

Chemical Analysis Report

NE-DIST-2018-11-28-01

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

Event Description: **LSJR SW**
Request ID: **RQ-2018-11-26-18**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256-7577
Attn: Jeremy Parrish

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 18-DEC-2018 16:21



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: Little Black Creek @ SR220

Collection Date/Time: 11/27/2018 09:30

Field ID: 20030667

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2043940	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P355266	
	EPA 300.0 Rev. 2.1	Chloride	23	A	mg Cl/L	P355687	
		Sulfate	9.0	A	mg SO4/L	P355689	
	SM 2120 B	Color (true)	130		PCU	P355252	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P355559	
	SM 2540 C-97	TDS	106		mg/L	P355726	
	SM 2540 D-97	TSS	3	I	mg/L	P355820	
	SM 4500 F-C-97	Fluoride	0.058	I	mg F/L	P355562	
2043942	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P355446	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P355701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P355334	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P355319	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P355424	
2043944	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.01	I	mg P/L	P355295	

Ref. Method and Comment:

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

Sample Location: Mill Log at Russell Rd

Collection Date/Time: 11/27/2018 10:40

Field ID: G2NE1150

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2043946	EPA 180.1 Rev. 2.0	Turbidity	9.3		NTU	P355267	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P355687	
		Sulfate	16		mg SO4/L	P355689	
		Color (true)	140		PCU	P355252	
	SM 2320 B-97	Total Alkalinity	34		mg CaCO3/L	P355559	
	SM 2540 C-97	TDS	119		mg/L	P355726	
	SM 2540 D-97	TSS	4	I	mg/L	P355820	
	SM 4500 F-C-97	Fluoride	0.066	I	mg F/L	P355562	
2043948	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P355444	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P355701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.073		mg N/L	P355334	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P355320	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P355424	
2043950	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P355295	
2043972	EPA 200.7 Rev. 4.4	Calcium	19.0		mg/L	P355304	
		Iron	500		ug/L	P355304	
		Magnesium	3.93		mg/L	P355304	
		Potassium	7.8		mg/L	P355304	
		Sodium	12.6		mg/L	P355304	
		Zinc	5.0	U	ug/L	P355304	
	EPA 200.8 Rev. 5.4	Arsenic	0.60		ug/L	P355304	
		Cadmium	0.020	U	ug/L	P355304	
		Chromium	0.78	I	ug/L	P355304	
		Copper	0.55	I	ug/L	P355304	
		Lead	0.34		ug/L	P355304	
		Nickel	0.40	I	ug/L	P355304	
		Silver	0.010	U	ug/L	P355304	

Ref. Method and Comment:

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

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

Sample Location: MILL LOG CREEK @ CR 739B(SANDRIDGE RD) Collection Date/Time: 11/27/2018 11:00

Field ID: 20030569

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2043947	EPA 180.1 Rev. 2.0	Turbidity	5.9		NTU	P355267	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P355687	
		Sulfate	12		mg SO4/L	P355689	
		Color (true)	140		PCU	P355253	
	SM 2320 B-97	Total Alkalinity	9.6		mg CaCO3/L	P355559	
	SM 2540 C-97	TDS	118		mg/L	P355726	
	SM 2540 D-97	TSS	4	I	mg/L	P355820	
	SM 4500 F-C-97	Fluoride	0.063	I	mg F/L	P355562	
2043949	EPA 350.1 Rev. 2.0	Ammonia-N	0.056		mg N/L	P355444	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P355701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.090		mg N/L	P355334	
	EPA 365.1 Rev. 2.0	Total-P	0.32		mg P/L	P355320	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P355424	
2043951	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.26		mg P/L	P355298	
2043973	EPA 200.7 Rev. 4.4	Calcium	7.72		mg/L	P355304	
		Iron	520		ug/L	P355304	
		Magnesium	4.40		mg/L	P355304	
		Potassium	7.4		mg/L	P355304	
		Sodium	13.1		mg/L	P355304	
		Zinc	7.7	I	ug/L	P355304	
	EPA 200.8 Rev. 5.4	Arsenic	0.30		ug/L	P355304	
		Cadmium	0.020	U	ug/L	P355304	
		Chromium	2.5		ug/L	P355304	
		Copper	0.37	I	ug/L	P355304	
		Lead	0.23		ug/L	P355304	
		Nickel	0.48	I	ug/L	P355304	
		Silver	0.010	U	ug/L	P355304	

Ref. Method and Comment:

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

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

Sample Location: MILL CR @ SR 16

Collection Date/Time: 11/27/2018 12:10

Field ID: 20030474

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2043941	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P355266	
	EPA 300.0 Rev. 2.1	Chloride	97		mg Cl/L	P355687	
		Sulfate	100		mg SO4/L	P355689	
	SM 2120 B	Color (true)	36	A	PCU	P355252	
	SM 2320 B-97	Total Alkalinity	116		mg CaCO3/L	P355559	
	SM 2540 C-97	TDS	442	A	mg/L	P355726	
	SM 2540 D-97	TSS	4	IA	mg/L	P355820	
	SM 4500 F-C-97	Fluoride	0.33		mg F/L	P355562	
2043943	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P355443	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.97		mg N/L	P355701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.28		mg N/L	P355334	
	EPA 365.1 Rev. 2.0	Total-P	0.21		mg P/L	P355319	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P355424	
2043945	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P355295	

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: P355266

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355267

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355304

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: P355304

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355687

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355689

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355443

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355444

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355446

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355701

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355334

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355319

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355320

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355295

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355298

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

Reference Method: SM 2120 B
Batch ID: P355252

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2120 B
Batch ID: P355253

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P355559

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P355726

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P355820

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P355562

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P355424

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: P355304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	102		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	95.6		P	85 - 115
Sodium	101		P	85 - 115
Zinc	95.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	108		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	103		P	85 - 115
Copper	106		P	85 - 115
Lead	99.9		P	85 - 115
Nickel	105		P	85 - 115
Silver	105		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355687

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355689

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355443

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355444

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355446

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355701

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355334

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: P355319

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355320

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355295

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355298

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

Reference Method: SM 2120 B
Batch ID: P355252

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

Reference Method: SM 2120 B
Batch ID: P355253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P355559

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P355562

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

Reference Method: SM 5310 B-00
Batch ID: P355424

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043856	Calcium	108		P	80 - 120
2043856	Iron	107		P	80 - 120
2043856	Magnesium	104		P	80 - 120
2043856	Potassium	101		P	80 - 120
2043856	Sodium	105		P	80 - 120
2043856	Zinc	94.6		P	80 - 120
2043929	Iron	109	95.7	P/P	80 - 120
2043929	Magnesium	109	94.4	P/P	80 - 120
2043929	Potassium	99.7	92.4	P/P	80 - 120
2043929	Sodium	102		P	80 - 120
2043929	Zinc	101	88.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043856	Arsenic	106		P	80 - 120
2043856	Cadmium	109		P	80 - 120
2043856	Chromium	102		P	80 - 120
2043856	Copper	98.8		P	80 - 120
2043856	Lead	101		P	80 - 120
2043856	Nickel	101		P	80 - 120
2043856	Silver	107		P	80 - 120
2043929	Arsenic	110	109	P/P	80 - 120
2043929	Cadmium	112	107	P/P	80 - 120
2043929	Chromium	104	104	P/P	80 - 120
2043929	Copper	102	102	P/P	80 - 120
2043929	Lead	103	104	P/P	80 - 120
2043929	Nickel	102	102	P/P	80 - 120
2043929	Silver	106	107	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043940	Chloride	99.6		P	90 - 110
2043947	Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043940	Sulfate	100		P	90 - 110
2043947	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043879	Ammonia-N	99.4	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355444

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043989	Ammonia-N	97.1	97.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355446

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2044031	Ammonia-N	105	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043986	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043942	NO2NO3-N	95.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043943	Total-P	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355320

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043986	Total-P	98.6	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043916	O-Phosphate-P	97.3	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355298

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2044036	O-Phosphate-P	98.9	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P355562

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2044762	Fluoride	98.3	99.0	P/P	91 - 105

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P355424

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043814	Organic Carbon	97.0		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043892	Turbidity	3.12	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2044018	Turbidity	2.21	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043929	Calcium	0.459	Spike	P	0 - 20
2043929	Iron	11.7	Spike	P	0 - 20
2043929	Magnesium	7.50	Spike	P	0 - 20
2043929	Potassium	5.51	Spike	P	0 - 20
2043929	Sodium	2.77	Spike	P	0 - 20
2043929	Zinc	13.5	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043929	Arsenic	1.30	Spike	P	0 - 20
2043929	Cadmium	5.13	Spike	P	0 - 20
2043929	Chromium	0.223	Spike	P	0 - 20
2043929	Copper	0.365	Spike	P	0 - 20
2043929	Lead	0.601	Spike	P	0 - 20
2043929	Nickel	0.318	Spike	P	0 - 20
2043929	Silver	0.959	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043940	Chloride	0.353	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043940	Sulfate	0.131	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043879	Ammonia-N	0.933	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355444

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043989	Ammonia-N	0.340	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355446

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2044031	Ammonia-N	1.79	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043986	Kjeldahl Nitrogen	0.432	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043942	NO2NO3-N	5.63	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043943	Total-P	1.83	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355320

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043986	Total-P	0.0248	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043916	O-Phosphate-P	1.73	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355298

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2044036	O-Phosphate-P	0.906	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043941	Color (true)	0.463	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043988	Color (true)	0.755	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P355559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2044762	Total Alkalinity	0.394	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P355726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043941	TDS	3.39	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P355562

