

Chemical Analysis Report

NW-DIST-2017-09-26-02

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

Event Description: **Baker Run West WBID 179 19 21 24C 271**
Request ID: **RQ-2017-09-25-19**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 13-OCT-2017 10:37



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: SWEETWATER CK. AT SANDY LANDING RD

Collection Date/Time: 09/25/2017 11:20

Field ID: G4NW0292

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931420	EPA 180.1 Rev. 2.0	Turbidity	2.4	A	NTU	P332255	
	EPA 300.0 Rev. 2.1	Chloride	2.4		mg Cl/L	P332362	
		Sulfate	0.61		mg SO4/L	P332365	
	SM 2120 B	Color (true)	46		PCU	P332277	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P332631	
	SM 2540 C-97	TDS	15	U	mg/L	P332561	
	SM 2540 D-97	TSS	2	I	mg/L	P332587	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P332635	
1931424	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P332540	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25		mg N/L	P332499	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.085		mg N/L	P332608	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P332395	
	SM 5310 B-00	Organic Carbon	3.8		mg C/L	P332514	
1931428	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P332272	

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: BEAR CK. @ UN-NAMED FOREST RD.

Collection Date/Time: 09/25/2017 11:45

Field ID: G4NW0380

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931421	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P332255	
	EPA 300.0 Rev. 2.1	Chloride	2.4		mg Cl/L	P332362	
		Sulfate	0.40	I	mg SO4/L	P332365	
	SM 2120 B	Color (true)	67		PCU	P332277	
	SM 2320 B-97	Total Alkalinity	4.5		mg CaCO3/L	P332631	
	SM 2540 C-97	TDS	26		mg/L	P332561	
	SM 2540 D-97	TSS	3	I	mg/L	P332587	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P332635	
1931425	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P332540	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25		mg N/L	P332499	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P332608	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P332395	
	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P332514	
1931429	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P332272	

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: BLACKWATER R. ABOVE BRYAND BRIDGE RD.

Collection Date/Time: 09/25/2017 12:20

Field ID: G4NW0413

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931417	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P332254	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P332362	

Field ID: G4NW0413

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931417	EPA 300.0 Rev. 2.1	Sulfate	0.85		mg SO4/L	P332365	
	SM 2120 B	Color (true)	43		PCU	P332277	
	SM 2320 B-97	Total Alkalinity	1.1	I	mg CaCO3/L	P332631	
	SM 2540 C-97	TDS	16	I	mg/L	P332561	
	SM 2540 D-97	TSS	4	I	mg/L	P332587	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P332635	
1931418	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P332540	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P332499	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P332608	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P332395	
	SM 5310 B-00	Organic Carbon	3.7		mg C/L	P332514	
1931419	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P332272	
1931445	EPA 200.7 Rev. 4.4	Calcium	0.87		mg/L	P332347	
		Iron	630		ug/L	P332347	
		Magnesium	0.62		mg/L	P332347	
		Potassium	0.34	I	mg/L	P332347	
		Sodium	1.6	I	mg/L	P332347	
		Zinc	5.0	U	ug/L	P332347	
	EPA 200.8 Rev. 5.4	Arsenic	0.27		ug/L	P332347	
		Cadmium	0.020	U	ug/L	P332347	
		Chromium	0.40	U	ug/L	P332347	
		Copper	0.20	U	ug/L	P332347	
		Lead	0.17	I	ug/L	P332347	
		Nickel	0.40	I	ug/L	P332347	
		Silver	0.010	U	ug/L	P332347	

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: ATES CK. NE OF BRYANT BRIDGE RD.

Collection Date/Time: 09/25/2017 12:35

Field ID: G4NW0332

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931422	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P332255	
	EPA 300.0 Rev. 2.1	Chloride	3.5		mg Cl/L	P332362	
		Sulfate	0.59		mg SO4/L	P332365	
		Color (true)	31		PCU	P332278	
	SM 2320 B-97	Total Alkalinity	8.3		mg CaCO3/L	P332631	
	SM 2540 C-97	TDS	23	I	mg/L	P332561	
	SM 2540 D-97	TSS	2	I	mg/L	P332587	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P332635	
1931426	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P332540	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20		mg N/L	P332499	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P332608	
	EPA 365.1 Rev. 2.0	Total-P	0.01		mg P/L	P332395	
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P332514	

Field ID: G4NW0332

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931430	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P332272	

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: BIG JUNIPER CK. @ INDIAN FORD RD.

