

Chemical Analysis Report

SFWMD-2021-06-09-01

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

Event Description: **SFWMD Bloom Response--As Needed**
Request ID: **RQ-2021-05-24-56**
Customer: **SFWMD**
Project ID: **BLOOM-RESP**

Send Reports to:
South Florida Water Management District
SFWMD
8894 Belvedere Rd. B374
West Palm Beach, FL 33411
Attn: Michael Tompkins

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

Date Certified: 10-JUN-2021 10:06

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 group are included in this report: 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: Taylor Creek,100 yards upstream of S390

Collection Date/Time: 06/08/2021 10:44

Field ID: BLOOM - RESP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2253377	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P399346	
		Cylindrospermopsin	0.10	U	ug/L	P399346	
		Desmethyl microcystin LR	0.25	U	ug/L	P399346	
		Microcystin H1LR**	0.25	U	ug/L	P399346	
		Microcystin HtyR**	0.25	U	ug/L	P399346	
		Microcystin LA	0.10	U	ug/L	P399346	
		Microcystin LF	0.10	U	ug/L	P399346	
		Microcystin LR	0.25	U	ug/L	P399346	
		Microcystin LW	0.25	U	ug/L	P399346	
		Microcystin LY	0.10	U	ug/L	P399346	
		Microcystin RR	0.10	U	ug/L	P399346	
		Microcystin WR	0.50	U	ug/L	P399346	
		Microcystin YR	0.25	U	ug/L	P399346	
		Nodularin-R**	0.10	U	ug/L	P399346	

Sample Location: Lake Worth

Collection Date/Time: 06/08/2021 07:44

Field ID: C51S155

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2253582	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P399411	
		Cylindrospermopsin	0.13	I	ug/L	P399411	
		Desmethyl microcystin LR	0.25	U	ug/L	P399411	
		Microcystin H1LR**	0.25	U	ug/L	P399411	
		Microcystin HtyR**	0.25	U	ug/L	P399411	
		Microcystin LA	0.10	U	ug/L	P399411	
		Microcystin LF	0.10	U	ug/L	P399411	
		Microcystin LR	0.25	U	ug/L	P399411	
		Microcystin LW	0.25	U	ug/L	P399411	
		Microcystin LY	0.10	U	ug/L	P399411	
		Microcystin RR	0.10	U	ug/L	P399411	
		Microcystin WR	0.50	U	ug/L	P399411	
		Microcystin YR	0.25	U	ug/L	P399411	
		Nodularin-R**	0.10	U	ug/L	P399411	

Sample Location: St.Lucier Lock

Collection Date/Time: 06/08/2021 09:11

Field ID: C44S80

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2253583	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P399411	
		Cylindrospermopsin	0.10	U	ug/L	P399411	
		Desmethyl microcystin LR	0.25	U	ug/L	P399411	
		Microcystin H1LR**	0.25	U	ug/L	P399411	
		Microcystin HtyR**	0.25	U	ug/L	P399411	
		Microcystin LA	0.10	U	ug/L	P399411	
		Microcystin LF	0.10	U	ug/L	P399411	
		Microcystin LR	0.25	U	ug/L	P399411	
		Microcystin LW	0.25	U	ug/L	P399411	
		Microcystin LY	0.10	U	ug/L	P399411	
		Microcystin RR	0.10	U	ug/L	P399411	
		Microcystin WR	0.50	U	ug/L	P399411	
		Microcystin YR	0.25	U	ug/L	P399411	
		Nodularin-R**	0.10	U	ug/L	P399411	

Sample Location: West Palm Beach

Collection Date/Time: 06/08/2021 14:42

Field ID: C51 Canal @ Southern+Military

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2253584	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P399411	
		Cylindrospermopsin	0.23	I	ug/L	P399411	
		Desmethyl microcystin LR	0.25	U	ug/L	P399411	
		Microcystin HILR**	0.25	U	ug/L	P399411	
		Microcystin HtyR**	0.25	U	ug/L	P399411	
		Microcystin LA	0.10	U	ug/L	P399411	
		Microcystin LF	0.10	U	ug/L	P399411	
		Microcystin LR	0.38	I	ug/L	P399411	
		Microcystin LW	0.25	U	ug/L	P399411	
		Microcystin LY	0.10	U	ug/L	P399411	
		Microcystin RR	0.10	U	ug/L	P399411	
		Microcystin WR	0.50	U	ug/L	P399411	
		Microcystin YR	0.25	U	ug/L	P399411	
		Nodularin-R**	0.10	U	ug/L	P399411	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P399346

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 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: P399411

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 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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B

