

Chemical Analysis Report

NW-DIST-2019-11-14-01

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

Event Description: **ESC/BW BAY RUN**
Request ID: **RQ-2019-11-11-22**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

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

Date Certified: 05-DEC-2019 18:07



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: Blackwater Bay West of Escribano Point

Collection Date/Time: 11/13/2019 11:30

Field ID: G4NW0401

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136111	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P374247	
	EPA 300.0	Bromide	39		mg Br/L	P374769	
	SM 2320 B-97	Total Alkalinity	70		mg CaCO3/L	P374662	
	SM 2540 D-97	TSS	12	A	mg/L	P374857	
	SM 4500 F-C-97	Fluoride	0.65		mg F/L	P374664	
2136112	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P374441	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32	I	mg N/L	P374608	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P374568	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P374707	
	SM 5310 B-00	Organic Carbon	3.1		mg C/L	P374430	
2136113	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374275	
2136153	EPA 200.7 Rev. 4.4	Iron	200	I	ug/L	P374231	
		Manganese	10	I	ug/L	P374231	
		Zinc	15	U	ug/L	P374231	
	EPA 200.8 Rev. 5.4	Aluminum	320		ug/L	P8493	
		Antimony	0.20	U	ug/L	P8493	
		Arsenic	0.92		ug/L	P8493	
		Cadmium	0.080	U	ug/L	P8493	
		Chromium	1.6	U	ug/L	P374231	
		Copper	1.6	U	ug/L	P8493	
		Lead	0.80	U	ug/L	P8493	
		Nickel	2.0	U	ug/L	P8493	
		Selenium	0.80	U	ug/L	P8493	
		Silver	0.040	U	ug/L	P8493	
		Thallium	0.40	I	ug/L	P8493	

Sample Location: TROUT BAYOU

Collection Date/Time: 11/13/2019 13:00

Field ID: G4NW0443

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136114	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P374247	
	EPA 300.0	Bromide	43		mg Br/L	P375025	
	SM 2320 B-97	Total Alkalinity	86		mg CaCO3/L	P374662	
	SM 2540 D-97	TSS	5	I	mg/L	P374857	
	SM 4500 F-C-97	Fluoride	0.77		mg F/L	P374664	
2136117	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P374441	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.30	I	mg N/L	P374608	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P374568	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P374707	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P374430	
2136120	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374275	

Sample Location: JUDGES BAYOU MOUTH

Collection Date/Time: 11/13/2019 13:30

Field ID: G4NW0441

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136115	EPA 180.1 Rev. 2.0	Turbidity	5.7		NTU	P374247	
	EPA 300.0	Bromide	13		mg Br/L	P375025	
	SM 2320 B-97	Total Alkalinity	32		mg CaCO3/L	P374662	
	SM 2540 D-97	TSS	6	I	mg/L	P374857	
	SM 4500 F-C-97	Fluoride	0.23		mg F/L	P375181	
2136118	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P374441	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P374608	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.52		mg N/L	P374568	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P374709	
	SM 5310 B-00	Organic Carbon	8.4		mg C/L	P374430	
2136121	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374275	

Sample Location: JUDGES BAYOU CONFLUENCE

Collection Date/Time: 11/13/2019 13:40

Field ID: G4NW0442

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136116	EPA 180.1 Rev. 2.0	Turbidity	5.6		NTU	P374247	
	EPA 300.0	Bromide	15		mg Br/L	P375025	
	SM 2320 B-97	Total Alkalinity	37		mg CaCO3/L	P374662	
	SM 2540 D-97	TSS	8	I	mg/L	P374857	
	SM 4500 F-C-97	Fluoride	0.29		mg F/L	P375181	
2136119	EPA 350.1 Rev. 2.0	Ammonia-N	0.066		mg N/L	P374441	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P374615	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P374568	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P374709	
	SM 5310 B-00	Organic Carbon	7.9		mg C/L	P374430	
2136122	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374275	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P374247

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P374231

Component	Result	Code	Units
Iron	30	U	ug/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374231

Component	Result	Code	Units
Chromium	0.40	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P8493

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

Reference Method: EPA 300.0
Batch ID: P374769

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 300.0
Batch ID: P375025

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374441

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374608

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374615

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374568

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374707

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374709

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374275

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

Reference Method: SM 2320 B-97
Batch ID: P374662

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

Reference Method: SM 2540 D-97
Batch ID: P374857

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P374664

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P375181

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P374430

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: P374231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	96.9		P	85 - 115
Manganese	102		P	85 - 115
Zinc	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	98.1		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P8493

