Chemical Analysis Report

WQAP-2023-01-11-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-12-19-32**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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3319 Maguire Blvd. Suite 232
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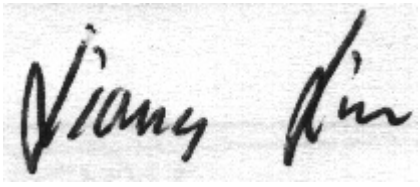
Date Certified: 01-FEB-2023 11:05



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: Tiger Lake - East Shore **Collection Date/Time: 01/10/2023 12:41**

Field ID: HABCE0105_TigerLake Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2379639	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P424374	
		Cylindrospermopsin	0.10	U	ug/L	P424373	
		Desmethyl microcystin LR	0.25	U	ug/L	P424373	
		Microcystin HilR	0.25	U	ug/L	P424373	
		Microcystin HtyR	0.25	U	ug/L	P424373	
		Microcystin LA	0.13	I	ug/L	P424373	
		Microcystin LF	0.10	U	ug/L	P424373	
		Microcystin LR	0.25	U	ug/L	P424373	
		Microcystin LW	0.25	U	ug/L	P424373	
		Microcystin LY	0.10	U	ug/L	P424373	
		Microcystin RR	0.10	U	ug/L	P424373	
		Microcystin WR	0.50	U	ug/L	P424373	
		Neosaxitoxin	0.50	U	ug/L	P424374	
		Microcystin YR	0.25	U	ug/L	P424373	
		Saxitoxin	0.50	U	ug/L	P424374	
		Nodularin-R	0.10	U	ug/L	P424373	
2379640	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P425102	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P424512	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P424608	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P424506	
2379641	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P424430	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425102

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424512

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424608

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424506

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424430

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

Reference Method: EPA 8321B
Batch ID: P424373

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	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: P424374

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: P425102

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424512

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424608

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: P424506

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424430

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

Reference Method: EPA 8321B
Batch ID: P424373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	92.1		P	40 - 150
Desmethyl microcystin LR	94.5		P	40 - 150
Microcystin HilR	99.0		P	40 - 150
Microcystin HtyR	89.0		P	40 - 150
Microcystin LA	93.8		P	40 - 150
Microcystin LF	95.1		P	40 - 150
Microcystin LR	99.5		P	40 - 150
Microcystin LW	79.7		P	40 - 150
Microcystin LY	99.3		P	40 - 150
Microcystin RR	93.6		P	40 - 150
Microcystin WR	84.9		P	40 - 150
Microcystin YR	84.9		P	40 - 150
Nodularin-R	94.1		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P424374

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	114		P	40 - 150
Neosaxitoxin	115		P	40 - 150
Saxitoxin	96.1		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379640	Ammonia-N	98.0	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379421	Kjeldahl Nitrogen	112	91.7	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379429	NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424506

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379540	Total-P	104	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379963	O-Phosphate-P	98.8	99.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P424373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379303	Cylindrospermopsin	94.2	99.6	P/P	40 - 150
2379303	Desmethyl microcystin LR	97.7	108	P/P	40 - 150
2379303	Microcystin HilR	101	110	P/P	40 - 150
2379303	Microcystin HtyR	88.2	101	P/P	40 - 150
2379303	Microcystin LA	89.1	87.0	P/P	40 - 150
2379303	Microcystin LF	95.2	110	P/P	40 - 150
2379303	Microcystin LR	112	114	P/P	40 - 150
2379303	Microcystin LW	88.6	82.0	P/P	40 - 150
2379303	Microcystin LY	86.7	99.7	P/P	40 - 150
2379303	Microcystin RR	87.9	95.6	P/P	40 - 150
2379303	Microcystin WR	97.1	93.5	P/P	40 - 150
2379303	Microcystin YR	87.4	97.1	P/P	40 - 150
2379303	Nodularin-R	92.7	97.8	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P424374

