverly Y. Sanders	1972516
	03/07/2018	03/09/2018 14:10	Sima Feizi	03/12/2018 12:48	Beverly Y. Sanders	1972517
	03/07/2018	03/09/2018 14:10	Sima Feizi	03/12/2018 12:49	Beverly Y. Sanders	1972518
	03/07/2018	03/09/2018 14:10	Sima Feizi	03/12/2018 12:50	Beverly Y. Sanders	1972519
	03/07/2018	03/09/2018 14:10	Sima Feizi	03/12/2018 12:52	Beverly Y. Sanders	1972526
	03/07/2018	03/09/2018 14:10	Sima Feizi	03/12/2018 12:53	Beverly Y. Sanders	1972527
EPA 365.1 Rev. 2.0 dissolved	03/07/2018			03/07/2018 17:25	Megan Treadwell	1972520
	03/07/2018			03/07/2018 17:26	Megan Treadwell	1972521
	03/07/2018			03/07/2018 17:27	Megan Treadwell	1972522
	03/07/2018			03/07/2018 17:34	Megan Treadwell	1972523, 1972528
	03/07/2018			03/07/2018 17:35	Megan Treadwell	1972529
SM 2120 B	03/07/2018			03/07/2018 15:33	Tanya Welborn	1972512
	03/07/2018			03/07/2018 15:34	Tanya Welborn	1972513, 1972514
	03/07/2018			03/07/2018 15:35	Tanya Welborn	1972515
	03/07/2018			03/07/2018 15:39	Tanya Welborn	1972524
	03/07/2018			03/07/2018 15:40	Tanya Welborn	1972525
SM 2320 B-97	03/07/2018			03/14/2018 01:30	Dale L. Simmons	1972512
	03/07/2018			03/14/2018 01:41	Dale L. Simmons	1972513
	03/07/2018			03/14/2018 01:51	Dale L. Simmons	1972514
	03/07/2018			03/14/2018 02:01	Dale L. Simmons	1972515
	03/07/2018			03/14/2018 02:11	Dale L. Simmons	1972524
	03/07/2018			03/14/2018 03:40	Dale L. Simmons	1972525
SM 2540 C-97	03/07/2018			03/10/2018 23:15	Yijie Li	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
SM 2540 D-97	03/07/2018			03/10/2018 23:15	Yijie Li	1972512, 1972513, 1972514, 1972515, 1972524, 1972525
SM 4500 F-C-97	03/07/2018			03/14/2018 01:30	Dale L. Simmons	1972512
	03/07/2018			03/14/2018 01:41	Dale L. Simmons	1972513
	03/07/2018			03/14/2018 01:51	Dale L. Simmons	1972514
	03/07/2018			03/14/2018 02:01	Dale L. Simmons	1972515
	03/07/2018			03/14/2018 02:11	Dale L. Simmons	1972524
	03/07/2018			03/14/2018 03:40	Dale L. Simmons	1972525
SM 5310 B-00	03/07/2018			03/09/2018 08:06	Megan Treadwell	1972516
	03/07/2018			03/09/2018 08:21	Megan Treadwell	1972517
	03/07/2018			03/09/2018 08:37	Megan Treadwell	1972518
	03/07/2018			03/09/2018 08:53	Megan Treadwell	1972519
	03/07/2018			03/09/2018 09:39	Megan Treadwell	1972526
	03/07/2018			03/12/2018 19:37	Megan Treadwell	1972527