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	97.6		P	85 - 115
Arsenic	98.1		P	85 - 115
Cadmium	95.0		P	85 - 115
Copper	98.3		P	85 - 115
Lead	93.0		P	85 - 115
Nickel	97.9		P	85 - 115
Selenium	95.7		P	85 - 115
Silver	93.9		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P374769

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

Reference Method: EPA 300.0
Batch ID: P375025

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	96.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374441

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374608

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.4		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374615

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374568

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374707

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374709

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374275

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

Reference Method: SM 2320 B-97
Batch ID: P374662

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

Reference Method: SM 4500 F-C-97
Batch ID: P374664

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.9		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P375181

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

Reference Method: SM 5310 B-00
Batch ID: P374430

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	103		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P374231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2134512	Iron	89.1	86.4	P/P	70 - 130
2134512	Manganese	94.7	92.6	P/P	70 - 130
2134512	Zinc	101	98.6	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2134512	Chromium	96.8	97.2	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P8493

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2134512	Aluminum	107	111	P/P	70 - 130
2134512	Antimony	103	103	P/P	70 - 130
2134512	Arsenic	107	108	P/P	70 - 130
2134512	Cadmium	93.7	91.0	P/P	70 - 130
2134512	Copper	95.3	97.0	P/P	70 - 130
2134512	Lead	98.7	98.8	P/P	70 - 130
2134512	Nickel	92.1	93.0	P/P	70 - 130
2134512	Selenium	99.3	100	P/P	70 - 130
2134512	Silver	90.9	90.6	P/P	70 - 130
2134512	Thallium	108	109	P/P	70 - 130

Reference Method: EPA 300.0
Batch ID: P374769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135473	Bromide	97.8	99.8	P/P	90 - 110
2135668	Bromide	97.3		P	90 - 110

Reference Method: EPA 300.0
Batch ID: P375025

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136213	Bromide	92.6	93.5	P/P	90 - 110
2136214	Bromide	92.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374441

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136143	Ammonia-N	105	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136117	Kjeldahl Nitrogen	97.3	100	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136140	Kjeldahl Nitrogen	97.7	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136112	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135715	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374709

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136119	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374275

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135905	O-Phosphate-P	95.9	94.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P374664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136607	Fluoride	95.1	95.8	P/P	89 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P375181

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136116	Fluoride	97.1	97.8	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P374430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135715	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P374247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135966	Turbidity	2.12	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P374231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2134512	Iron	2.42	Spike	P	0 - 20
2134512	Manganese	1.57	Spike	P	0 - 20
2134512	Zinc	2.14	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2134512	Chromium	0.406	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P8493

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2134512	Aluminum	3.54	Spike	P	0 - 20
2134512	Antimony	0.114	Spike	P	0 - 20
2134512	Arsenic	0.944	Spike	P	0 - 20
2134512	Cadmium	2.84	Spike	P	0 - 20
2134512	Copper	1.69	Spike	P	0 - 20
2134512	Lead	0.0709	Spike	P	0 - 20
2134512	Nickel	0.976	Spike	P	0 - 20
2134512	Selenium	0.868	Spike	P	0 - 20
2134512	Silver	0.345	Spike	P	0 - 20
2134512	Thallium	1.33	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P374769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135473	Bromide	1.96	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P375025

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136213	Bromide	0.791	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P374441

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136143	Ammonia-N	1.37	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P374608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136117	Kjeldahl Nitrogen	2.39	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P374615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136140	Kjeldahl Nitrogen	2.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P374568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136112	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P374707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135715	Total-P	1.38	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P374709

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136119	Total-P	0.529	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P374275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135905	O-Phosphate-P	2.00	Spike	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P374662

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136607	Total Alkalinity	0.607	Sample	P	0 - 2.8

Quality Assurance Report Precision

Reference Method: SM 2540 D-97
Batch ID: P374857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136111	TSS	3.28	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P374664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136607	Fluoride	0.473	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
Batch ID: P375181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136116	Fluoride	0.476	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P374430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135715	Organic Carbon	0.993	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A95743

Included Lab Sample IDs: 2136111, 2136114, 2136115, 2136116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	98.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A95753

