

Chemical Analysis Report

WQAP-2022-06-07-01

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

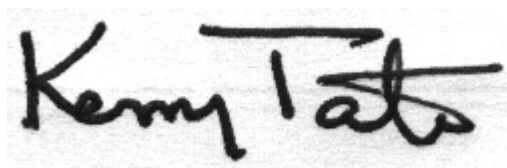
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-05-09-23**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 27-JUN-2022 08:51

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 Buffum - Boat Ramp

Collection Date/Time: 06/06/2022 14:20

Field ID: HABCE0127_LakeBuffum

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2332389	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P414894	
		Cylindrospermopsin	0.10	U	ug/L	P414894	
		Desmethyl microcystin LR	0.25	U	ug/L	P414894	
		Microcystin HIR**	0.25	U	ug/L	P414894	
		Microcystin HtyR**	0.25	U	ug/L	P414894	
		Microcystin LA	0.10	U	ug/L	P414894	
		Microcystin LF	0.10	UJ	ug/L	P414894	MS
		Microcystin LR	0.25	U	ug/L	P414894	
		Microcystin LW	0.25	U	ug/L	P414894	
		Microcystin LY	0.10	U	ug/L	P414894	
		Microcystin RR	0.10	U	ug/L	P414894	
		Microcystin WR	0.50	U	ug/L	P414894	
		Microcystin YR	0.25	U	ug/L	P414894	
		Nodularin-R**	0.10	U	ug/L	P414894	
2332390	EPA 350.1 Rev. 2.0	Ammonia-N	0.044		mg N/L	P415426	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P415359	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.054		mg N/L	P415291	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P414902	
2332391	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P414840	

Ref. Method and Comment:

EPA 8321B: Refer to the Lab Analysis Report for an explanation of QC Codes.

EPA 350.1 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 350.1 Rev. 2.0
Batch ID: P415426

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415359

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415291

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414902

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414840

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

Reference Method: EPA 8321B
Batch ID: P414894

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HIR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415426

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: P415359

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: P415291

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414902

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414840

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

Reference Method: EPA 8321B
Batch ID: P414894

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	111		P	40 - 150
Cylindrospermopsin	97.3		P	40 - 150
Desmethyl microcystin LR	115		P	40 - 150
Microcystin HIR	96.3		P	40 - 150
Microcystin HtyR	109		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	139		P	40 - 150
Microcystin LR	105		P	40 - 150
Microcystin LW	113		P	40 - 150
Microcystin LY	126		P	40 - 150
Microcystin RR	99.4		P	40 - 150
Microcystin WR	94.9		P	40 - 150
Microcystin YR	104		P	40 - 150
Nodularin-R	104		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P415359

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332280	Kjeldahl Nitrogen	109	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P415291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2333047	NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P414902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332368	Total-P	102	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P414840

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332284	O-Phosphate-P	96.6	96.9	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P414894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332389	Anatoxin-a	114	121	P/P	40 - 150
2332389	Cylindrospermopsin	91.6	94.3	P/P	40 - 150
2332389	Desmethyl microcystin LR	120	125	P/P	40 - 150
2332389	Microcystin HilR	98.3	98.7	P/P	40 - 150
2332389	Microcystin HtyR	112	113	P/P	40 - 150
2332389	Microcystin LA	98.2	114	P/P	40 - 150
2332389	Microcystin LF	143	153	P/F	40 - 150
2332389	Microcystin LR	116	121	P/P	40 - 150
2332389	Microcystin LW	133	116	P/P	40 - 150
2332389	Microcystin LY	114	103	P/P	40 - 150
2332389	Microcystin RR	96.8	100	P/P	40 - 150
2332389	Microcystin WR	106	101	P/P	40 - 150
2332389	Microcystin YR	98.3	118	P/P	40 - 150
2332389	Nodularin-R	99.7	102	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P415426

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332333	Ammonia-N	1.28	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P415359

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332280	Kjeldahl Nitrogen	5.91	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P415291

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333047	NO2NO3-N	2.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P414902

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332368	Total-P	2.62	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P414840

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332284	O-Phosphate-P	0.279	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P414894

