

Chemical Analysis Report

SE-DIST-2024-04-30-01

Florida DEP Laboratory
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Tallahassee, FL 32399-2400
DOH Accreditation E31780

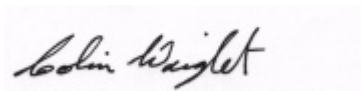
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2024-04-22-56**
Customer: **SE-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
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2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Colin Wright, Program Administrator

Date Certified: 03-MAY-2024 08:49

A handwritten signature in black ink, appearing to read "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 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: St. Lucie River - at Four River

Collection Date/Time: 04/29/2024 11:45

Field ID: SEHAB0112

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2485506	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P444951	
		Cylindrospermopsin	0.10	U	ug/L	P444950	
		Desmethyl microcystin LR	0.25	U	ug/L	P444950	
		Microcystin HlIR	0.25	U	ug/L	P444950	
		Microcystin HtyR	0.25	U	ug/L	P444950	
		Microcystin LA	0.10	U	ug/L	P444950	
		Microcystin LF	0.10	U	ug/L	P444950	
		Microcystin LR	0.25	U	ug/L	P444950	
		Microcystin LW	0.25	U	ug/L	P444950	
		Microcystin LY	0.10	U	ug/L	P444950	
		Microcystin RR	0.10	U	ug/L	P444950	
		Microcystin WR	0.50	U	ug/L	P444950	
		Neosaxitoxin	0.50	U	ug/L	P444951	
		Microcystin YR	0.25	U	ug/L	P444950	
		Saxitoxin	0.50	U	ug/L	P444951	
		Nodularin-R	0.10	U	ug/L	P444950	

Sample Location: C-23 Canal - SW Citrus Blvd

Collection Date/Time: 04/29/2024 13:15

Field ID: SEHAB0117

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2485510	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P444951	
		Cylindrospermopsin	0.10	U	ug/L	P444950	
		Desmethyl microcystin LR	0.25	U	ug/L	P444950	
		Microcystin HlIR	0.25	U	ug/L	P444950	
		Microcystin HtyR	0.25	U	ug/L	P444950	
		Microcystin LA	0.10	U	ug/L	P444950	
		Microcystin LF	0.10	U	ug/L	P444950	
		Microcystin LR	0.25	U	ug/L	P444950	
		Microcystin LW	0.25	U	ug/L	P444950	
		Microcystin LY	0.10	U	ug/L	P444950	
		Microcystin RR	0.10	U	ug/L	P444950	
		Microcystin WR	0.50	U	ug/L	P444950	
		Neosaxitoxin	0.50	U	ug/L	P444951	
		Microcystin YR	0.25	U	ug/L	P444950	
		Saxitoxin	0.50	U	ug/L	P444951	
		Nodularin-R	0.10	U	ug/L	P444950	

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2485508	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P444951	
		Cylindrospermopsin	0.10	U	ug/L	P444950	
		Desmethyl microcystin LR	0.25	U	ug/L	P444950	
		Microcystin HilR	0.25	U	ug/L	P444950	
		Microcystin HtyR	0.25	U	ug/L	P444950	
		Microcystin LA	0.10	U	ug/L	P444950	
		Microcystin LF	0.10	U	ug/L	P444950	
		Microcystin LR	0.25	U	ug/L	P444950	
		Microcystin LW	0.25	U	ug/L	P444950	
		Microcystin LY	0.10	U	ug/L	P444950	
		Microcystin RR	0.10	U	ug/L	P444950	
		Microcystin WR	0.50	U	ug/L	P444950	
		Neosaxitoxin	0.50	U	ug/L	P444951	
		Microcystin YR	0.25	U	ug/L	P444950	
		Saxitoxin	0.50	U	ug/L	P444951	
Nodularin-R	0.10	U	ug/L	P444950			

Sample Location: St. Lucie River - at Palm City Bridge

Collection Date/Time: 04/29/2024 11:00

Field ID: SEHAB0113

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2485507	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P444951	
		Cylindrospermopsin	0.10	U	ug/L	P444950	
		Desmethyl microcystin LR	0.25	U	ug/L	P444950	
		Microcystin HlIR	0.25	U	ug/L	P444950	
		Microcystin HtyR	0.25	U	ug/L	P444950	
		Microcystin LA	0.10	U	ug/L	P444950	
		Microcystin LF	0.10	U	ug/L	P444950	
		Microcystin LR	0.25	U	ug/L	P444950	
		Microcystin LW	0.25	U	ug/L	P444950	
		Microcystin LY	0.10	U	ug/L	P444950	
		Microcystin RR	0.10	U	ug/L	P444950	
		Microcystin WR	0.50	U	ug/L	P444950	
		Neosaxitoxin	0.50	U	ug/L	P444951	
		Microcystin YR	0.25	U	ug/L	P444950	
		Saxitoxin	0.50	U	ug/L	P444951	
		Nodularin-R	0.10	U	ug/L	P444950	

