Chemical Analysis Report

SO-DIST-2018-04-12-01

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

Event Description: **Telegraph**
Request ID: **RQ-2018-04-09-41**
Customer: **SO-DIST**
Project ID: **SMP**

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FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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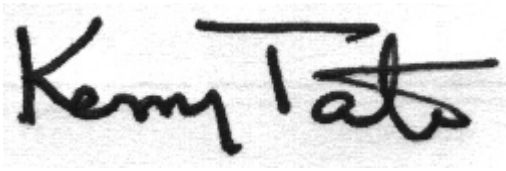
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 07-MAY-2018 14:46



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: Telegraph Swamp South **Collection Date/Time: 04/11/2018 09:35**

Field ID: G3SD0100 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1983783	EPA 180.1 Rev. 2.0	Turbidity	170		NTU	P343334	
	EPA 300.0 Rev. 2.1	Chloride	250		mg Cl/L	P343435	
		Sulfate	70		mg SO4/L	P343438	
	SM 2120 B	Color (true)	85	A	PCU	P343303	
	SM 2320 B-97	Total Alkalinity	84		mg CaCO3/L	P343812	
	SM 2540 C-97	TDS	609		mg/L	P343627	
	SM 2540 D-97	TSS	274		mg/L	P343519	
	SM 4500 F-C-97	Fluoride	0.35		mg F/L	P343816	
1983784	EPA 350.1 Rev. 2.0	Ammonia-N	8.2		mg N/L	P343688	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	21		mg N/L	P343635	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P343569	
	EPA 365.1 Rev. 2.0	Total-P	2.8		mg P/L	P344081	
	SM 5310 B-00	Organic Carbon	33		mg C/L	P343572	
1983785	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P343295	
1983794	EPA 200.7 Rev. 4.4	Calcium	66.5		mg/L	P343463	
		Iron	7.97E+03		ug/L	P343463	
		Magnesium	16.4		mg/L	P343463	
		Potassium	8.4		mg/L	P343463	
		Sodium	114		mg/L	P343463	
		Zinc	33		ug/L	P343463	
	EPA 200.8 Rev. 5.4	Arsenic	6.09		ug/L	P343463	
		Cadmium	0.055	I	ug/L	P343463	
		Chromium	2.7		ug/L	P343463	
		Copper	3.88		ug/L	P343463	
		Lead	3.96		ug/L	P343463	
		Nickel	1.20		ug/L	P343463	
		Silver	0.011	I	ug/L	P343463	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample contains large amount of particulates matter with green/black sludge appearance.

Sample Location: BLANK_04112018 **Collection Date/Time: 04/11/2018 09:40**

Field ID: BLANK_04112018 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1983786	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P343334	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P343435	
		Sulfate	0.20	U	mg SO4/L	P343438	
	SM 2120 B	Color (true)	2.5	U	PCU	P343299	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P343812	
	SM 2540 C-97	TDS	15	U	mg/L	P343627	
	SM 2540 D-97	TSS	2	U	mg/L	P343519	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P343816	
1983787	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P343688	

Field ID: BLANK_04112018 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1983787	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P343353	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P343569	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P343482	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P343572	
1983788	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P343295	
1983795	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P343463	
		Iron	30	U	ug/L	P343463	
		Magnesium	0.040	U	mg/L	P343463	
		Potassium	0.30	U	mg/L	P343463	
		Sodium	0.50	U	mg/L	P343463	
		Zinc	5.0	U	ug/L	P343463	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P343463	
		Cadmium	0.020	U	ug/L	P343463	
		Chromium	0.40	U	ug/L	P343463	
		Copper	0.20	U	ug/L	P343463	
		Lead	0.050	U	ug/L	P343463	
		Nickel	0.20	U	ug/L	P343463	
		Silver	0.010	U	ug/L	P343463	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343334

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343463

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 200.8 Rev. 5.4
Batch ID: P343463