Collection Date/Time: 09/25/2017 12:55

Field ID: G4NW0285

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931423	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P332255	
	EPA 300.0 Rev. 2.1	Chloride	2.6		mg Cl/L	P332362	
		Sulfate	0.59		mg SO4/L	P332365	
	SM 2120 B	Color (true)	36		PCU	P332278	
	SM 2320 B-97	Total Alkalinity	0.88	I	mg CaCO3/L	P332631	
	SM 2540 C-97	TDS	23	I	mg/L	P332561	
	SM 2540 D-97	TSS	4	I	mg/L	P332587	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P332635	
1931427	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P332540	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P332499	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P332608	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P332395	
	SM 5310 B-00	Organic Carbon	3.3		mg C/L	P332514	
1931431	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P332272	

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: P332254

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P332255

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P332347

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P332347

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: P332362

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332365

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332540

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332499

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332608

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332395

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332272

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
 Batch ID: P332277

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
 Batch ID: P332278

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
 Batch ID: P332631

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

Reference Method: SM 2540 C-97
 Batch ID: P332561

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
 Batch ID: P332587

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
 Batch ID: P332635

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
 Batch ID: P332514

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: P332347

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	100		P	85 - 115
Sodium	101		P	85 - 115
Zinc	98.4		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P332347

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	97.5		P	85 - 115
Copper	99.1		P	85 - 115
Lead	97.4		P	85 - 115
Nickel	102		P	85 - 115
Silver	98.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332362

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332365

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332540

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: P332499

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332608

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332395

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332272

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P332631

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P332635

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P332514

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P332347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931489	Calcium	100		P	80 - 120
1931489	Iron	101		P	80 - 120
1931489	Magnesium	99.8		P	80 - 120
1931489	Potassium	101		P	80 - 120
1931489	Sodium	93.3		P	80 - 120
1931489	Zinc	94.0		P	80 - 120
1931663	Calcium	105	106	P/P	80 - 120
1931663	Iron	103	104	P/P	80 - 120
1931663	Magnesium	105	105	P/P	80 - 120
1931663	Potassium	102	102	P/P	80 - 120
1931663	Sodium	96.6	96.3	P/P	80 - 120
1931663	Zinc	96.8	97.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P332347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931489	Arsenic	98.7		P	80 - 120
1931489	Cadmium	103		P	80 - 120
1931489	Chromium	99.1		P	80 - 120
1931489	Copper	95.8		P	80 - 120
1931489	Lead	97.2		P	80 - 120
1931489	Nickel	97.8		P	80 - 120
1931489	Silver	98.1		P	80 - 120
1931663	Arsenic	97.3	98.3	P/P	80 - 120
1931663	Cadmium	102	103	P/P	80 - 120
1931663	Chromium	99.9	101	P/P	80 - 120
1931663	Copper	95.3	95.6	P/P	80 - 120
1931663	Lead	96.4	98.2	P/P	80 - 120
1931663	Nickel	97.0	96.9	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P332347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931663	Silver	97.0	97.7	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332362

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931421	Chloride	95.5		P	90 - 110
1931433	Chloride	97.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931421	Sulfate	96.8		P	90 - 110
1931433	Sulfate	97.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931418	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332499

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931438	Kjeldahl Nitrogen	95.8	95.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931418	NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332395

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931349	Total-P	98.6	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931351	O-Phosphate-P	94.4	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P332635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931611	Fluoride	95.8	96.3	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P332514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931437	Organic Carbon	97.4	99.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P332254

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931341	Turbidity	2.02	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P332255

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931420	Turbidity	2.06	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P332347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931663	Calcium	0.901	Spike	P	0 - 20
1931663	Iron	0.530	Spike	P	0 - 20
1931663	Magnesium	0.112	Spike	P	0 - 20
1931663	Potassium	0.345	Spike	P	0 - 20
1931663	Sodium	0.189	Spike	P	0 - 20
1931663	Zinc	0.299	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P332347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931663	Arsenic	1.03	Spike	P	0 - 20
1931663	Cadmium	0.553	Spike	P	0 - 20
1931663	Chromium	0.842	Spike	P	0 - 20
1931663	Copper	0.339	Spike	P	0 - 20
1931663	Lead	1.81	Spike	P	0 - 20
1931663	Nickel	0.134	Spike	P	0 - 20
1931663	Silver	0.760	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P332362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931433	Chloride	7.11	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931433	Sulfate	16.8	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931418	Ammonia-N	1.73	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931438	Kjeldahl Nitrogen	0.638	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931418	NO2NO3-N	0.221	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931349	Total-P	0.0226	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931351	O-Phosphate-P	1.03	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P332277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931372	Color (true)	1.03	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P332278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931435	Color (true)	0.912	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P332631

