Chemical Analysis Report

NW-DIST-2021-07-30-01

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

Event Description: **Twin Lakes Run**
Request ID: **RQ-2021-07-26-15**
Customer: **NW-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 25-AUG-2021 15:12

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Twin Lake South Lobe **Collection Date/Time: 07/29/2021 11:08**

Field ID: G3NW0448 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266207	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P401779	
	EPA 300.0 Rev. 2.1	Chloride	26		mg Cl/L	P402078	
		Sulfate	12		mg SO4/L	P402080	
	SM 2120 B-2011	Color (true)	74		PCU	P401781	
	SM 2320 B-2011	Total Alkalinity	84	A	mg CaCO3/L	P401937	
	SM 2540 C-2011	TDS	170		mg/L	P402222	
	SM 2540 D-2011	TSS	2	I	mg/L	P402225	
	SM 4500 F-C-2011	Fluoride	0.17		mg F/L	P401939	
2266212	EPA 350.1 Rev. 2.0	Ammonia-N	0.15		mg N/L	P402267	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P402527	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P401811	
	EPA 365.1 Rev. 2.0	Total-P	0.46		mg P/L	P402012	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P402468	
2266217	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.35		mg P/L	P401771	

Ref. Method and Comment:
SM 2540 D-2011: 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: Twin Lake Eastern Lake **Collection Date/Time: 07/29/2021 11:37**

Field ID: G3NW0449 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266208	EPA 180.1 Rev. 2.0	Turbidity	8.6		NTU	P401779	
	EPA 300.0 Rev. 2.1	Chloride	19	A	mg Cl/L	P402411	
		Sulfate	7.8	A	mg SO4/L	P402414	
	SM 2120 B-2011	Color (true)	55		PCU	P401781	
	SM 2320 B-2011	Total Alkalinity	49		mg CaCO3/L	P401937	
	SM 2540 C-2011	TDS	115		mg/L	P402222	
	SM 2540 D-2011	TSS	13		mg/L	P402225	
	SM 4500 F-C-2011	Fluoride	0.076	I	mg F/L	P401939	
2266213	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P402267	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P402636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P401811	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P402012	
	SM 5310 B-2011	Organic Carbon	7.7		mg C/L	P402468	
2266218	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P401771	

Ref. Method and Comment:
SM 2540 D-2011: 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: Kell-Aire Lake **Collection Date/Time: 07/29/2021 12:19**

Field ID: G3NW0217 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266209	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P401779	
	EPA 300.0 Rev. 2.1	Chloride	30		mg Cl/L	P402411	
		Sulfate	10		mg SO4/L	P402414	
	SM 2120 B-2011	Color (true)	55	J	PCU	P401781	
	SM 2320 B-2011	Total Alkalinity	64		mg CaCO3/L	P401937	
	SM 2540 C-2011	TDS	148		mg/L	P402222	
	SM 2540 D-2011	TSS	10		mg/L	P402225	
	SM 4500 F-C-2011	Fluoride	0.15		mg F/L	P401939	
2266214	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P402267	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P402527	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P401811	
	EPA 365.1 Rev. 2.0	Total-P	0.35		mg P/L	P402012	
	SM 5310 B-2011	Organic Carbon	7.7		mg C/L	P402468	
2266219	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.21		mg P/L	P401771	

Ref. Method and Comment:
SM 2120 B-2011: The result may be biased high because of matrix interference.
SM 2540 D-2011: 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: Coleman Lake **Collection Date/Time: 07/29/2021 12:10**

Field ID: G3NW0216 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266210	EPA 180.1 Rev. 2.0	Turbidity	23		NTU	P401779	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P402411	
		Sulfate	9.7		mg SO4/L	P402414	
	SM 2120 B-2011	Color (true)	60	J	PCU	P401781	
	SM 2320 B-2011	Total Alkalinity	62		mg CaCO3/L	P401937	
	SM 2540 C-2011	TDS	148	Q	mg/L	P402819	
	SM 2540 D-2011	TSS	12		mg/L	P402225	
	SM 4500 F-C-2011	Fluoride	0.15		mg F/L	P401939	
2266215	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P402267	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P402527	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P401811	
	EPA 365.1 Rev. 2.0	Total-P	0.45		mg P/L	P402012	
	SM 5310 B-2011	Organic Carbon	8.2		mg C/L	P402468	
2266220	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.25		mg P/L	P401771	