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343463

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343435

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343438

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343688

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343353

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	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: P343569

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343482

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344081

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343295

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

Reference Method: SM 2120 B
Batch ID: P343299

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P343303

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P343812

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

Reference Method: SM 2540 C-97
Batch ID: P343627

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P343519

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343572

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: P343463

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: P343463

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	102		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	99.7		P	85 - 115
Sodium	105		P	85 - 115
Zinc	98.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343463

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	97.7		P	85 - 115
Copper	104		P	85 - 115
Lead	98.3		P	85 - 115
Nickel	104		P	85 - 115
Silver	99.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343435

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343438

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	105		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343688

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343353

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.3		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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343569

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: P343482

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344081

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: P343295

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

Reference Method: SM 2320 B-97
Batch ID: P343812

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

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.8		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343572

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983715	Calcium	108	101	P/P	80 - 120
1983715	Iron	106	99.9	P/P	80 - 120
1983715	Magnesium	109	103	P/P	80 - 120
1983715	Potassium	108	102	P/P	80 - 120
1983715	Sodium	105	99.6	P/P	80 - 120
1983715	Zinc	94.7	95.1	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983965	Calcium	102		P	80 - 120
1983965	Iron	103		P	80 - 120
1983965	Magnesium	100		P	80 - 120
1983965	Potassium	96.7		P	80 - 120
1983965	Sodium	103		P	80 - 120
1983965	Zinc	99.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983715	Arsenic	103	104	P/P	80 - 120
1983715	Cadmium	99.4	99.4	P/P	80 - 120
1983715	Chromium	97.2	98.0	P/P	80 - 120
1983715	Copper	102	103	P/P	80 - 120
1983715	Lead	96.9	97.7	P/P	80 - 120
1983715	Nickel	103	104	P/P	80 - 120
1983715	Silver	99.6	99.5	P/P	80 - 120
1983965	Arsenic	108		P	80 - 120
1983965	Cadmium	99.7		P	80 - 120
1983965	Chromium	94.0		P	80 - 120
1983965	Copper	100		P	80 - 120
1983965	Lead	100		P	80 - 120
1983965	Nickel	102		P	80 - 120
1983965	Silver	97.4		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983697	Chloride	98.7		P	90 - 110
1983952	Chloride	94.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343438

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983697	Sulfate	97.0		P	90 - 110
1983952	Sulfate	94.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343688

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983781	Ammonia-N	99.2	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343353

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983729	Kjeldahl Nitrogen	93.2	93.8	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

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: P343569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983730	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983922	Total-P	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344081

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986923	Total-P	94.8	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983723	O-Phosphate-P	97.9	97.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983728	Fluoride	96.1	96.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983558	Organic Carbon	95.1	95.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983721	Turbidity	1.38	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983715	Calcium	5.45	Spike	P	0 - 20
1983715	Iron	6.00	Spike	P	0 - 20
1983715	Magnesium	5.46	Spike	P	0 - 20
1983715	Potassium	5.98	Spike	P	0 - 20
1983715	Sodium	3.46	Spike	P	0 - 20
1983715	Zinc	0.436	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983715	Arsenic	0.465	Spike	P	0 - 20
1983715	Cadmium	0.0154	Spike	P	0 - 20
1983715	Chromium	0.855	Spike	P	0 - 20
1983715	Copper	0.639	Spike	P	0 - 20
1983715	Lead	0.824	Spike	P	0 - 20
1983715	Nickel	0.929	Spike	P	0 - 20
1983715	Silver	0.0950	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983697	Chloride	0.0356	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983697	Sulfate	0.135	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343688

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983781	Ammonia-N	2.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343353

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983729	Kjeldahl Nitrogen	0.413	Spike	P	0 - 20

