

Chemical Analysis Report

SO-DIST-2016-10-14-01

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

Event Description: **SMP: Lee County Streams**

Request ID: **RQ-2016-10-10-11**

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: 10-NOV-2016 14:42



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: Manuel Branch upstream of weir

Collection Date/Time: 10/13/2016 09:00

Field ID: G3SD101316-1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840949	EPA 180.1 Rev. 2.0	Turbidity	2.4	A	NTU	P313229	
	EPA 300.0 Rev. 2.1	Chloride	88		mg Cl/L	P313704	
		Sulfate	26		mg SO4/L	P313702	
	SM 2120 B	Color (true)	64	A	PCU	P313211	
	SM 2320 B-97	Total Alkalinity	195		mg CaCO3/L	P313346	
	SM 2540 C-97	TDS	376		mg/L	P313744	
	SM 2540 D-97	TSS	4	I	mg/L	P313839	
	SM 4500 F-C-97	Fluoride	0.22		mg F/L	P313348	
1840955	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P314218	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P313910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.22		mg N/L	P313384	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P314062	
	SM 5310 B-00	Organic Carbon	9.1		mg C/L	P313339	
1840961	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P313232	

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: Carrell Canal below FMCC weir

Collection Date/Time: 10/13/2016 09:25

Field ID: G3SD101316-2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840950	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P313229	
	EPA 300.0 Rev. 2.1	Chloride	65		mg Cl/L	P313704	
		Sulfate	36		mg SO4/L	P313702	
	SM 2120 B	Color (true)	52		PCU	P313211	
	SM 2320 B-97	Total Alkalinity	241		mg CaCO3/L	P313346	
	SM 2540 C-97	TDS	383		mg/L	P313744	
	SM 2540 D-97	TSS	8	I	mg/L	P313839	
	SM 4500 F-C-97	Fluoride	0.22		mg F/L	P313348	
1840956	EPA 350.1 Rev. 2.0	Ammonia-N	0.080		mg N/L	P314218	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P313910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P313384	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P314062	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P313339	
1840962	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P313232	

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: Chapel creek South of SR 78

Collection Date/Time: 10/13/2016 08:15

Field ID: G3SD101316-3

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840951	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P313229	
	EPA 300.0 Rev. 2.1	Chloride	30		mg Cl/L	P313891	
		Sulfate	1.4		mg SO4/L	P313894	

Field ID: G3SD101316-3

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840951	SM 2120 B	Color (true)	110		PCU	P313211	
	SM 2320 B-97	Total Alkalinity	93		mg CaCO3/L	P313346	
	SM 2540 C-97	TDS	172	A	mg/L	P313744	
	SM 2540 D-97	TSS	6	I	mg/L	P313839	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P313348	
1840957	EPA 350.1 Rev. 2.0	Ammonia-N	0.051		mg N/L	P314218	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P313910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P313384	
	EPA 365.1 Rev. 2.0	Total-P	0.075		mg P/L	P314062	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P313339	
1840963	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.037		mg P/L	P313232	

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: Winkler Canal @ Princeton St

Collection Date/Time: 10/13/2016 09:45

Field ID: G3SD101316-4

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840952	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P313229	
	EPA 300.0 Rev. 2.1	Chloride	71		mg Cl/L	P313891	
		Sulfate	29		mg SO4/L	P313894	
	SM 2120 B	Color (true)	24		PCU	P313211	
	SM 2320 B-97	Total Alkalinity	236		mg CaCO3/L	P313346	
	SM 2540 C-97	TDS	377		mg/L	P313744	
	SM 2540 D-97	TSS	3	I	mg/L	P313839	
	SM 4500 F-C-97	Fluoride	0.31		mg F/L	P313348	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.091		mg N/L	P314548	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P314282	
1840958	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P313384	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P314062	
	SM 5310 B-00	Organic Carbon	6.8		mg C/L	P313339	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P313232	

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: Manual Branch Duplicate

Collection Date/Time: 10/13/2016 09:10

Field ID: G3SD101316-DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840953	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P313229	
	EPA 300.0 Rev. 2.1	Chloride	87		mg Cl/L	P313891	
		Sulfate	26		mg SO4/L	P313894	
	SM 2120 B	Color (true)	64		PCU	P313211	
	SM 2320 B-97	Total Alkalinity	196		mg CaCO3/L	P313346	
	SM 2540 C-97	TDS	388		mg/L	P313744	
	SM 2540 D-97	TSS	4	I	mg/L	P313839	

Field ID: G3SD101316-DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840953	SM 4500 F-C-97	Fluoride	0.23		mg F/L	P313348	
1840959	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P314218	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P313910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.22		mg N/L	P313384	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P314062	
	SM 5310 B-00	Organic Carbon	9.2		mg C/L	P313339	
1840965	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P313232	

