Chemical Analysis Report

NE-DIST-2018-04-13-02

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

Event Description: **Trout 2223 SCI**
Request ID: **RQ-2018-04-16-24**
Customer: **NE-DIST**
Project ID: **SMP**

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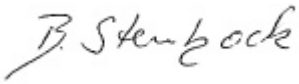
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 24-MAY-2018 15:24



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: Trout River at Garden St **Collection Date/Time: 04/12/2018 10:40**

Field ID: 21030751 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1984524	EPA 180.1 Rev. 2.0	Turbidity	6.4		NTU	P343395	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P343613	
		Sulfate	8.2		mg SO4/L	P343615	
	SM 2120 B	Color (true)	180		PCU	P343385	
	SM 2320 B-97	Total Alkalinity	9.6		mg CaCO3/L	P343950	
	SM 2540 C-97	TDS	102		mg/L	P343893	
	SM 2540 D-97	TSS	11		mg/L	P343876	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P343953	
1984525	EPA 350.1 Rev. 2.0	Ammonia-N	0.033		mg N/L	P343692	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P343635	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.056		mg N/L	P343656	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P343664	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P343561	
1984526	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.033		mg P/L	P343382	
1984530	EPA 200.7 Rev. 4.4	Calcium	8.04		mg/L	P343487	
		Iron	830		ug/L	P343487	
		Magnesium	2.14		mg/L	P343487	
		Potassium	1.8		mg/L	P343487	
		Sodium	13.0		mg/L	P343487	
		Zinc	9.6	I	ug/L	P343487	
	EPA 200.8 Rev. 5.4	Arsenic	0.44		ug/L	P343487	
		Cadmium	0.020	U	ug/L	P343487	
		Chromium	0.54	I	ug/L	P344319	
		Copper	0.55	I	ug/L	P344319	
		Lead	0.71		ug/L	P344319	
		Nickel	0.52	I	ug/L	P344319	
		Silver	0.010	U	ug/L	P343487	

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 lead result was confirmed on 04/19/2018.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343395

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343487

Component	Result	Code	Units
Calcium	0.097	I	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343487

Component	Result	Code	Units
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343487

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343613

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343615

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343692

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343635

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343656

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343664

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343382

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

Reference Method: SM 2120 B
Batch ID: P343385

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P343950

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

Reference Method: SM 2540 C-97
Batch ID: P343893

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P343876

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P343953

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343561

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: P343487

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343487

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	104		P	85 - 115
Magnesium	111		P	85 - 115
Potassium	102		P	85 - 115
Sodium	110		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343487

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	101		P	85 - 115
Silver	98.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	95.6		P	85 - 115
Copper	98.7		P	85 - 115
Lead	95.8		P	85 - 115
Nickel	95.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343613

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343615

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343692

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343635

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343656

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343656

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: P343664

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343382

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

Reference Method: SM 2320 B-97
Batch ID: P343950

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P343953

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

Reference Method: SM 5310 B-00
Batch ID: P343561

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984354	Calcium	102		P	80 - 120
1984354	Iron	104		P	80 - 120
1984354	Magnesium	108		P	80 - 120
1984354	Potassium	100		P	80 - 120
1984354	Sodium	104		P	80 - 120
1984354	Zinc	101		P	80 - 120
1984472	Calcium	105	101	P/P	80 - 120
1984472	Iron	106	103	P/P	80 - 120
1984472	Magnesium	112	109	P/P	80 - 120
1984472	Potassium	109	104	P/P	80 - 120
1984472	Sodium	106	103	P/P	80 - 120
1984472	Zinc	103	102	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984354	Arsenic	99.9		P	80 - 120
1984354	Cadmium	101		P	80 - 120
1984354	Silver	98.3		P	80 - 120
1984472	Arsenic	99.4	99.4	P/P	80 - 120
1984472	Cadmium	101	100	P/P	80 - 120
1984472	Silver	98.5	98.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1987474	Chromium	89.5	89.9	P/P	75 - 125
1987474	Copper	90.6	90.5	P/P	80 - 120
1987474	Lead	92.6	93.4	P/P	75 - 125
1987474	Nickel	90.6	91.4	P/P	75 - 125

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984415	Chloride	94.7		P	90 - 110
1984524	Chloride	95.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984415	Sulfate	94.0		P	90 - 110
1984524	Sulfate	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984513	Ammonia-N	99.4	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984513	Kjeldahl Nitrogen	90.1	92.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984422	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984513	Total-P	95.8	95.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343382

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984423	O-Phosphate-P	99.9	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P343953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984545	Fluoride	97.2	97.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343561

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984426	Organic Carbon	94.4	95.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984512	Turbidity	1.04	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984472	Calcium	2.41	Spike	P	0 - 20
1984472	Iron	2.92	Spike	P	0 - 20
1984472	Magnesium	2.59	Spike	P	0 - 20
1984472	Potassium	3.60	Spike	P	0 - 20
1984472	Sodium	1.88	Spike	P	0 - 20
1984472	Zinc	1.81	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984472	Arsenic	0.0116	Spike	P	0 - 20
1984472	Cadmium	0.984	Spike	P	0 - 20
1984472	Silver	0.541	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1987474	Chromium	0.349	Spike	P	0 - 20
1987474	Copper	0.156	Spike	P	0 - 20
1987474	Lead	0.838	Spike	P	0 - 20
1987474	Nickel	0.720	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984415	Chloride	0.00689	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984415	Sulfate	0.137	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984513	Ammonia-N	0.980	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984513	Kjeldahl Nitrogen	1.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984422	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984513	Total-P	0.438	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984423	O-Phosphate-P	0.200	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P343385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984512	Color (true)	3.69	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P343950

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984545	Total Alkalinity	0.310	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P343893

