

Chemical Analysis Report

NW-DIST-2018-03-23-02

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

Event Description: **CRESTVIEW**
Request ID: **RQ-2018-03-19-22**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government St
Suite 208A
Pensacola, FL 32502-5794
Attn: Michael King

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 12-APR-2018 10:29

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical group are included in this report: Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: WILKINSON CREEK UPSTREAM OF WILKINSON BLUFF ROAD

Collection Date/Time: 03/22/2018 10:25

Field ID: G4NW0357

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977148	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P342125	
	EPA 300.0 Rev. 2.1	Chloride	3.5		mg Cl/L	P342312	
		Sulfate	1.2		mg SO4/L	P342314	
	SM 2120 B	Color (true)	19		PCU	P342121	
	SM 2320 B-97	Total Alkalinity	2.1	I	mg CaCO3/L	P342530	
	SM 2540 C-97	TDS	25		mg/L	P342574	
	SM 2540 D-97	TSS	3	I	mg/L	P342629	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342534	
1977154	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P342678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P342171	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P342256	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P342250	
	SM 5310 B-00	Organic Carbon	1.1		mg C/L	P342762	
1977160	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342102	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: BAGGETT CREEK UPSTREAM OF HWY 90

Collection Date/Time: 03/22/2018 10:50

Field ID: G4NW0336

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977149	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P342125	
	EPA 300.0 Rev. 2.1	Chloride	4.1		mg Cl/L	P342312	
		Sulfate	0.77		mg SO4/L	P342314	
	SM 2120 B	Color (true)	27	A	PCU	P342121	
	SM 2320 B-97	Total Alkalinity	7.7		mg CaCO3/L	P342530	
	SM 2540 C-97	TDS	29		mg/L	P342574	
	SM 2540 D-97	TSS	3	I	mg/L	P342629	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342534	
1977155	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P342678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.14	I	mg N/L	P342171	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.48		mg N/L	P342257	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P342250	
	SM 5310 B-00	Organic Carbon	1.9		mg C/L	P342762	
1977161	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342102	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: TRAMMEL CREEK EAST OF HWY 4

Collection Date/Time: 03/22/2018 11:15

Field ID: G4NW0052

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977150	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P342125	

Field ID: G4NW0052

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977150	EPA 300.0 Rev. 2.1	Chloride	4.7		mg Cl/L	P342312	
		Sulfate	4.5		mg SO4/L	P342314	
	SM 2120 B	Color (true)	41		PCU	P342121	
	SM 2320 B-97	Total Alkalinity	12		mg CaCO3/L	P342530	
	SM 2540 C-97	TDS	48		mg/L	P342574	
	SM 2540 D-97	TSS	3	I	mg/L	P342629	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342534	
1977156	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P342678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.14	I	mg N/L	P342171	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P342257	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P342250	
	SM 5310 B-00	Organic Carbon	3.2		mg C/L	P342762	
1977162	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P342102	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: GREEN BRANCH UPSTREAM OF BUCK TYNER RD Collection Date/Time: 03/22/2018 12:05

Field ID: G4NW0207

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977151	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P342125	
	EPA 300.0 Rev. 2.1	Chloride	4.6		mg Cl/L	P342414	
		Sulfate	0.78		mg SO4/L	P342418	
	SM 2120 B	Color (true)	38		PCU	P342121	
	SM 2320 B-97	Total Alkalinity	4.3		mg CaCO3/L	P342530	
	SM 2540 C-97	TDS	27		mg/L	P342574	
	SM 2540 D-97	TSS	3	I	mg/L	P342629	
1977157	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342534	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P342678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.13	I	mg N/L	P342171	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342257	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P342250	
1977163	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P342762	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P342102	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: OAK CREEK BELOW TOMMY STEEL RD Collection Date/Time: 03/22/2018 12:50

Field ID: G4NW0395

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977152	EPA 180.1 Rev. 2.0	Turbidity	5.4		NTU	P342125	
	EPA 300.0 Rev. 2.1	Chloride	3.8		mg Cl/L	P342414	
		Sulfate	1.5		mg SO4/L	P342418	

Field ID: G4NW0395

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977152	SM 2120 B	Color (true)	79		PCU	P342121	
	SM 2320 B-97	Total Alkalinity	2.8		mg CaCO3/L	P342530	
	SM 2540 C-97	TDS	36		mg/L	P342574	
	SM 2540 D-97	TSS	3	I	mg/L	P342629	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342534	
1977158	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P342678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23		mg N/L	P342171	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342257	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P342250	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P342762	
1977164	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P342103	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: HURRICANE CREEK BELOW HURRICANE LAKE

