Chemical Analysis Report

SO-DIST-2019-05-30-01

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

Event Description: **Wilderness Waterway**
Request ID: **RQ-2019-05-13-42**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
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Certified by: Colin Wright, Program Administrator

Date Certified: 25-JUN-2019 11:46

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: ENRE 10 near Boat Ramp **Collection Date/Time: 05/29/2019 10:15**

Field ID: G1SD0074 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089825	EPA 180.1 Rev. 2.0	Turbidity	7.2		NTU	P364762	
	EPA 300.0	Bromide	73		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	162		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	8	I	mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P364931	
2089829	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P364808	
	EPA 365.1 Rev. 2.0	Total-P	0.043	J	mg P/L	P364978	MS
	SM 5310 B-00	Organic Carbon	7.6		mg C/L	P364906	
2089833	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Refer to the narrative for an explanation of QC Codes.

Sample Location: ENRE 10 off Chokoloskee **Collection Date/Time: 05/29/2019 10:35**

Field ID: G1SD0075 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089826	EPA 180.1 Rev. 2.0	Turbidity	10		NTU	P364762	
	EPA 300.0	Bromide	74		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	163		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	15		mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P364931	
2089830	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364808	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P364978	MS
	SM 5310 B-00	Organic Carbon	7.3		mg C/L	P364906	
2089834	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE10 Lopez River **Collection Date/Time: 05/29/2019 10:50**

Field ID: G5SD0092 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089810	EPA 180.1 Rev. 2.0	Turbidity	5.1		NTU	P364762	
	EPA 300.0	Bromide	73		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	162		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	5	IA	mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P364931	
2089815	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P364807	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P364904	
	SM 5310 B-00	Organic Carbon	6.7		mg C/L	P364906	
2089820	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.015		mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE9 Lopez River **Collection Date/Time: 05/29/2019 11:10**

Field ID: G5SD0093 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089811	EPA 180.1 Rev. 2.0	Turbidity	6.0		NTU	P364762	
	EPA 300.0	Bromide	72		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	169		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	10		mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P364931	
2089816	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P364808	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P364904	
	SM 5310 B-00	Organic Carbon	8.6		mg C/L	P364906	
2089821	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE11 Sunday Bay **Collection Date/Time: 05/29/2019 11:30**

Field ID: G5SD0094 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089812	EPA 180.1 Rev. 2.0	Turbidity	6.7		NTU	P364762	
	EPA 300.0	Bromide	67		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	173		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	12		mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P364931	
2089817	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P364808	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P364904	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P364906	
2089822	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE 11 at Huston Bay **Collection Date/Time: 05/29/2019 11:50**

Field ID: G5SD0026 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089813	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P364762	
	EPA 300.0	Bromide	66		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	160		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	7	I	mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P364931	
2089818	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364808	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P364978	MS
	SM 5310 B-00	Organic Carbon	12		mg C/L	P364906	
2089823	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE 11 at Huston Bay **Collection Date/Time: 05/29/2019 11:55**

Field ID: G5SD0026_DUP Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089814	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P364762	
	EPA 300.0	Bromide	64		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	158		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	6	I	mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P364931	
2089819	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364808	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P364978	MS
	SM 5310 B-00	Organic Carbon	12		mg C/L	P364906	
2089824	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE9 @CopelandCauseway **Collection Date/Time: 05/29/2019 13:20**

Field ID: G1SD0073 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089827	EPA 180.1 Rev. 2.0	Turbidity	6.6		NTU	P364763	
	EPA 300.0	Bromide	71		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	173		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	16		mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P364931	
2089831	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364808	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P364978	MS
	SM 5310 B-00	Organic Carbon	9.2		mg C/L	P364906	
2089835	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P364769	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE 9 **Collection Date/Time: 05/29/2019 13:35**