Included Lab Sample IDs: 2136113, 2136120, 2136121, 2136122

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A95796

Included Lab Sample IDs: 2136153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	99.2	99.1	P/P	90 - 110
Manganese	105	104	P/P	90 - 110
Zinc	100	99.7	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A95823

Included Lab Sample IDs: 2136112, 2136117, 2136118, 2136119

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95824

Included Lab Sample IDs: 2136112, 2136117, 2136118, 2136119

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95873

Included Lab Sample IDs: 2136153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	106	107	P/P	90 - 110
Antimony	99.3	98.2	P/P	90 - 110
Arsenic	103	104	P/P	90 - 110
Cadmium	100	98.7	P/P	90 - 110
Copper	105	106	P/P	90 - 110
Lead	95.1	95.4	P/P	90 - 110
Nickel	102	103	P/P	90 - 110
Selenium	99.0	99.6	P/P	90 - 110
Silver	98.7	98.1	P/P	90 - 110
Thallium	95.7	95.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A95875

Included Lab Sample IDs: 2136112, 2136117, 2136118, 2136119

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

Reference Method: SM 2320 B-97

Run ID: A95901

Included Lab Sample IDs: 2136111, 2136114, 2136115, 2136116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.1	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A95901

Included Lab Sample IDs: 2136111, 2136114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A95908

Included Lab Sample IDs: 2136112, 2136117, 2136118, 2136119

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.5	P/P	90 - 110
Kjeldahl Nitrogen	97.5	99.1	P/P	90 - 110
Kjeldahl Nitrogen	99.1	98.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95926

Included Lab Sample IDs: 2136153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	96.6	97.1	P/P	90 - 110

Reference Method: EPA 300.0

Run ID: A95940

Included Lab Sample IDs: 2136111

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95989

Included Lab Sample IDs: 2136112, 2136117, 2136118, 2136119

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.5	99.2	P/P	90 - 110
Total-P	99.2	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0

Run ID: A96041

Included Lab Sample IDs: 2136114, 2136115, 2136116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	97.9	98.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A96084

Included Lab Sample IDs: 2136115, 2136116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	100	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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					2.12	
EPA 200.7 Rev. 4.4	Iron	96.9	89.1	86.4			2.42
	Manganese	102	94.7	92.6			1.57
	Zinc	99.7	101	98.6			2.14
EPA 200.8 Rev. 5.4	Aluminum	102	107	111			3.54
	Antimony	97.6	103	103			0.114
	Arsenic	98.1	107	108			0.944
	Cadmium	95.0	93.7	91.0			2.84
	Chromium	98.1	96.8	97.2			0.406
	Copper	98.3	95.3	97.0			1.69
	Lead	93.0	98.7	98.8			0.0709
	Nickel	97.9	92.1	93.0			0.976
	Selenium	95.7	99.3	100			0.868
	Silver	93.9	90.9	90.6			0.345
	Thallium	100	108	109			1.33
EPA 300.0	Bromide	101	97.8	99.8	97.3		1.96
	Bromide	96.3	92.6	93.5	92.7		0.791
EPA 350.1 Rev. 2.0	Ammonia-N	101	105	106			1.37
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.4	97.3	100			2.39
	Kjeldahl Nitrogen	99.9	97.7	100			2.28
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	101	101			0.0
EPA 365.1 Rev. 2.0	Total-P	100	103	105			1.38
	Total-P	103	101	101			0.529
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	95.9	94.0			2.00
SM 2320 B-97	Total Alkalinity	101				0.607	
SM 2540 D-97	TSS					3.28	
SM 4500 F-C-97	Fluoride	95.9	95.1	95.8			0.473
	Fluoride	97.1	97.1	97.8			0.476
SM 5310 B-00	Organic Carbon	103	102	101			0.993

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2136111, 2136114, 2136115, 2136116
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2136153
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2136153
EPA 300.0 / E31780	Bromide in aqueous matrices	2136111, 2136114, 2136115, 2136116
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2136112, 2136117, 2136118, 2136119
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2136112, 2136117, 2136118, 2136119
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2136112, 2136117, 2136118, 2136119
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2136112, 2136117, 2136118, 2136119
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2136113, 2136120, 2136121, 2136122
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2136111, 2136114, 2136115, 2136116
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2136111, 2136114, 2136115, 2136116
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2136111, 2136114, 2136115, 2136116
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2136112, 2136117, 2136118, 2136119

