

Chemical Analysis Report

WQAP-2023-04-12-03

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-03-27-15**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

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

Certified by: Colin Wright, Program Administrator

Date Certified: 26-APR-2023 15:54

A handwritten signature in black ink, reading "Colin Wright", is displayed on a light blue rectangular background.

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: Wood Lake - E Shore

Collection Date/Time: 04/11/2023 10:42

Field ID: HABCE0168_WoodLake2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2399785	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P428310	
		Cylindrospermopsin	0.10	U	ug/L	P428311	
		Desmethyl microcystin LR	0.25	U	ug/L	P428311	
		Microcystin HILR	0.25	U	ug/L	P428311	
		Microcystin HtyR	0.25	U	ug/L	P428311	
		Microcystin LA	0.10	U	ug/L	P428311	
		Microcystin LF	0.10	U	ug/L	P428311	
		Microcystin LR	0.25	U	ug/L	P428311	
		Microcystin LW	0.25	U	ug/L	P428311	
		Microcystin LY	0.10	U	ug/L	P428311	
		Microcystin RR	0.10	U	ug/L	P428311	
		Microcystin WR	0.50	U	ug/L	P428311	
		Neosaxitoxin	0.50	U	ug/L	P428310	
		Microcystin YR	0.25	U	ug/L	P428311	
		Saxitoxin	0.50	U	ug/L	P428310	
		Nodularin-R	0.10	U	ug/L	P428311	
2399786	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P428789	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P428682	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P428775	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P428552	
2399787	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P428379	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P428789

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428682

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P428775

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428552

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428379

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

Reference Method: EPA 8321B
Batch ID: P428310

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Reference Method: EPA 8321B
Batch ID: P428311

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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: P428789

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428682

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: P428775

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: P428552

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428379

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P428310

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	94.0		P	40 - 150
Neosaxitoxin	90.9		P	40 - 150
Saxitoxin	89.2		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P428311

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	85.8		P	40 - 150
Desmethyl microcystin LR	99.4		P	40 - 150
Microcystin HiiR	104		P	40 - 150
Microcystin HtyR	98.4		P	40 - 150
Microcystin LA	108		P	40 - 150
Microcystin LF	114		P	40 - 150
Microcystin LR	94.9		P	40 - 150
Microcystin LW	78.3		P	40 - 150
Microcystin LY	101		P	40 - 150
Microcystin RR	91.6		P	40 - 150
Microcystin WR	99.2		P	40 - 150
Microcystin YR	94.8		P	40 - 150
Nodularin-R	89.8		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P428789

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2399823	Ammonia-N	102	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2400643	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P428775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2399714	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428552

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2399742	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428379

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2399754	O-Phosphate-P	92.8	93.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P428310

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2399487	Anatoxin-a	77.2	76.5	P/P	40 - 150
2399487	Neosaxitoxin	63.0	62.0	P/P	40 - 150
2399487	Saxitoxin	76.1	75.0	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P428311

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2399487	Cylindrospermopsin	80.2	82.9	P/P	40 - 150
2399487	Desmethyl microcystin LR	104	100	P/P	40 - 150
2399487	Microcystin HILR	108	99.3	P/P	40 - 150
2399487	Microcystin HtyR	110	105	P/P	40 - 150
2399487	Microcystin LA	115	128	P/P	40 - 150
2399487	Microcystin LF	126	111	P/P	40 - 150
2399487	Microcystin LR	99.2	104	P/P	40 - 150
2399487	Microcystin LW	99.5	103	P/P	40 - 150
2399487	Microcystin LY	115	104	P/P	40 - 150
2399487	Microcystin RR	95.0	96.6	P/P	40 - 150
2399487	Microcystin WR	113	108	P/P	40 - 150
2399487	Microcystin YR	105	101	P/P	40 - 150
2399487	Nodularin-R	95.3	93.7	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P428789

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2399823	Ammonia-N	1.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2400643	Kjeldahl Nitrogen	0.534	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P428775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2399714	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428552

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2399742	Total-P	0.659	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2399754	O-Phosphate-P	0.858	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P428310

