Chemical Analysis Report

SO-DIST-2018-12-20-01

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

Event Description: **Lake Pythias, Huckleberry Lake, Pearl Lake, Lake Henry**
Request ID: **RQ-2018-09-03-68**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
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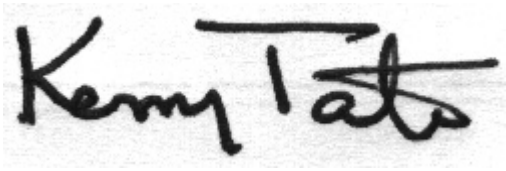
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 08-JAN-2019 14:27



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: LakeHuckleberry-2Middle **Collection Date/Time: 12/19/2018 10:15**

Field ID: G4SD0166 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2050132	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P356502	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P356721	
		Sulfate	3.3		mg SO4/L	P356723	
	SM 2120 B	Color (true)	100		PCU	P356472	
	SM 2320 B-97	Total Alkalinity	24		mg CaCO3/L	P356563	
	SM 2540 C-97	TDS	91		mg/L	P356691	
	SM 2540 D-97	TSS	9	I	mg/L	P356583	
	SM 4500 F-C-97	Fluoride	0.081	I	mg F/L	P356663	
2050133	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P356623	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P356576	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.077		mg N/L	P356513	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P356655	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P356718	
2050134	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.054		mg P/L	P356473	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: 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: P356502

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356721

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356513

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356655

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

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

Reference Method: SM 2120 B
Batch ID: P356472

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P356563

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

Reference Method: SM 2540 C-97
Batch ID: P356691

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356583

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356663

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P356718

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: P356721

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356513

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356655

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.2		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P356472

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P356563

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P356663

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356718

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356721

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050014	Chloride	96.6		P	90 - 110
2050221	Chloride	94.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050014	Sulfate	96.0		P	90 - 110
2050221	Sulfate	91.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050061	Ammonia-N	103	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050150	Kjeldahl Nitrogen	115	99.5	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356513

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050091	NO2NO3-N	97.0	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050062	O-Phosphate-P	93.2	95.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049413	Fluoride	95.9	95.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356718

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050119	Organic Carbon	92.0	92.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050118	Turbidity	3.08	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050221	Chloride	1.45	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050221	Sulfate	1.36	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050061	Ammonia-N	3.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050150	Kjeldahl Nitrogen	9.76	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050091	NO2NO3-N	0.273	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356655

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050150	Total-P	1.87	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050062	O-Phosphate-P	1.71	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P356472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050118	Color (true)	0.280	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050008	Total Alkalinity	0.807	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356691

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050008	TDS	1.61	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049413	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P356718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050119	Organic Carbon	0.548	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: A88469
Included Lab Sample IDs: 2050134

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.3	97.2	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A88470
Included Lab Sample IDs: 2050132

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.4	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A88486
Included Lab Sample IDs: 2050132

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A88490
Included Lab Sample IDs: 2050133

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88500
Included Lab Sample IDs: 2050133

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

Reference Method: SM 2320 B-97
Run ID: A88515
Included Lab Sample IDs: 2050132

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.7	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A88542
Included Lab Sample IDs: 2050132

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A88546
Included Lab Sample IDs: 2050132

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	99.8	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88560
Included Lab Sample IDs: 2050133

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

Reference Method: SM 5310 B-00
Run ID: A88576
Included Lab Sample IDs: 2050133

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88585
Included Lab Sample IDs: 2050133

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	100	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					3.08	
EPA 300.0 Rev. 2.1	Chloride	99.3	94.6	96.6		1.45	
	Sulfate	97.5	91.8	96.0		1.36	
EPA 350.1 Rev. 2.0	Ammonia-N	100	103	98.5			3.32
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	115	99.5			9.76
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	97.0	97.5			0.273
EPA 365.1 Rev. 2.0	Total-P	96.4					1.87
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.2	93.2	95.0			1.71
SM 2120 B	Color (true)	101				0.280	
SM 2320 B-97	Total Alkalinity	101				0.807	
SM 2540 C-97	TDS					1.61	
SM 4500 F-C-97	Fluoride	98.7	95.9	95.9			0.0
SM 5310 B-00	Organic Carbon	95.4	92.0	92.9			0.548

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2050132
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2050132
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2050132
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2050133
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2050133
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2050133
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2050133
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2050134
SM 2120 B / E31780	True Color measured at 450 nm	2050132
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2050132
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2050132
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2050132
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2050132
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2050133

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	12/20/2018			12/20/2018 15:16	Megan Treadwell	2050132
EPA 300.0 Rev. 2.1	12/20/2018			12/29/2018 01:08	Lipi Saha	2050132
EPA 350.1 Rev. 2.0	12/20/2018			12/21/2018 10:32	Ping Hua	2050133
EPA 351.2 Rev. 2.0	12/20/2018	12/26/2018 10:45	Adrian Shelby	12/27/2018 17:13	Chelsea Hernandez	2050133
EPA 353.2 Rev. 2.0	12/20/2018			12/21/2018 10:02	Lauren Bottorf	2050133
EPA 365.1 Rev. 2.0	12/20/2018	12/28/2018 11:30	Joseph Suarez	01/02/2019 09:05	Beverly Y. Sanders	2050133
EPA 365.1 Rev. 2.0 dissolved	12/20/2018			12/20/2018 14:45	Jhamieka S. Greenwood	2050134
SM 2120 B	12/20/2018			12/20/2018 15:55	Chelsea Hernandez	2050132
SM 2320 B-97	12/20/2018			12/22/2018 13:28	Dale L. Simmons	2050132
SM 2540 C-97	12/20/2018			12/21/2018 11:15	Yijie Li	2050132
SM 2540 D-97	12/20/2018			12/21/2018 11:15	Yijie Li	2050132
SM 4500 F-C-97	12/20/2018			12/28/2018 03:03	Dale L. Simmons	2050132
SM 5310 B-00	12/20/2018			12/21/2018 21:05	Megan Treadwell	2050133