

Chemical Analysis Report

NE-DIST-2019-04-25-01

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

Event Description: **Suwannee Central**
Request ID: **RQ-2019-04-22-14**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 14-MAY-2019 11:02

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first 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 by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: Sunshine Lake Center

Collection Date/Time: 04/24/2019 10:40

Field ID: G1NE0857

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2080943	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P362879	
	EPA 300.0 Rev. 2.1	Chloride	6.7		mg Cl/L	P363140	
		Sulfate	1.5		mg SO4/L	P363141	
	SM 2120 B	Color (true)	110		PCU	P362890	
	SM 2320 B-97	Total Alkalinity	10		mg CaCO3/L	P363360	
	SM 2540 C-97	TDS	59		mg/L	P363233	
	SM 2540 D-97	TSS	2	U	mg/L	P363123	
	SM 4500 F-C-97	Fluoride	0.098	I	mg F/L	P363364	
2080944	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P363135	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P363097	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P363009	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P363060	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P363083	
2080945	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.082		mg P/L	P362870	
2080961	EPA 200.7 Rev. 4.4	Barium	3.4	I	ug/L	P362970	
		Calcium	6.21		mg/L	P362970	
		Iron	200		ug/L	P362970	
		Magnesium	1.31		mg/L	P362970	
		Potassium	0.65	I	mg/L	P362970	
		Sodium	4.3		mg/L	P362970	
		Zinc	5.0	U	ug/L	P362970	
		Aluminum	103		ug/L	P362970	
		Antimony	0.050	U	ug/L	P362970	
		Arsenic	0.71		ug/L	P362970	
	EPA 200.8 Rev. 5.4	Boron**	15.2		ug/L	P362970	
		Cadmium	0.020	U	ug/L	P362970	
		Chromium	0.40	U	ug/L	P362970	
		Copper	0.40	U	ug/L	P362970	
		Lead	0.20	U	ug/L	P362970	
		Nickel	0.50	U	ug/L	P362970	
		Selenium	0.20	U	ug/L	P362970	
		Silver	0.010	U	ug/L	P362970	
		Thallium	0.10	U	ug/L	P362970	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Five Mile Cr. At SW 150th blvd

Collection Date/Time: 04/24/2019 10:05

Field ID: G1NE0919

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2080946	EPA 180.1 Rev. 2.0	Turbidity	2.6	A	NTU	P362879	
	EPA 300.0 Rev. 2.1	Chloride	9.5		mg Cl/L	P363140	
		Sulfate	0.58	I	mg SO4/L	P363141	
	SM 2120 B	Color (true)	330		PCU	P362890	
	SM 2320 B-97	Total Alkalinity	13		mg CaCO3/L	P363360	
	SM 2540 C-97	TDS	113		mg/L	P363233	
	SM 2540 D-97	TSS	2	I	mg/L	P363123	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P363364	
2080947	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P363135	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99		mg N/L	P363097	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P363009	
	EPA 365.1 Rev. 2.0	Total-P	0.47		mg P/L	P363060	
	SM 5310 B-00	Organic Carbon	31		mg C/L	P363083	
2080948	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.40		mg P/L	P362870	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: Calf Creek at SE 27th st.

