

Chemical Analysis Report

SO-DIST-2016-03-30-03

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

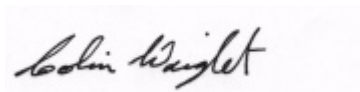
Event Description: **SMP: Highlands Lakes**
Request ID: **RQ-2016-03-07-49**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 15-APR-2016 09:17

A handwritten signature in black ink, appearing to read "Colin Wright", is written on a light-colored rectangular background.

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: Hill Lake @ South Side

Collection Date/Time: 03/29/2016 11:15

Field ID: G4HL032016-14

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784442	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P301293	
	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P301449	
		Sulfate	4.8		mg SO4/L	P301451	
	SM 2120 B	Color (true)	51	A	PCU	P301286	
	SM 2320 B-97	Total Alkalinity	4.1		mg CaCO3/L	P301700	
	SM 2540 C-97	TDS	49		mg/L	P301779	
	SM 2540 D-97	TSS	3	I	mg/L	P301790	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P301705	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P301689	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P302023	
1784447	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P301533	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P301653	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P301502	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P301298	
	dissolved						

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 59 umhos/cm.

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

Sample Location: Hill Lake @ East Side

Collection Date/Time: 03/29/2016 11:25

Field ID: G4HL032016-15

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784443	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P301293	
	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P301449	
		Sulfate	4.8		mg SO4/L	P301451	
	SM 2120 B	Color (true)	51		PCU	P301286	
	SM 2320 B-97	Total Alkalinity	4.1		mg CaCO3/L	P301700	
	SM 2540 C-97	TDS	52		mg/L	P301779	
	SM 2540 D-97	TSS	2	U	mg/L	P301790	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P301705	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P301690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P302023	
1784448	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P301533	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P301653	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P301502	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P301298	
	dissolved						

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 59 umhos/cm.

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

Sample Location: Hill Lake @ North

Collection Date/Time: 03/29/2016 10:50

Field ID: G4HL032016-11

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784444	EPA 180.1 Rev. 2.0	Turbidity	1.2	A	NTU	P301294	

Field ID: G4HL032016-11

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784444	EPA 300.0 Rev. 2.1	Chloride	9.1		mg Cl/L	P301449	
		Sulfate	4.8		mg SO4/L	P301451	
	SM 2120 B	Color (true)	52		PCU	P301286	
	SM 2320 B-97	Total Alkalinity	4.3		mg CaCO3/L	P301700	
	SM 2540 C-97	TDS	65		mg/L	P301779	
	SM 2540 D-97	TSS	2	I	mg/L	P301790	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P301705	
1784449	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P301690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P302023	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P301533	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P301653	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P301502	
1784454	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301298	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 59 umhos/cm.

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

Sample Location: Hill Lake @ Center

Collection Date/Time: 03/29/2016 11:00

Field ID: G4HL032016-12

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784445	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P301294	
	EPA 300.0 Rev. 2.1	Chloride	9.0	A	mg Cl/L	P301452	
		Sulfate	4.8		mg SO4/L	P301555	
	SM 2120 B	Color (true)	51		PCU	P301286	
	SM 2320 B-97	Total Alkalinity	4.2		mg CaCO3/L	P301700	
	SM 2540 C-97	TDS	59		mg/L	P301779	
	SM 2540 D-97	TSS	3	I	mg/L	P301790	
1784450	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P301705	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P301690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P302023	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P301533	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P301653	
1784455	SM 5310 B-00	Organic Carbon	10		mg C/L	P301502	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301298	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 59 umhos/cm.

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

Sample Location: Hill Lake @ West Side

Collection Date/Time: 03/29/2016 11:10

Field ID: G4HL032016-13

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784446	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P301294	
	EPA 300.0 Rev. 2.1	Chloride	9.0		mg Cl/L	P301452	
		Sulfate	4.8	A	mg SO4/L	P301555	

Field ID: G4HL032016-13

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784446	SM 2120 B	Color (true)	53		PCU	P301286	
	SM 2320 B-97	Total Alkalinity	4.1		mg CaCO3/L	P301700	
	SM 2540 C-97	TDS	49		mg/L	P301779	
	SM 2540 D-97	TSS	2	I	mg/L	P301790	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P301705	
1784451	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P301690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P302023	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P301533	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P301653	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P301502	
1784456	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301298	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 59 umhos/cm.

