

Chemical Analysis Report

SW-DIST-2016-04-15-01

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

Event Description: **1423A, 1423B, 1409A, 1420, 1432A**

Request ID: **RQ-2016-04-11-41**

Customer: **SW-DIST**

Project ID: **SMP**

Send Reports to:

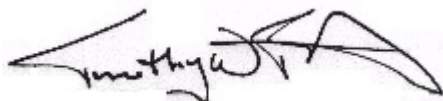
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Stephen Clingerman

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: Timothy Fitzpatrick, Program Administrator

Date Certified: 10-MAY-2016 16:50



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: G5SW0102

Collection Date/Time: 04/14/2016 10:00

Field ID: G5SW0102

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789840	EPA 180.1 Rev. 2.0	Turbidity	5.2		NTU	P302379	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P302720	
		Sulfate	28		mg SO4/L	P302724	
	SM 2120 B	Color (true)	21		PCU	P302345	
	SM 2320 B-97	Total Alkalinity	162		mg CaCO3/L	P302739	
	SM 2540 C-97	TDS	407	A	mg/L	P302953	
	SM 2540 D-97	TSS	10	I	mg/L	P302887	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P302744	
1789847	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P303083	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1	J	mg N/L	P303328	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302862	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P302928	
	SM 5310 B-00	Organic Carbon	5.5		mg C/L	P302948	
1789854	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P302359	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Refer to the narrative for an explanation of QC Codes.

Sample Location: G5SW0101

Collection Date/Time: 04/14/2016 11:10

Field ID: G5SW0101

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789841	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P302379	
	EPA 300.0 Rev. 2.1	Chloride	25	A	mg Cl/L	P302720	
		Sulfate	1.9	A	mg SO4/L	P302724	
	SM 2120 B	Color (true)	38	A	PCU	P302345	
	SM 2320 B-97	Total Alkalinity	26	A	mg CaCO3/L	P302740	
	SM 2540 C-97	TDS	96		mg/L	P302953	
	SM 2540 D-97	TSS	2	U	mg/L	P302887	
	SM 4500 F-C-97	Fluoride	0.079	I	mg F/L	P302745	
1789848	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P303083	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P303328	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302862	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P302928	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P302948	
1789855	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302359	

Sample Location: G5SW0100

Collection Date/Time: 04/14/2016 11:00

Field ID: G5SW0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789842	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P302379	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P302774	
		Sulfate	1.9		mg SO4/L	P302777	
	SM 2120 B	Color (true)	38		PCU	P302345	

Field ID: G5SW0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789842	SM 2320 B-97	Total Alkalinity	26		mg CaCO3/L	P302739	
	SM 2540 C-97	TDS	103		mg/L	P302953	
	SM 2540 D-97	TSS	2	I	mg/L	P302887	
	SM 4500 F-C-97	Fluoride	0.080	I	mg F/L	P302744	
1789849	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P303083	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P303328	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302862	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P302928	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P302948	
1789856	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302359	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: The precision data is unavailable due to low analyte concentration in the QC sample.

Sample Location: G5SW0030

Collection Date/Time: 04/14/2016 12:10

Field ID: G5SW0030

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789843	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P302379	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P302774	
		Sulfate	0.76		mg SO4/L	P302777	
	SM 2120 B	Color (true)	180		PCU	P302345	
	SM 2320 B-97	Total Alkalinity	74		mg CaCO3/L	P302739	
	SM 2540 C-97	TDS	175		mg/L	P302953	
	SM 2540 D-97	TSS	2	U	mg/L	P302887	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P302744	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P303083	
1789850	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P303328	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302862	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P302928	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P302948	
1789857	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017		mg P/L	P302359	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: The precision data is unavailable due to low analyte concentration in the QC sample.

Sample Location: G5SW0104

Collection Date/Time: 04/14/2016 13:20

Field ID: G5SW0104

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789844	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P302379	
	EPA 300.0 Rev. 2.1	Chloride	6.4		mg Cl/L	P302774	
		Sulfate	0.94		mg SO4/L	P302777	
	SM 2120 B	Color (true)	36		PCU	P302345	
	SM 2320 B-97	Total Alkalinity	4.0		mg CaCO3/L	P302739	
	SM 2540 C-97	TDS	41		mg/L	P302953	
	SM 2540 D-97	TSS	2	U	mg/L	P302887	
	SM 4500 F-C-97	Fluoride	0.047	I	mg F/L	P302744	

Field ID: G5SW0104

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789851	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P303083	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P303389	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302862	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P302928	
	SM 5310 B-00	Organic Carbon	8.7		mg C/L	P302948	
1789858	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302359	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: The precision data is unavailable due to low analyte concentration in the QC sample.

