

Chemical Analysis Report

NE-DIST-2017-10-31-01

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

Event Description: **LSJR SW SJR**
Request ID: **RQ-2017-10-30-65**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256-7577
Attn: Jeremy Parrish

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 22-NOV-2017 13:48



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: SJR out from Black Creek

Collection Date/Time: 10/30/2017 10:30

Field ID: G2NE0183 10302017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1941431	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P334415	
	EPA 300.0 Rev. 2.1	Chloride	90		mg Cl/L	P334688	
		Sulfate	21		mg SO4/L	P334691	
	SM 2120 B	Color (true)	360		PCU	P334407	
	SM 2320 B-97	Total Alkalinity	51		mg CaCO3/L	P334549	
	SM 2540 C-97	TDS	289		mg/L	P334829	
	SM 2540 D-97	TSS	7	I	mg/L	P334839	
	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P334864	
1941433	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P334772	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P334931	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P334729	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P334486	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P334888	
1941435	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.090		mg P/L	P334402	
1941439	EPA 200.7 Rev. 4.4	Calcium	26.2		mg/L	P334505	
		Iron	600		ug/L	P334505	
		Magnesium	8.36		mg/L	P334505	
		Potassium	4.1		mg/L	P334505	
		Sodium	51.9		mg/L	P334505	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P334505	
		Arsenic	1.39		ug/L	P334505	
		Cadmium	0.020	U	ug/L	P334505	
		Chromium	0.72	I	ug/L	P334505	
		Copper	1.35		ug/L	P334505	
		Lead	0.58		ug/L	P334505	
		Nickel	0.46	I	ug/L	P334505	
		Silver	0.010	U	ug/L	P334505	

Ref. Method and Comment:

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

SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high 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: SJR @ CM 17

Collection Date/Time: 10/30/2017 10:50

Field ID: G2NE0173 10302017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1941432	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P334415	
	EPA 300.0 Rev. 2.1	Chloride	97		mg Cl/L	P334688	
		Sulfate	23		mg SO4/L	P334691	
	SM 2120 B	Color (true)	360	A	PCU	P334408	
	SM 2320 B-97	Total Alkalinity	55		mg CaCO3/L	P334549	
	SM 2540 C-97	TDS	310	A	mg/L	P334829	
	SM 2540 D-97	TSS	6	IA	mg/L	P334839	
	SM 4500 F-C-97	Fluoride	0.095	I	mg F/L	P334864	

Field ID: G2NE0173 10302017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1941434	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P334772	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P334931	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.35		mg N/L	P334729	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P334486	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P334888	
1941436	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.090		mg P/L	P334402	
1941440	EPA 200.7 Rev. 4.4	Calcium	26.7		mg/L	P334505	
		Iron	590		ug/L	P334505	
		Magnesium	8.71		mg/L	P334505	
		Potassium	3.9		mg/L	P334505	
		Sodium	52.0		mg/L	P334505	
		Zinc	5.0	U	ug/L	P334505	
	EPA 200.8 Rev. 5.4	Arsenic	1.33		ug/L	P334505	
		Cadmium	0.020	U	ug/L	P334505	
		Chromium	0.73	I	ug/L	P334505	
		Copper	0.68	I	ug/L	P334505	
		Lead	0.63		ug/L	P334505	
		Nickel	0.39	I	ug/L	P334505	
		Silver	0.010	U	ug/L	P334505	

Ref. Method and Comment:

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

SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high 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.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P334415

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P334505

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: P334505

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334505

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334688

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334691

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334772

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334931

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334729

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334486

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334402

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

Reference Method: SM 2120 B
Batch ID: P334407

Component	Result	Code	Units
-----------	--------	------	-------

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
 Batch ID: P334407

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
 Batch ID: P334408

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
 Batch ID: P334549

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

Reference Method: SM 2540 C-97
 Batch ID: P334829

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P334839

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P334864

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P334888

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: P334505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	102		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	98.5		P	85 - 115
Sodium	102		P	85 - 115
Zinc	96.6		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	108		P	85 - 115
Chromium	104		P	85 - 115
Copper	98.7		P	85 - 115
Lead	103		P	85 - 115
Nickel	101		P	85 - 115
Silver	98.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334688

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334691

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334772

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334729

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334402

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P334549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P334864

