Chemical Analysis Report

SO-DIST-2016-04-27-01

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-2016-04-11-05**
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
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 20-MAY-2016 16:47

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 @ North **Collection Date/Time: 04/26/2016 11:25**

Field ID: G4HL042016-11 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793210	EPA 180.1 Rev. 2.0	Turbidity	1.9	A	NTU	P303118	
	EPA 300.0 Rev. 2.1	Chloride	9.5		mg Cl/L	P303579	
		Sulfate	5.1		mg SO4/L	P303583	
	SM 2120 B	Color (true)	49	A	PCU	P303050	
	SM 2320 B-97	Total Alkalinity	3.8		mg CaCO3/L	P303464	
	SM 2540 C-97	TDS	56		mg/L	P303760	
	SM 2540 D-97	TSS	4	I	mg/L	P303751	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P303280	
1793215	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P303690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P303997	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P303838	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P303811	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P304299	
1793220	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303100	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 62 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: 04/26/2016 11:36**

Field ID: G4HL042016-12 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793211	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P303118	
	EPA 300.0 Rev. 2.1	Chloride	9.6		mg Cl/L	P303580	
		Sulfate	5.1		mg SO4/L	P303584	
	SM 2120 B	Color (true)	48		PCU	P303050	
	SM 2320 B-97	Total Alkalinity	3.9		mg CaCO3/L	P303464	
	SM 2540 C-97	TDS	58		mg/L	P303760	
	SM 2540 D-97	TSS	3	I	mg/L	P303751	
	SM 4500 F-C-97	Fluoride	0.037	I	mg F/L	P303280	
1793216	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P303690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P303997	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P303838	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P303811	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P304299	
1793221	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303101	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 62 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 **Collection Date/Time: 04/26/2016 11:43**

Field ID: G4HL042016-13 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

Field ID: G4HL042016-13 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793212	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P303118	
	EPA 300.0 Rev. 2.1	Chloride	9.6		mg Cl/L	P303580	
		Sulfate	5.1		mg SO4/L	P303584	
	SM 2120 B	Color (true)	50		PCU	P303050	
	SM 2320 B-97	Total Alkalinity	3.8		mg CaCO3/L	P303464	
	SM 2540 C-97	TDS	57		mg/L	P303760	
	SM 2540 D-97	TSS	3	I	mg/L	P303751	
	SM 4500 F-C-97	Fluoride	0.037	I	mg F/L	P303280	
1793217	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P303690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P304306	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P303839	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P303813	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P304299	
1793222	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303101	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 62 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 @ South Side **Collection Date/Time: 04/26/2016 11:54**

Field ID: G4HL042016-14 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793213	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P303118	
	EPA 300.0 Rev. 2.1	Chloride	9.5		mg Cl/L	P303580	
		Sulfate	5.1		mg SO4/L	P303584	
	SM 2120 B	Color (true)	49		PCU	P303050	
	SM 2320 B-97	Total Alkalinity	3.9		mg CaCO3/L	P303464	
	SM 2540 C-97	TDS	50		mg/L	P303760	
	SM 2540 D-97	TSS	3	I	mg/L	P303751	
	SM 4500 F-C-97	Fluoride	0.037	I	mg F/L	P303280	
1793218	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P303690	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P303998	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P303839	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P303813	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P304299	
1793223	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303101	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 62 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: 04/26/2016 12:06**

Field ID: G4HL042016-15 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

Field ID: G4HL042016-15 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1793214	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P303118	
	EPA 300.0 Rev. 2.1	Chloride	9.5		mg Cl/L	P303580	
		Sulfate	5.1		mg SO4/L	P303584	
	SM 2120 B	Color (true)	49		PCU	P303050	
	SM 2320 B-97	Total Alkalinity	3.9		mg CaCO3/L	P303464	
	SM 2540 C-97	TDS	59		mg/L	P303761	
	SM 2540 D-97	TSS	2	I	mg/L	P303752	
	SM 4500 F-C-97	Fluoride	0.035	I	mg F/L	P303280	
1793219	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P303783	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P303998	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P303839	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P303813	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P304299	
1793224	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P303101	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Matrix spike recovery data for one of two spiked samples is unavailable due to high analyte concentration in the QC sample.
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 62 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: P303118

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303579

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303580

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303583

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303584

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: P303690

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303783

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303997

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303998

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304306

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303838

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303839

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303811

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303813

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303100

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303101

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

Reference Method: SM 2120 B
Batch ID: P303050

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P303464

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

Reference Method: SM 2540 C-97
Batch ID: P303760

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P303761

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P303751

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P303752

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P303280

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P304299

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: P303579

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303580

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	92.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	91.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303690