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2044762	Fluoride	0.470	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P355424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043814	Organic Carbon	0.771	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A88016

Included Lab Sample IDs: 2043940, 2043941, 2043946, 2043947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	105	P/P	90 - 115
Color (true)	102	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88018

Included Lab Sample IDs: 2043940, 2043941, 2043946, 2043947

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88035

Included Lab Sample IDs: 2043944, 2043945, 2043950, 2043951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	99.6	99.3	P/P	90 - 110
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88043

Included Lab Sample IDs: 2043942, 2043943, 2043948, 2043949

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: A88068

Included Lab Sample IDs: 2043942, 2043943, 2043948, 2043949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.8	95.0	P/P	90 - 110
Organic Carbon	94.8	93.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88077

Included Lab Sample IDs: 2043942, 2043943, 2043948, 2043949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	102	P/P	90 - 110
Ammonia-N	100	102	P/P	90 - 110
Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88087

Included Lab Sample IDs: 2043943, 2043948, 2043949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	101	P/P	90 - 110
Total-P	105	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88113

Included Lab Sample IDs: 2043940, 2043941, 2043946, 2043947

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88117

Included Lab Sample IDs: 2043942

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88123

Included Lab Sample IDs: 2043972, 2043973

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	107	107	P/P	90 - 110
Iron	107	107	P/P	90 - 110
Magnesium	106	106	P/P	90 - 110
Potassium	100	101	P/P	90 - 110
Sodium	104	104	P/P	90 - 110
Zinc	104	102	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A88134

Included Lab Sample IDs: 2043940, 2043941, 2043946, 2043947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	97.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88134

Included Lab Sample IDs: 2043940, 2043941, 2043946, 2043947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88217

Included Lab Sample IDs: 2043972, 2043973

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88261

Included Lab Sample IDs: 2043942, 2043943, 2043948, 2043949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	93.0	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	MS
EPA 180.1 Rev. 2.0	Turbidity					3.12	
	Turbidity					2.21	
EPA 200.7 Rev. 4.4	Calcium	106	108				0.459
	Iron	102	107	109	95.7		11.7
	Magnesium	104	104	109	94.4		7.50
	Potassium	95.6	101	99.7	92.4		5.51
	Sodium	101	105	102			2.77
	Zinc	95.7	94.6	101	88.4		13.5
EPA 200.8 Rev. 5.4	Arsenic	108	106	110	109		1.30
	Cadmium	104	109	112	107		5.13
	Chromium	103	102	104	104		0.223
	Copper	106	98.8	102	102		0.365
	Lead	99.9	101	103	104		0.601
	Nickel	105	101	102	102		0.318
	Silver	105	107	106	107		0.959
EPA 300.0 Rev. 2.1	Chloride	101	99.6	99.1		0.353	
	Sulfate	99.9	100	100		0.131	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	99.4	101			0.933
	Ammonia-N	97.8	97.1	97.6			0.340
	Ammonia-N	98.6	105	103			1.79
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	103	104			0.432
EPA 353.2 Rev. 2.0	NO2NO3-N	102	95.0	100			5.63
EPA 365.1 Rev. 2.0	Total-P	102	104	102			1.83
	Total-P	98.9	98.6	98.5			0.0248
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.3	99.0			1.73
	O-Phosphate-P	98.6	98.9	99.8			0.906
SM 2120 B	Color (true)	101				0.463	
	Color (true)	104				0.755	
SM 2320 B-97	Total Alkalinity	101				0.394	
SM 2540 C-97	TDS					3.39	
SM 4500 F-C-97	Fluoride	97.2	98.3	99.0			0.470
SM 5310 B-00	Organic Carbon	94.4	97.0				0.771

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2043940, 2043941, 2043946, 2043947
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2043972, 2043973
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2043972, 2043973
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2043940, 2043941, 2043946, 2043947
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2043940, 2043941, 2043946, 2043947
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2043942, 2043943, 2043948, 2043949
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2043942, 2043943, 2043948, 2043949
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2043942, 2043943, 2043948, 2043949
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2043942, 2043943, 2043948, 2043949

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2043944, 2043945, 2043950, 2043951
SM 2120 B / E31780	True Color measured at 450 nm	2043940, 2043941, 2043946, 2043947
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2043940, 2043941, 2043946, 2043947
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2043940, 2043941, 2043946, 2043947
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2043940, 2043941, 2043946, 2043947
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2043940, 2043941, 2043946, 2043947
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2043942, 2043943, 2043948, 2043949

