Chemical Analysis Report

CEN-DIST-2016-09-20-01

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

Event Description: **Holly Hill Ditch & Mizner's Branch**
Request ID: **RQ-2016-08-22-32**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

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

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 18-OCT-2016 13:19

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: MIZNER'S BRANCH @ FALLS WAY DRIVE **Collection Date/Time: 09/19/2016 09:30**

Field ID: G5CE0050 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1832577	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P311551	
	EPA 300.0 Rev. 2.1	Chloride	52		mg Cl/L	P311766	
		Sulfate	11		mg SO4/L	P311769	
	SM 2120 B	Color (true)	71		PCU	P311539	
	SM 2320 B-97	Total Alkalinity	132		mg CaCO3/L	P311736	
	SM 2540 C-97	TDS	302	A	mg/L	P311824	
	SM 2540 D-97	TSS	2	U	mg/L	P311890	
	SM 4500 F-C-97	Fluoride	0.046	I	mg F/L	P311740	MS
1832579	EPA 350.1 Rev. 2.0	Ammonia-N	0.070		mg N/L	P311750	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P311839	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P311896	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P312015	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P311728	
1832581	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.039		mg P/L	P311525	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: HOLLY HILL DITCH @ RIDGEWOOD **Collection Date/Time: 09/19/2016 10:15**

Field ID: G5CE0060 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1832578	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P311551	
	EPA 300.0 Rev. 2.1	Chloride	2.4E+03		mg Cl/L	P311766	
		Sulfate	340		mg SO4/L	P311769	
	SM 2120 B	Color (true)	52	A	PCU	P311535	
	SM 2320 B-97	Total Alkalinity	200		mg CaCO3/L	P311801	
	SM 2540 C-97	TDS	4.40E+03		mg/L	P311824	
	SM 2540 D-97	TSS	8	I	mg/L	P311890	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P311804	
1832580	EPA 350.1 Rev. 2.0	Ammonia-N	0.071		mg N/L	P311752	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P311840	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.072		mg N/L	P311940	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P312140	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P311728	
1832582	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.18		mg P/L	P311527	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311551

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311766

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311769

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311750

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311752

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311839

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311840

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311896

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311940

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312015

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: P312140

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311525

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311527

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

Reference Method: SM 2120 B
Batch ID: P311535

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P311539

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P311736

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

Reference Method: SM 2320 B-97
Batch ID: P311801

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

Reference Method: SM 2540 C-97
Batch ID: P311824

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P311890

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P311740

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P311804

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P311728

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: P311766

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311769

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311750

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311752

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311839

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311840

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: P311840

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311896

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311940

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312015

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: P312140

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	92.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311525

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311527

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

Reference Method: SM 2320 B-97
Batch ID: P311736

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P311801

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P311740

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

Reference Method: SM 4500 F-C-97
Batch ID: P311804

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

Reference Method: SM 5310 B-00
Batch ID: P311728

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311766

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832252	Chloride	99.5		P	90 - 110
1832479	Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832252	Sulfate	96.4		P	90 - 110
1832479	Sulfate	96.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311750

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832561	Ammonia-N	97.6	98.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832704	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311839

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832707	Kjeldahl Nitrogen	88.1	90.5	F/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311840

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832648	Kjeldahl Nitrogen	93.5	92.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832579	NO2NO3-N	94.5	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832305	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312015

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832495	Total-P	98.7	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312140

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832580	Total-P	95.5	96.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311525

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832790	O-Phosphate-P	94.3	94.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311527

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832812	O-Phosphate-P	99.1	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P311740

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832112	Fluoride	105	107	P/F	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P311804

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832758	Fluoride	99.3	99.3	P/P	91 - 105

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P311728

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1832546	Organic Carbon	98.7	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P311551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832543	Turbidity	2.33	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311766

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832252	Chloride	0.0392	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832252	Sulfate	0.648	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311750

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832561	Ammonia-N	0.682	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P311752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832704	Ammonia-N	0.0578	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311839

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832707	Kjeldahl Nitrogen	2.23	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P311840

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832648	Kjeldahl Nitrogen	0.942	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832579	NO2NO3-N	1.53	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832305	NO2NO3-N	0.957	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312015

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832495	Total-P	1.90	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832580	Total-P	1.11	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832790	O-Phosphate-P	0.423	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P311527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832812	O-Phosphate-P	0.904	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P311535

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832578	Color (true)	1.54	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P311539

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832757	Color (true)	3.12	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P311736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832112	Total Alkalinity	0.347	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P311801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832758	Total Alkalinity	0.816	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P311824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832577	TDS	5.62	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P311740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832112	Fluoride	1.97	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P311804

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832758	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P311728

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1832546	Organic Carbon	1.52	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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71736
Included Lab Sample IDs: 1832581, 1832582

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.6	P/P	90 - 110
O-Phosphate-P	99.6	100	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A71738
Included Lab Sample IDs: 1832578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.8	97.1	P/P	85 - 115