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2399487	Anatoxin-a	0.923	Spike	P	0 - 30
2399487	Neosaxitoxin	1.66	Spike	P	0 - 30
2399487	Saxitoxin	1.38	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P428311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2399487	Cylindrospermopsin	3.35	Spike	P	0 - 30
2399487	Desmethyl microcystin LR	4.36	Spike	P	0 - 30
2399487	Microcystin HiLR	8.26	Spike	P	0 - 30
2399487	Microcystin HtyR	4.38	Spike	P	0 - 30
2399487	Microcystin LA	11.3	Spike	P	0 - 30
2399487	Microcystin LF	13.0	Spike	P	0 - 30
2399487	Microcystin LR	4.30	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P428311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2399487	Microcystin LW	3.48	Spike	P	0 - 30
2399487	Microcystin LY	9.97	Spike	P	0 - 30
2399487	Microcystin RR	1.65	Spike	P	0 - 30
2399487	Microcystin WR	3.94	Spike	P	0 - 30
2399487	Microcystin YR	3.49	Spike	P	0 - 30
2399487	Nodularin-R	1.69	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2399785

Field Sample ID: HABCE0168_WoodLake2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	91.2	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	83.0	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A118479
Included Lab Sample IDs: 2399785

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	90.6	86.8	P/P	50 - 160
Desmethyl microcystin LR	100	91.7	P/P	50 - 160
Microcystin HiLR	104	100	P/P	50 - 160
Microcystin HtyR	99.9	98.9	P/P	50 - 160
Microcystin LA	100	109	P/P	50 - 160
Microcystin LF	107	110	P/P	50 - 160
Microcystin LR	99.0	105	P/P	50 - 160
Microcystin LW	106	104	P/P	50 - 160
Microcystin LY	100	108	P/P	50 - 160
Microcystin RR	91.2	90.9	P/P	50 - 160
Microcystin WR	108	103	P/P	50 - 160
Microcystin YR	96.8	98.8	P/P	50 - 160
Nodularin-R	94.5	88.2	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A118532
Included Lab Sample IDs: 2399787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.0	97.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A118560
Included Lab Sample IDs: 2399785

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	91.8	87.8	P/P	50 - 160
Neosaxitoxin	88.6	87.5	P/P	50 - 160
Saxitoxin	86.4	89.9	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118633
Included Lab Sample IDs: 2399786

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A118686
Included Lab Sample IDs: 2399786

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: A118690
Included Lab Sample IDs: 2399786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	98.7	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A118695

Included Lab Sample IDs: 2399786

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	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
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	102	100		1.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109	103	102		0.534
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	100		0.0
EPA 365.1 Rev. 2.0	Total-P	100	102	103		0.659
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.8	92.8	93.6		0.858
EPA 8321B	Anatoxin-a	94.0	77.2	76.5		0.923
	Cylindrospermopsin	85.8	80.2	82.9		3.35
	Desmethyl microcystin LR	99.4	104	100		4.36
	Microcystin HiLR	104	108	99.3		8.26
	Microcystin HtyR	98.4	110	105		4.38
	Microcystin LA	108	115	128		11.3
	Microcystin LF	114	126	111		13.0
	Microcystin LR	94.9	99.2	104		4.30
	Microcystin LW	78.3	99.5	103		3.48
	Microcystin LY	101	115	104		9.97
	Microcystin RR	91.6	95.0	96.6		1.65
	Microcystin WR	99.2	113	108		3.94
	Microcystin YR	94.8	105	101		3.49
	Neosaxitoxin	90.9	63.0	62.0		1.66
	Nodularin-R	89.8	95.3	93.7		1.69
	Saxitoxin	89.2	76.1	75.0		1.38

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2399786
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2399786
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2399786
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2399786
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2399787
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2399785
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2399785

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	04/12/2023			04/20/2023 11:54	Khloe J Berg	2399786
EPA 351.2 Rev. 2.0	04/12/2023	04/19/2023 11:19	Dana G. Hughes	04/20/2023 13:17	Ping Hua	2399786
EPA 353.2 Rev. 2.0	04/12/2023			04/20/2023 10:59	Beverly Y. Sanders	2399786
EPA 365.1 Rev. 2.0	04/12/2023	04/17/2023 18:31	Adam P Silver	04/18/2023 12:30	James L Waggeberby	2399786
EPA 365.1 Rev. 2.0 dissolved	04/12/2023			04/12/2023 14:29	Elise M. Gillis	2399787
EPA 8321B	04/12/2023	04/13/2023 09:00	Manjita Shrestha	04/13/2023 13:15	Manjita Shrestha	2399785
	04/12/2023	04/13/2023 13:00	Manjita Shrestha	04/14/2023 00:05	Manjita Shrestha	2399785