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984512	TDS	6.78	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P343953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984545	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P343561

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984426	Organic Carbon	0.453	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 365.1 Rev. 2.0 dissolved
Run ID: A83231
Included Lab Sample IDs: 1984526

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A83232
Included Lab Sample IDs: 1984524

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	99.9	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83235
Included Lab Sample IDs: 1984524

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.5	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83267
Included Lab Sample IDs: 1984524

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	98.6	P/P	90 - 110
Sulfate	98.7	99.1	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83286
Included Lab Sample IDs: 1984525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.6	97.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83301
Included Lab Sample IDs: 1984530

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.6	101	P/P	90 - 110
Iron	98.4	98.7	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	105	108	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83321
Included Lab Sample IDs: 1984525

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83326
Included Lab Sample IDs: 1984525

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83334
Included Lab Sample IDs: 1984525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83336
Included Lab Sample IDs: 1984530

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83356
Included Lab Sample IDs: 1984530

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.5	99.2	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83373
Included Lab Sample IDs: 1984525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	106	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83412
Included Lab Sample IDs: 1984530

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	97.2	99.9	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A83420
Included Lab Sample IDs: 1984524

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.6	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83420
Included Lab Sample IDs: 1984524

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83582
Included Lab Sample IDs: 1984530

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	98.6	98.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83582
Included Lab Sample IDs: 1984530

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	98.7	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83783
Included Lab Sample IDs: 1984530

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84101
Included Lab Sample IDs: 1984530

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	97.2	96.6	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		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.04	
EPA 200.7 Rev. 4.4	Calcium	104	102	105	101			2.41
	Iron	104	104	106	103			2.92
	Magnesium	111	108	112	109			2.59
	Potassium	102	100	109	104			3.60
	Sodium	110	104	106	103			1.88
	Zinc	101	101	103	102			1.81
EPA 200.8 Rev. 5.4	Arsenic	100	99.9	99.4	99.4			0.0116
	Cadmium	101	101	101	100			0.984
	Chromium	95.6	89.5	89.9				0.349
	Copper	98.7	90.6	90.5				0.156
	Lead	95.8	92.6	93.4				0.838
	Nickel	95.8	90.6	91.4				0.720
	Silver	98.8	98.3	98.5	98.0			0.541
EPA 300.0 Rev. 2.1	Chloride	94.8	94.7	95.3			0.0068	
	Sulfate	96.3	94.0	96.4			0.137	
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	99.4	98.0				0.980
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	90.1	92.1				1.35
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	102				0.487
EPA 365.1 Rev. 2.0	Total-P	104	95.8	95.2				0.438
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.9	99.7				0.200
SM 2120 B	Color (true)						3.69	
SM 2320 B-97	Total Alkalinity	101					0.310	
SM 2540 C-97	TDS						6.78	
SM 4500 F-C-97	Fluoride	95.4	97.2	97.2				0.0

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 5310 B-00	Organic Carbon	96.4	94.4	95.0			0.453

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1984524
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1984530
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1984530
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1984524
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1984524
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1984525
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1984525
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1984525
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1984525
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1984526
SM 2120 B / E31780	True Color measured at 450 nm	1984524
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1984524
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1984524
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1984524
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1984524
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1984525

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	04/13/2018			04/13/2018 15:33	Tanya Welborn	1984524
EPA 200.7 Rev. 4.4	04/13/2018	04/16/2018 17:45	Elliott D. Healy	04/17/2018 17:28	Martin Acosta	1984530
	04/13/2018	04/16/2018 17:45	Elliott D. Healy	04/18/2018 15:04	Martin Acosta	1984530
EPA 200.8 Rev. 5.4	04/13/2018	04/16/2018 17:45	Elliott D. Healy	04/19/2018 18:22	Nadine Brooks	1984530
	04/13/2018	04/16/2018 17:45	Elliott D. Healy	04/23/2018 16:38	Nadine Brooks	1984530
	04/13/2018	04/16/2018 17:45	Elliott D. Healy	05/22/2018 13:46	Robert K Palmer	1984530
	04/13/2018	04/30/2018 15:15	Elliott D. Healy	05/01/2018 19:49	Robert K Palmer	1984530
	04/13/2018	04/30/2018 15:15	Elliott D. Healy	05/09/2018 19:18	Robert K Palmer	1984530
EPA 300.0 Rev. 2.1	04/13/2018			04/17/2018 13:57	Lipi Saha	1984524
EPA 350.1 Rev. 2.0	04/13/2018			04/17/2018 13:27	Ping Hua	1984525
EPA 351.2 Rev. 2.0	04/13/2018	04/18/2018 10:10	Adrian Shelby	04/19/2018 09:26	Joseph Suarez	1984525
EPA 353.2 Rev. 2.0	04/13/2018			04/18/2018 13:26	Lauren Bottorf	1984525
EPA 365.1 Rev. 2.0	04/13/2018	04/18/2018 14:25	Sima Feizi	04/20/2018 09:21	Beverly Y. Sanders	1984525
EPA 365.1 Rev. 2.0 dissolved	04/13/2018			04/13/2018 14:45	Megan Treadwell	1984526
SM 2120 B	04/13/2018			04/13/2018 15:23	Tanya Welborn	1984524
SM 2320 B-97	04/13/2018			04/24/2018 01:22	Dale L. Simmons	1984524
SM 2540 C-97	04/13/2018			04/18/2018 16:03	Yijie Li	1984524
SM 2540 D-97	04/13/2018			04/18/2018 16:03	Yijie Li	1984524
SM 4500 F-C-97	04/13/2018			04/24/2018 01:22	Dale L. Simmons	1984524
SM 5310 B-00	04/13/2018			04/17/2018 01:36	Megan Treadwell	1984525