Collection Date/Time: 03/22/2018 13:15

Field ID: G4NW0160

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977153	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P342125	
	EPA 300.0 Rev. 2.1	Chloride	2.7		mg Cl/L	P342414	
		Sulfate	0.51		mg SO4/L	P342418	
	SM 2120 B	Color (true)	22		PCU	P342121	
	SM 2320 B-97	Total Alkalinity	3.4		mg CaCO3/L	P342530	
	SM 2540 C-97	TDS	20	I	mg/L	P342574	
	SM 2540 D-97	TSS	4	I	mg/L	P342629	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P342534	
1977159	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P342591	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26		mg N/L	P342171	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342257	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P342250	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P342762	
1977165	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342103	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P342125

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: P342312

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342314

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342678

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342171

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342256

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342250

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342102

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

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

Reference Method: SM 2120 B
Batch ID: P342121

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P342530

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

Reference Method: SM 2540 C-97
Batch ID: P342574

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P342629

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P342762

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: P342312

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342314

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342678

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342171

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342256

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	103		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342250

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: P342102

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

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

Reference Method: SM 2320 B-97
Batch ID: P342530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.2		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342762

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1976970	Chloride	100		P	90 - 110
1977112	Chloride	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342314

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1976970	Sulfate	103		P	90 - 110
1977112	Sulfate	98.2		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1976686	Chloride	97.4		P	90 - 110
1977257	Chloride	93.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1976686	Sulfate	98.3		P	90 - 110
1977257	Sulfate	94.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977159	Ammonia-N	97.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342678

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977154	Ammonia-N	97.8	94.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342256

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977043	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977156	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977156	Total-P	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977114	O-Phosphate-P	98.4	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977191	O-Phosphate-P	99.5	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977257	Fluoride	97.3	98.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342762

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977041	Organic Carbon	105		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977112	Turbidity	1.50	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976970	Chloride	1.89	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976970	Sulfate	2.53	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976686	Chloride	0.596	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976686	Sulfate	1.35	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

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

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977159	Ammonia-N	2.44	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342678

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977154	Ammonia-N	2.80	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342171

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977187	Kjeldahl Nitrogen	11.2	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342256

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977043	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977156	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977156	Total-P	1.30	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977114	O-Phosphate-P	1.11	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977191	O-Phosphate-P	1.40	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P342121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977149	Color (true)	4.48	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P342530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977257	Total Alkalinity	0.330	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P342574

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977132	TDS	3.29	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977257	Fluoride	0.934	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P342762

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977041	Organic Carbon	0.432	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 365.1 Rev. 2.0 dissolved
Run ID: A82810
Included Lab Sample IDs: 1977160, 1977161, 1977162, 1977163, 1977164, 1977165

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	99.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A82815
Included Lab Sample IDs: 1977148, 1977149, 1977150, 1977151, 1977152, 1977153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	100	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A82817

Included Lab Sample IDs: 1977148, 1977149, 1977150, 1977151, 1977152, 1977153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82873

Included Lab Sample IDs: 1977154, 1977155, 1977156, 1977157, 1977158, 1977159

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82892

Included Lab Sample IDs: 1977148, 1977149, 1977150, 1977151, 1977152, 1977153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	99.8	P/P	90 - 110
Chloride	99.2	100	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110
Sulfate	99.2	98.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82912

Included Lab Sample IDs: 1977154, 1977155, 1977156, 1977157, 1977158, 1977159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.4	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82948

Included Lab Sample IDs: 1977156, 1977157, 1977158, 1977159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82958

Included Lab Sample IDs: 1977154, 1977155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	99.2	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82967

Included Lab Sample IDs: 1977148, 1977149, 1977150, 1977151, 1977152, 1977153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A82967

Included Lab Sample IDs: 1977148, 1977149, 1977150, 1977151, 1977152, 1977153

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.2	98.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82997

