

Chemical Analysis Report

WQAP-2022-01-21-01

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

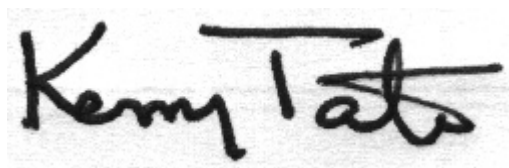
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-12-27-03**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd. Suite 232
Orlando, FL 32803
Attn: Matt Bearden

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 08-FEB-2022 09:01

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 Estelle - NE lobe

Collection Date/Time: 01/20/2022 11:22

Field ID: HABCE0103_LakeEstelle1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2300958	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P408898	
		Cylindrospermopsin	0.10	U	ug/L	P408898	
		Desmethyl microcystin LR	0.25	U	ug/L	P408898	
		Microcystin HilR**	0.25	U	ug/L	P408898	
		Microcystin HtyR**	0.25	U	ug/L	P408898	
		Microcystin LA	0.49		ug/L	P408898	
		Microcystin LF	0.10	U	ug/L	P408898	
		Microcystin LR	0.56	I	ug/L	P408898	
		Microcystin LW	0.25	U	ug/L	P408898	
		Microcystin LY	0.10	U	ug/L	P408898	
		Microcystin RR	0.10	U	ug/L	P408898	
		Microcystin WR	0.50	U	ug/L	P408898	
		Microcystin YR	0.25	U	ug/L	P408898	
		Nodularin-R**	0.10	U	ug/L	P408898	
2300959	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P409347	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P409133	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.030		mg N/L	P408986	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P409098	
2300960	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P408799	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409347

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409133

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408986

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409098

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408799

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

Reference Method: EPA 8321B
Batch ID: P408898

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: P409347

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409133

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408986

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409098

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408799

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

Reference Method: EPA 8321B
Batch ID: P408898

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	99.3		P	40 - 150
Cylindrospermopsin	97.3		P	40 - 150
Desmethyl microcystin LR	93.4		P	40 - 150
Microcystin HIR	95.8		P	40 - 150
Microcystin HtyR	105		P	40 - 150
Microcystin LA	99.9		P	40 - 150
Microcystin LF	94.0		P	40 - 150
Microcystin LR	92.2		P	40 - 150
Microcystin LW	102		P	40 - 150
Microcystin LY	94.0		P	40 - 150
Microcystin RR	98.0		P	40 - 150
Microcystin WR	90.2		P	40 - 150
Microcystin YR	103		P	40 - 150
Nodularin-R	95.0		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300905	Ammonia-N	98.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300959	Kjeldahl Nitrogen	105	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408986

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300959	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300984	Total-P	107	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300960	O-Phosphate-P	97.4	99.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P408898

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2300958	Anatoxin-a	111	106	P/P	40 - 150
2300958	Cylindrospermopsin	127	120	P/P	40 - 150
2300958	Desmethyl microcystin LR	113	113	P/P	40 - 150
2300958	Microcystin HiLR	124	111	P/P	40 - 150
2300958	Microcystin HtyR	118	116	P/P	40 - 150
2300958	Microcystin LA	109	109	P/P	40 - 150
2300958	Microcystin LF	109	107	P/P	40 - 150
2300958	Microcystin LR	106	93.5	P/P	40 - 150
2300958	Microcystin LW	102	108	P/P	40 - 150
2300958	Microcystin LY	102	100	P/P	40 - 150
2300958	Microcystin RR	111	111	P/P	40 - 150
2300958	Microcystin WR	102	101	P/P	40 - 150
2300958	Microcystin YR	115	119	P/P	40 - 150
2300958	Nodularin-R	104	104	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300905	Ammonia-N	2.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300959	Kjeldahl Nitrogen	1.29	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300959	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300984	Total-P	0.635	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300960	O-Phosphate-P	1.63	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P408898