Sample Location: St. Lucie Canal - 96th Street Bridge

Collection Date/Time: 04/29/2024 10:30

Field ID: SEHAB0111

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2485505	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P444951	
		Cylindrospermopsin	0.10	U	ug/L	P444950	
		Desmethyl microcystin LR	0.25	U	ug/L	P444950	
		Microcystin HILR	0.25	U	ug/L	P444950	
		Microcystin HtyR	0.25	U	ug/L	P444950	
		Microcystin LA	0.10	U	ug/L	P444950	
		Microcystin LF	0.10	U	ug/L	P444950	
		Microcystin LR	0.25	U	ug/L	P444950	
		Microcystin LW	0.25	U	ug/L	P444950	
		Microcystin LY	0.10	U	ug/L	P444950	
		Microcystin RR	0.10	U	ug/L	P444950	
		Microcystin WR	0.50	U	ug/L	P444950	
		Neosaxitoxin	0.50	U	ug/L	P444951	
		Microcystin YR	0.25	U	ug/L	P444950	
		Saxitoxin	0.50	U	ug/L	P444951	
		Nodularin-R	0.10	U	ug/L	P444950	

Sample Location: St. Lucie Canal - Army Corps Campground

Collection Date/Time: 04/29/2024 10:00

Field ID: SEHAB0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2485509	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P444951	
		Cylindrospermopsin	0.10	U	ug/L	P444950	
		Desmethyl microcystin LR	0.25	U	ug/L	P444950	
		Microcystin HlIR	0.25	U	ug/L	P444950	
		Microcystin HtyR	0.25	U	ug/L	P444950	
		Microcystin LA	0.10	U	ug/L	P444950	
		Microcystin LF	0.10	U	ug/L	P444950	
		Microcystin LR	0.25	U	ug/L	P444950	
		Microcystin LW	0.25	U	ug/L	P444950	
		Microcystin LY	0.10	U	ug/L	P444950	
		Microcystin RR	0.10	U	ug/L	P444950	
		Microcystin WR	0.50	U	ug/L	P444950	
		Neosaxitoxin	0.50	U	ug/L	P444951	
		Microcystin YR	0.25	U	ug/L	P444950	
		Saxitoxin	0.50	U	ug/L	P444951	
		Nodularin-R	0.10	U	ug/L	P444950	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P444950

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: P444951

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 8321B
Batch ID: P444950

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	97.2		P	40 - 150
Desmethyl microcystin LR	99.0		P	40 - 150
Microcystin HilR	99.1		P	40 - 150
Microcystin HtyR	94.3		P	40 - 150
Microcystin LA	101		P	40 - 150
Microcystin LF	105		P	40 - 150
Microcystin LR	99.0		P	40 - 150
Microcystin LW	102		P	40 - 150
Microcystin LY	106		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	97.1		P	40 - 150
Microcystin YR	93.2		P	40 - 150
Nodularin-R	95.2		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P444951

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	92.5		P	40 - 150
Neosaxitoxin	70.9		P	40 - 150
Saxitoxin	73.5		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P444950

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2485447	Cylindrospermopsin	112	105	P/P	40 - 150
2485447	Desmethyl microcystin LR	107	97.7	P/P	40 - 150
2485447	Microcystin HilR	112	105	P/P	40 - 150
2485447	Microcystin HtyR	98.4	96.2	P/P	40 - 150
2485447	Microcystin LA	99.3	100	P/P	40 - 150
2485447	Microcystin LF	119	110	P/P	40 - 150
2485447	Microcystin LR	96.7	104	P/P	40 - 150
2485447	Microcystin LW	105	108	P/P	40 - 150
2485447	Microcystin LY	109	105	P/P	40 - 150
2485447	Microcystin RR	108	107	P/P	40 - 150
2485447	Microcystin WR	102	92.6	P/P	40 - 150
2485447	Microcystin YR	101	101	P/P	40 - 150
2485447	Nodularin-R	105	103	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P444951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2485447	Anatoxin-a	103	103	P/P	40 - 150
2485447	Neosaxitoxin	47.4	47.0	P/P	40 - 150
2485447	Saxitoxin	58.4	55.9	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P444950

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2485447	Cylindrospermopsin	6.75	Spike	P	0 - 30
2485447	Desmethyl microcystin LR	8.78	Spike	P	0 - 30
2485447	Microcystin HilR	5.99	Spike	P	0 - 30
2485447	Microcystin HtyR	2.32	Spike	P	0 - 30
2485447	Microcystin LA	1.10	Spike	P	0 - 30
2485447	Microcystin LF	8.09	Spike	P	0 - 30
2485447	Microcystin LR	6.19	Spike	P	0 - 30
2485447	Microcystin LW	2.62	Spike	P	0 - 30
2485447	Microcystin LY	3.57	Spike	P	0 - 30
2485447	Microcystin RR	0.445	Spike	P	0 - 30
2485447	Microcystin WR	9.93	Spike	P	0 - 30
2485447	Microcystin YR	0.387	Spike	P	0 - 30
2485447	Nodularin-R	1.54	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P444951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2485447	Anatoxin-a	0.444	Spike	P	0 - 30
2485447	Neosaxitoxin	0.882	Spike	P	0 - 30
2485447	Saxitoxin	4.38	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2485505
Field Sample ID: SEHAB0111