Ref. Method and Comment:
SM 2120 B-2011: The result may be biased high because of matrix interference.
SM 2540 C-2011: The sample was analyzed out of holding time because of analytical difficulties.
SM 2540 D-2011: 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: Twin Lake **Collection Date/Time: 07/29/2021 10:55**

Field ID: G3NW0215 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2266211	EPA 180.1 Rev. 2.0	Turbidity	3.9		NTU	P401779	
	EPA 300.0 Rev. 2.1	Chloride	37		mg Cl/L	P402411	
		Sulfate	12		mg SO4/L	P402414	
	SM 2120 B-2011	Color (true)	56		PCU	P401782	
	SM 2320 B-2011	Total Alkalinity	78		mg CaCO3/L	P401937	
	SM 2540 C-2011	TDS	187		mg/L	P402222	
	SM 2540 D-2011	TSS	12		mg/L	P402225	
	SM 4500 F-C-2011	Fluoride	0.23		mg F/L	P401939	
2266216	EPA 350.1 Rev. 2.0	Ammonia-N	0.24		mg N/L	P402267	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P402527	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P401811	
	EPA 365.1 Rev. 2.0	Total-P	1.1		mg P/L	P402437	MS
	SM 5310 B-2011	Organic Carbon	8.9		mg C/L	P402489	
2266221	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.91		mg P/L	P401771	

Ref. Method and Comment:
SM 2540 D-2011: 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: P401779

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402078

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402080

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402411

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402414

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402267

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402527

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402636

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401811

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: P402012

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402437

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401771

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

Reference Method: SM 2120 B-2011
Batch ID: P401781

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P401782

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P401937

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

Reference Method: SM 2540 C-2011
Batch ID: P402222

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P402819

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P402225

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P402468

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-2011
Batch ID: P402489

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: P402078

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: P402080

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402411

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402414

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: P402267

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402527

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402636

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401811

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402012

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401771

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P401781

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

Reference Method: SM 2120 B-2011
Batch ID: P401782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.9		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P401937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P402468

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P402489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.3		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265759	Chloride	98.7		P	90 - 110
2265947	Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402080

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265759	Sulfate	94.5		P	90 - 110
2265947	Sulfate	99.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266208	Chloride	95.5		P	90 - 110
2266490	Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266208	Sulfate	95.3		P	90 - 110
2266490	Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266082	Ammonia-N	99.4	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401811

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266179	NO2NO3-N	96.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402012

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266213	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402437

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2267211	Total-P	114	106	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401771

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401771

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266086	O-Phosphate-P	95.0	97.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266207	Fluoride	99.2	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P402468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266214	Organic Carbon	98.6	99.0	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P402489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2266484	Organic Carbon	97.0	96.7	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P401779

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266080	Turbidity	5.74	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265759	Chloride	0.114	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265759	Sulfate	0.795	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266208	Chloride	1.19	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266208	Sulfate	1.63	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266082	Ammonia-N	0.182	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266215	Kjeldahl Nitrogen	6.17	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266586	Kjeldahl Nitrogen	0.409	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401811

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266179	NO2NO3-N	0.245	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266213	Total-P	0.464	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2267211	Total-P	3.73	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401771

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266086	O-Phosphate-P	2.21	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P401781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266078	Color (true)	7.26	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P401782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266389	Color (true)	1.89	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P401937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266207	Total Alkalinity	0.690	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P402222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266078	TDS	6.64	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P402819

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269417	TDS	3.98	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P401939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266207	Fluoride	0.897	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P402468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266214	Organic Carbon	0.218	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P402489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2266484	Organic Carbon	0.212	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A106947
Included Lab Sample IDs: 2266217, 2266218, 2266219, 2266220, 2266221

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.8	96.6	P/P	90 - 110
O-Phosphate-P	98.2	98.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A106950
Included Lab Sample IDs: 2266207, 2266208, 2266209, 2266210, 2266211

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

Reference Method: SM 2120 B-2011
Run ID: A106951
Included Lab Sample IDs: 2266207, 2266208, 2266209, 2266210, 2266211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	100	P/P	90 - 115
Color (true)	99.4	101	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106974
Included Lab Sample IDs: 2266212, 2266213, 2266214, 2266215, 2266216

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A107025
Included Lab Sample IDs: 2266207

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

Reference Method: SM 2320 B-2011
Run ID: A107027
Included Lab Sample IDs: 2266207, 2266208, 2266209, 2266210, 2266211