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: G3SDBLANK

Collection Date/Time: 10/13/2016 08:25

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1840954	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P313229	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P313891	
		Sulfate	0.20	U	mg SO4/L	P313894	
	SM 2120 B	Color (true)	2.5	U	PCU	P313211	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P313346	
	SM 2540 C-97	TDS	15	U	mg/L	P313744	
	SM 2540 D-97	TSS	2	U	mg/L	P313839	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P313348	
1840960	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P314219	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P314282	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313489	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P314062	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P313339	
1840966	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P313232	

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: P313229

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P313702

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313704

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313891

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313894

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314218

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314219

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314548

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313910

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P314282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313384

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313489

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314062

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P313232

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

Reference Method: SM 2120 B
Batch ID: P313211

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P313346

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

Reference Method: SM 2540 C-97
Batch ID: P313744

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P313839

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P313348

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P313339

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: P313702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313704

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313891

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313894

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314218

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314219

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314548

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313910

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P314282

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313384

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314062

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P313232

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: P313346

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

Reference Method: SM 4500 F-C-97
Batch ID: P313348

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P313339

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1842448	Sulfate	94.8		P	90 - 110
1842588	Sulfate	95.3		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1842448	Chloride	97.1		P	90 - 110
1842588	Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313891

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1841033	Chloride	99.9		P	90 - 110
1841034	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1841033	Sulfate	92.7		P	90 - 110
1841034	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314218

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840862	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314219

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1841035	Ammonia-N	100	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840958	Ammonia-N	96.3	95.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840863	Kjeldahl Nitrogen	97.7	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P314282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1841070	Kjeldahl Nitrogen	102	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313384

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840956	NO2NO3-N	104	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840907	NO2NO3-N	94.2	91.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314062

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840958	Total-P	101	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P313232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840962	O-Phosphate-P	99.3	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P313348

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1841106	Fluoride	98.4	99.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P313339

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1840821	Organic Carbon	91.4	93.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P313229

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840949	Turbidity	5.34	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1842588	Sulfate	0.387	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1842588	Chloride	0.207	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1841033	Chloride	3.08	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1841033	Sulfate	3.76	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314218

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840862	Ammonia-N	0.262	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314219

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1841035	Ammonia-N	2.14	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P314548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840958	Ammonia-N	0.444	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840863	Kjeldahl Nitrogen	0.882	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P314282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1841070	Kjeldahl Nitrogen	2.10	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840956	NO2NO3-N	0.905	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840907	NO2NO3-N	2.28	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P314062

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840958	Total-P	2.27	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P313232

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840962	O-Phosphate-P	0.661	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P313211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840949	Color (true)	2.14	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P313346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1841106	Total Alkalinity	0.251	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P313744

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840951	TDS	2.33	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P313348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1841106	Fluoride	0.527	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P313339

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1840821	Organic Carbon	2.24	Spike	P	0 - 20

Quality Assurance Report Precision

* 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: A72234

Included Lab Sample IDs: 1840949, 1840950, 1840951, 1840952, 1840953, 1840954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.1	99.7	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A72238

Included Lab Sample IDs: 1840949, 1840950, 1840951, 1840952, 1840953, 1840954

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A72240

Included Lab Sample IDs: 1840961, 1840962, 1840963, 1840964, 1840965, 1840966

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.8	P/P	90 - 110
O-Phosphate-P	99.1	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A72266

Included Lab Sample IDs: 1840955, 1840956, 1840957, 1840958, 1840959, 1840960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A72268

Included Lab Sample IDs: 1840949, 1840950, 1840951, 1840952, 1840953, 1840954

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

Reference Method: SM 4500 F-C-97

Run ID: A72268

Included Lab Sample IDs: 1840949, 1840950, 1840951, 1840952, 1840953, 1840954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72281

Included Lab Sample IDs: 1840955, 1840956, 1840957, 1840958, 1840959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A72305

Included Lab Sample IDs: 1840949, 1840950

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	105	P/P	90 - 110
Chloride	105	105	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110
Sulfate	98.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72313

Included Lab Sample IDs: 1840960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	97.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A72432

Included Lab Sample IDs: 1840951, 1840952, 1840953, 1840954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Chloride	103	105	P/P	90 - 110
Sulfate	98.7	102	P/P	90 - 110
Sulfate	99.1	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A72517

Included Lab Sample IDs: 1840955, 1840956, 1840957, 1840959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.6	93.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72522

Included Lab Sample IDs: 1840955, 1840958, 1840959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	104	P/P	90 - 110
Total-P	104	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72528

Included Lab Sample IDs: 1840955, 1840956, 1840957, 1840959, 1840960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	99.8	P/P	90 - 110
Ammonia-N	99.8	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72531

Included Lab Sample IDs: 1840956, 1840957, 1840960

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A72577
 Included Lab Sample IDs: 1840958, 1840960