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931611	Total Alkalinity	0.333	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P332561

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931332	TDS	4.63	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P332635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931611	Fluoride	0.495	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P332514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931437	Organic Carbon	2.00	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 180.1 Rev. 2.0
Run ID: A79162
Included Lab Sample IDs: 1931417, 1931420, 1931421, 1931422, 1931423

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A79167
Included Lab Sample IDs: 1931419, 1931428, 1931429, 1931430, 1931431

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.6	P/P	90 - 110
O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A79170
Included Lab Sample IDs: 1931417, 1931420, 1931421, 1931422, 1931423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	90 - 115

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A79170

Included Lab Sample IDs: 1931417, 1931420, 1931421, 1931422, 1931423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	101	P/P	90 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A79203

Included Lab Sample IDs: 1931417, 1931420, 1931421, 1931422, 1931423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.0	99.6	P/P	90 - 110
Chloride	99.6	96.1	P/P	90 - 110
Sulfate	101	98.1	P/P	90 - 110
Sulfate	94.3	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A79221

Included Lab Sample IDs: 1931445

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	101	P/P	90 - 110
Cadmium	103	104	P/P	90 - 110
Chromium	101	104	P/P	90 - 110
Copper	101	100	P/P	90 - 110
Lead	99.7	100	P/P	90 - 110
Nickel	101	99.9	P/P	90 - 110
Silver	98.7	99.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A79222

Included Lab Sample IDs: 1931445

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	97.3	P/P	90 - 110
Iron	100	97.2	P/P	90 - 110
Magnesium	100	97.2	P/P	90 - 110
Potassium	96.8	94.3	P/P	90 - 110
Sodium	96.1	93.1	P/P	90 - 110
Zinc	93.9	91.9	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A79261

Included Lab Sample IDs: 1931418, 1931424, 1931425, 1931426, 1931427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A79267

Included Lab Sample IDs: 1931418, 1931424, 1931425, 1931426, 1931427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A79286

Included Lab Sample IDs: 1931418, 1931424, 1931425, 1931426, 1931427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	104	P/P	90 - 110
Kjeldahl Nitrogen	107	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A79298

Included Lab Sample IDs: 1931418, 1931424, 1931425, 1931426, 1931427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A79299

Included Lab Sample IDs: 1931418, 1931424, 1931425, 1931426, 1931427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.5	P/P	90 - 110
Total-P	99.5	98.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A79305

Included Lab Sample IDs: 1931417, 1931420, 1931421, 1931422, 1931423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A79305

Included Lab Sample IDs: 1931417, 1931420, 1931421, 1931422, 1931423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	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					2.02	
	Turbidity					2.06	
EPA 200.7 Rev. 4.4	Calcium	107	100	105	106		0.901
	Iron	106	101	103	104		0.530
	Magnesium	107	99.8	105	105		0.112
	Potassium	100	101	102	102		0.345
	Sodium	101	93.3	96.6	96.3		0.189
	Zinc	98.4	94.0	96.8	97.1		0.299
EPA 200.8 Rev. 5.4	Arsenic	102	98.7	97.3	98.3		1.03

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision	MS
			LCS	SMP	MS		
EPA 200.8 Rev. 5.4	Cadmium	103	103	102	103		0.553
	Chromium	97.5	99.1	99.9	101		0.842
	Copper	99.1	95.8	95.3	95.6		0.339
	Lead	97.4	97.2	96.4	98.2		1.81
	Nickel	102	97.8	97.0	96.9		0.134
	Silver	98.9	98.1	97.0	97.7		0.760
EPA 300.0 Rev. 2.1	Chloride	95.4	97.3	95.5		7.11	
	Sulfate	95.7	97.5	96.8		16.8	
EPA 350.1 Rev. 2.0	Ammonia-N	103	101	102			1.73
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	95.8	95.1			0.638
EPA 353.2 Rev. 2.0	NO2NO3-N	106	104				0.221
EPA 365.1 Rev. 2.0	Total-P	97.0	98.6	98.6			0.0226
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	94.4	95.7			1.03
SM 2120 B	Color (true)					1.03	
	Color (true)					0.912	
SM 2320 B-97	Total Alkalinity	102				0.333	
SM 2540 C-97	TDS					4.63	
SM 4500 F-C-97	Fluoride	97.2	95.8	96.3			0.495
SM 5310 B-00	Organic Carbon	100	97.4	99.8			2.00