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

Reference Method: SM 4500 F-C-2011
Run ID: A107027
Included Lab Sample IDs: 2266207, 2266208, 2266209, 2266210, 2266211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	105	P/P	90 - 110
Fluoride	103	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107087
Included Lab Sample IDs: 2266212, 2266213, 2266214, 2266215

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	106	P/P	90 - 110
Total-P	106	107	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A107154
Included Lab Sample IDs: 2266212, 2266213, 2266214, 2266215, 2266216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A107166
Included Lab Sample IDs: 2266208, 2266209, 2266210, 2266211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.6	98.8	P/P	90 - 110
Sulfate	98.5	98.3	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A107246
Included Lab Sample IDs: 2266212, 2266213, 2266214, 2266215

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	97.6	P/P	90 - 110
Organic Carbon	97.2	97.6	P/P	90 - 110
Organic Carbon	97.6	97.9	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A107256
Included Lab Sample IDs: 2266216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.0	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107303
Included Lab Sample IDs: 2266212, 2266214, 2266215, 2266216

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107315
Included Lab Sample IDs: 2266216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	107	108	P/P	85 - 115

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107355
Included Lab Sample IDs: 2266213

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	103	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					5.74	
EPA 300.0 Rev. 2.1	Chloride	98.2	98.7	99.4		0.114	
	Chloride	97.7	95.5	97.5		1.19	
	Sulfate	96.6	94.5	99.2		0.795	
	Sulfate	97.0	95.3	97.3		1.63	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.4	99.6			0.182
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100					6.17
	Kjeldahl Nitrogen	107					0.409
EPA 353.2 Rev. 2.0	NO2NO3-N	100	96.0				0.245
EPA 365.1 Rev. 2.0	Total-P	106	105	106			0.464
	Total-P	108	114	106			3.73
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	95.0	97.4			2.21
SM 2120 B-2011	Color (true)	99.1				7.26	
	Color (true)	99.9				1.89	
SM 2320 B-2011	Total Alkalinity	102				0.690	
SM 2540 C-2011	TDS					6.64	
	TDS					3.98	
SM 4500 F-C-2011	Fluoride	101	99.2	101			0.897
SM 5310 B-2011	Organic Carbon	97.6	98.6	99.0			0.218
	Organic Carbon	98.3	97.0	96.7			0.212

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2266207, 2266208, 2266209, 2266210, 2266211
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2266207, 2266208, 2266209, 2266210, 2266211
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2266207, 2266208, 2266209, 2266210, 2266211
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2266212, 2266213, 2266214, 2266215, 2266216
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2266212, 2266213, 2266214, 2266215, 2266216
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2266212, 2266213, 2266214, 2266215, 2266216
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2266212, 2266213, 2266214, 2266215, 2266216
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2266217, 2266218, 2266219, 2266220, 2266221
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2266207, 2266208, 2266209, 2266210, 2266211
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2266207, 2266208, 2266209, 2266210, 2266211
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2266207, 2266208, 2266209, 2266210, 2266211
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2266207, 2266208, 2266209, 2266210, 2266211
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2266207, 2266208, 2266209, 2266210, 2266211
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2266212, 2266213, 2266214, 2266215, 2266216

