Chemical Analysis Report

SO-DIST-2016-02-10-01

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

Event Description: **SMP: Highlands Canoe Lakes**
Request ID: **RQ-2016-01-25-68**
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: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 25-FEB-2016 13:56

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: Platt Branch at CR 731 **Collection Date/Time: 02/09/2016 10:25**

Field ID: G4SD020916-1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770162	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P298416	
	EPA 300.0 Rev. 2.1	Chloride	78		mg Cl/L	P298613	
		Sulfate	38		mg SO4/L	P298615	
	SM 2120 B	Color (true)	300		PCU	P298409	
	SM 2320 B-97	Total Alkalinity	22		mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	276		mg/L	P298991	
	SM 2540 D-97	TSS	3	I	mg/L	P298985	
	SM 4500 F-C-97	Fluoride	0.082	I	mg F/L	P298775	
1770168	EPA 350.1 Rev. 2.0	Ammonia-N	0.047		mg N/L	P298737	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P298648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.053		mg N/L	P298657	
	EPA 365.1 Rev. 2.0	Total-P	0.30		mg P/L	P298637	
	SM 5310 B-00	Organic Carbon	28		mg C/L	P298679	
1770174	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.24		mg P/L	P298403	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Bootheel Creek East Branch **Collection Date/Time: 02/09/2016 11:30**

Field ID: G4SD020916-2 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770163	EPA 180.1 Rev. 2.0	Turbidity	1.7	A	NTU	P298417	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P298613	
		Sulfate	3.0		mg SO4/L	P298615	
	SM 2120 B	Color (true)	460		PCU	P298409	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	107		mg/L	P298991	
	SM 2540 D-97	TSS	2	I	mg/L	P298985	
	SM 4500 F-C-97	Fluoride	0.041	I	mg F/L	P298775	
1770169	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P298737	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P298648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P298657	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P298637	
	SM 5310 B-00	Organic Carbon	36		mg C/L	P298679	
1770175	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P298403	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Joe Slough at Graham Dairy Road **Collection Date/Time: 02/09/2016 10:55**

Field ID: G4SD020916-3 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770164	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P298417	

Field ID: G4SD020916-3 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770164	EPA 300.0 Rev. 2.1	Chloride	29	A	mg Cl/L	P298613	
		Sulfate	6.9	A	mg SO4/L	P298615	
	SM 2120 B	Color (true)	320		PCU	P298409	
	SM 2320 B-97	Total Alkalinity	9.4		mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	127		mg/L	P298991	
	SM 2540 D-97	TSS	2	I	mg/L	P298985	
	SM 4500 F-C-97	Fluoride	0.067	I	mg F/L	P298775	
1770170	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P298737	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P298648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.033		mg N/L	P298657	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P298638	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P298679	
1770176	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.064		mg P/L	P298403	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Placid June Canal @ end of Lake Groves Rd **Collection Date/Time: 02/09/2016 12:15**

Field ID: G4SD020916-4 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770165	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P298417	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P298613	
		Sulfate	13		mg SO4/L	P298615	
	SM 2120 B	Color (true)	61	A	PCU	P298409	
	SM 2320 B-97	Total Alkalinity	10		mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	67		mg/L	P298991	
	SM 2540 D-97	TSS	4	I	mg/L	P298985	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P298775	
1770171	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P298738	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P298648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P298657	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P298638	
	SM 5310 B-00	Organic Carbon	9.3		mg C/L	P298679	
1770177	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P298403	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: LWO @ SR 66 **Collection Date/Time: 02/09/2016 13:40**

Field ID: G4SD020916-5 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770166	EPA 180.1 Rev. 2.0	Turbidity	8.2		NTU	P298417	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P298613	
		Sulfate	4.0		mg SO4/L	P298615	

Field ID: G4SD020916-5 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770166	SM 2120 B	Color (true)	470		PCU	P298410	
	SM 2320 B-97	Total Alkalinity	3.9		mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	103		mg/L	P298991	
	SM 2540 D-97	TSS	6	I	mg/L	P298985	
	SM 4500 F-C-97	Fluoride	0.042	I	mg F/L	P298775	
1770172	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P298738	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P298648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.037		mg N/L	P298657	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P298638	
	SM 5310 B-00	Organic Carbon	36		mg C/L	P298679	
1770178	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P298404	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Field Blank **Collection Date/Time: 02/09/2016 13:45**