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2300958	Anatoxin-a	4.66	Spike	P	0 - 30
2300958	Cylindrospermopsin	6.24	Spike	P	0 - 30
2300958	Desmethyl microcystin LR	0.0883	Spike	P	0 - 30
2300958	Microcystin HtIR	11.5	Spike	P	0 - 30
2300958	Microcystin HtyR	1.97	Spike	P	0 - 30
2300958	Microcystin LA	0.247	Spike	P	0 - 30
2300958	Microcystin LF	1.19	Spike	P	0 - 30
2300958	Microcystin LR	12.0	Spike	P	0 - 30
2300958	Microcystin LW	5.69	Spike	P	0 - 30
2300958	Microcystin LY	1.71	Spike	P	0 - 30
2300958	Microcystin RR	0.354	Spike	P	0 - 30
2300958	Microcystin WR	1.06	Spike	P	0 - 30
2300958	Microcystin YR	3.53	Spike	P	0 - 30
2300958	Nodularin-R	0.204	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: 2300958

Field Sample ID: HABCE0103_LakeEstelle1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	91.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	86.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A109981

Included Lab Sample IDs: 2300960

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A110050

Included Lab Sample IDs: 2300959

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

Reference Method: EPA 8321B

Run ID: A110066

Included Lab Sample IDs: 2300958

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	102	107	P/P	50 - 160
Cylindrospermopsin	101	129	P/P	50 - 160
Desmethyl microcystin LR	106	114	P/P	50 - 160
Microcystin HII R	106	112	P/P	50 - 160
Microcystin HtyR	114	116	P/P	50 - 160
Microcystin LA	113	110	P/P	50 - 160
Microcystin LF	118	110	P/P	50 - 160
Microcystin LR	101	106	P/P	50 - 160
Microcystin LW	110	122	P/P	50 - 160
Microcystin LY	110	104	P/P	50 - 160
Microcystin RR	110	111	P/P	50 - 160
Microcystin WR	101	102	P/P	50 - 160
Microcystin YR	112	110	P/P	50 - 160
Nodularin-R	103	105	P/P	50 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110164

Included Lab Sample IDs: 2300959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	95.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110182

Included Lab Sample IDs: 2300959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110201

Included Lab Sample IDs: 2300959

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	98.8	101			2.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	105	103			1.29
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	103	103			0.0
EPA 365.1 Rev. 2.0	Total-P	104	107	106			0.635
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.6	97.4	99.0			1.63
EPA 8321B	Anatoxin-a	99.3	111	106			4.66
	Cylindrospermopsin	97.3	127	120			6.24
	Desmethyl microcystin LR	93.4	113	113			0.0883
	Microcystin HiLR	95.8	124	111			11.5
	Microcystin HtyR	105	118	116			1.97
	Microcystin LA	99.9	109	109			0.247
	Microcystin LF	94.0	109	107			1.19
	Microcystin LR	92.2	106	93.5			12.0
	Microcystin LW	102	102	108			5.69
	Microcystin LY	94.0	102	100			1.71
	Microcystin RR	98.0	111	111			0.354
	Microcystin WR	90.2	102	101			1.06
	Microcystin YR	103	115	119			3.53
	Nodularin-R	95.0	104	104			0.204

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2300959
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2300959
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2300959
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2300959
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2300960
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2300958

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	01/21/2022			02/02/2022 12:56	Ping Hua	2300959
EPA 351.2 Rev. 2.0	01/21/2022	01/31/2022 10:51	Samantha L Bates	02/01/2022 16:27	Virginia P. Brown	2300959
EPA 353.2 Rev. 2.0	01/21/2022			01/26/2022 09:45	Beverly Y. Sanders	2300959
EPA 365.1 Rev. 2.0	01/21/2022	01/28/2022 14:50	Simonne.V. Calhoun	02/02/2022 16:17	Sarah A Nixon	2300959
EPA 365.1 Rev. 2.0 dissolved	01/21/2022			01/21/2022 13:54	James L Waggerby	2300960
EPA 8321B	01/21/2022	01/26/2022 08:00	Manjita Shrestha	01/27/2022 02:29	Manjita Shrestha	2300958