Collection Date/Time: 04/24/2019 12:15

Field ID: G1NE0931

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2080940	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P362879	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P363140	
		Sulfate	6.8		mg SO4/L	P363141	
	SM 2120 B	Color (true)	70	A	PCU	P362890	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P363359	
	SM 2540 C-97	TDS	182	A	mg/L	P363233	
	SM 2540 D-97	TSS	2	UA	mg/L	P363123	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P363554	
2080941	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P363135	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.43		mg N/L	P363097	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P363009	
	EPA 365.1 Rev. 2.0	Total-P	0.096		mg P/L	P363060	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P363083	
2080942	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.076		mg P/L	P362870	
2080960	EPA 200.7 Rev. 4.4	Barium	11.1		ug/L	P362970	
		Calcium	38.6		mg/L	P362970	
		Iron	320		ug/L	P362970	
		Magnesium	10.9		mg/L	P362970	
		Potassium	0.82	I	mg/L	P362970	
		Sodium	8.6		mg/L	P362970	
		Zinc	5.0	U	ug/L	P362970	
	EPA 200.8 Rev. 5.4	Aluminum	88		ug/L	P362970	
		Antimony	0.075	I	ug/L	P362970	
		Arsenic	1.24		ug/L	P362970	
		Boron**	24.7		ug/L	P362970	
		Cadmium	0.020	U	ug/L	P362970	
		Chromium	0.45	I	ug/L	P362970	
		Copper	0.40	U	ug/L	P362970	
		Lead	0.20	U	ug/L	P362970	
		Nickel	0.50	U	ug/L	P362970	
		Selenium	0.20	U	ug/L	P362970	
		Silver	0.010	U	ug/L	P362970	
		Thallium	0.10	U	ug/L	P362970	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P362879

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362970

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362970

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363140

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363141

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363135

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363097

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363009

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363060

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362870

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

Reference Method: SM 2120 B
Batch ID: P362890

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P363359

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

Reference Method: SM 2320 B-97
Batch ID: P363360

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

Reference Method: SM 2540 C-97
Batch ID: P363233

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P363123

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P363364

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P363554

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P363083

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: P362970

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	105		P	85 - 115
Calcium	103		P	85 - 115
Iron	109		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	103		P	85 - 115
Sodium	101		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362970

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.1		P	85 - 115
Antimony	97.0		P	85 - 115
Arsenic	99.9		P	85 - 115
Boron	97.6		P	85 - 115
Cadmium	99.5		P	85 - 115
Chromium	92.0		P	85 - 115
Copper	100		P	85 - 115
Lead	92.1		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	101		P	85 - 115
Silver	104		P	85 - 115
Thallium	94.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363140

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363141

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363135

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363097

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363009

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363060

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: P362870

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.7		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P362890

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

Reference Method: SM 2320 B-97
Batch ID: P363359

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 106

Reference Method: SM 2320 B-97
Batch ID: P363360

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P363364

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P363554

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P363083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080969	Barium	100	98.4	P/P	80 - 120
2080969	Calcium	105		P	80 - 120
2080969	Iron	105	104	P/P	80 - 120
2080969	Magnesium	105		P	80 - 120
2080969	Potassium	107		P	80 - 120
2080969	Sodium	106		P	80 - 120
2080969	Zinc	101	99.2	P/P	80 - 120
2081162	Barium	98.2		P	80 - 120
2081162	Calcium	101		P	80 - 120
2081162	Iron	101		P	80 - 120
2081162	Magnesium	106		P	80 - 120
2081162	Potassium	98.7		P	80 - 120
2081162	Zinc	107		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080969	Aluminum	96.7	96.9	P/P	80 - 120
2080969	Antimony	100	98.3	P/P	80 - 120
2080969	Arsenic	100	100	P/P	80 - 120
2080969	Boron	98.7	99.4	P/P	80 - 120
2080969	Cadmium	100	100	P/P	80 - 120
2080969	Chromium	88.6	87.3	P/P	80 - 120
2080969	Copper	95.5	95.4	P/P	80 - 120
2080969	Lead	93.1	92.9	P/P	80 - 120
2080969	Nickel	91.8	90.8	P/P	80 - 120
2080969	Selenium	99.1	99.9	P/P	80 - 120
2080969	Silver	102	101	P/P	80 - 120
2080969	Thallium	98.0	100	P/P	80 - 120
2081162	Aluminum	101		P	80 - 120
2081162	Antimony	101		P	80 - 120
2081162	Arsenic	102		P	80 - 120
2081162	Cadmium	101		P	80 - 120
2081162	Chromium	83.3		P	80 - 120
2081162	Copper	97.7		P	80 - 120
2081162	Lead	95.4		P	80 - 120
2081162	Nickel	89.4		P	80 - 120
2081162	Selenium	96.7		P	80 - 120
2081162	Silver	100		P	80 - 120
2081162	Thallium	98.1		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363140