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

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A72604
 Included Lab Sample IDs: 1840958

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	101	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
 Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
 Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	
						SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					5.34	
EPA 300.0 Rev. 2.1	Chloride	100	99.6	97.1		0.207	
	Chloride	102	99.9	101		3.08	
	Sulfate	94.3	95.3	94.8		0.387	
	Sulfate	97.7	92.7	98.4		3.76	
EPA 350.1 Rev. 2.0	Ammonia-N	105	105	105			0.262
	Ammonia-N	104	100	103			2.14
	Ammonia-N	103	96.3	95.0			0.444
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	97.7	96.8			0.882
	Kjeldahl Nitrogen	101	102	98.1			2.10
EPA 353.2 Rev. 2.0	NO2NO3-N	102	104	103			0.905
	NO2NO3-N	99.5	94.2	91.2			2.28
EPA 365.1 Rev. 2.0	Total-P	103	101	98.2			2.27
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	99.3	100			0.661
SM 2120 B	Color (true)					2.14	
SM 2320 B-97	Total Alkalinity	103				0.251	
SM 2540 C-97	TDS					2.33	
SM 4500 F-C-97	Fluoride	98.0	98.4	99.0			0.527
SM 5310 B-00	Organic Carbon	98.0	91.4	93.9			2.24

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1840955, 1840956, 1840957, 1840958, 1840959, 1840960

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1840955, 1840956, 1840957, 1840958, 1840959, 1840960
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1840955, 1840956, 1840957, 1840958, 1840959, 1840960
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1840955, 1840956, 1840957, 1840958, 1840959, 1840960
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1840961, 1840962, 1840963, 1840964, 1840965, 1840966
SM 2120 B / E31780	True Color measured at 450 nm	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1840955, 1840956, 1840957, 1840958, 1840959, 1840960

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	10/14/2016			10/14/2016 15:51	Sima Feizi	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
EPA 300.0 Rev. 2.1	10/14/2016			10/22/2016	Ping Hua	1840949, 1840950
	10/14/2016			10/26/2016	Ping Hua	1840951, 1840952, 1840953, 1840954
EPA 350.1 Rev. 2.0	10/14/2016			10/28/2016	Sofia Elnemr	1840955, 1840956, 1840957, 1840959, 1840960
	10/14/2016			11/03/2016	Sofia Elnemr	1840958
EPA 351.2 Rev. 2.0	10/14/2016	10/26/2016	Adrian Shelby	10/28/2016	Joseph Suarez	1840955, 1840956, 1840957, 1840959
	10/14/2016	11/01/2016	Adrian Shelby	11/02/2016	Joseph Suarez	1840958, 1840960
EPA 353.2 Rev. 2.0	10/14/2016			10/18/2016	Beverly Y. Sanders	1840955, 1840956, 1840957, 1840958, 1840959
	10/14/2016			10/19/2016	Beverly Y. Sanders	1840960
EPA 365.1 Rev. 2.0	10/14/2016	10/27/2016	Vijayalakshmi Reddy	10/28/2016	Lipi Saha	1840955, 1840958, 1840959
	10/14/2016	10/27/2016	Vijayalakshmi Reddy	10/31/2016	Lipi Saha	1840956, 1840957, 1840960
EPA 365.1 Rev. 2.0 dissolved	10/14/2016			10/14/2016 15:58	Julia Storbeck	1840962
	10/14/2016			10/14/2016 16:01	Julia Storbeck	1840961
	10/14/2016			10/14/2016 16:02	Julia Storbeck	1840965
	10/14/2016			10/14/2016 16:03	Julia Storbeck	1840963
	10/14/2016			10/14/2016 16:04	Julia Storbeck	1840966
	10/14/2016			10/14/2016 16:09	Julia Storbeck	1840964
SM 2120 B	10/14/2016			10/14/2016 14:16	Julie Michelle Frank	1840949
	10/14/2016			10/14/2016 14:17	Julie Michelle Frank	1840950
	10/14/2016			10/14/2016 14:18	Julie Michelle Frank	1840951
	10/14/2016			10/14/2016 14:19	Julie Michelle Frank	1840952
	10/14/2016			10/14/2016 14:20	Julie Michelle Frank	1840953, 1840954
SM 2320 B-97	10/14/2016			10/17/2016	Dale L. Simmons	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 2540 C-97	10/14/2016			10/19/2016	Yijie Li	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 2540 D-97	10/14/2016			10/19/2016	Yijie Li	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 4500 F-C-97	10/14/2016			10/17/2016	Dale L. Simmons	1840949, 1840950, 1840951, 1840952, 1840953, 1840954
SM 5310 B-00	10/14/2016			10/17/2016	Julie Michelle Frank	1840955, 1840956, 1840957, 1840958, 1840959, 1840960