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303783

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303997

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303998

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303998

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: P304306

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303838

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303839

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303811

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303813

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303100

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303101

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

Reference Method: SM 2320 B-97
Batch ID: P303464

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P303280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P304299

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793068	Chloride	92.8		P	90 - 110
1793193	Chloride	95.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303580

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793263	Chloride	95.8		P	90 - 110
1793328	Chloride	94.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793068	Sulfate	92.4		P	90 - 110
1793193	Sulfate	92.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793328	Sulfate	93.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793129	Ammonia-N	99.7	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303783

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793219	Ammonia-N	99.6	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303997

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793128	Kjeldahl Nitrogen	97.6	111	P/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793218	Kjeldahl Nitrogen	98.3	96.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793217	Kjeldahl Nitrogen	97.3	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303838

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793127	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303839

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793217	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303811

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793127	Total-P	97.8	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793219	Total-P	96.1	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303100

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793135	O-Phosphate-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303101

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793223	O-Phosphate-P	100	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P303280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793320	Fluoride	98.2	98.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P304299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1793071	Organic Carbon	98.8	98.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P303118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793210	Turbidity	1.60	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793193	Chloride	0.0888	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793263	Chloride	0.00898	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793193	Sulfate	0.520	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P303584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793263	Sulfate	0.120	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793129	Ammonia-N	0.551	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P303783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793219	Ammonia-N	1.69	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793128	Kjeldahl Nitrogen	7.03	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P303998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793218	Kjeldahl Nitrogen	1.57	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P304306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793217	Kjeldahl Nitrogen	4.81	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793127	NO2NO3-N	0.985	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P303839

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793217	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303811

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793127	Total-P	0.762	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P303813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793219	Total-P	3.20	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793135	O-Phosphate-P	0.683	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P303101

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793223	O-Phosphate-P	1.19	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P303050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793210	Color (true)	6.82	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P303464

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793320	Total Alkalinity	0.236	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P303760

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793102	TDS	4.88	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P303761

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793230	TDS	5.71	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P303280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793320	Fluoride	0.509	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P304299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1793071	Organic Carbon	0.0630	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: A69125
Included Lab Sample IDs: 1793210, 1793211, 1793212, 1793213, 1793214

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	99.5	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A69135
Included Lab Sample IDs: 1793220, 1793221, 1793222, 1793223, 1793224

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	102	101	P/P	90 - 110
O-Phosphate-P	99.3	99.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A69141
Included Lab Sample IDs: 1793210, 1793211, 1793212, 1793213, 1793214

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

Reference Method: SM 4500 F-C-97
Run ID: A69187
Included Lab Sample IDs: 1793210, 1793211, 1793212, 1793213, 1793214

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A69217
Included Lab Sample IDs: 1793210, 1793211, 1793212, 1793213, 1793214

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	101	101	P/P	90 - 110
Chloride	101	100	P/P	90 - 110
Sulfate	96.6	99.0	P/P	90 - 110
Sulfate	99.0	95.2	P/P	90 - 110
Sulfate	99.9	96.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A69249
Included Lab Sample IDs: 1793210, 1793211, 1793212, 1793213, 1793214

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A69311
Included Lab Sample IDs: 1793215, 1793216, 1793217, 1793218

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A69333
Included Lab Sample IDs: 1793219

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A69353
Included Lab Sample IDs: 1793215, 1793216, 1793217, 1793218, 1793219

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	99.0	P/P	90 - 110
NO2NO3-N	99.0	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A69412
Included Lab Sample IDs: 1793215, 1793216, 1793217, 1793218, 1793219

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A69442
Included Lab Sample IDs: 1793215, 1793216, 1793218, 1793219

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.1	97.4	P/P	90 - 110
Kjeldahl Nitrogen	96.8	95.9	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A69474
Included Lab Sample IDs: 1793215, 1793216, 1793217, 1793218, 1793219

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A69525
Included Lab Sample IDs: 1793217