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332389	Anatoxin-a	5.70	Spike	P	0 - 30
2332389	Cylindrospermopsin	2.85	Spike	P	0 - 30
2332389	Desmethyl microcystin LR	3.42	Spike	P	0 - 30
2332389	Microcystin H1LR	0.366	Spike	P	0 - 30
2332389	Microcystin HtyR	1.32	Spike	P	0 - 30
2332389	Microcystin LA	14.7	Spike	P	0 - 30
2332389	Microcystin LF	6.80	Spike	P	0 - 30
2332389	Microcystin LR	3.46	Spike	P	0 - 30
2332389	Microcystin LW	13.4	Spike	P	0 - 30
2332389	Microcystin LY	10.3	Spike	P	0 - 30
2332389	Microcystin RR	3.39	Spike	P	0 - 30
2332389	Microcystin WR	5.50	Spike	P	0 - 30
2332389	Microcystin YR	18.0	Spike	P	0 - 30
2332389	Nodularin-R	2.50	Spike	P	0 - 30

Quality Assurance Report Precision

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

Quality Assurance Report Surrogates

Lab Sample ID: 2332389

Field Sample ID: HABCE0127_LakeBuffum

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	60.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A112652

Included Lab Sample IDs: 2332391

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	97.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A112713

Included Lab Sample IDs: 2332389

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	109	106	P/P	50 - 160
Cylindrospermopsin	88.3	90.5	P/P	50 - 160
Desmethyl microcystin LR	114	112	P/P	50 - 160
Microcystin HIR	86.4	89.4	P/P	50 - 160
Microcystin HtyR	101	109	P/P	50 - 160
Microcystin LA	96.1	92.7	P/P	50 - 160
Microcystin LF	131	143	P/P	50 - 160
Microcystin LR	111	105	P/P	50 - 160
Microcystin LW	111	101	P/P	50 - 160
Microcystin LY	111	98.9	P/P	50 - 160
Microcystin RR	96.4	91.2	P/P	50 - 160
Microcystin WR	102	89.0	P/P	50 - 160
Microcystin YR	99.0	90.2	P/P	50 - 160
Nodularin-R	95.7	94.4	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112804

Included Lab Sample IDs: 2332390

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112865

Included Lab Sample IDs: 2332390

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112931

Included Lab Sample IDs: 2332390

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	95.9	94.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112989

Included Lab Sample IDs: 2332390

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	99.4	P/P	90 - 110

Quality Assurance Report

Calibration Verification

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

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

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
					LCS	
EPA 350.1 Rev. 2.0	Ammonia-N	100				1.28
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	109	101		5.91
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	105	100			2.16
EPA 365.1 Rev. 2.0	Total-P	103	102	105		2.62
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	96.6	96.9		0.279
EPA 8321B	Anatoxin-a	111	114	121		5.70
	Cylindrospermopsin	97.3	91.6	94.3		2.85
	Desmethyl microcystin LR	115	120	125		3.42
	Microcystin HiLR	96.3	98.3	98.7		0.366
	Microcystin HtyR	109	112	113		1.32
	Microcystin LA	103	98.2	114		14.7
	Microcystin LF	139	143	153		6.80
	Microcystin LR	105	116	121		3.46
	Microcystin LW	113	133	116		13.4
	Microcystin LY	126	114	103		10.3
	Microcystin RR	99.4	96.8	100		3.39
	Microcystin WR	94.9	106	101		5.50
	Microcystin YR	104	98.3	118		18.0
	Nodularin-R	104	99.7	102		2.50

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2332390
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2332390
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2332390
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2332390
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2332391
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2332389

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	06/07/2022			06/20/2022 12:58	Judith K. Clark	2332390
EPA 351.2 Rev. 2.0	06/07/2022	06/20/2022 16:20	Samantha L Bates	06/22/2022 15:29	Alexandra J Mattheus	2332390
EPA 353.2 Rev. 2.0	06/07/2022			06/13/2022 18:51	Touraj Touran	2332390
EPA 365.1 Rev. 2.0	06/07/2022	06/09/2022 15:30	Simonne.V. Calhoun	06/10/2022 14:15	James L Waggerby	2332390
EPA 365.1 Rev. 2.0 dissolved	06/07/2022			06/07/2022 15:37	Nathaniel J Jones	2332391
EPA 8321B	06/07/2022	06/09/2022 09:00	Manjita Shrestha	06/09/2022 12:54	Manjita Shrestha	2332389