Reference Method: SM 2120 B
Run ID: A71739
Included Lab Sample IDs: 1832577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.5	95.6	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71745
Included Lab Sample IDs: 1832577, 1832578

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71789
Included Lab Sample IDs: 1832577, 1832578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.9	98.9	P/P	90 - 110
Chloride	98.0	98.0	P/P	90 - 110
Sulfate	98.1	98.9	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A71797
Included Lab Sample IDs: 1832579, 1832580

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

Reference Method: SM 2320 B-97
Run ID: A71798
Included Lab Sample IDs: 1832577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A71798
Included Lab Sample IDs: 1832577

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71807
Included Lab Sample IDs: 1832579, 1832580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.8	P/P	90 - 110
Ammonia-N	101	101	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A71811
Included Lab Sample IDs: 1832578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A71811
Included Lab Sample IDs: 1832578

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71833
Included Lab Sample IDs: 1832580

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71854
Included Lab Sample IDs: 1832579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71889
Included Lab Sample IDs: 1832579, 1832580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	98.9	P/P	90 - 110
Kjeldahl Nitrogen	106	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71968
Included Lab Sample IDs: 1832579

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71968
Included Lab Sample IDs: 1832579

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71974
Included Lab Sample IDs: 1832580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	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		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.33	
EPA 300.0 Rev. 2.1	Chloride	98.6	99.5	99.9		0.0392	
	Sulfate	97.0	96.4	96.3		0.648	
EPA 350.1 Rev. 2.0	Ammonia-N	102	97.6	98.3			0.682
	Ammonia-N	104	104	104			0.0578
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	88.1	90.5			2.23
	Kjeldahl Nitrogen	104	93.5	92.5			0.942
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	94.5	97.0			1.53
	NO2NO3-N	105	105	104			0.957
EPA 365.1 Rev. 2.0	Total-P	102	98.7	101			1.90
	Total-P	92.3	95.5	96.9			1.11
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	94.3	94.7			0.423
	O-Phosphate-P	99.5	99.1	100			0.904
SM 2120 B	Color (true)					1.54	
	Color (true)					3.12	
SM 2320 B-97	Total Alkalinity	103				0.347	
	Total Alkalinity	103				0.816	
SM 2540 C-97	TDS					5.62	
SM 4500 F-C-97	Fluoride	98.8	105	107			1.97
	Fluoride	96.7	99.3	99.3			0.0
SM 5310 B-00	Organic Carbon	99.2	98.7	101			1.52

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1832577, 1832578
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1832577, 1832578
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1832577, 1832578

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1832579, 1832580
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1832579, 1832580
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1832579, 1832580
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1832579, 1832580
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1832581, 1832582
SM 2120 B / E31780	True Color measured at 450 nm	1832577, 1832578
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1832577, 1832578
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1832577, 1832578
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1832577, 1832578
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1832577, 1832578
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1832579, 1832580

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	09/20/2016			09/20/2016 17:03	Blanca Fach	1832577, 1832578
EPA 300.0 Rev. 2.1	09/20/2016			09/24/2016	Ping Hua	1832577, 1832578
EPA 350.1 Rev. 2.0	09/20/2016			09/22/2016	Sofia Elnemr	1832579, 1832580
EPA 351.2 Rev. 2.0	09/20/2016	09/26/2016	Adrian Shelby	09/27/2016	Christopher Armour	1832579, 1832580
EPA 353.2 Rev. 2.0	09/20/2016			09/26/2016	Beverly Y. Sanders	1832580
	09/20/2016			09/27/2016	Peter D. Kaus	1832579
EPA 365.1 Rev. 2.0	09/20/2016	09/28/2016	Lipi Saha	09/29/2016	Lipi Saha	1832579
	09/20/2016	09/29/2016	Vijayalakshmi Reddy	10/03/2016	Lipi Saha	1832580
EPA 365.1 Rev. 2.0 dissolved	09/20/2016			09/20/2016 15:31	Julia Storbeck	1832581
	09/20/2016			09/20/2016 15:47	Julia Storbeck	1832582
SM 2120 B	09/20/2016			09/20/2016 15:47	Julie Michelle Frank	1832578
	09/20/2016			09/20/2016 16:59	Julie Michelle Frank	1832577
SM 2320 B-97	09/20/2016			09/23/2016	Dale L. Simmons	1832577
	09/20/2016			09/24/2016	Dale L. Simmons	1832578
SM 2540 C-97	09/20/2016			09/22/2016	Yijie Li	1832577, 1832578
SM 2540 D-97	09/20/2016			09/22/2016	Yijie Li	1832577, 1832578
SM 4500 F-C-97	09/20/2016			09/23/2016	Dale L. Simmons	1832577
	09/20/2016			09/24/2016	Dale L. Simmons	1832578
SM 5310 B-00	09/20/2016			09/22/2016	Julie Michelle Frank	1832579, 1832580