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P334888

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P334505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941686	Iron	95.6		P	80 - 120
1941686	Magnesium	95.2		P	80 - 120
1941686	Potassium	97.0		P	80 - 120
1941686	Sodium	94.9		P	80 - 120
1941686	Zinc	93.5		P	80 - 120
1941806	Calcium	96.2		P	80 - 120
1941806	Iron	98.2	102	P/P	80 - 120
1941806	Magnesium	99.6	103	P/P	80 - 120
1941806	Potassium	96.4	99.1	P/P	80 - 120
1941806	Sodium	98.9	102	P/P	80 - 120
1941806	Zinc	93.0	94.5	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941686	Arsenic	106		P	80 - 120
1941686	Cadmium	109		P	80 - 120
1941686	Chromium	98.0		P	80 - 120
1941686	Copper	95.9		P	80 - 120
1941686	Lead	103		P	80 - 120
1941686	Nickel	100		P	80 - 120
1941686	Silver	97.6		P	80 - 120
1941806	Arsenic	101	103	P/P	80 - 120
1941806	Cadmium	105	106	P/P	80 - 120
1941806	Chromium	97.8	98.7	P/P	80 - 120
1941806	Copper	96.5	97.3	P/P	80 - 120
1941806	Lead	101	99.7	P/P	80 - 120
1941806	Nickel	100	101	P/P	80 - 120
1941806	Silver	96.7	98.7	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334688

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941308	Chloride	101		P	90 - 110
1941589	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334691

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941308	Sulfate	98.5		P	90 - 110
1941589	Sulfate	98.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334772

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941310	Ammonia-N	107	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P334931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941601	Kjeldahl Nitrogen	89.0	90.5	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334729

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941434	NO2NO3-N	99.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941601	Total-P	101	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941245	O-Phosphate-P	95.4	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P334864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941239	Fluoride	98.5	97.9	P/P	91 - 105

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P334415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941294	Turbidity	0.516	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P334505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941806	Calcium	1.36	Spike	P	0 - 20
1941806	Iron	2.70	Spike	P	0 - 20
1941806	Magnesium	2.26	Spike	P	0 - 20
1941806	Potassium	2.41	Spike	P	0 - 20
1941806	Sodium	1.78	Spike	P	0 - 20
1941806	Zinc	1.63	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P334505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941806	Arsenic	1.43	Spike	P	0 - 20
1941806	Cadmium	1.19	Spike	P	0 - 20
1941806	Chromium	0.863	Spike	P	0 - 20
1941806	Copper	0.802	Spike	P	0 - 20
1941806	Lead	0.941	Spike	P	0 - 20
1941806	Nickel	1.08	Spike	P	0 - 20
1941806	Silver	2.06	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334688

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941308	Chloride	0.0288	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334691

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941308	Sulfate	1.88	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334772

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941310	Ammonia-N	0.260	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P334931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941601	Kjeldahl Nitrogen	1.48	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P334729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941434	NO2NO3-N	0.183	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P334486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941601	Total-P	1.52	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P334402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941245	O-Phosphate-P	4.51	Spike	P	0 - 20

Reference Method: SM 2120 B
 Batch ID: P334407

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941294	Color (true)	3.73	Sample	P	0 - 20

Reference Method: SM 2120 B
 Batch ID: P334408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941432	Color (true)	0.0137	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P334549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941239	Total Alkalinity	0.414	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
 Batch ID: P334829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941432	TDS	6.14	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P334864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941239	Fluoride	0.527	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P334888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941258	Organic Carbon	0.0158	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: A79927
Included Lab Sample IDs: 1941435, 1941436

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	98.5	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A79932
Included Lab Sample IDs: 1941431, 1941432

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	85 - 115
Color (true)	103	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A79933
Included Lab Sample IDs: 1941431, 1941432

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105

Reference Method: SM 2320 B-97
Run ID: A79986
Included Lab Sample IDs: 1941431, 1941432

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A80007
Included Lab Sample IDs: 1941439, 1941440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.4	93.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A80007

Included Lab Sample IDs: 1941439, 1941440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	97.8	93.7	P/P	90 - 110
Magnesium	98.0	93.8	P/P	90 - 110
Potassium	97.0	94.6	P/P	90 - 110
Sodium	98.0	95.1	P/P	90 - 110
Zinc	94.6	94.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A80039

Included Lab Sample IDs: 1941431, 1941432

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	102	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A80044

Included Lab Sample IDs: 1941439, 1941440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	105	106	P/P	90 - 110
Cadmium	107	105	P/P	90 - 110
Chromium	106	101	P/P	90 - 110
Copper	103	104	P/P	90 - 110
Lead	105	103	P/P	90 - 110
Nickel	104	105	P/P	90 - 110
Silver	98.6	97.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80058

Included Lab Sample IDs: 1941433, 1941434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A80060