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A69525
Included Lab Sample IDs: 1793217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	94.8	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		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					1.60	
EPA 300.0 Rev. 2.1	Chloride	95.1	95.4	92.8		0.0888	
	Chloride	96.0	95.8	94.6		0.0089	
	Sulfate	92.5	92.9	92.4		0.520	
	Sulfate	91.3	93.6			0.120	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.7	100			0.551
	Ammonia-N	99.9	99.6	101			1.69
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	97.6	111			7.03
	Kjeldahl Nitrogen	102	98.3	96.1			1.57
	Kjeldahl Nitrogen	102	97.3	104			4.81
EPA 353.2 Rev. 2.0	NO2NO3-N	103	101	102			0.985
	NO2NO3-N	102	100	100			0.499
EPA 365.1 Rev. 2.0	Total-P	96.9	97.8	97.0			0.762
	Total-P	102	96.1	99.4			3.20
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	106	102	103			0.683
	O-Phosphate-P	103	100	101			1.19
SM 2120 B	Color (true)					6.82	
SM 2320 B-97	Total Alkalinity	101				0.236	
SM 2540 C-97	TDS					4.88	
	TDS					5.71	
SM 4500 F-C-97	Fluoride	98.8	98.2	98.9			0.509
SM 5310 B-00	Organic Carbon	102	98.8	98.6			0.0630

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1793210, 1793211, 1793212, 1793213, 1793214
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1793210, 1793211, 1793212, 1793213, 1793214
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1793210, 1793211, 1793212, 1793213, 1793214
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1793215, 1793216, 1793217, 1793218, 1793219
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1793215, 1793216, 1793217, 1793218, 1793219
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1793215, 1793216, 1793217, 1793218, 1793219
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1793215, 1793216, 1793217, 1793218, 1793219

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1793220, 1793221, 1793222, 1793223, 1793224
SM 2120 B / E31780	True Color measured at 450 nm	1793210, 1793211, 1793212, 1793213, 1793214
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1793210, 1793211, 1793212, 1793213, 1793214
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1793210, 1793211, 1793212, 1793213, 1793214
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1793210, 1793211, 1793212, 1793213, 1793214
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1793210, 1793211, 1793212, 1793213, 1793214
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1793215, 1793216, 1793217, 1793218, 1793219

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	04/27/2016			04/27/2016 16:13	Sima Feizi	1793210, 1793211, 1793212, 1793213, 1793214
EPA 300.0 Rev. 2.1	04/27/2016			05/04/2016	Elisa J Lutz	1793210, 1793211, 1793212, 1793213, 1793214
EPA 350.1 Rev. 2.0	04/27/2016			05/05/2016	Diana M. Turner	1793215, 1793216, 1793217, 1793218
	04/27/2016			05/06/2016	Diana M. Turner	1793219
EPA 351.2 Rev. 2.0	04/27/2016	05/11/2016	Sofia Elnemr	05/12/2016	Christopher Armour	1793215, 1793216, 1793218, 1793219
	04/27/2016	05/13/2016	Christopher Armour	05/16/2016	Christopher Armour	1793217
EPA 353.2 Rev. 2.0	04/27/2016			05/09/2016	Peter D. Kaus	1793215, 1793216, 1793217, 1793218, 1793219
EPA 365.1 Rev. 2.0	04/27/2016	05/09/2016	Vijayalakshmi Reddy	05/10/2016	Lipi Saha	1793215, 1793216, 1793217, 1793218, 1793219
EPA 365.1 Rev. 2.0 dissolved	04/27/2016			04/27/2016 14:33	Julia Storbeck	1793223
	04/27/2016			04/27/2016 15:36	Julia Storbeck	1793220
	04/27/2016			04/27/2016 15:37	Julia Storbeck	1793221
	04/27/2016			04/27/2016 15:38	Julia Storbeck	1793222
	04/27/2016			04/27/2016 15:39	Julia Storbeck	1793224
SM 2120 B	04/27/2016			04/27/2016 13:01	Rochelle Y Jackson	1793210
	04/27/2016			04/27/2016 13:02	Rochelle Y Jackson	1793211
	04/27/2016			04/27/2016 13:03	Rochelle Y Jackson	1793212, 1793213
	04/27/2016			04/27/2016 13:04	Rochelle Y Jackson	1793214
SM 2320 B-97	04/27/2016			05/04/2016	Dale L. Simmons	1793210, 1793211, 1793212, 1793213, 1793214
SM 2540 C-97	04/27/2016			04/29/2016	Yijie Li	1793210, 1793211, 1793212, 1793213, 1793214
SM 2540 D-97	04/27/2016			04/29/2016	Yijie Li	1793210, 1793211, 1793212, 1793213, 1793214
SM 4500 F-C-97	04/27/2016			04/30/2016	Dale L. Simmons	1793210, 1793211, 1793212, 1793213, 1793214
SM 5310 B-00	04/27/2016			05/14/2016	Diana M. Turner	1793215, 1793216, 1793217, 1793218, 1793219