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080943	Chloride	99.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363141

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080611	Sulfate	98.2		P	90 - 110
2080943	Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080978	Ammonia-N	98.5	96.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080857	Kjeldahl Nitrogen	105	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363009

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080856	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363060

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080978	Total-P	107	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362870

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080889	O-Phosphate-P	97.1	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P363364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080993	Fluoride	97.9	100	P/P	89 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P363554

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080442	Fluoride	97.0	97.7	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P363083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080928	Organic Carbon	101	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P362879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080946	Turbidity	12.9	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P362970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080969	Barium	1.71	Spike	P	0 - 20
2080969	Calcium	0.719	Spike	P	0 - 20
2080969	Iron	0.718	Spike	P	0 - 20
2080969	Magnesium	1.20	Spike	P	0 - 20
2080969	Potassium	0.904	Spike	P	0 - 20
2080969	Sodium	0.116	Spike	P	0 - 20
2080969	Zinc	1.93	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P362970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080969	Aluminum	0.261	Spike	P	0 - 20
2080969	Antimony	1.66	Spike	P	0 - 20
2080969	Arsenic	0.432	Spike	P	0 - 20
2080969	Boron	0.395	Spike	P	0 - 20
2080969	Cadmium	0.201	Spike	P	0 - 20
2080969	Chromium	1.39	Spike	P	0 - 20
2080969	Copper	0.0636	Spike	P	0 - 20
2080969	Lead	0.247	Spike	P	0 - 20
2080969	Nickel	1.10	Spike	P	0 - 20
2080969	Selenium	0.881	Spike	P	0 - 20
2080969	Silver	1.01	Spike	P	0 - 20
2080969	Thallium	1.95	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080611	Chloride	0.977	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080611	Sulfate	0.805	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080978	Ammonia-N	1.45	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080857	Kjeldahl Nitrogen	2.14	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363009

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080856	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363060

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080978	Total-P	3.69	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362870

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080889	O-Phosphate-P	1.53	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P362890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080940	Color (true)	1.25	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P363359

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080442	Total Alkalinity	2.11	Sample	P	0 - 2.8

Reference Method: SM 2320 B-97
Batch ID: P363360

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080993	Total Alkalinity	2.57	Sample	P	0 - 2.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P363233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080940	TDS	2.20	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P363364

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080993	Fluoride	1.95	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
Batch ID: P363554

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080442	Fluoride	0.513	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P363083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080928	Organic Carbon	0.571	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: A91004

Included Lab Sample IDs: 2080942, 2080945, 2080948

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.6	95.7	P/P	90 - 110
O-Phosphate-P	97.5	96.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A91005

Included Lab Sample IDs: 2080940, 2080943, 2080946

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A91012

Included Lab Sample IDs: 2080940, 2080943, 2080946

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115
Color (true)	98.5	101	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91059

Included Lab Sample IDs: 2080941, 2080944, 2080947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.0	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A91089

Included Lab Sample IDs: 2080941, 2080944, 2080947

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A91099

Included Lab Sample IDs: 2080960, 2080961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	105	P/P	90 - 110
Calcium	103	106	P/P	90 - 110
Iron	104	106	P/P	90 - 110
Magnesium	104	106	P/P	90 - 110
Potassium	104	107	P/P	90 - 110
Sodium	106	109	P/P	90 - 110
Zinc	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91100

Included Lab Sample IDs: 2080941, 2080944, 2080947

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A91105

Included Lab Sample IDs: 2080940, 2080943, 2080946

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91112

Included Lab Sample IDs: 2080941, 2080944, 2080947

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

Reference Method: SM 2320 B-97

Run ID: A91204

Included Lab Sample IDs: 2080940, 2080943, 2080946

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.8	P/P	90 - 110
Total Alkalinity	99.8	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A91204