Field ID: SD020916-7 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1770167	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P298417	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P298613	
		Sulfate	0.20	U	mg SO4/L	P298615	
	SM 2120 B	Color (true)	2.5	U	PCU	P298410	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P298964	
	SM 2540 C-97	TDS	15	U	mg/L	P298988	
	SM 2540 D-97	TSS	2	U	mg/L	P298982	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P298775	
1770173	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P298738	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P298648	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P298658	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P298892	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P298679	
1770179	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298404	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298416

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298417

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298613

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298615

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298737

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298738

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298648

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298657

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298658

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298637

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
Batch ID: P298638

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298892

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298403

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298404

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

Reference Method: SM 2120 B
Batch ID: P298409

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P298410

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P298964

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

Reference Method: SM 2540 C-97
Batch ID: P298988

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P298991

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P298982

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P298985

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P298775

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P298679

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: P298613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298615

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298737

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298738

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298648

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: P298648

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298657

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298658

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298637

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298638

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298892

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298403

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298404

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

Reference Method: SM 2320 B-97
Batch ID: P298964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	95 - 105

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P298775

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

Reference Method: SM 5310 B-00
Batch ID: P298679

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770164	Chloride	97.2		P	90 - 110
1770165	Chloride	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770164	Sulfate	94.4		P	90 - 110
1770165	Sulfate	93.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298737

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770131	Ammonia-N	97.6	98.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770172	Ammonia-N	97.9	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298657

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770171	NO2NO3-N	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298658

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770224	NO2NO3-N	104	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298637

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770122	Total-P	97.8	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298638

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770170	Total-P	97.6	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298892

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1771195	Total-P	99.2	94.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770125	O-Phosphate-P	97.0	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770225	O-Phosphate-P	101	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P298775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770128	Fluoride	99.1	98.4	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P298679

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1770069	Organic Carbon	95.6	94.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770119	Turbidity	1.36	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770163	Turbidity	8.70	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770164	Chloride	0.100	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770164	Sulfate	0.110	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298737

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770131	Ammonia-N	1.29	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770172	Ammonia-N	0.212	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298648

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770168	Kjeldahl Nitrogen	2.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298657

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770171	NO2NO3-N	0.866	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298658

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770224	NO2NO3-N	0.471	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298637

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770122	Total-P	3.35	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298638

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770170	Total-P	1.99	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298892

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1771195	Total-P	4.30	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298403

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770125	O-Phosphate-P	0.638	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298404

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770225	O-Phosphate-P	1.18	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P298409

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770165	Color (true)	0.298	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P298410

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770192	Color (true)	0.696	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P298964

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770128	Total Alkalinity	0.135	Sample	P	0 - 4.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P298988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1769800	TDS	6.90	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P298991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770223	TDS	5.68	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P298775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770128	Fluoride	0.473	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P298679

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1770069	Organic Carbon	0.787	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A67519
Included Lab Sample IDs: 1770162, 1770163, 1770164, 1770165, 1770166, 1770167

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.3	98.2	P/P	90 - 110
Chloride	97.6	98.3	P/P	90 - 110
Chloride	98.2	97.6	P/P	90 - 110
Sulfate	94.6	96.9	P/P	90 - 110
Sulfate	95.0	96.6	P/P	90 - 110
Sulfate	96.6	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A67554
Included Lab Sample IDs: 1770174, 1770175, 1770176, 1770177, 1770178, 1770179

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	97.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A67555
Included Lab Sample IDs: 1770162, 1770163, 1770164, 1770165, 1770166, 1770167

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	96.2	P/P	90 - 115
Color (true)	96.2	95.9	P/P	90 - 115
Color (true)	99.9	98.8	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A67557
Included Lab Sample IDs: 1770162, 1770163, 1770164, 1770165, 1770166, 1770167

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67618
Included Lab Sample IDs: 1770168, 1770169, 1770170, 1770171, 1770172, 1770173

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

Reference Method: SM 5310 B-00
Run ID: A67629
Included Lab Sample IDs: 1770168, 1770169, 1770170, 1770171, 1770172, 1770173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.5	92.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A67633
Included Lab Sample IDs: 1770162, 1770163, 1770164, 1770165, 1770166, 1770167

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67640
Included Lab Sample IDs: 1770168, 1770169, 1770170, 1770171, 1770172

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	102	P/P	90 - 110
Total-P	99.8	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A67650
Included Lab Sample IDs: 1770168, 1770169, 1770170, 1770171, 1770172, 1770173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	98.2	P/P	90 - 110
Ammonia-N	98.6	98.5	P/P	90 - 110
Ammonia-N	98.7	98.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A67651
Included Lab Sample IDs: 1770168, 1770169, 1770170, 1770171, 1770172, 1770173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	97.7	P/P	90 - 110
Kjeldahl Nitrogen	91.5	102	P/P	90 - 110
Kjeldahl Nitrogen	97.7	95.9	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A67716
Included Lab Sample IDs: 1770162, 1770163, 1770164, 1770165, 1770166, 1770167