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1931417, 1931420, 1931421, 1931422, 1931423
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1931445
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1931445
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1931417, 1931420, 1931421, 1931422, 1931423
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1931417, 1931420, 1931421, 1931422, 1931423
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1931418, 1931424, 1931425, 1931426, 1931427
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1931418, 1931424, 1931425, 1931426, 1931427
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1931418, 1931424, 1931425, 1931426, 1931427
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1931418, 1931424, 1931425, 1931426, 1931427
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1931419, 1931428, 1931429, 1931430, 1931431
SM 2120 B / E31780	True Color measured at 450 nm	1931417, 1931420, 1931421, 1931422, 1931423
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1931417, 1931420, 1931421, 1931422, 1931423
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1931417, 1931420, 1931421, 1931422, 1931423
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1931417, 1931420, 1931421, 1931422, 1931423
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1931417, 1931420, 1931421, 1931422, 1931423
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1931418, 1931424, 1931425, 1931426, 1931427

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	09/26/2017			09/26/2017 15:39	Tanya Welborn	1931417, 1931420, 1931421, 1931422, 1931423
EPA 200.7 Rev. 4.4	09/26/2017	09/27/2017	Elliott D. Healy	09/28/2017	Betina Topolski	1931445
EPA 200.8 Rev. 5.4	09/26/2017	09/27/2017	Elliott D. Healy	09/28/2017	Nadine Brooks	1931445
EPA 300.0 Rev. 2.1	09/26/2017			09/27/2017	Julia Storbeck	1931417, 1931420, 1931421, 1931422, 1931423
EPA 350.1 Rev. 2.0	09/26/2017			09/29/2017	Sofia Elnemr	1931418, 1931424, 1931425, 1931426, 1931427
EPA 351.2 Rev. 2.0	09/26/2017	09/29/2017	Adrian Shelby	10/02/2017	Tanya Welborn	1931418, 1931424, 1931425, 1931426, 1931427
EPA 353.2 Rev. 2.0	09/26/2017			10/03/2017	Beverly Y. Sanders	1931418, 1931424, 1931425, 1931426, 1931427
EPA 365.1 Rev. 2.0	09/26/2017	09/28/2017	Sima Feizi	10/03/2017	Lipi Saha	1931418, 1931424, 1931425, 1931426, 1931427
EPA 365.1 Rev. 2.0 dissolved	09/26/2017			09/26/2017 15:16	Megan Treadwell	1931419
	09/26/2017			09/26/2017 15:17	Megan Treadwell	1931428
	09/26/2017			09/26/2017 15:18	Megan Treadwell	1931429
	09/26/2017			09/26/2017 15:19	Megan Treadwell	1931430
	09/26/2017			09/26/2017 15:24	Megan Treadwell	1931431
SM 2120 B	09/26/2017			09/26/2017 15:40	DeAsia Armster	1931417
	09/26/2017			09/26/2017 15:41	DeAsia Armster	1931420
	09/26/2017			09/26/2017 15:42	DeAsia Armster	1931421
	09/26/2017			09/26/2017 15:45	DeAsia Armster	1931422
	09/26/2017			09/26/2017 15:46	DeAsia Armster	1931423
SM 2320 B-97	09/26/2017			10/02/2017	Dale L. Simmons	1931417, 1931420
	09/26/2017			10/03/2017	Dale L. Simmons	1931421, 1931422, 1931423
SM 2540 C-97	09/26/2017			09/27/2017	Yijie Li	1931417, 1931420, 1931421, 1931422, 1931423
SM 2540 D-97	09/26/2017			09/27/2017	Yijie Li	1931417, 1931420, 1931421, 1931422, 1931423
SM 4500 F-C-97	09/26/2017			10/02/2017	Dale L. Simmons	1931417, 1931420
	09/26/2017			10/03/2017	Dale L. Simmons	1931421, 1931422, 1931423
SM 5310 B-00	09/26/2017			09/28/2017	Ping Hua	1931418, 1931424, 1931425, 1931426, 1931427