Field ID: G1SD0090 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089828	EPA 180.1 Rev. 2.0	Turbidity	5.9	A	NTU	P364763	
	EPA 300.0	Bromide	73		mg Br/L	P364877	
	SM 2320 B-97	Total Alkalinity	164		mg CaCO3/L	P364929	
	SM 2540 D-97	TSS	8	I	mg/L	P365413	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P364931	
2089832	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P365206	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P364970	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P366096	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P364978	MS
	SM 5310 B-00	Organic Carbon	7.5		mg C/L	P364906	
2089836	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.023		mg P/L	P364768	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: 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: P364762

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364763

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0
Batch ID: P364877

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365206

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364970

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364807

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364808

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366096

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364904

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364978

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364768

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364769

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

Reference Method: SM 2320 B-97
Batch ID: P364929

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

Reference Method: SM 2540 D-97
Batch ID: P365413

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364931

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P364906

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0
Batch ID: P364877

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365206

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: P364970

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364807

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364808

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366096

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: P364904

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364978

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364768

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364769

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

Reference Method: SM 2320 B-97
Batch ID: P364929

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P364931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.8		P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P364906

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0
Batch ID: P364877

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089522	Bromide	94.5	95.6	P/P	90 - 110
2089528	Bromide	95.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365206

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089815	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089829	Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364807

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089450	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364808

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089816	NO2NO3-N	99.8	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2096214	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364904

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089486	Total-P	94.0	91.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089829	Total-P	92.4	87.4	P/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089823	O-Phosphate-P	95.2	97.5	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089835	O-Phosphate-P	94.3	96.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P364906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089599	Organic Carbon	99.7	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364762

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089790	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089828	Turbidity	7.62	Sample	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P364877

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089522	Bromide	0.625	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089815	Ammonia-N	0.484	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089829	Kjeldahl Nitrogen	1.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089450	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364808

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089816	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2096214	NO2NO3-N	0.491	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364904

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089486	Total-P	2.40	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089829	Total-P	5.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089823	O-Phosphate-P	2.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089835	O-Phosphate-P	1.50	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P364929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088458	Total Alkalinity	0.434	Sample	P	0 - 2.8

Reference Method: SM 4500 F-C-97
Batch ID: P364931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088458	Fluoride	0.513	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P364906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089599	Organic Carbon	0.954	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 180.1 Rev. 2.0
Run ID: A91762
Included Lab Sample IDs: 2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A91763
Included Lab Sample IDs: 2089820, 2089821, 2089822, 2089823, 2089824, 2089833, 2089834, 2089835, 2089836

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	99.6	P/P	90 - 110
O-Phosphate-P	97.6	97.5	P/P	90 - 110
O-Phosphate-P	99.5	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A91781
Included Lab Sample IDs: 2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	100	P/P	90 - 110
NO2NO3-N	99.5	98.0	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A91804
Included Lab Sample IDs: 2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828

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

Reference Method: SM 5310 B-00
Run ID: A91812
Included Lab Sample IDs: 2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	101	P/P	90 - 110
Organic Carbon	101	102	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A91818
Included Lab Sample IDs: 2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828

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

Reference Method: SM 4500 F-C-97
Run ID: A91818
Included Lab Sample IDs: 2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	99.1	P/P	90 - 110
Fluoride	99.1	98.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91839
Included Lab Sample IDs: 2089815, 2089816, 2089817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.2	P/P	90 - 110
Total-P	99.2	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91886
Included Lab Sample IDs: 2089818, 2089819, 2089829, 2089830, 2089831, 2089832

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.2	P/P	90 - 110
Total-P	99.5	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A91914
Included Lab Sample IDs: 2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	103	P/P	90 - 110
Ammonia-N	103	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A91922
Included Lab Sample IDs: 2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	103	P/P	90 - 110
Kjeldahl Nitrogen	103	96.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A92272
Included Lab Sample IDs: 2089832