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379303	Anatoxin-a	109	119	P/P	40 - 150
2379303	Neosaxitoxin	108	116	P/P	40 - 150
2379303	Saxitoxin	89.6	97.0	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379640	Ammonia-N	0.173	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379421	Kjeldahl Nitrogen	12.8	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379429	NO2NO3-N	0.357	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379540	Total-P	2.68	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379963	O-Phosphate-P	0.166	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P424373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379303	Cylindrospermopsin	5.55	Spike	P	0 - 30
2379303	Desmethyl microcystin LR	10.0	Spike	P	0 - 30
2379303	Microcystin HilR	8.12	Spike	P	0 - 30
2379303	Microcystin HtyR	13.2	Spike	P	0 - 30
2379303	Microcystin LA	2.36	Spike	P	0 - 30
2379303	Microcystin LF	14.6	Spike	P	0 - 30
2379303	Microcystin LR	2.16	Spike	P	0 - 30
2379303	Microcystin LW	7.70	Spike	P	0 - 30
2379303	Microcystin LY	13.9	Spike	P	0 - 30
2379303	Microcystin RR	8.36	Spike	P	0 - 30
2379303	Microcystin WR	3.81	Spike	P	0 - 30
2379303	Microcystin YR	10.5	Spike	P	0 - 30
2379303	Nodularin-R	5.37	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P424374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2379303	Anatoxin-a	8.28	Spike	P	0 - 30
2379303	Neosaxitoxin	7.73	Spike	P	0 - 30
2379303	Saxitoxin	7.92	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2379639
Field Sample ID: HABCE0105_TigerLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	78.2	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	107	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A116850
Included Lab Sample IDs: 2379641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.6	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A116851
Included Lab Sample IDs: 2379639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	96.6	95.0	P/P	50 - 160
Desmethyl microcystin LR	95.1	93.3	P/P	50 - 160
Microcystin HilR	99.4	99.4	P/P	50 - 160
Microcystin HtyR	92.0	91.9	P/P	50 - 160
Microcystin LA	98.5	97.6	P/P	50 - 160
Microcystin LF	103	87.7	P/P	50 - 160
Microcystin LR	95.7	96.0	P/P	50 - 160
Microcystin LW	98.7	74.3	P/P	50 - 160
Microcystin LY	95.3	98.7	P/P	50 - 160
Microcystin RR	90.2	91.4	P/P	50 - 160
Microcystin WR	97.1	94.8	P/P	50 - 160
Microcystin YR	85.6	85.9	P/P	50 - 160
Nodularin-R	87.5	91.7	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A116884
Included Lab Sample IDs: 2379639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	111	118	P/P	50 - 160
Neosaxitoxin	122	138	P/P	50 - 160
Saxitoxin	92.5	96.4	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116915
Included Lab Sample IDs: 2379640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116920
Included Lab Sample IDs: 2379640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	106	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116975
Included Lab Sample IDs: 2379640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	99.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117140
Included Lab Sample IDs: 2379640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	98.2	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	98.2	98.0	98.2			0.173
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	112	91.7			12.8
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	103			0.357
EPA 365.1 Rev. 2.0	Total-P	105	104	107			2.68
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.8	99.0			0.166
EPA 8321B	Anatoxin-a	114	109	119			8.28
	Cylindrospermopsin	92.1	94.2	99.6			5.55
	Desmethyl microcystin LR	94.5	97.7	108			10.0
	Microcystin HilR	99.0	101	110			8.12
	Microcystin HtyR	89.0	88.2	101			13.2
	Microcystin LA	93.8	89.1	87.0			2.36
	Microcystin LF	95.1	95.2	110			14.6
	Microcystin LR	99.5	112	114			2.16
	Microcystin LW	79.7	88.6	82.0			7.70
	Microcystin LY	99.3	86.7	99.7			13.9
	Microcystin RR	93.6	87.9	95.6			8.36
	Microcystin WR	84.9	97.1	93.5			3.81
	Microcystin YR	84.9	87.4	97.1			10.5
	Neosaxitoxin	115	108	116			7.73
	Nodularin-R	94.1	92.7	97.8			5.37
	Saxitoxin	96.1	89.6	97.0			7.92

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2379640
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2379640
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2379640
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2379640
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2379641
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2379639
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2379639

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	01/11/2023			01/27/2023 14:20	Ping Hua	2379640
EPA 351.2 Rev. 2.0	01/11/2023	01/13/2023 09:42	Simonne.V. Calhoun	01/19/2023 10:01	Samantha L Bates	2379640
EPA 353.2 Rev. 2.0	01/11/2023			01/17/2023 11:34	Beverly Y. Sanders	2379640
EPA 365.1 Rev. 2.0	01/11/2023	01/13/2023 15:29	Adam P Silver	01/17/2023 10:51	James L Waggerby	2379640
EPA 365.1 Rev. 2.0 dissolved	01/11/2023			01/11/2023 15:08	Elise M. Gillis	2379641
EPA 8321B	01/11/2023	01/12/2023 07:00	Manjita Shrestha	01/12/2023 10:09	Manjita Shrestha	2379639
	01/11/2023	01/12/2023 12:00	Manjita Shrestha	01/13/2023 01:38	Manjita Shrestha	2379639