Included Lab Sample IDs: 2080943, 2080946

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A91214

Included Lab Sample IDs: 2080941, 2080944, 2080947

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91215

Included Lab Sample IDs: 2080960, 2080961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	104	103	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	102	100	P/P	90 - 110
Boron	106	105	P/P	90 - 110
Cadmium	102	104	P/P	90 - 110
Chromium	98.4	99.6	P/P	90 - 110
Lead	97.6	98.2	P/P	90 - 110
Nickel	97.4	98.2	P/P	90 - 110
Selenium	103	103	P/P	90 - 110
Silver	103	105	P/P	90 - 110
Thallium	92.7	94.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A91266

Included Lab Sample IDs: 2080940

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91334

Included Lab Sample IDs: 2080960, 2080961

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	98.9	99.3	P/P	90 - 110

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

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					12.9	
EPA 200.7 Rev. 4.4	Barium	105	100	98.4	98.2		1.71
	Calcium	103	105	101			0.719
	Iron	109	105	104	101		0.718
	Magnesium	102	105	106			1.20
	Potassium	103	98.7	107			0.904
	Sodium	101	106				0.116
	Zinc	105	101	99.2	107		1.93
EPA 200.8 Rev. 5.4	Aluminum	96.1	96.7	96.9	101		0.261
	Antimony	97.0	100	98.3	101		1.66
	Arsenic	99.9	100	100	102		0.432
	Boron	97.6	98.7	99.4			0.395
	Cadmium	99.5	100	100	101		0.201
	Chromium	92.0	88.6	87.3	83.3		1.39
	Copper	100	95.5	95.4	97.7		0.0636
	Lead	92.1	93.1	92.9	95.4		0.247
	Nickel	98.7	91.8	90.8	89.4		1.10
	Selenium	101	99.1	99.9	96.7		0.881
	Silver	104	102	101	100		1.01
	Thallium	94.8	98.0	100	98.1		1.95
EPA 300.0 Rev. 2.1	Chloride	99.9	99.2			0.977	
	Sulfate	100	98.2	99.7		0.805	
EPA 350.1 Rev. 2.0	Ammonia-N	103	98.5	96.9			1.45
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	105	101			2.14
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	103	107	103			3.69
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	97.1	98.6			1.53
SM 2120 B	Color (true)	99.1				1.25	
SM 2320 B-97	Total Alkalinity	101				2.11	
	Total Alkalinity	101				2.57	
SM 2540 C-97	TDS					2.20	
SM 4500 F-C-97	Fluoride	97.6	97.9	100			1.95
	Fluoride	96.5	97.0	97.7			0.513
SM 5310 B-00	Organic Carbon	99.4	101	100			0.571

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2080940, 2080943, 2080946
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2080960, 2080961
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2080960, 2080961
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2080940, 2080943, 2080946
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2080940, 2080943, 2080946
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2080941, 2080944, 2080947
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2080941, 2080944, 2080947
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2080941, 2080944, 2080947

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2080941, 2080944, 2080947
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2080942, 2080945, 2080948
SM 2120 B / E31780	True Color measured at 450 nm	2080940, 2080943, 2080946
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2080940, 2080943, 2080946
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2080940, 2080943, 2080946
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2080940, 2080943, 2080946
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2080940, 2080943, 2080946
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2080941, 2080944, 2080947