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	11/14/2019			11/14/2019 17:30	Blanca Fach	2136111, 2136114, 2136115, 2136116
EPA 200.7 Rev. 4.4	11/14/2019	11/14/2019 15:00	Elliott D. Healy	11/18/2019 17:01	Betina Topolski	2136153
EPA 200.8 Rev. 5.4	11/14/2019	11/14/2019 15:00	Elliott D. Healy	11/20/2019 22:06	Justin Cutchin	2136153
	11/14/2019	11/14/2019 15:00	Elliott D. Healy	11/20/2019 23:15	Justin Cutchin	2136153
	11/14/2019	11/14/2019 15:00	Elliott D. Healy	11/22/2019 23:58	Justin Cutchin	2136153
EPA 300.0	11/14/2019			11/21/2019 05:42	Lipi Saha	2136111
	11/14/2019			11/27/2019 08:26	Julia Storbeck	2136114
	11/14/2019			11/27/2019 08:43	Julia Storbeck	2136115
	11/14/2019			11/27/2019 09:00	Julia Storbeck	2136116
EPA 350.1 Rev. 2.0	11/14/2019			11/18/2019 13:58	Ping Hua	2136112
	11/14/2019			11/18/2019 14:00	Ping Hua	2136117
	11/14/2019			11/18/2019 14:01	Ping Hua	2136118
	11/14/2019			11/18/2019 14:03	Ping Hua	2136119
EPA 351.2 Rev. 2.0	11/14/2019	11/21/2019 12:25	Sima Feizi	11/22/2019 12:06	Jhamieka S. Greenwood	2136117
	11/14/2019	11/21/2019 12:25	Sima Feizi	11/22/2019 12:25	Jhamieka S. Greenwood	2136112
	11/14/2019	11/21/2019 12:25	Sima Feizi	11/22/2019 12:26	Jhamieka S. Greenwood	2136118
	11/14/2019	11/21/2019 12:25	Sima Feizi	11/22/2019 12:45	Jhamieka S. Greenwood	2136119
EPA 353.2 Rev. 2.0	11/14/2019			11/21/2019 09:48	Beverly Y. Sanders	2136112
	11/14/2019			11/21/2019 09:54	Beverly Y. Sanders	2136117
	11/14/2019			11/21/2019 09:55	Beverly Y. Sanders	2136118
	11/14/2019			11/21/2019 09:57	Beverly Y. Sanders	2136119
EPA 365.1 Rev. 2.0	11/14/2019	11/22/2019 13:04	Yen Ta	11/26/2019 16:32	Benjamin T. Nordmann	2136112
	11/14/2019	11/22/2019 13:04	Yen Ta	11/26/2019 16:33	Benjamin T. Nordmann	2136117
	11/14/2019	11/22/2019 13:04	Yen Ta	11/26/2019 16:41	Benjamin T. Nordmann	2136119
	11/14/2019	11/22/2019 13:04	Yen Ta	11/26/2019 16:48	Benjamin T. Nordmann	2136118
EPA 365.1 Rev. 2.0 dissolved	11/14/2019			11/14/2019 16:08	Samantha Davila	2136113
	11/14/2019			11/14/2019 16:09	Samantha Davila	2136120
	11/14/2019			11/14/2019 16:10	Samantha Davila	2136121, 2136122
SM 2320 B-97	11/14/2019			11/21/2019 02:27	Dale L. Simmons	2136111
	11/14/2019			11/21/2019 02:38	Dale L. Simmons	2136114
	11/14/2019			11/21/2019 02:49	Dale L. Simmons	2136115
	11/14/2019			11/21/2019 03:01	Dale L. Simmons	2136116
SM 2540 D-97	11/14/2019			11/19/2019 15:21	Yijie Li	2136111, 2136114, 2136115, 2136116
SM 4500 F-C-97	11/14/2019			11/21/2019 00:03	Dale L. Simmons	2136111
	11/14/2019			11/21/2019 00:07	Dale L. Simmons	2136114
	11/14/2019			12/03/2019 10:01	Dale L. Simmons	2136116
	11/14/2019			12/03/2019 10:12	Dale L. Simmons	2136115
SM 5310 B-00	11/14/2019			11/19/2019 08:38	Lauren Lees	2136112
	11/14/2019			11/19/2019 08:50	Lauren Lees	2136117
	11/14/2019			11/19/2019 09:03	Lauren Lees	2136118

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	11/14/2019			11/19/2019 09:15	Lauren Lees	2136119