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: P301293

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P301294

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P301449

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P301451

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P301452

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P301555

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301689

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301690

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302023

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301533

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: P301653

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301298

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

Reference Method: SM 2120 B
Batch ID: P301286

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P301700

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

Reference Method: SM 2540 C-97
Batch ID: P301779

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P301790

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P301705

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P301502

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: P301449

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301451

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301452

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301555

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301689

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: P301690

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301690

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301533

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: P301653

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301298

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

Reference Method: SM 2320 B-97
Batch ID: P301700

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

Reference Method: SM 4500 F-C-97
Batch ID: P301705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P301502

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: P301449

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301449

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784317	Chloride	98.0		P	90 - 110
1784318	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301451

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784317	Sulfate	95.5		P	90 - 110
1784318	Sulfate	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301452

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784445	Chloride	94.7		P	90 - 110
1784446	Chloride	99.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301555

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784446	Sulfate	99.1		P	90 - 110
1784785	Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784375	Ammonia-N	102	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784448	Ammonia-N	99.0	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784376	Kjeldahl Nitrogen	93.8	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784448	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784375	Total-P	94.3	94.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301298

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784452	O-Phosphate-P	100	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P301705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784758	Fluoride	96.3	97.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P301502

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784360	Organic Carbon	94.3	93.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P301293

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784355	Turbidity	2.60	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P301294

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784444	Turbidity	1.64	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301449

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784317	Chloride	0.304	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784317	Sulfate	0.197	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784445	Chloride	0.0213	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301555

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784446	Sulfate	0.438	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784375	Ammonia-N	1.12	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784448	Ammonia-N	1.53	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P302023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784376	Kjeldahl Nitrogen	2.37	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784448	NO2NO3-N	0.496	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784375	Total-P	0.0261	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301298

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784452	O-Phosphate-P	1.48	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P301286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784442	Color (true)	0.620	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P301700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784758	Total Alkalinity	1.00	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P301779

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784758	TDS	5.20	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P301705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784758	Fluoride	1.03	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P301502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784360	Organic Carbon	0.418	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: A68535
Included Lab Sample IDs: 1784442, 1784443, 1784444, 1784445, 1784446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.9	100	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68538
Included Lab Sample IDs: 1784452, 1784453, 1784454, 1784455, 1784456

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.4	P/P	90 - 110
O-Phosphate-P	99.2	98.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A68539

Included Lab Sample IDs: 1784442, 1784443, 1784444, 1784445, 1784446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.0	P/P	95 - 105
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A68546

Included Lab Sample IDs: 1784442, 1784443, 1784444, 1784445, 1784446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Chloride	102	101	P/P	90 - 110
Sulfate	99.2	99.7	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A68615

Included Lab Sample IDs: 1784447, 1784448, 1784449, 1784450, 1784451

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.6	93.8	P/P	90 - 110
Organic Carbon	94.0	93.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A68624

Included Lab Sample IDs: 1784447, 1784448, 1784449, 1784450, 1784451

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A68637

Included Lab Sample IDs: 1784445, 1784446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	98.7	99.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A68662