Sample Location: G5SW0107

Collection Date/Time: 04/14/2016 14:15

Field ID: G5SW0107

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789845	EPA 180.1 Rev. 2.0	Turbidity	0.65		NTU	P302379	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P302774	
		Sulfate	0.30	I	mg SO4/L	P302777	
	SM 2120 B	Color (true)	30		PCU	P302345	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P302739	
	SM 2540 C-97	TDS	67		mg/L	P302954	
	SM 2540 D-97	TSS	2	I	mg/L	P302888	
	SM 4500 F-C-97	Fluoride	0.061	I	mg F/L	P302744	
1789852	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P303083	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P303389	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302862	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P302928	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P302948	
1789859	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302359	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: The precision data is unavailable due to low analyte concentration in the QC sample.

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

Sample Location: G5SW0108

Collection Date/Time: 04/14/2016 14:25

Field ID: G5SW0108

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789846	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P302379	
	EPA 300.0 Rev. 2.1	Chloride	17	A	mg Cl/L	P302774	
		Sulfate	0.26	I	mg SO4/L	P302777	
	SM 2120 B	Color (true)	30		PCU	P302345	
	SM 2320 B-97	Total Alkalinity	13		mg CaCO3/L	P302739	
	SM 2540 C-97	TDS	71		mg/L	P302954	
	SM 2540 D-97	TSS	2	U	mg/L	P302888	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P302744	
1789853	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P303083	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P303389	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P302864	

Field ID: G5SW0108

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1789853	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P302928	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P302949	
1789860	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P302359	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: The precision data is unavailable due to low analyte concentration in the QC sample.
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: P302379

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302720

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302724

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302774

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302777

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303083

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303328

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303389

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302862

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302864

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: P302928

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302359

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

Reference Method: SM 2120 B
Batch ID: P302345

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P302739

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

Reference Method: SM 2320 B-97
Batch ID: P302740

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

Reference Method: SM 2540 C-97
Batch ID: P302953

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P302954

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P302887

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P302888

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P302744

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P302745

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P302948

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

Reference Method: SM 5310 B-00
Batch ID: P302949

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: P302720

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302724

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: P302724

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302774

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302777

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303083

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303328

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302862

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302864

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P302928

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302359

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.7		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P302739

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

Reference Method: SM 2320 B-97
Batch ID: P302740

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P302744

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.5		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P302745

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P302948

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P302949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302720

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789835	Chloride	102		P	90 - 110
1789841	Chloride	99.7		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789835	Sulfate	100		P	90 - 110
1789841	Sulfate	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302774

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789846	Chloride	99.7		P	90 - 110
1789938	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302777

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789846	Sulfate	99.7		P	90 - 110
1789938	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789850	Ammonia-N	98.7	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303328

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789847	Kjeldahl Nitrogen	89.2	97.6	F/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789851	Kjeldahl Nitrogen	98.8	90.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789836	NO2NO3-N	98.8	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789874	NO2NO3-N	104	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P302928

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789753	Total-P	94.6	99.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302359

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789858	O-Phosphate-P	96.6	98.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P302744

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1790152	Fluoride	98.1	98.8	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P302745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789841	Fluoride	97.4	96.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P302948

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789501	Organic Carbon	96.3	95.4	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P302949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1789874	Organic Carbon	96.6	97.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P302379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789834	Turbidity	2.17	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302720

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789841	Chloride	0.000161	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789841	Sulfate	1.35	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P302774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789846	Chloride	0.626	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789850	Ammonia-N	0.287	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303328

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789847	Kjeldahl Nitrogen	4.49	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789851	Kjeldahl Nitrogen	5.39	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789836	NO2NO3-N	0.460	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P302864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789874	NO2NO3-N	4.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P302928

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789753	Total-P	4.41	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P302359

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789858	O-Phosphate-P	1.74	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P302345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789841	Color (true)	0.00522	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P302739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790152	Total Alkalinity	0.711	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P302740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789841	Total Alkalinity	0.305	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P302953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789840	TDS	3.93	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P302954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789873	TDS	3.92	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P302887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789840	TSS	8.33	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P302744

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1790152	Fluoride	0.516	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P302745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789841	Fluoride	0.530	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P302948

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789501	Organic Carbon	0.675	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P302949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1789874	Organic Carbon	0.351	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A68902
Included Lab Sample IDs: 1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.8	P/P	90 - 115
Color (true)	98.2	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68905
Included Lab Sample IDs: 1789854, 1789855, 1789856, 1789857, 1789858, 1789859, 1789860

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	99.5	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A68911
Included Lab Sample IDs: 1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A68939
Included Lab Sample IDs: 1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	101	100	P/P	90 - 110
Chloride	98.9	100	P/P	90 - 110
Sulfate	98.4	100	P/P	90 - 110
Sulfate	99.6	100	P/P	90 - 110
Sulfate	100	98.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A69026

Included Lab Sample IDs: 1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.4	P/P	90 - 110
Total Alkalinity	98.7	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A69026

Included Lab Sample IDs: 1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69066

Included Lab Sample IDs: 1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110
NO2NO3-N	104	104	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A69096