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	11/28/2018			11/28/2018 15:24	Megan Treadwell	2043940, 2043941, 2043946, 2043947
EPA 200.7 Rev. 4.4	11/28/2018	11/29/2018 13:35	Elliott D. Healy	12/04/2018 13:36	Betina Topolski	2043972
	11/28/2018	11/29/2018 13:35	Elliott D. Healy	12/04/2018 13:43	Betina Topolski	2043973
EPA 200.8 Rev. 5.4	11/28/2018	11/29/2018 13:35	Elliott D. Healy	12/07/2018 01:45	Robert K Palmer	2043972
	11/28/2018	11/29/2018 13:35	Elliott D. Healy	12/07/2018 01:54	Robert K Palmer	2043973
EPA 300.0 Rev. 2.1	11/28/2018			12/04/2018 15:31	Lipi Saha	2043940
	11/28/2018			12/04/2018 15:56	Lipi Saha	2043947
	11/28/2018			12/04/2018 17:57	Lipi Saha	2043941
	11/28/2018			12/04/2018 18:09	Lipi Saha	2043946
EPA 350.1 Rev. 2.0	11/28/2018			11/30/2018 12:18	Ping Hua	2043943
	11/28/2018			11/30/2018 12:36	Ping Hua	2043948
	11/28/2018			11/30/2018 12:37	Ping Hua	2043949
	11/28/2018			11/30/2018 13:51	Ping Hua	2043942
EPA 351.2 Rev. 2.0	11/28/2018	12/06/2018 11:30	Adrian Shelby	12/10/2018 12:16	Virginia P. Brown	2043942
	11/28/2018	12/06/2018 11:30	Adrian Shelby	12/10/2018 12:18	Virginia P. Brown	2043943
	11/28/2018	12/06/2018 11:30	Adrian Shelby	12/10/2018 12:19	Virginia P. Brown	2043948
	11/28/2018	12/06/2018 11:30	Adrian Shelby	12/10/2018 12:21	Virginia P. Brown	2043949
EPA 353.2 Rev. 2.0	11/28/2018			11/29/2018 13:46	Lauren Bottorf	2043942
	11/28/2018			11/29/2018 13:54	Lauren Bottorf	2043943
	11/28/2018			11/29/2018 13:55	Lauren Bottorf	2043948
	11/28/2018			11/29/2018 13:56	Lauren Bottorf	2043949
EPA 365.1 Rev. 2.0	11/28/2018	11/29/2018 11:45	Sima Feizi	12/03/2018 09:26	Beverly Y. Sanders	2043943
	11/28/2018	11/29/2018 11:45	Sima Feizi	12/03/2018 09:47	Beverly Y. Sanders	2043948
	11/28/2018	11/29/2018 11:45	Sima Feizi	12/03/2018 09:48	Beverly Y. Sanders	2043949
	11/28/2018	11/29/2018 11:45	Sima Feizi	12/03/2018 13:36	Beverly Y. Sanders	2043942
EPA 365.1 Rev. 2.0 dissolved	11/28/2018			11/28/2018 17:05	Jhamieka S. Greenwood	2043944
	11/28/2018			11/28/2018 17:07	Jhamieka S. Greenwood	2043950
	11/28/2018			11/28/2018 17:15	Jhamieka S. Greenwood	2043945
	11/28/2018			11/28/2018 17:40	Jhamieka S. Greenwood	2043951
SM 2120 B	11/28/2018			11/28/2018 14:14	Chelsea Hernandez	2043940
	11/28/2018			11/28/2018 14:15	Chelsea Hernandez	2043941
	11/28/2018			11/28/2018 14:16	Chelsea Hernandez	2043946
	11/28/2018			11/28/2018 14:20	Chelsea Hernandez	2043947
SM 2320 B-97	11/28/2018			12/04/2018 03:45	Dale L. Simmons	2043940
	11/28/2018			12/04/2018 03:56	Dale L. Simmons	2043941
	11/28/2018			12/04/2018 04:06	Dale L. Simmons	2043946
	11/28/2018			12/04/2018 04:16	Dale L. Simmons	2043947
SM 2540 C-97	11/28/2018			11/30/2018 16:02	Yijie Li	2043940, 2043941, 2043946, 2043947
SM 2540 D-97	11/28/2018			11/30/2018 16:02	Yijie Li	2043940, 2043941, 2043946, 2043947
SM 4500 F-C-97	11/28/2018			12/04/2018 03:45	Dale L. Simmons	2043940

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-97	11/28/2018			12/04/2018 03:56	Dale L. Simmons	2043941
	11/28/2018			12/04/2018 04:06	Dale L. Simmons	2043946
	11/28/2018			12/04/2018 04:16	Dale L. Simmons	2043947
SM 5310 B-00	11/28/2018			11/30/2018 08:12	Megan Treadwell	2043942
	11/28/2018			11/30/2018 08:25	Megan Treadwell	2043943
	11/28/2018			11/30/2018 08:38	Megan Treadwell	2043948
	11/28/2018			11/30/2018 09:24	Megan Treadwell	2043949