Included Lab Sample IDs: 1784447, 1784448, 1784449, 1784450, 1784451

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

Reference Method: SM 2320 B-97

Run ID: A68687

Included Lab Sample IDs: 1784442, 1784443, 1784444, 1784445, 1784446

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A68687

Included Lab Sample IDs: 1784442, 1784443, 1784444, 1784445, 1784446

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A68725

Included Lab Sample IDs: 1784447, 1784448, 1784449, 1784450, 1784451

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A68850

Included Lab Sample IDs: 1784447, 1784448, 1784449, 1784450, 1784451

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	102	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				2.60	
	Turbidity				1.64	
EPA 300.0 Rev. 2.1	Chloride	102	100	98.0	0.304	
	Chloride	97.9	94.7	99.0	0.0213	
	Sulfate	99.5	95.5	98.2	0.197	
	Sulfate	98.4	99.1	95.9	0.438	
EPA 350.1 Rev. 2.0	Ammonia-N	100	102	104		1.12
	Ammonia-N	98.7	99.0	101		1.53
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.0	93.8	97.8		2.37
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	100		0.496
EPA 365.1 Rev. 2.0	Total-P	96.9	94.3	94.3		0.0261
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	102		1.48
SM 2120 B	Color (true)				0.620	
SM 2320 B-97	Total Alkalinity	103			1.00	
SM 2540 C-97	TDS				5.20	
SM 4500 F-C-97	Fluoride	96.7	96.3	97.5		1.03
SM 5310 B-00	Organic Carbon	95.4	94.3	93.8		0.418

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1784442, 1784443, 1784444, 1784445, 1784446
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1784442, 1784443, 1784444, 1784445, 1784446

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1784442, 1784443, 1784444, 1784445, 1784446
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1784447, 1784448, 1784449, 1784450, 1784451
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1784447, 1784448, 1784449, 1784450, 1784451
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1784447, 1784448, 1784449, 1784450, 1784451
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1784447, 1784448, 1784449, 1784450, 1784451
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1784452, 1784453, 1784454, 1784455, 1784456
SM 2120 B / E31780	True Color measured at 450 nm	1784442, 1784443, 1784444, 1784445, 1784446
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1784442, 1784443, 1784444, 1784445, 1784446
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1784442, 1784443, 1784444, 1784445, 1784446
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1784442, 1784443, 1784444, 1784445, 1784446
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1784442, 1784443, 1784444, 1784445, 1784446
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1784447, 1784448, 1784449, 1784450, 1784451

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	03/30/2016			03/30/2016 14:45	Sima Feizi	1784442, 1784443, 1784444, 1784445, 1784446
EPA 300.0 Rev. 2.1	03/30/2016			04/01/2016	Ping Hua	1784442, 1784443, 1784444
	03/30/2016			04/04/2016	Julia Storbeck	1784445, 1784446
EPA 350.1 Rev. 2.0	03/30/2016			04/05/2016	Diana M. Turner	1784447, 1784448, 1784449, 1784450, 1784451
EPA 351.2 Rev. 2.0	03/30/2016	04/12/2016	Sofia Elnemr	04/13/2016	Christopher Armour	1784447, 1784448, 1784449, 1784450, 1784451
EPA 353.2 Rev. 2.0	03/30/2016			04/04/2016	Diana M. Turner	1784447, 1784448, 1784449, 1784450, 1784451
EPA 365.1 Rev. 2.0	03/30/2016	04/06/2016	Christopher Armour	04/07/2016	Lipi Saha	1784447, 1784448, 1784449, 1784450, 1784451
EPA 365.1 Rev. 2.0 dissolved	03/30/2016			03/30/2016 13:22	Julia Storbeck	1784452
	03/30/2016			03/30/2016 13:59	Julia Storbeck	1784453
	03/30/2016			03/30/2016 14:00	Julia Storbeck	1784454
	03/30/2016			03/30/2016 14:01	Julia Storbeck	1784455
	03/30/2016			03/30/2016 14:02	Julia Storbeck	1784456
SM 2120 B	03/30/2016			03/30/2016 13:45	Blanca Fach	1784442
	03/30/2016			03/30/2016 13:46	Blanca Fach	1784443, 1784444
	03/30/2016			03/30/2016 13:47	Blanca Fach	1784445
	03/30/2016			03/30/2016 13:48	Blanca Fach	1784446
SM 2320 B-97	03/30/2016			04/06/2016	Dale L. Simmons	1784442, 1784443, 1784444, 1784445, 1784446
SM 2540 C-97	03/30/2016			04/01/2016	Yijie Li	1784442, 1784443, 1784444, 1784445, 1784446
SM 2540 D-97	03/30/2016			04/01/2016	Yijie Li	1784442, 1784443, 1784444, 1784445, 1784446
SM 4500 F-C-97	03/30/2016			04/06/2016	Dale L. Simmons	1784442, 1784443, 1784444, 1784445, 1784446
SM 5310 B-00	03/30/2016			04/02/2016	Sofia Elnemr	1784447, 1784448, 1784449, 1784450, 1784451