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100		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						0.0	
	Turbidity						7.62	
EPA 300.0	Bromide	101	94.5	95.6	95.8			0.625
EPA 350.1 Rev. 2.0	Ammonia-N	101	104	104				0.484
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	100	103				1.73
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	100	99.5				1.00
	NO2NO3-N	98.5	99.8	99.8				0.0
	NO2NO3-N	100	102	102				0.491
EPA 365.1 Rev. 2.0	Total-P	99.7	94.0	91.7				2.40
	Total-P	102	92.4	87.4				5.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.0	95.2	97.5				2.39
	O-Phosphate-P	97.4	94.3	96.0				1.50
SM 2320 B-97	Total Alkalinity	102					0.434	
SM 4500 F-C-97	Fluoride	95.8						0.513
SM 5310 B-00	Organic Carbon	100	99.7	101				0.954

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828
EPA 300.0 / E31780	Bromide in aqueous matrices	2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2089820, 2089821, 2089822, 2089823, 2089824, 2089833, 2089834, 2089835, 2089836
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2089815, 2089816, 2089817, 2089818, 2089819, 2089829, 2089830, 2089831, 2089832

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	05/30/2019			05/30/2019 16:27	Julia Storbeck	2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828
EPA 300.0	05/30/2019			05/30/2019 16:21	Lipi Saha	2089810
	05/30/2019			05/30/2019 17:13	Lipi Saha	2089811
	05/30/2019			05/30/2019 17:30	Lipi Saha	2089812
	05/30/2019			05/30/2019 17:47	Lipi Saha	2089813
	05/30/2019			05/30/2019 18:04	Lipi Saha	2089814
	05/30/2019			05/30/2019 18:21	Lipi Saha	2089825
	05/30/2019			05/30/2019 18:38	Lipi Saha	2089826
	05/30/2019			05/30/2019 18:55	Lipi Saha	2089827
	05/30/2019			05/30/2019 19:12	Lipi Saha	2089828
EPA 350.1 Rev. 2.0	05/30/2019			06/05/2019 11:17	Ping Hua	2089815
	05/30/2019			06/05/2019 11:23	Ping Hua	2089816
	05/30/2019			06/05/2019 11:25	Ping Hua	2089818
	05/30/2019			06/05/2019 11:26	Ping Hua	2089819
	05/30/2019			06/05/2019 11:34	Ping Hua	2089817
	05/30/2019			06/05/2019 11:35	Ping Hua	2089829
	05/30/2019			06/05/2019 11:37	Ping Hua	2089830
	05/30/2019			06/05/2019 11:38	Ping Hua	2089831
	05/30/2019			06/05/2019 11:40	Ping Hua	2089832
EPA 351.2 Rev. 2.0	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:03	Joseph Suarez	2089815
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:04	Joseph Suarez	2089816
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:06	Joseph Suarez	2089817
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:07	Joseph Suarez	2089818
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:09	Joseph Suarez	2089819
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:10	Joseph Suarez	2089829
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:18	Joseph Suarez	2089830
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:20	Joseph Suarez	2089831
	05/30/2019	06/04/2019 17:45	Adrian Shelby	06/05/2019 16:21	Joseph Suarez	2089832
EPA 353.2 Rev. 2.0	05/30/2019			05/31/2019 11:22	Beverly Y. Sanders	2089815
	05/30/2019			05/31/2019 11:29	Beverly Y. Sanders	2089816
	05/30/2019			05/31/2019 11:35	Beverly Y. Sanders	2089817
	05/30/2019			05/31/2019 11:36	Beverly Y. Sanders	2089818
	05/30/2019			05/31/2019 11:38	Beverly Y. Sanders	2089819
	05/30/2019			05/31/2019 11:39	Beverly Y. Sanders	2089829
	05/30/2019			05/31/2019 11:40	Beverly Y. Sanders	2089830
	05/30/2019			05/31/2019 11:41	Beverly Y. Sanders	2089831
	05/30/2019			06/21/2019 09:34	Beverly Y. Sanders	2089832
EPA 365.1 Rev. 2.0	05/30/2019	06/03/2019 11:05	Sima Feizi	06/04/2019 13:16	Rosalyn Ballman	2089815

