

Chemical Analysis Report

WQAP-2021-01-19-03

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

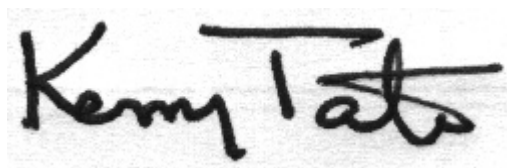
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-01-25-21**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 09-FEB-2021 10:55

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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 groups are included in this report: Nutrients and Pesticides.

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: Lake Buckeye @ Boat Ramp

Collection Date/Time: 01/18/2021 11:17

Field ID: HABCE00060_LakeBuckeye

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2219919	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P392510	
		Cylindrospermopsin**	0.25	U	ug/L	P392510	
		Desmethyl microcystin LR**	0.25	U	ug/L	P392510	
		Microcystin LA**	0.25	U	ug/L	P392510	
		Microcystin LF**	0.25	U	ug/L	P392510	
		Microcystin LR**	0.25	U	ug/L	P392510	
		Microcystin LW**	0.25	U	ug/L	P392510	
		Microcystin LY**	0.25	U	ug/L	P392510	
		Microcystin RR**	0.25	U	ug/L	P392510	
		Microcystin WR**	0.50	U	ug/L	P392510	
		Microcystin YR**	0.25	U	ug/L	P392510	
2219920	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P393205	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P393023	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P392667	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P392649	
2219921	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P392546	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393205

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393023

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392667

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392649

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392546

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

Reference Method: EPA 8321B
Batch ID: P392510

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P393205

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P393023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	109		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P392667

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P392649

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P392546

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

Reference Method: EPA 8321B
 Batch ID: P392510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	140		P	40 - 150
Cylindrospermopsin	115		P	40 - 150
Desmethyl microcystin LR	92.0		P	40 - 150
Microcystin LA	106		P	40 - 150
Microcystin LF	93.9		P	40 - 150
Microcystin LR	70.5		P	40 - 150
Microcystin LW	98.2		P	40 - 150
Microcystin LY	78.8		P	40 - 150
Microcystin RR	114		P	40 - 150
Microcystin WR	78.1		P	40 - 150
Microcystin YR	91.2		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P393205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219920	Ammonia-N	99.2	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P392667

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219235	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P392649

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219337	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P392546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219921	O-Phosphate-P	98.5	98.5	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P392510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219446	Anatoxin-a	106	101	P/P	40 - 150
2219446	Cylindrospermopsin	83.1	77.8	P/P	40 - 150
2219446	Desmethyl microcystin LR	82.3	88.5	P/P	40 - 150
2219446	Microcystin LA	82.1	99.9	P/P	40 - 150
2219446	Microcystin LF	76.2	71.7	P/P	40 - 150
2219446	Microcystin LR	56.3	65.9	P/P	40 - 150
2219446	Microcystin LW	73.8	77.6	P/P	40 - 150
2219446	Microcystin LY	65.5	67.5	P/P	40 - 150
2219446	Microcystin RR	99.4	105	P/P	40 - 150
2219446	Microcystin WR	74.7	73.3	P/P	40 - 150
2219446	Microcystin YR	72.4	82.3	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P393205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219920	Ammonia-N	1.72	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P392667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219235	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P392649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219337	Total-P	0.940	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P392546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219921	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P392510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219446	Anatoxin-a	4.86	Spike	P	0 - 30
2219446	Cylindrospermopsin	6.66	Spike	P	0 - 30
2219446	Desmethyl microcystin LR	7.24	Spike	P	0 - 30
2219446	Microcystin LA	19.6	Spike	P	0 - 30
2219446	Microcystin LF	6.09	Spike	P	0 - 30
2219446	Microcystin LR	15.7	Spike	P	0 - 30
2219446	Microcystin LW	5.01	Spike	P	0 - 30
2219446	Microcystin LY	3.00	Spike	P	0 - 30
2219446	Microcystin RR	5.25	Spike	P	0 - 30
2219446	Microcystin WR	1.90	Spike	P	0 - 30
2219446	Microcystin YR	12.7	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2219919

Field Sample ID: HABCE00060_LakeBuckeye

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	81.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	48.4	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A103120

Included Lab Sample IDs: 2219921

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	97.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A103149

Included Lab Sample IDs: 2219919

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	132	143	P/P	50 - 160
Cylindrospermopsin	114	121	P/P	60 - 160
Desmethyl microcystin LR	95.4	96.5	P/P	60 - 160
Microcystin LA	117	108	P/P	50 - 160
Microcystin LF	83.4	76.4	P/P	50 - 160
Microcystin LR	62.9	60.3	P/P	60 - 160
Microcystin LW	84.6	73.6	P/P	60 - 160
Microcystin LY	74.3	61.9	P/P	60 - 160
Microcystin RR	122	134	P/P	60 - 160
Microcystin WR	81.3	73.7	P/P	60 - 160
Microcystin YR	67.7	60.6	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103152

Included Lab Sample IDs: 2219920

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103211

Included Lab Sample IDs: 2219920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103294

Included Lab Sample IDs: 2219920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103348

Included Lab Sample IDs: 2219920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	93.0	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	98.3	99.2	101			1.72
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109					
EPA 353.2 Rev. 2.0	NO2NO3-N	103	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	106	106	107			0.940
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	98.5	98.5			0.0
EPA 8321B	Anatoxin-a	140	106	101			4.86
	Cylindrospermopsin	115	83.1	77.8			6.66
	Desmethyl microcystin LR	92.0	82.3	88.5			7.24
	Microcystin LA	106	82.1	99.9			19.6
	Microcystin LF	93.9	76.2	71.7			6.09
	Microcystin LR	70.5	56.3	65.9			15.7
	Microcystin LW	98.2	73.8	77.6			5.01
	Microcystin LY	78.8	65.5	67.5			3.00
	Microcystin RR	114	99.4	105			5.25
	Microcystin WR	78.1	74.7	73.3			1.90
	Microcystin YR	91.2	72.4	82.3			12.7

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2219920
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2219920
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2219920
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2219920
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2219921
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2219919

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 350.1 Rev. 2.0	01/19/2021			02/01/2021 18:39	Ping Hua	2219920
EPA 351.2 Rev. 2.0	01/19/2021	01/27/2021 13:15	Yen Ta	01/28/2021 15:57	Julia Storbeck	2219920
EPA 353.2 Rev. 2.0	01/19/2021			01/21/2021 10:08	Beverly Y. Sanders	2219920
EPA 365.1 Rev. 2.0	01/19/2021	01/20/2021 18:21	Madeline Gruver	01/25/2021 13:02	Shengyu Wang	2219920
EPA 365.1 Rev. 2.0 dissolved	01/19/2021			01/19/2021 15:01	Blanca Fach	2219921
EPA 8321B	01/19/2021	01/20/2021 11:00	Pramila Ghimire	01/20/2021 16:38	Pramila Ghimire	2219919