Included Lab Sample IDs: 1977159

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A83017

Included Lab Sample IDs: 1977154, 1977155, 1977156, 1977157, 1977158

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

Reference Method: SM 5310 B-00

Run ID: A83038

Included Lab Sample IDs: 1977154, 1977155, 1977156, 1977157, 1977158, 1977159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.4	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 SMP	MS
			LCS			
EPA 180.1 Rev. 2.0	Turbidity				1.50	
EPA 300.0 Rev. 2.1	Chloride	99.1	100	96.6	1.89	
	Chloride	98.2	97.4	93.3	0.596	
	Sulfate	97.7	103	98.2	2.53	
	Sulfate	98.0	98.3	94.6	1.35	
	Sulfate	96.0	97.8	100		2.44
EPA 350.1 Rev. 2.0	Ammonia-N	99.1	97.8	94.9		2.80
	Ammonia-N					11.2
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101				0.501
EPA 353.2 Rev. 2.0	NO2NO3-N	104	100	99.5		0.0
	NO2NO3-N	103	104	104		1.30
EPA 365.1 Rev. 2.0	Total-P	103	101	100		1.11
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	98.4	99.5		1.40
	O-Phosphate-P	102	99.5	101		
SM 2120 B	Color (true)				4.48	
SM 2320 B-97	Total Alkalinity	99.4			0.330	
SM 2540 C-97	TDS				3.29	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision		
				LCS	SMP	MS
SM 4500 F-C-97	Fluoride	94.2	97.3 98.5			0.934
SM 5310 B-00	Organic Carbon	99.6	105			0.432

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1977154, 1977155, 1977156, 1977157, 1977158, 1977159
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1977154, 1977155, 1977156, 1977157, 1977158, 1977159
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1977154, 1977155, 1977156, 1977157, 1977158, 1977159
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1977154, 1977155, 1977156, 1977157, 1977158, 1977159
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1977160, 1977161, 1977162, 1977163, 1977164, 1977165
SM 2120 B / E31780	True Color measured at 450 nm	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1977154, 1977155, 1977156, 1977157, 1977158, 1977159

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/23/2018			03/23/2018 14:40	Tanya Welborn	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
EPA 300.0 Rev. 2.1	03/23/2018			03/27/2018	Lipi Saha	1977148, 1977149, 1977150
	03/23/2018			03/28/2018	Lipi Saha	1977151, 1977152, 1977153
EPA 350.1 Rev. 2.0	03/23/2018			04/02/2018	Ping Hua	1977159
	03/23/2018			04/03/2018	Ping Hua	1977154, 1977155, 1977156, 1977157, 1977158
EPA 351.2 Rev. 2.0	03/23/2018	03/26/2018	Adrian Shelby	03/28/2018	Joseph Suarez	1977154, 1977155, 1977156, 1977157, 1977158, 1977159
EPA 353.2 Rev. 2.0	03/23/2018			03/27/2018	Lauren Bottorf	1977154, 1977155, 1977156, 1977157, 1977158, 1977159
EPA 365.1 Rev. 2.0	03/23/2018	03/27/2018	Sima Feizi	03/29/2018	Beverly Y. Sanders	1977156, 1977157, 1977158, 1977159
	03/23/2018	03/27/2018	Sima Feizi	03/30/2018	Beverly Y. Sanders	1977154, 1977155
EPA 365.1 Rev. 2.0 dissolved	03/23/2018			03/23/2018 14:07	Megan Treadwell	1977160
	03/23/2018			03/23/2018 14:08	Megan Treadwell	1977161
	03/23/2018			03/23/2018 14:09	Megan Treadwell	1977162
	03/23/2018			03/23/2018 14:10	Megan Treadwell	1977163, 1977164
	03/23/2018			03/23/2018 14:11	Megan Treadwell	1977165
SM 2120 B	03/23/2018			03/23/2018 15:21	Tanya Welborn	1977148
	03/23/2018			03/23/2018 15:23	Tanya Welborn	1977149, 1977150
	03/23/2018			03/23/2018 15:24	Tanya Welborn	1977151
	03/23/2018			03/23/2018 15:25	Tanya Welborn	1977152
	03/23/2018			03/23/2018 15:26	Tanya Welborn	1977153
SM 2320 B-97	03/23/2018			03/30/2018	Lauren Bottorf	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 2540 C-97	03/23/2018			03/28/2018	Yijie Li	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 2540 D-97	03/23/2018			03/28/2018	Yijie Li	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 4500 F-C-97	03/23/2018			03/30/2018	Lauren Bottorf	1977148, 1977149, 1977150, 1977151, 1977152, 1977153
SM 5310 B-00	03/23/2018			04/04/2018	Megan Treadwell	1977154, 1977155, 1977156, 1977157, 1977158, 1977159