Quality Assurance Report
Precision

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: P343569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983730	NO2NO3-N	0.471	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983922	Total-P	0.0838	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986923	Total-P	0.112	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983723	O-Phosphate-P	0.821	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P343299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983728	Color (true)	1.95	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P343303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983783	Color (true)	0.911	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P343812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983728	Total Alkalinity	0.445	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P343627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983799	TDS	2.33	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P343816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983728	Fluoride	0.480	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P343572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983558	Organic Carbon	0.320	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: A83196
Included Lab Sample IDs: 1983785, 1983788

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.7	P/P	90 - 110
O-Phosphate-P	99.7	100	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A83198
Included Lab Sample IDs: 1983783, 1983786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.7	P/P	90 - 115
Color (true)	99.1	98.4	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83212
Included Lab Sample IDs: 1983783, 1983786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83234
Included Lab Sample IDs: 1983783, 1983786

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83234
Included Lab Sample IDs: 1983783, 1983786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.5	P/P	90 - 110
Sulfate	102	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83278
Included Lab Sample IDs: 1983787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.3	99.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83287
Included Lab Sample IDs: 1983784, 1983787

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

Reference Method: SM 5310 B-00
Run ID: A83288
Included Lab Sample IDs: 1983784, 1983787

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83296
Included Lab Sample IDs: 1983794, 1983795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	100	P/P	95 - 105
Calcium	95.1	100	P/P	90 - 110
Iron	103	99.6	P/P	95 - 105
Iron	95.8	98.7	P/P	90 - 110
Magnesium	102	99.6	P/P	95 - 105
Magnesium	95.5	98.8	P/P	90 - 110
Potassium	101	98.7	P/P	95 - 105
Potassium	96.6	97.7	P/P	90 - 110
Sodium	102	99.5	P/P	95 - 105
Sodium	97.8	100	P/P	90 - 110
Zinc	101	99.3	P/P	95 - 105
Zinc	94.7	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83326
Included Lab Sample IDs: 1983784, 1983787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	101	P/P	90 - 110
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: 1983784

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.5	92.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83340
Included Lab Sample IDs: 1983787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A83371
Included Lab Sample IDs: 1983783, 1983786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	99.0	P/P	90 - 110
Total Alkalinity	99.0	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83371
Included Lab Sample IDs: 1983783, 1983786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	100	P/P	90 - 110
Fluoride	98.5	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83389
Included Lab Sample IDs: 1983794, 1983795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	104	104	P/P	90 - 110
Arsenic	106	105	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110
Cadmium	103	102	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Chromium	102	100	P/P	90 - 110
Copper	105	105	P/P	90 - 110
Copper	105	102	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Nickel	103	102	P/P	90 - 110
Nickel	105	104	P/P	90 - 110
Silver	101	100	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83544
Included Lab Sample IDs: 1983784

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	106	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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						1.38	
EPA 200.7 Rev. 4.4	Calcium	105	108	101	102			5.45
	Iron	102	106	99.9	103			6.00
	Magnesium	106	109	103	100			5.46
	Potassium	99.7	108	102	96.7			5.98
	Sodium	105	105	99.6	103			3.46
	Zinc	98.3	94.7	95.1	99.3			0.436
EPA 200.8 Rev. 5.4	Arsenic	104	103	104	108			0.465
	Cadmium	100	99.4	99.4	99.7			0.0154
	Chromium	97.7	97.2	98.0	94.0			0.855
	Copper	104	102	103	100			0.639
	Lead	98.3	96.9	97.7	100			0.824
	Nickel	104	103	104	102			0.929
	Silver	99.7	99.6	99.5	97.4			0.0950
EPA 300.0 Rev. 2.1	Chloride	98.4	98.7	94.7			0.0356	
	Sulfate	105	97.0	94.7			0.135	
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	99.2	96.0				2.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.3	93.2	93.8				0.413
	Kjeldahl Nitrogen	103	90.1	92.1				1.35
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	101				0.471
EPA 365.1 Rev. 2.0	Total-P	105	105	105				0.0838
	Total-P	103	94.8	94.6				0.112
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.9	97.1				0.821
SM 2120 B	Color (true)						1.95	
	Color (true)						0.911	
SM 2320 B-97	Total Alkalinity	101					0.445	
SM 2540 C-97	TDS						2.33	
SM 4500 F-C-97	Fluoride	94.8	96.1	96.9				0.480
SM 5310 B-00	Organic Carbon	99.0	95.1	95.6				0.320

