

Chemical Analysis Report

NW-DIST-2016-03-09-02

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

Event Description: **TMDL Bioassessment**
Request ID: **RQ-2016-02-01-57**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government St
Suite 208A
Pensacola, FL 32502-5794
Attn: Michael King

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

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 28-MAR-2016 11:53



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 group are included in this report: 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: Shoal River

Collection Date/Time: 03/08/2016 13:00

Field ID: G4NW0025

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1778633	EPA 180.1 Rev. 2.0	Turbidity	7.1		NTU	P300084	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P300294	
		Sulfate	1.4		mg SO4/L	P300296	
	SM 2120 B	Color (true)	62		PCU	P300624	
	SM 2320 B-97	Total Alkalinity	3.2		mg CaCO3/L	P300454	
	SM 2540 C-97	TDS	21	I	mg/L	P300530	RPD
	SM 2540 D-97	TSS	6	I	mg/L	P300286	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P300458	
1778636	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P300570	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P300725	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P300383	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P300613	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P300358	
1778639	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P300066	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: Trammel Creek @ Hwy 4

Collection Date/Time: 03/08/2016 14:50

Field ID: G4NW0052

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1778634	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P300084	
	EPA 300.0 Rev. 2.1	Chloride	4.1		mg Cl/L	P300294	
		Sulfate	5.2		mg SO4/L	P300296	
	SM 2120 B	Color (true)	47		PCU	P300624	
	SM 2320 B-97	Total Alkalinity	9.1		mg CaCO3/L	P300460	
	SM 2540 C-97	TDS	35		mg/L	P300531	
	SM 2540 D-97	TSS	3	I	mg/L	P300287	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P300462	
1778637	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P300571	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20		mg N/L	P300725	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P300383	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P300613	
	SM 5310 B-00	Organic Carbon	3.9		mg C/L	P300359	
1778640	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P300066	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: Trammel Creek @ Hwy 4

Collection Date/Time: 03/08/2016 15:00

Field ID: G4NW0052DUPLICATE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1778635	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P300084	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P300294	
		Sulfate	5.0		mg SO4/L	P300485	

Field ID: G4NW0052DUPLICATE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1778635	SM 2120 B	Color (true)	46		PCU	P300624	
	SM 2320 B-97	Total Alkalinity	9.0		mg CaCO3/L	P300460	
	SM 2540 C-97	TDS	38		mg/L	P300531	
	SM 2540 D-97	TSS	2	I	mg/L	P300287	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P300462	
1778638	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P300571	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20		mg N/L	P300725	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P300383	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P300613	
	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P300359	
1778641	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P300066	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P300084

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P300294

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P300296

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P300485

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P300570

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P300571

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: P300725

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300383

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P300613

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300066

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

Reference Method: SM 2120 B
Batch ID: P300624

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P300454

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

Reference Method: SM 2320 B-97
Batch ID: P300460

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

Reference Method: SM 2540 C-97
Batch ID: P300530

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P300531

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P300286

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P300287

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P300458

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P300462

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P300358

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P300359

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300294

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300296

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300485

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
-----------	---------	---------	-----------	----------------

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P300485

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P300570

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P300571

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: P300725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P300383

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: P300613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	92.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P300066

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

Reference Method: SM 2320 B-97
 Batch ID: P300454

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 105

Reference Method: SM 2320 B-97
 Batch ID: P300460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P300458

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	94 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P300462

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P300358

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

Reference Method: SM 5310 B-00
Batch ID: P300359

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300294

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778633	Chloride	107	107	P/P	90 - 110
1778634	Chloride	107		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778633	Sulfate	103	104	P/P	90 - 110
1778634	Sulfate	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778845	Sulfate	102		P	90 - 110
1779206	Sulfate	99.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300570

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778636	Ammonia-N	102	99.7	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300571

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778835	Ammonia-N	100	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P300725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778595	Kjeldahl Nitrogen	103	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300383

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778824	NO2NO3-N	98.2	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P300613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778594	Total-P	93.5	92.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300066

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778626	O-Phosphate-P	94.2	95.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P300458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778252	Fluoride	95.3	96.5	P/P	94 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P300462

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1779207	Fluoride	101	101	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P300358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778264	Organic Carbon	96.9	97.9	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P300359

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778637	Organic Carbon	96.9	97.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P300084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778576	Turbidity	5.13	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300294

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778633	Chloride	0.0436	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778633	Sulfate	0.473	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778845	Sulfate	2.67	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300570

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778636	Ammonia-N	1.68	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778835	Ammonia-N	1.38	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P300725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778595	Kjeldahl Nitrogen	1.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778824	NO2NO3-N	3.41	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P300613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778594	Total-P	1.60	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300066

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778626	O-Phosphate-P	1.41	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P300624

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778591	Color (true)	2.09	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P300454

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778252	Total Alkalinity	3.95	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P300460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1779207	Total Alkalinity	0.297	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P300530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778260	TDS	16.1	Sample	F	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P300531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778624	TDS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P300458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778252	Fluoride	1.01	Spike	P	0 - 3.7

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P300462

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1779207	Fluoride	0.0	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P300358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778264	Organic Carbon	0.752	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P300359

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778637	Organic Carbon	0.728	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 300.0 Rev. 2.1
Run ID: A68089
Included Lab Sample IDs: 1778633, 1778634, 1778635

