

Chemical Analysis Report

WQAP-2022-12-28-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-12-19-33**
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: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 18-JAN-2023 10:05



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: Raccoon Lake - Near Boat Ramp

Collection Date/Time: 12/27/2022 11:33

Field ID: HABCE0159_RaccoonLake

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2377445	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P424013	
		Cylindrospermopsin	0.10	U	ug/L	P424010	
		Desmethyl microcystin LR	0.25	UJ	ug/L	P424010	MS
		Microcystin HILR	0.25	U	ug/L	P424010	
		Microcystin HtyR	0.25	U	ug/L	P424010	
		Microcystin LA	0.10	U	ug/L	P424010	
		Microcystin LF	0.10	UJ	ug/L	P424010	RPD
		Microcystin LR	0.25	UJ	ug/L	P424010	MS
		Microcystin LW	0.25	U	ug/L	P424010	
		Microcystin LY	0.10	U	ug/L	P424010	
		Microcystin RR	0.10	U	ug/L	P424010	
		Microcystin WR	0.50	U	ug/L	P424010	
		Neosaxitoxin	0.50	U	ug/L	P424013	
		Microcystin YR	0.25	U	ug/L	P424010	
		Saxitoxin	0.50	U	ug/L	P424013	
		Nodularin-R	0.10	U	ug/L	P424010	
2377446	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P424559	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P424063	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.070		mg N/L	P424288	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P424137	
2377447	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P423997	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424559

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424063

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424288

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424137

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423997

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

Reference Method: EPA 8321B
Batch ID: P424010

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

Reference Method: EPA 8321B
Batch ID: P424013

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424559

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424063

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424288

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: P424137

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: P423997

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P424010

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	139		P	40 - 150
Desmethyl microcystin LR	117		P	40 - 150
Microcystin H1R	116		P	40 - 150
Microcystin HtyR	113		P	40 - 150
Microcystin LA	96.7		P	40 - 150
Microcystin LF	95.9		P	40 - 150
Microcystin LR	109		P	40 - 150
Microcystin LW	115		P	40 - 150
Microcystin LY	120		P	40 - 150
Microcystin RR	115		P	40 - 150
Microcystin WR	112		P	40 - 150
Microcystin YR	116		P	40 - 150
Nodularin-R	120		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P424013

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	78.4		P	40 - 150
Neosaxitoxin	92.5		P	40 - 150
Saxitoxin	81.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378478	Ammonia-N	100	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424063

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377458	Kjeldahl Nitrogen	96.2	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424288

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377429	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377531	Total-P	108	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423997

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377447	O-Phosphate-P	103	102	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P424010

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377445	Cylindrospermopsin	134	131	P/P	40 - 150
2377445	Desmethyl microcystin LR	150	147	F/P	40 - 150
2377445	Microcystin HiLR	122	127	P/P	40 - 150
2377445	Microcystin HtyR	121	120	P/P	40 - 150
2377445	Microcystin LA	116	99.4	P/P	40 - 150
2377445	Microcystin LF	92.1	126	P/P	40 - 150
2377445	Microcystin LR	151	147	F/P	40 - 150
2377445	Microcystin LW	129	117	P/P	40 - 150
2377445	Microcystin LY	94.2	122	P/P	40 - 150
2377445	Microcystin RR	113	111	P/P	40 - 150
2377445	Microcystin WR	123	125	P/P	40 - 150
2377445	Microcystin YR	117	123	P/P	40 - 150
2377445	Nodularin-R	127	129	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P424013

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377445	Anatoxin-a	92.4	100	P/P	40 - 150
2377445	Neosaxitoxin	76.4	84.8	P/P	40 - 150
2377445	Saxitoxin	65.4	71.7	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P424559

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378478	Ammonia-N	0.182	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P424063

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377458	Kjeldahl Nitrogen	5.18	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P424288

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377429	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P424137

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377531	Total-P	2.29	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P423997

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377447	O-Phosphate-P	0.487	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P424010