Batch ID: P399346

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	106		P	40 - 150
Cylindrospermopsin	117		P	40 - 150
Desmethyl microcystin LR	80.2		P	40 - 150
Microcystin HILR	98.5		P	40 - 150
Microcystin HtyR	96.3		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	98.4		P	40 - 150
Microcystin LR	92.5		P	40 - 150
Microcystin LW	97.9		P	40 - 150
Microcystin LY	110		P	40 - 150
Microcystin RR	109		P	40 - 150
Microcystin WR	89.3		P	40 - 150
Microcystin YR	101		P	40 - 150
Nodularin-R	106		P	40 - 150

Reference Method: EPA 8321B

Batch ID: P399411

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	101		P	40 - 150
Cylindrospermopsin	109		P	40 - 150
Desmethyl microcystin LR	84.5		P	40 - 150
Microcystin HILR	92.2		P	40 - 150
Microcystin HtyR	96.1		P	40 - 150
Microcystin LA	111		P	40 - 150
Microcystin LF	107		P	40 - 150
Microcystin LR	87.6		P	40 - 150
Microcystin LW	101		P	40 - 150
Microcystin LY	114		P	40 - 150
Microcystin RR	107		P	40 - 150
Microcystin WR	87.6		P	40 - 150
Microcystin YR	102		P	40 - 150
Nodularin-R	106		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B

Batch ID: P399346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2252694	Anatoxin-a	108	113	P/P	40 - 150
2252694	Cylindrospermopsin	99.7	111	P/P	40 - 150
2252694	Desmethyl microcystin LR	89.5	92.6	P/P	40 - 150
2252694	Microcystin HilR	98.0	101	P/P	40 - 150
2252694	Microcystin HtyR	91.7	98.0	P/P	40 - 150
2252694	Microcystin LA	97.5	107	P/P	40 - 150
2252694	Microcystin LF	90.2	104	P/P	40 - 150
2252694	Microcystin LR	88.5	94.3	P/P	40 - 150
2252694	Microcystin LW	91.5	94.2	P/P	40 - 150
2252694	Microcystin LY	98.0	112	P/P	40 - 150
2252694	Microcystin RR	106	116	P/P	40 - 150
2252694	Microcystin WR	88.9	99.6	P/P	40 - 150
2252694	Microcystin YR	106	108	P/P	40 - 150
2252694	Nodularin-R	109	111	P/P	40 - 150

Reference Method: EPA 8321B

Batch ID: P399411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253418	Anatoxin-a	107	106	P/P	40 - 150
2253418	Cylindrospermopsin	96.3	104	P/P	40 - 150
2253418	Desmethyl microcystin LR	89.1	94.1	P/P	40 - 150
2253418	Microcystin HilR	92.2	91.6	P/P	40 - 150
2253418	Microcystin HtyR	88.6	90.9	P/P	40 - 150
2253418	Microcystin LA	105	105	P/P	40 - 150
2253418	Microcystin LF	111	109	P/P	40 - 150
2253418	Microcystin LR	82.1	90.8	P/P	40 - 150
2253418	Microcystin LW	91.7	97.6	P/P	40 - 150
2253418	Microcystin LY	107	110	P/P	40 - 150
2253418	Microcystin RR	103	103	P/P	40 - 150
2253418	Microcystin WR	91.5	93.8	P/P	40 - 150
2253418	Microcystin YR	95.5	102	P/P	40 - 150
2253418	Nodularin-R	106	102	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B

Batch ID: P399346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252694	Anatoxin-a	4.51	Spike	P	0 - 30
2252694	Cylindrospermopsin	11.1	Spike	P	0 - 30
2252694	Desmethyl microcystin LR	3.39	Spike	P	0 - 30
2252694	Microcystin HiLR	3.03	Spike	P	0 - 30
2252694	Microcystin HtyR	6.60	Spike	P	0 - 30
2252694	Microcystin LA	8.85	Spike	P	0 - 30
2252694	Microcystin LF	14.5	Spike	P	0 - 30
2252694	Microcystin LR	6.32	Spike	P	0 - 30
2252694	Microcystin LW	2.94	Spike	P	0 - 30
2252694	Microcystin LY	13.3	Spike	P	0 - 30
2252694	Microcystin RR	8.93	Spike	P	0 - 30
2252694	Microcystin WR	11.3	Spike	P	0 - 30
2252694	Microcystin YR	1.91	Spike	P	0 - 30
2252694	Nodularin-R	1.70	Spike	P	0 - 30

Reference Method: EPA 8321B

Batch ID: P399411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253418	Anatoxin-a	0.835	Spike	P	0 - 30
2253418	Cylindrospermopsin	7.29	Spike	P	0 - 30
2253418	Desmethyl microcystin LR	5.50	Spike	P	0 - 30
2253418	Microcystin HiLR	0.667	Spike	P	0 - 30
2253418	Microcystin HtyR	2.59	Spike	P	0 - 30
2253418	Microcystin LA	0.0406	Spike	P	0 - 30
2253418	Microcystin LF	2.14	Spike	P	0 - 30
2253418	Microcystin LR	9.25	Spike	P	0 - 30
2253418	Microcystin LW	6.18	Spike	P	0 - 30
2253418	Microcystin LY	2.79	Spike	P	0 - 30
2253418	Microcystin RR	0.189	Spike	P	0 - 30
2253418	Microcystin WR	2.48	Spike	P	0 - 30
2253418	Microcystin YR	6.89	Spike	P	0 - 30
2253418	Nodularin-R	3.17	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2253377
Field Sample ID: BLOOM - RESP