Included Lab Sample IDs: 1941433, 1941434

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A80077

Included Lab Sample IDs: 1941433, 1941434

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A80108

Included Lab Sample IDs: 1941431, 1941432

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

Reference Method: SM 5310 B-00

Run ID: A80113

Included Lab Sample IDs: 1941433, 1941434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A80178

Included Lab Sample IDs: 1941433, 1941434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	97.8	P/P	90 - 110

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

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

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						0.516	
EPA 200.7 Rev. 4.4	Calcium	100	96.2					1.36
	Iron	102	95.6	98.2	102			2.70
	Magnesium	106	95.2	99.6	103			2.26
	Potassium	98.5	97.0	96.4	99.1			2.41
	Sodium	102	94.9	98.9	102			1.78
	Zinc	96.6	93.5	93.0	94.5			1.63
EPA 200.8 Rev. 5.4	Arsenic	103	106	101	103			1.43
	Cadmium	108	109	105	106			1.19
	Chromium	104	98.0	97.8	98.7			0.863
	Copper	98.7	95.9	96.5	97.3			0.802
	Lead	103	103	101	99.7			0.941
	Nickel	101	100	100	101			1.08
	Silver	98.0	97.6	96.7	98.7			2.06
EPA 300.0 Rev. 2.1	Chloride	100	101	101			0.0288	
	Sulfate	97.9	98.5	98.5			1.88	
EPA 350.1 Rev. 2.0	Ammonia-N	97.1	107	107				0.260
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.1	89.0	90.5				1.48
EPA 353.2 Rev. 2.0	NO2NO3-N	104	99.8					0.183
EPA 365.1 Rev. 2.0	Total-P	99.4	101	99.4				1.52
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	95.4	99.8				4.51
SM 2120 B	Color (true)						3.73	
	Color (true)						0.0137	
SM 2320 B-97	Total Alkalinity	103					0.414	
SM 2540 C-97	TDS						6.14	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
SM 4500 F-C-97	Fluoride	97.1	98.5 97.9			0.527
SM 5310 B-00	Organic Carbon	98.0				0.0158

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1941431, 1941432
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1941439, 1941440
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1941439, 1941440
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1941431, 1941432
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1941431, 1941432
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1941433, 1941434
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1941433, 1941434
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1941433, 1941434
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1941433, 1941434
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1941435, 1941436
SM 2120 B / E31780	True Color measured at 450 nm	1941431, 1941432
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1941431, 1941432
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1941431, 1941432
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1941431, 1941432
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1941431, 1941432
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1941433, 1941434

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	10/31/2017			10/31/2017 16:25	DeAsia Armster	1941431, 1941432
EPA 200.7 Rev. 4.4	10/31/2017	11/01/2017	Elliott D. Healy	11/03/2017	Betina Topolski	1941439, 1941440
EPA 200.8 Rev. 5.4	10/31/2017	11/01/2017	Elliott D. Healy	11/05/2017	Robert K Palmer	1941439
	10/31/2017	11/01/2017	Elliott D. Healy	11/06/2017	Robert K Palmer	1941440
EPA 300.0 Rev. 2.1	10/31/2017			11/03/2017	Julia Storbeck	1941431, 1941432
EPA 350.1 Rev. 2.0	10/31/2017			11/06/2017	Sofia Elnemr	1941433, 1941434
EPA 351.2 Rev. 2.0	10/31/2017	11/08/2017	Adrian Shelby	11/09/2017	Tanya Welborn	1941433, 1941434
EPA 353.2 Rev. 2.0	10/31/2017			11/06/2017	Beverly Y. Sanders	1941433, 1941434
EPA 365.1 Rev. 2.0	10/31/2017	11/01/2017	Sima Feizi	11/06/2017	Lipi Saha	1941433, 1941434
EPA 365.1 Rev. 2.0 dissolved	10/31/2017			10/31/2017 15:04	Megan Treadwell	1941435
	10/31/2017			10/31/2017 15:05	Megan Treadwell	1941436
SM 2120 B	10/31/2017			10/31/2017 15:22	Tanya Welborn	1941432
	10/31/2017			10/31/2017 15:32	Tanya Welborn	1941431
SM 2320 B-97	10/31/2017			11/02/2017	Dale L. Simmons	1941431, 1941432
SM 2540 C-97	10/31/2017			11/01/2017	Yijie Li	1941431, 1941432
SM 2540 D-97	10/31/2017			11/01/2017	Yijie Li	1941431, 1941432
SM 4500 F-C-97	10/31/2017			11/07/2017	Dale L. Simmons	1941431, 1941432
SM 5310 B-00	10/31/2017			11/07/2017	Ping Hua	1941433, 1941434