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	07/30/2021			07/30/2021 15:49	Sarah A Nixon	2266207, 2266208, 2266209, 2266210, 2266211
EPA 300.0 Rev. 2.1	07/30/2021			08/06/2021 01:57	Lipi Saha	2266207
	07/30/2021			08/11/2021 12:47	Lipi Saha	2266208
	07/30/2021			08/11/2021 13:36	Lipi Saha	2266209
	07/30/2021			08/11/2021 13:48	Lipi Saha	2266210
	07/30/2021			08/11/2021 14:00	Lipi Saha	2266211
EPA 350.1 Rev. 2.0	07/30/2021			08/10/2021 14:00	Ping Hua	2266212
	07/30/2021			08/10/2021 14:02	Ping Hua	2266213
	07/30/2021			08/10/2021 14:03	Ping Hua	2266214
	07/30/2021			08/10/2021 14:04	Ping Hua	2266215
	07/30/2021			08/10/2021 14:06	Ping Hua	2266216
EPA 351.2 Rev. 2.0	07/30/2021	08/16/2021 18:04	Madeline Gruver	08/17/2021 14:38	Virginia P. Brown	2266212
	07/30/2021	08/16/2021 18:04	Madeline Gruver	08/17/2021 14:41	Virginia P. Brown	2266214
	07/30/2021	08/16/2021 18:04	Madeline Gruver	08/17/2021 14:43	Virginia P. Brown	2266215
	07/30/2021	08/16/2021 18:04	Madeline Gruver	08/17/2021 14:48	Virginia P. Brown	2266216
	07/30/2021	08/18/2021 14:23	Benjamin T. Nordmann	08/19/2021 14:05	Virginia P. Brown	2266213
EPA 353.2 Rev. 2.0	07/30/2021			08/02/2021 10:11	Beverly Y. Sanders	2266212
	07/30/2021			08/02/2021 10:12	Beverly Y. Sanders	2266213
	07/30/2021			08/02/2021 10:13	Beverly Y. Sanders	2266214
	07/30/2021			08/02/2021 10:15	Beverly Y. Sanders	2266215
	07/30/2021			08/02/2021 10:16	Beverly Y. Sanders	2266216
EPA 365.1 Rev. 2.0	07/30/2021	08/05/2021 15:45	Simonne.V. Calhoun	08/06/2021 09:59	Shengyu Ding	2266212
	07/30/2021	08/05/2021 15:45	Simonne.V. Calhoun	08/06/2021 10:00	Shengyu Ding	2266213
	07/30/2021	08/05/2021 15:45	Simonne.V. Calhoun	08/06/2021 10:04	Shengyu Ding	2266214
	07/30/2021	08/05/2021 15:45	Simonne.V. Calhoun	08/06/2021 10:05	Shengyu Ding	2266215
	07/30/2021	08/13/2021 15:00	Simonne.V. Calhoun	08/18/2021 14:21	Shengyu Ding	2266216
EPA 365.1 Rev. 2.0 dissolved	07/30/2021			07/30/2021 15:40	Ping Hua	2266217
	07/30/2021			07/30/2021 15:41	Ping Hua	2266218
	07/30/2021			07/30/2021 15:43	Ping Hua	2266221
	07/30/2021			07/30/2021 16:17	Ping Hua	2266219
	07/30/2021			07/30/2021 16:18	Ping Hua	2266220
SM 2120 B-2011	07/30/2021			07/30/2021 16:41	Sarah A Nixon	2266207
	07/30/2021			07/30/2021 16:42	Sarah A Nixon	2266208
	07/30/2021			07/30/2021 16:43	Sarah A Nixon	2266209
	07/30/2021			07/30/2021 16:44	Sarah A Nixon	2266210
	07/30/2021			07/30/2021 16:49	Sarah A Nixon	2266211
SM 2320 B-2011	07/30/2021			08/03/2021 15:50	Dale L. Simmons	2266207
	07/30/2021			08/03/2021 18:47	Dale L. Simmons	2266208
	07/30/2021			08/03/2021 19:02	Dale L. Simmons	2266209

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2320 B-2011	07/30/2021			08/03/2021 19:16	Dale L. Simmons	2266210
	07/30/2021			08/03/2021 19:30	Dale L. Simmons	2266211
SM 2540 C-2011	07/30/2021			08/03/2021 14:36	Yijie Li	2266207, 2266208, 2266209, 2266211
	07/30/2021			08/18/2021 11:05	Yijie Li	2266210
SM 2540 D-2011	07/30/2021			08/03/2021 14:36	Yijie Li	2266207, 2266208, 2266209, 2266210, 2266211
SM 4500 F-C-2011	07/30/2021			08/03/2021 15:37	Dale L. Simmons	2266207
	07/30/2021			08/03/2021 18:47	Dale L. Simmons	2266208
	07/30/2021			08/03/2021 19:02	Dale L. Simmons	2266209
	07/30/2021			08/03/2021 19:16	Dale L. Simmons	2266210
	07/30/2021			08/03/2021 19:30	Dale L. Simmons	2266211
SM 5310 B-2011	07/30/2021			08/12/2021 02:31	Madeline Gruver	2266214
	07/30/2021			08/12/2021 07:51	Madeline Gruver	2266212
	07/30/2021			08/12/2021 08:04	Madeline Gruver	2266213
	07/30/2021			08/12/2021 08:43	Madeline Gruver	2266215
	07/30/2021			08/13/2021 22:30	Touraj Touran	2266216