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	103	P/P	90 - 110
Chloride	98.9	99.6	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68113
Included Lab Sample IDs: 1778639, 1778640, 1778641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.4	96.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A68115
Included Lab Sample IDs: 1778633, 1778634, 1778635

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

Reference Method: SM 2120 B
Run ID: A68130
Included Lab Sample IDs: 1778633, 1778634, 1778635

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
-----------	---------	---------	------------	----------------

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A68130

Included Lab Sample IDs: 1778633, 1778634, 1778635

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.6	96.9	P/P	90 - 115

Reference Method: SM 5310 B-00

Run ID: A68221

Included Lab Sample IDs: 1778636, 1778637, 1778638

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	98.6	P/P	90 - 110
Organic Carbon	98.6	98.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A68232

Included Lab Sample IDs: 1778636, 1778637, 1778638

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	103	102	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A68254

Included Lab Sample IDs: 1778633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A68254

Included Lab Sample IDs: 1778633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	98.6	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A68255

Included Lab Sample IDs: 1778634, 1778635

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

Reference Method: SM 4500 F-C-97

Run ID: A68255

Included Lab Sample IDs: 1778634, 1778635

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A68261

Included Lab Sample IDs: 1778635

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
-----------	---------	---------	------------	----------------

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A68261

Included Lab Sample IDs: 1778635

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	99.1	96.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A68284

Included Lab Sample IDs: 1778636, 1778637, 1778638

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A68367

Included Lab Sample IDs: 1778636, 1778637, 1778638

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A68381

Included Lab Sample IDs: 1778636, 1778637, 1778638

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.4	96.7	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					5.13	
EPA 300.0 Rev. 2.1	Chloride	107	107	107	107		0.0436
	Sulfate	103	103	104	103		0.473
	Sulfate	101	102	99.5		2.67	
EPA 350.1 Rev. 2.0	Ammonia-N	100	102	99.7			1.68
	Ammonia-N	101	100	102			1.38
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.9	103	105			1.35
EPA 353.2 Rev. 2.0	NO2NO3-N	104	98.2	102			3.41
EPA 365.1 Rev. 2.0	Total-P	92.0	93.5	92.0			1.60
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.9	94.2	95.9			1.41
SM 2120 B	Color (true)					2.09	
SM 2320 B-97	Total Alkalinity	103				3.95	
	Total Alkalinity	102				0.297	
SM 2540 C-97	TDS					16.1	
	TDS					0.0	
SM 4500 F-C-97	Fluoride	97.1	95.3	96.5			1.01
	Fluoride	98.3	101	101			0.0

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
SM 5310 B-00	Organic Carbon	99.4	96.9	97.9		0.752
	Organic Carbon	99.4	96.9	97.8		0.728

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1778633, 1778634, 1778635
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1778633, 1778634, 1778635
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1778633, 1778634, 1778635
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1778636, 1778637, 1778638
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1778636, 1778637, 1778638
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1778636, 1778637, 1778638
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1778636, 1778637, 1778638
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1778639, 1778640, 1778641
SM 2120 B / E31780	True Color measured at 450 nm	1778633, 1778634, 1778635
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1778633, 1778634, 1778635
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1778633, 1778634, 1778635
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1778633, 1778634, 1778635
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1778633, 1778634, 1778635
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1778636, 1778637, 1778638

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	03/09/2016			03/09/2016 14:47	Sima Feizi	1778633, 1778634, 1778635
EPA 300.0 Rev. 2.1	03/09/2016			03/11/2016	Julia Storbeck	1778633, 1778634, 1778635
	03/09/2016			03/16/2016	Ping Hua	1778635
EPA 350.1 Rev. 2.0	03/09/2016			03/17/2016	Diana M. Turner	1778636, 1778637, 1778638
EPA 351.2 Rev. 2.0	03/09/2016	03/21/2016	Sofia Elnemr	03/22/2016	Christopher Armour	1778636, 1778637, 1778638
EPA 353.2 Rev. 2.0	03/09/2016			03/15/2016	Peter D. Kaus	1778636, 1778637, 1778638
EPA 365.1 Rev. 2.0	03/09/2016	03/18/2016	Christopher Armour	03/21/2016	Lipi Saha	1778636, 1778637, 1778638
EPA 365.1 Rev. 2.0 dissolved	03/09/2016			03/09/2016 14:06	Ping Hua	1778639
	03/09/2016			03/09/2016 14:07	Ping Hua	1778640
	03/09/2016			03/09/2016 14:08	Ping Hua	1778641
SM 2120 B	03/09/2016			03/10/2016 09:34	Rochelle Y Jackson	1778633
	03/09/2016			03/10/2016 09:35	Rochelle Y Jackson	1778634, 1778635
SM 2320 B-97	03/09/2016			03/15/2016	Dale L. Simmons	1778633
	03/09/2016			03/16/2016	Dale L. Simmons	1778634, 1778635
SM 2540 C-97	03/09/2016			03/09/2016	Yijie Li	1778633, 1778634, 1778635
SM 2540 D-97	03/09/2016			03/09/2016	Yijie Li	1778633, 1778634, 1778635
SM 4500 F-C-97	03/09/2016			03/15/2016	Dale L. Simmons	1778633
	03/09/2016			03/16/2016	Dale L. Simmons	1778634, 1778635
SM 5310 B-00	03/09/2016			03/14/2016	Sofia Elnemr	1778636
	03/09/2016			03/15/2016	Sofia Elnemr	1778637, 1778638