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	99.3	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	75.3	P	30 - 160

Lab Sample ID: 2485506
Field Sample ID: SEHAB0112

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	87.7	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	85.7	P	30 - 160

Lab Sample ID: 2485507
Field Sample ID: SEHAB0113

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	87.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	81.9	P	30 - 160

Lab Sample ID: 2485508
Field Sample ID: SEHAB0115

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	87.4	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	69.7	P	30 - 160

Lab Sample ID: 2485509
Field Sample ID: SEHAB0116

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	97.3	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	82.6	P	30 - 160

Lab Sample ID: 2485510
Field Sample ID: SEHAB0117

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	97.9	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	101	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A125622

Included Lab Sample IDs: 2485505, 2485506, 2485507, 2485508, 2485509, 2485510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	107	105	P/P	50 - 160
Desmethyl microcystin LR	105	112	P/P	50 - 160
Microcystin HilR	109	107	P/P	50 - 160
Microcystin HtyR	100	104	P/P	50 - 160
Microcystin LA	106	103	P/P	50 - 160
Microcystin LF	109	115	P/P	50 - 160
Microcystin LR	105	107	P/P	50 - 160
Microcystin LW	106	111	P/P	50 - 160
Microcystin LY	112	113	P/P	50 - 160
Microcystin RR	102	101	P/P	50 - 160
Microcystin WR	97.7	107	P/P	50 - 160
Microcystin YR	97.2	101	P/P	50 - 160
Nodularin-R	99.9	106	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A125630

Included Lab Sample IDs: 2485505, 2485506, 2485507, 2485508, 2485509, 2485510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	109	107	P/P	50 - 160
Neosaxitoxin	92.0	90.4	P/P	50 - 160
Saxitoxin	102	102	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	MS
			LCS	SMP		
EPA 8321B	Anatoxin-a	92.5	103	103		0.444
	Cylindrospermopsin	97.2	112	105		6.75
	Desmethyl microcystin LR	99.0	107	97.7		8.78
	Microcystin HilR	99.1	112	105		5.99
	Microcystin HtyR	94.3	98.4	96.2		2.32
	Microcystin LA	101	99.3	100		1.10
	Microcystin LF	105	119	110		8.09
	Microcystin LR	99.0	96.7	104		6.19
	Microcystin LW	102	105	108		2.62
	Microcystin LY	106	109	105		3.57
	Microcystin RR	101	108	107		0.445
	Microcystin WR	97.1	102	92.6		9.93
	Microcystin YR	93.2	101	101		0.387
	Neosaxitoxin	70.9	47.4	47.0		0.882
	Nodularin-R	95.2	105	103		1.54
	Saxitoxin	73.5	58.4	55.9		4.38

Reference Method Descriptions

Method	Description	Associated Samples
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2485505, 2485506, 2485507, 2485508, 2485509, 2485510
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2485505, 2485506, 2485507, 2485508, 2485509, 2485510

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	04/30/2024	05/01/2024 07:00	Tae K Lee	05/01/2024 11:12	Tae K Lee	2485505
	04/30/2024	05/01/2024 07:00	Tae K Lee	05/01/2024 11:29	Tae K Lee	2485506
	04/30/2024	05/01/2024 07:00	Tae K Lee	05/01/2024 11:45	Tae K Lee	2485507
	04/30/2024	05/01/2024 07:00	Tae K Lee	05/01/2024 12:02	Tae K Lee	2485508
	04/30/2024	05/01/2024 07:00	Tae K Lee	05/01/2024 12:19	Tae K Lee	2485509
	04/30/2024	05/01/2024 07:00	Tae K Lee	05/01/2024 12:36	Tae K Lee	2485510
	04/30/2024	05/01/2024 12:00	Tae K Lee	05/01/2024 21:34	Tae K Lee	2485505
	04/30/2024	05/01/2024 12:00	Tae K Lee	05/01/2024 21:48	Tae K Lee	2485506
	04/30/2024	05/01/2024 12:00	Tae K Lee	05/01/2024 22:01	Tae K Lee	2485507
	04/30/2024	05/01/2024 12:00	Tae K Lee	05/01/2024 22:15	Tae K Lee	2485508
	04/30/2024	05/01/2024 12:00	Tae K Lee	05/01/2024 22:29	Tae K Lee	2485509
	04/30/2024	05/01/2024 12:00	Tae K Lee	05/01/2024 22:43	Tae K Lee	2485510