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	04/25/2019			04/25/2019 18:32	Julia Storbeck	2080940, 2080943, 2080946
EPA 200.7 Rev. 4.4	04/25/2019	04/29/2019 13:15	Alexander Thompson	04/30/2019 13:24	Betina Topolski	2080960
	04/25/2019	04/29/2019 13:15	Alexander Thompson	04/30/2019 13:29	Betina Topolski	2080961
EPA 200.8 Rev. 5.4	04/25/2019	04/29/2019 13:15	Alexander Thompson	05/02/2019 21:44	Robert K Palmer	2080960
	04/25/2019	04/29/2019 13:15	Alexander Thompson	05/02/2019 21:54	Robert K Palmer	2080961
	04/25/2019	04/29/2019 13:15	Alexander Thompson	05/09/2019 19:13	Robert K Palmer	2080960
	04/25/2019	04/29/2019 13:15	Alexander Thompson	05/09/2019 19:21	Robert K Palmer	2080961
EPA 300.0 Rev. 2.1	04/25/2019			04/30/2019 16:53	Lipi Saha	2080943
	04/25/2019			04/30/2019 19:18	Lipi Saha	2080940
	04/25/2019			04/30/2019 19:30	Lipi Saha	2080946
EPA 350.1 Rev. 2.0	04/25/2019			04/30/2019 12:32	Ping Hua	2080941
	04/25/2019			04/30/2019 12:33	Ping Hua	2080944
	04/25/2019			04/30/2019 12:35	Ping Hua	2080947
EPA 351.2 Rev. 2.0	04/25/2019	04/30/2019 12:15	Adrian Shelby	05/06/2019 10:00	Joseph Suarez	2080941
	04/25/2019	04/30/2019 12:15	Adrian Shelby	05/06/2019 10:05	Joseph Suarez	2080944
	04/25/2019	04/30/2019 12:15	Adrian Shelby	05/06/2019 10:06	Joseph Suarez	2080947
EPA 353.2 Rev. 2.0	04/25/2019			04/29/2019 10:59	Beverly Y. Sanders	2080941
	04/25/2019			04/29/2019 11:00	Beverly Y. Sanders	2080944
	04/25/2019			04/29/2019 11:01	Beverly Y. Sanders	2080947
EPA 365.1 Rev. 2.0	04/25/2019	04/29/2019 13:45	Sima Feizi	04/30/2019 14:44	Rosalyn Ballman	2080941
	04/25/2019	04/29/2019 13:45	Sima Feizi	04/30/2019 14:45	Rosalyn Ballman	2080944
	04/25/2019	04/29/2019 13:45	Sima Feizi	04/30/2019 14:46	Rosalyn Ballman	2080947
EPA 365.1 Rev. 2.0 dissolved	04/25/2019			04/25/2019 15:51	Jhamieka S. Greenwood	2080942
	04/25/2019			04/25/2019 15:52	Jhamieka S. Greenwood	2080945
	04/25/2019			04/25/2019 16:07	Jhamieka S. Greenwood	2080948
SM 2120 B	04/25/2019			04/25/2019 15:03	Blanca Fach	2080940
	04/25/2019			04/25/2019 15:04	Blanca Fach	2080943
	04/25/2019			04/25/2019 15:29	Blanca Fach	2080946
SM 2320 B-97	04/25/2019			05/04/2019 05:33	Samantha Davila	2080940
	04/25/2019			05/04/2019 08:19	Samantha Davila	2080946
	04/25/2019			05/04/2019 09:21	Samantha Davila	2080943
SM 2540 C-97	04/25/2019			04/29/2019 17:35	Mariam Hanna	2080940, 2080943, 2080946
SM 2540 D-97	04/25/2019			04/29/2019 20:05	Mariam Hanna	2080940, 2080943, 2080946
SM 4500 F-C-97	04/25/2019			05/04/2019 08:19	Samantha Davila	2080946
	04/25/2019			05/04/2019 09:21	Samantha Davila	2080943
	04/25/2019			05/07/2019 17:22	Dale L. Simmons	2080940
SM 5310 B-00	04/25/2019			04/29/2019 21:01	Julia Storbeck	2080941
	04/25/2019			04/29/2019 21:14	Julia Storbeck	2080944
	04/25/2019			04/29/2019 21:26	Julia Storbeck	2080947