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377445	Cylindrospermopsin	1.78	Spike	P	0 - 30
2377445	Desmethyl microcystin LR	2.29	Spike	P	0 - 30
2377445	Microcystin H1LR	4.37	Spike	P	0 - 30
2377445	Microcystin HtyR	0.819	Spike	P	0 - 30
2377445	Microcystin LA	15.3	Spike	P	0 - 30
2377445	Microcystin LF	31.4	Spike	F	0 - 30
2377445	Microcystin LR	2.29	Spike	P	0 - 30
2377445	Microcystin LW	9.95	Spike	P	0 - 30
2377445	Microcystin LY	25.6	Spike	P	0 - 30
2377445	Microcystin RR	1.57	Spike	P	0 - 30
2377445	Microcystin WR	1.86	Spike	P	0 - 30
2377445	Microcystin YR	5.34	Spike	P	0 - 30
2377445	Nodularin-R	1.61	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P424013

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377445	Anatoxin-a	7.81	Spike	P	0 - 30
2377445	Neosaxitoxin	10.3	Spike	P	0 - 30
2377445	Saxitoxin	9.10	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2377445

Field Sample ID: HABCE0159_RaccoonLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Neosaxitoxin-15N7	71.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A116671

Included Lab Sample IDs: 2377447

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

Reference Method: EPA 8321B

Run ID: A116703

Included Lab Sample IDs: 2377445

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	123	120	P/P	50 - 160
Desmethyl microcystin LR	95.7	108	P/P	50 - 160
Microcystin HILR	94.9	105	P/P	50 - 160
Microcystin HtyR	94.7	104	P/P	50 - 160
Microcystin LA	104	109	P/P	50 - 160
Microcystin LF	81.2	108	P/P	50 - 160
Microcystin LR	97.5	101	P/P	50 - 160
Microcystin LW	113	118	P/P	50 - 160
Microcystin LY	111	109	P/P	50 - 160
Microcystin RR	101	102	P/P	50 - 160
Microcystin WR	95.6	99.8	P/P	50 - 160
Microcystin YR	92.7	103	P/P	50 - 160
Nodularin-R	102	107	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A116704

Included Lab Sample IDs: 2377445

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	86.8	81.9	P/P	50 - 160
Neosaxitoxin	103	96.5	P/P	50 - 160
Saxitoxin	87.8	86.8	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A116779

Included Lab Sample IDs: 2377446

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A116781

Included Lab Sample IDs: 2377446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A116803

Included Lab Sample IDs: 2377446

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116902

Included Lab Sample IDs: 2377446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.2	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 350.1 Rev. 2.0	Ammonia-N	102	100	100			0.182
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	96.2	105			5.18
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	104	104			0.482
EPA 365.1 Rev. 2.0	Total-P	106	108	105			2.29
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	103	102			0.487
EPA 8321B	Anatoxin-a	78.4	92.4	100			7.81
	Cylindrospermopsin	139	134	131			1.78
	Desmethyl microcystin LR	117	150	147			2.29
	Microcystin HiLR	116	122	127			4.37
	Microcystin HtyR	113	121	120			0.819
	Microcystin LA	96.7	116	99.4			15.3
	Microcystin LF	95.9	92.1	126			31.4
	Microcystin LR	109	151	147			2.29
	Microcystin LW	115	129	117			9.95
	Microcystin LY	120	94.2	122			25.6
	Microcystin RR	115	113	111			1.57
	Microcystin WR	112	123	125			1.86
	Microcystin YR	116	117	123			5.34
	Neosaxitoxin	92.5	76.4	84.8			10.3
	Nodularin-R	120	127	129			1.61
	Saxitoxin	81.1	65.4	71.7			9.10

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2377446
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2377446
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2377446
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2377446
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2377447
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2377445
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2377445

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	12/28/2022			01/13/2023 11:02	Ping Hua	2377446
EPA 351.2 Rev. 2.0	12/28/2022	01/04/2023 10:00	Simonne.V. Calhoun	01/06/2023 15:23	Samantha L Bates	2377446
EPA 353.2 Rev. 2.0	12/28/2022			01/09/2023 11:17	Beverly Y. Sanders	2377446
EPA 365.1 Rev. 2.0	12/28/2022	01/05/2023 13:37	Adam P Silver	01/06/2023 15:16	James L Waggeberby	2377446
EPA 365.1 Rev. 2.0 dissolved	12/28/2022			12/28/2022 15:07	Elise M. Gillis	2377447
EPA 8321B	12/28/2022	12/29/2022 11:00	Manjita Shrestha	12/29/2022 18:08	Manjita Shrestha	2377445
	12/28/2022	12/29/2022 11:00	Manjita Shrestha	12/30/2022 01:24	Manjita Shrestha	2377445