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67744
Included Lab Sample IDs: 1770173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.0	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					1.36	
	Turbidity					8.70	
EPA 300.0 Rev. 2.1	Chloride	99.3	97.2	98.5		0.100	
	Sulfate	95.0	94.4	93.1		0.110	
EPA 350.1 Rev. 2.0	Ammonia-N	97.9	97.6	98.9			1.29
	Ammonia-N	96.3	97.9	97.6			0.212
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.6					2.28
EPA 353.2 Rev. 2.0	NO2NO3-N	105	104	106			0.866
	NO2NO3-N	104	104	104			0.471
EPA 365.1 Rev. 2.0	Total-P	102	97.8	102			3.35
	Total-P	102	97.6	100			1.99
	Total-P	99.1	99.2	94.8			4.30
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.0	97.8			0.638
	O-Phosphate-P	103	101	103			1.18
SM 2120 B	Color (true)					0.298	
	Color (true)					0.696	
SM 2320 B-97	Total Alkalinity	100				0.135	
SM 2540 C-97	TDS					6.90	
	TDS					5.68	
SM 4500 F-C-97	Fluoride	97.1	99.1	98.4			0.473
SM 5310 B-00	Organic Carbon	93.6	95.6	94.9			0.787

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1770168, 1770169, 1770170, 1770171, 1770172, 1770173
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1770168, 1770169, 1770170, 1770171, 1770172, 1770173
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1770168, 1770169, 1770170, 1770171, 1770172, 1770173
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1770168, 1770169, 1770170, 1770171, 1770172, 1770173
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1770174, 1770175, 1770176, 1770177, 1770178, 1770179
SM 2120 B / E31780	True Color measured at 450 nm	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1770168, 1770169, 1770170, 1770171, 1770172, 1770173

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	02/10/2016			02/10/2016 15:11	Sima Feizi	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
EPA 300.0 Rev. 2.1	02/10/2016			02/12/2016	Ping Hua	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
EPA 350.1 Rev. 2.0	02/10/2016			02/17/2016	Diana M. Turner	1770168, 1770169, 1770170, 1770171, 1770172, 1770173
EPA 351.2 Rev. 2.0	02/10/2016	02/16/2016	Sofia Elnemr	02/17/2016	Bryan A. Werth	1770168, 1770169, 1770170, 1770171, 1770172, 1770173
EPA 353.2 Rev. 2.0	02/10/2016			02/16/2016	Peter D. Kaus	1770168, 1770169, 1770170, 1770171, 1770172, 1770173
EPA 365.1 Rev. 2.0	02/10/2016	02/16/2016	Christopher Armour	02/16/2016	Lipi Saha	1770168, 1770169, 1770170, 1770171, 1770172
	02/10/2016	02/19/2016	Christopher Armour	02/22/2016	Lipi Saha	1770173
EPA 365.1 Rev. 2.0 dissolved	02/10/2016			02/10/2016 14:03	Bryan A. Werth	1770174
	02/10/2016			02/10/2016 14:04	Bryan A. Werth	1770175
	02/10/2016			02/10/2016 14:05	Bryan A. Werth	1770176
	02/10/2016			02/10/2016 14:06	Bryan A. Werth	1770177, 1770178
	02/10/2016			02/10/2016 14:07	Bryan A. Werth	1770179
SM 2120 B	02/10/2016			02/10/2016 13:22	Rochelle Y Jackson	1770165
	02/10/2016			02/10/2016 13:26	Rochelle Y Jackson	1770167
	02/10/2016			02/10/2016 13:48	Rochelle Y Jackson	1770162
	02/10/2016			02/10/2016 13:49	Rochelle Y Jackson	1770163
	02/10/2016			02/10/2016 13:50	Rochelle Y Jackson	1770164
	02/10/2016			02/10/2016 13:51	Rochelle Y Jackson	1770166
SM 2320 B-97	02/10/2016			02/21/2016	Dale L. Simmons	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 2540 C-97	02/10/2016			02/12/2016	Yijie Li	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 2540 D-97	02/10/2016			02/12/2016	Yijie Li	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 4500 F-C-97	02/10/2016			02/12/2016	Dale L. Simmons	1770162, 1770163, 1770164, 1770165, 1770166, 1770167
SM 5310 B-00	02/10/2016			02/15/2016	Sofia Elnemr	1770168, 1770169
	02/10/2016			02/16/2016	Sofia Elnemr	1770170, 1770171, 1770172, 1770173