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	86.8	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	85.2	P	30 - 160

Lab Sample ID: 2253582
Field Sample ID: C51S155

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	76.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	70.1	P	30 - 160

Lab Sample ID: 2253583
Field Sample ID: C44S80

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	81.6	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	63.6	P	30 - 160

Lab Sample ID: 2253584
Field Sample ID: C51 Canal @ Southern+Military

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	76.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	73.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A105974

Included Lab Sample IDs: 2253377, 2253582, 2253583, 2253584

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	73.8	74.1	P/P	50 - 160
Anatoxin-a	81.1	80.0	P/P	50 - 160
Cylindrospermopsin	107	107	P/P	50 - 160
Cylindrospermopsin	111	114	P/P	50 - 160
Desmethyl microcystin LR	92.4	99.7	P/P	50 - 160
Desmethyl microcystin LR	93.6	90.5	P/P	50 - 160
Microcystin HILR	91.9	95.7	P/P	50 - 160
Microcystin HILR	99.7	110	P/P	50 - 160
Microcystin HtyR	93.4	105	P/P	50 - 160
Microcystin HtyR	95.6	106	P/P	50 - 160
Microcystin LA	112	113	P/P	50 - 160
Microcystin LA	116	113	P/P	50 - 160
Microcystin LF	109	108	P/P	50 - 160
Microcystin LF	118	118	P/P	50 - 160
Microcystin LR	92.7	95.0	P/P	50 - 160
Microcystin LR	93.4	98.9	P/P	50 - 160
Microcystin LW	94.9	97.7	P/P	50 - 160
Microcystin LW	97.4	95.0	P/P	50 - 160
Microcystin LY	108	111	P/P	50 - 160
Microcystin LY	118	119	P/P	50 - 160
Microcystin RR	108	119	P/P	50 - 160
Microcystin RR	113	110	P/P	50 - 160
Microcystin WR	88.4	89.8	P/P	50 - 160
Microcystin WR	94.7	97.2	P/P	50 - 160
Microcystin YR	101	109	P/P	50 - 160
Microcystin YR	103	109	P/P	50 - 160
Nodularin-R	106	111	P/P	50 - 160
Nodularin-R	114	106	P/P	50 - 160

* 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 8321B	Anatoxin-a	106	108	113		4.51
	Anatoxin-a	101	107	106		0.835
	Cylindrospermopsin	117	99.7	111		11.1
	Cylindrospermopsin	109	96.3	104		7.29
	Desmethyl microcystin LR	80.2	89.5	92.6		3.39
	Desmethyl microcystin LR	84.5	89.1	94.1		5.50
	Microcystin HiLR	98.5	98.0	101		3.03
	Microcystin HiLR	92.2	92.2	91.6		0.667
	Microcystin HtyR	96.3	91.7	98.0		6.60
	Microcystin HtyR	96.1	88.6	90.9		2.59
	Microcystin LA	103	97.5	107		8.85
	Microcystin LA	111	105	105		0.0406
	Microcystin LF	98.4	90.2	104		14.5
	Microcystin LF	107	111	109		2.14
	Microcystin LR	92.5	88.5	94.3		6.32
	Microcystin LR	87.6	82.1	90.8		9.25
	Microcystin LW	97.9	91.5	94.2		2.94
	Microcystin LW	101	91.7	97.6		6.18
	Microcystin LY	110	98.0	112		13.3
	Microcystin LY	114	107	110		2.79
	Microcystin RR	109	106	116		8.93
	Microcystin RR	107	103	103		0.189
	Microcystin WR	89.3	88.9	99.6		11.3
	Microcystin WR	87.6	91.5	93.8		2.48
	Microcystin YR	101	106	108		1.91
	Microcystin YR	102	95.5	102		6.89
	Nodularin-R	106	109	111		1.70
	Nodularin-R	106	106	102		3.17

Reference Method Descriptions

Method	Description	Associated Samples
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2253377, 2253582, 2253583, 2253584

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	06/09/2021	06/09/2021 12:00	Pramila Ghimire	06/09/2021 14:24	Pramila Ghimire	2253377
	06/09/2021	06/09/2021 12:00	Pramila Ghimire	06/09/2021 22:11	Pramila Ghimire	2253582
	06/09/2021	06/09/2021 12:00	Pramila Ghimire	06/09/2021 22:28	Pramila Ghimire	2253583
	06/09/2021	06/09/2021 12:00	Pramila Ghimire	06/09/2021 22:45	Pramila Ghimire	2253584