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 365.1 Rev. 2.0	05/30/2019	06/03/2019 11:05	Sima Feizi	06/04/2019 13:17	Rosalyn Ballman	2089816
	05/30/2019	06/03/2019 11:05	Sima Feizi	06/04/2019 13:24	Rosalyn Ballman	2089817
	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 14:53	Rosalyn Ballman	2089818
	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 14:54	Rosalyn Ballman	2089819
	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 14:55	Rosalyn Ballman	2089829
	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 15:02	Rosalyn Ballman	2089830
	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 15:03	Rosalyn Ballman	2089831
	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 15:04	Rosalyn Ballman	2089832
EPA 365.1 Rev. 2.0 dissolved	05/30/2019			05/30/2019 15:07	Jhamieka S. Greenwood	2089823
	05/30/2019			05/30/2019 15:15	Jhamieka S. Greenwood	2089835
	05/30/2019			05/30/2019 15:28	Jhamieka S. Greenwood	2089820
	05/30/2019			05/30/2019 15:29	Jhamieka S. Greenwood	2089821
	05/30/2019			05/30/2019 15:30	Jhamieka S. Greenwood	2089822
	05/30/2019			05/30/2019 15:31	Jhamieka S. Greenwood	2089824
	05/30/2019			05/30/2019 15:32	Jhamieka S. Greenwood	2089833, 2089834
	05/30/2019			05/30/2019 15:33	Jhamieka S. Greenwood	2089836
SM 2320 B-97	05/30/2019			06/03/2019 01:47	Dale L. Simmons	2089810
	05/30/2019			06/03/2019 02:00	Dale L. Simmons	2089811
	05/30/2019			06/03/2019 02:12	Dale L. Simmons	2089812
	05/30/2019			06/03/2019 02:24	Dale L. Simmons	2089813
	05/30/2019			06/03/2019 02:36	Dale L. Simmons	2089814
	05/30/2019			06/03/2019 02:48	Dale L. Simmons	2089825
	05/30/2019			06/03/2019 03:01	Dale L. Simmons	2089826
	05/30/2019			06/03/2019 03:14	Dale L. Simmons	2089827
	05/30/2019			06/03/2019 03:25	Dale L. Simmons	2089828
SM 2540 D-97	05/30/2019			06/04/2019 15:00	Yijie Li	2089810, 2089811, 2089812, 2089813, 2089814, 2089825, 2089826, 2089827, 2089828
SM 4500 F-C-97	05/30/2019			06/02/2019 21:22	Dale L. Simmons	2089810
	05/30/2019			06/02/2019 22:07	Dale L. Simmons	2089811
	05/30/2019			06/02/2019 22:11	Dale L. Simmons	2089812
	05/30/2019			06/02/2019 22:15	Dale L. Simmons	2089813
	05/30/2019			06/02/2019 22:20	Dale L. Simmons	2089814
	05/30/2019			06/02/2019 22:24	Dale L. Simmons	2089825
	05/30/2019			06/02/2019 22:28	Dale L. Simmons	2089826
	05/30/2019			06/02/2019 22:32	Dale L. Simmons	2089827
	05/30/2019			06/02/2019 22:37	Dale L. Simmons	2089828
SM 5310 B-00	05/30/2019			05/31/2019 23:34	Julia Storbeck	2089815
	05/30/2019			05/31/2019 23:46	Julia Storbeck	2089816
	05/30/2019			06/01/2019 00:12	Julia Storbeck	2089817

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	05/30/2019			06/01/2019 00:24	Julia Storbeck	2089818
	05/30/2019			06/01/2019 00:37	Julia Storbeck	2089819
	05/30/2019			06/01/2019 00:49	Julia Storbeck	2089829
	05/30/2019			06/01/2019 01:06	Julia Storbeck	2089830
	05/30/2019			06/01/2019 01:56	Julia Storbeck	2089831
	05/30/2019			06/01/2019 02:09	Julia Storbeck	2089832