Included Lab Sample IDs: 1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.2	94.4	P/P	90 - 110
Organic Carbon	94.6	94.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69108

Included Lab Sample IDs: 1789847

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69134

Included Lab Sample IDs: 1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A69175

Included Lab Sample IDs: 1789848, 1789849, 1789850, 1789851, 1789852, 1789853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69236

Included Lab Sample IDs: 1789847, 1789848, 1789849, 1789850

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.6	100	P/P	90 - 110
Kjeldahl Nitrogen	98.6	96.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69302

Included Lab Sample IDs: 1789851, 1789852, 1789853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.3	99.6	P/P	90 - 110
Kjeldahl Nitrogen	99.6	98.7	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				2.17	
EPA 300.0 Rev. 2.1	Chloride	102	99.7 102		0.0001	
	Chloride	100	99.7 100		0.626	
	Sulfate	101	101 100		1.35	
	Sulfate	99.4	99.7 100			
EPA 350.1 Rev. 2.0	Ammonia-N	100	98.7 99.0			0.287
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	89.2 97.6			4.49
	Kjeldahl Nitrogen	99.0	98.8 90.4			5.39
EPA 353.2 Rev. 2.0	NO2NO3-N	104	98.8 98.3			0.460
	NO2NO3-N	109	104 108			4.12
EPA 365.1 Rev. 2.0	Total-P	96.6	94.6 99.0			4.41
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	96.6 98.3			1.74
SM 2120 B	Color (true)				0.0052	
SM 2320 B-97	Total Alkalinity	102			0.711	
	Total Alkalinity	101			0.305	
SM 2540 C-97	TDS				3.93	
	TDS				3.92	
SM 2540 D-97	TSS				8.33	
SM 4500 F-C-97	Fluoride	95.5	98.1 98.8			0.516
	Fluoride	97.0	97.4 96.8			0.530
SM 5310 B-00	Organic Carbon	95.2	96.3 95.4			0.675
	Organic Carbon	95.4	96.6 97.2			0.351

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1789854, 1789855, 1789856, 1789857, 1789858, 1789859, 1789860
SM 2120 B / E31780	True Color measured at 450 nm	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853

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	04/15/2016			04/15/2016 14:58	Sima Feizi	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
EPA 300.0 Rev. 2.1	04/15/2016			04/21/2016	Julia Storbeck	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
EPA 350.1 Rev. 2.0	04/15/2016			04/27/2016	Diana M. Turner	1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853
EPA 351.2 Rev. 2.0	04/15/2016	05/02/2016	Sofia Elnemr	05/03/2016	Christopher Armour	1789847, 1789848, 1789849, 1789850
	04/15/2016	05/03/2016	Sofia Elnemr	05/04/2016	Christopher Armour	1789851, 1789852, 1789853
EPA 353.2 Rev. 2.0	04/15/2016			04/22/2016	Peter D. Kaus	1789847, 1789848, 1789849, 1789850, 1789851, 1789852, 1789853
EPA 365.1 Rev. 2.0	04/15/2016	04/26/2016	Christopher Armour	04/26/2016	Lipi Saha	1789847
	04/15/2016	04/26/2016	Christopher Armour	04/27/2016	Lipi Saha	1789848, 1789849, 1789850, 1789851, 1789852, 1789853
EPA 365.1 Rev. 2.0 dissolved	04/15/2016			04/15/2016 12:53	Julia Storbeck	1789858
	04/15/2016			04/15/2016 13:06	Julia Storbeck	1789854
	04/15/2016			04/15/2016 13:07	Julia Storbeck	1789855
	04/15/2016			04/15/2016 13:08	Julia Storbeck	1789856
	04/15/2016			04/15/2016 13:09	Julia Storbeck	1789857, 1789859
	04/15/2016			04/15/2016 13:10	Julia Storbeck	1789860
SM 2120 B	04/15/2016			04/15/2016 11:31	Rochelle Y Jackson	1789840
	04/15/2016			04/15/2016 11:33	Rochelle Y Jackson	1789841, 1789842
	04/15/2016			04/15/2016 11:35	Rochelle Y Jackson	1789844
	04/15/2016			04/15/2016 11:36	Rochelle Y Jackson	1789845, 1789846
	04/15/2016			04/15/2016 11:51	Rochelle Y Jackson	1789843
SM 2320 B-97	04/15/2016			04/21/2016	Dale L. Simmons	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 2540 C-97	04/15/2016			04/20/2016	Yijie Li	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 2540 D-97	04/15/2016			04/20/2016	Yijie Li	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 4500 F-C-97	04/15/2016			04/21/2016	Dale L. Simmons	1789840, 1789841, 1789842, 1789843, 1789844, 1789845, 1789846
SM 5310 B-00	04/15/2016			04/25/2016	Sofia Elnemr	1789847, 1789848, 1789849, 1789850, 1789851, 1789852
	04/15/2016			04/26/2016	Sofia Elnemr	1789853