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1983783, 1983786
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1983794, 1983795
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1983794, 1983795
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1983783, 1983786
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1983783, 1983786
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1983784, 1983787
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1983784, 1983787

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	1983784, 1983787
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1983784, 1983787
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1983785, 1983788
SM 2120 B / E31780	True Color measured at 450 nm	1983783, 1983786
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1983783, 1983786
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1983783, 1983786
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1983783, 1983786
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1983783, 1983786
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1983784, 1983787

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	04/12/2018			04/12/2018 17:21	William L. Brown IV	1983783, 1983786
EPA 200.7 Rev. 4.4	04/12/2018	04/16/2018 13:30	Elliott D. Healy	04/17/2018 12:04	Betina Topolski	1983795
	04/12/2018	04/16/2018 13:30	Elliott D. Healy	04/17/2018 14:46	Betina Topolski	1983794
EPA 200.8 Rev. 5.4	04/12/2018	04/16/2018 13:30	Elliott D. Healy	04/20/2018 14:59	Nadine Brooks	1983795
	04/12/2018	04/16/2018 13:30	Elliott D. Healy	04/20/2018 18:41	Nadine Brooks	1983794
EPA 300.0 Rev. 2.1	04/12/2018			04/14/2018 08:14	Lipi Saha	1983783
	04/12/2018			04/14/2018 08:26	Lipi Saha	1983786
EPA 350.1 Rev. 2.0	04/12/2018			04/17/2018 11:28	Ping Hua	1983787
	04/12/2018			04/17/2018 13:45	Ping Hua	1983784
EPA 351.2 Rev. 2.0	04/12/2018	04/13/2018 10:00	Adrian Shelby	04/17/2018 11:46	Joseph Suarez	1983787
	04/12/2018	04/18/2018 10:10	Adrian Shelby	04/19/2018 10:34	Joseph Suarez	1983784
EPA 353.2 Rev. 2.0	04/12/2018			04/17/2018 13:50	Lauren Bottorf	1983787
	04/12/2018			04/17/2018 13:53	Lauren Bottorf	1983784
EPA 365.1 Rev. 2.0	04/12/2018	04/16/2018 13:16	Sima Feizi	04/19/2018 12:11	Beverly Y. Sanders	1983787
	04/12/2018	04/26/2018 12:50	Sima Feizi	04/30/2018 11:20	Beverly Y. Sanders	1983784
EPA 365.1 Rev. 2.0 dissolved	04/12/2018			04/12/2018 14:25	Megan Treadwell	1983785
	04/12/2018			04/12/2018 14:30	Megan Treadwell	1983788
SM 2120 B	04/12/2018			04/12/2018 15:26	Tanya Welborn	1983786
	04/12/2018			04/12/2018 16:14	Tanya Welborn	1983783
SM 2320 B-97	04/12/2018			04/19/2018 23:58	Dale L. Simmons	1983786
	04/12/2018			04/20/2018 01:00	Dale L. Simmons	1983783
SM 2540 C-97	04/12/2018			04/13/2018 13:20	DeAsia Armster	1983783, 1983786
SM 2540 D-97	04/12/2018			04/13/2018 13:20	DeAsia Armster	1983783, 1983786
SM 4500 F-C-97	04/12/2018			04/19/2018 23:58	Dale L. Simmons	1983786
	04/12/2018			04/20/2018 01:00	Dale L. Simmons	1983783
SM 5310 B-00	04/12/2018			04/16/2018 20:25	Megan Treadwell	1983784
	04/12/2018			04/16/2018 20:37	Megan Treadwell	1983787