Chemical Analysis Report

WQAP-2021-06-24-02

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

Event Description: **Lake Sebring Highlands County HAB**
Request ID: **RQ-2021-04-26-55**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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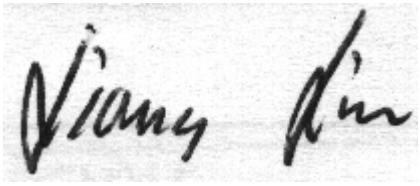
Date Certified: 25-JUN-2021 12:48



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: Lake Sebring **Collection Date/Time: 06/23/2021 13:20**

Field ID: HAB-SW-0039 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2256841	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P400146	
		Cylindrospermopsin	0.10	U	ug/L	P400146	
		Desmethyl microcystin LR	0.25	U	ug/L	P400146	
		Microcystin HilR**	0.25	U	ug/L	P400146	
		Microcystin HtyR**	0.25	U	ug/L	P400146	
		Microcystin LA	0.10	U	ug/L	P400146	
		Microcystin LF	0.10	U	ug/L	P400146	
		Microcystin LR	0.25	U	ug/L	P400146	
		Microcystin LW	0.25	U	ug/L	P400146	
		Microcystin LY	0.10	U	ug/L	P400146	
		Microcystin RR	0.10	U	ug/L	P400146	
		Microcystin WR	0.50	U	ug/L	P400146	
		Neosaxitoxin**	0.50	U	ug/L	P400021	
		Microcystin YR	0.25	U	ug/L	P400146	
		Saxitoxin	0.50	U	ug/L	P400021	
		Nodularin-R**	0.10	U	ug/L	P400146	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P400021

Component	Result	Code	Units
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Reference Method: EPA 8321B
Batch ID: P400146

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: P400021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Neosaxitoxin	135		P	40 - 150
Saxitoxin	128		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P400146

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	121		P	40 - 150
Cylindrospermopsin	126		P	40 - 150
Desmethyl microcystin LR	84.7		P	40 - 150
Microcystin HilR	93.3		P	40 - 150
Microcystin HtyR	97.9		P	40 - 150
Microcystin LA	126		P	40 - 150
Microcystin LF	125		P	40 - 150
Microcystin LR	78.9		P	40 - 150
Microcystin LW	96.2		P	40 - 150
Microcystin LY	125		P	40 - 150
Microcystin RR	136		P	40 - 150
Microcystin WR	85.3		P	40 - 150
Microcystin YR	120		P	40 - 150
Nodularin-R	125		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P400021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2255875	Neosaxitoxin	66.7	77.5	P/P	40 - 150
2255875	Saxitoxin	81.6	92.6	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P400146

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256832	Anatoxin-a	138	143	P/P	40 - 150
2256832	Cylindrospermopsin	127	126	P/P	40 - 150
2256832	Desmethyl microcystin LR	81.6	78.0	P/P	40 - 150
2256832	Microcystin HilR	92.6	91.5	P/P	40 - 150
2256832	Microcystin HtyR	92.8	96.1	P/P	40 - 150
2256832	Microcystin LA	122	123	P/P	40 - 150
2256832	Microcystin LF	120	126	P/P	40 - 150
2256832	Microcystin LR	86.7	92.9	P/P	40 - 150
2256832	Microcystin LW	97.7	88.3	P/P	40 - 150
2256832	Microcystin LY	127	127	P/P	40 - 150
2256832	Microcystin RR	129	139	P/P	40 - 150
2256832	Microcystin WR	93.9	88.2	P/P	40 - 150
2256832	Microcystin YR	117	119	P/P	40 - 150
2256832	Nodularin-R	121	137	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P400021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2255875	Neosaxitoxin	15.0	Spike	P	0 - 30
2255875	Saxitoxin	12.6	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P400146

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256832	Anatoxin-a	3.53	Spike	P	0 - 30
2256832	Cylindrospermopsin	0.453	Spike	P	0 - 30
2256832	Desmethyl microcystin LR	4.61	Spike	P	0 - 30
2256832	Microcystin HilR	1.17	Spike	P	0 - 30
2256832	Microcystin HtyR	3.48	Spike	P	0 - 30
2256832	Microcystin LA	1.45	Spike	P	0 - 30
2256832	Microcystin LF	5.18	Spike	P	0 - 30
2256832	Microcystin LR	6.89	Spike	P	0 - 30
2256832	Microcystin LW	10.1	Spike	P	0 - 30
2256832	Microcystin LY	0.593	Spike	P	0 - 30
2256832	Microcystin RR	7.62	Spike	P	0 - 30
2256832	Microcystin WR	6.21	Spike	P	0 - 30
2256832	Microcystin YR	1.43	Spike	P	0 - 30
2256832	Nodularin-R	12.6	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2256841
Field Sample ID: HAB-SW-0039

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	104	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	92.1	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	38.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A106246
Included Lab Sample IDs: 2256841

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Neosaxitoxin	119	117	P/P	50 - 160
Saxitoxin	110	108	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A106269
Included Lab Sample IDs: 2256841

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	119	123	P/P	50 - 160
Cylindrospermopsin	121	127	P/P	50 - 160
Desmethyl microcystin LR	81.9	75.9	P/P	50 - 160
Microcystin HilR	86.1	84.7	P/P	50 - 160
Microcystin HtyR	93.9	88.8	P/P	50 - 160
Microcystin LA	119	119	P/P	50 - 160
Microcystin LF	118	122	P/P	50 - 160
Microcystin LR	86.8	85.1	P/P	50 - 160
Microcystin LW	98.8	95.2	P/P	50 - 160
Microcystin LY	123	123	P/P	50 - 160
Microcystin RR	132	131	P/P	50 - 160
Microcystin WR	90.5	85.9	P/P	50 - 160
Microcystin YR	112	96.8	P/P	50 - 160
Nodularin-R	116	119	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		
					LCS	SMP	MS
EPA 8321B	Anatoxin-a	121	138	143			3.53
	Cylindrospermopsin	126	127	126			0.453
	Desmethyl microcystin LR	84.7	81.6	78.0			4.61
	Microcystin HilR	93.3	92.6	91.5			1.17
	Microcystin HtyR	97.9	92.8	96.1			3.48
	Microcystin LA	126	122	123			1.45
	Microcystin LF	125	120	126			5.18
	Microcystin LR	78.9	86.7	92.9			6.89
	Microcystin LW	96.2	97.7	88.3			10.1
	Microcystin LY	125	127	127			0.593
	Microcystin RR	136	129	139			7.62
	Microcystin WR	85.3	93.9	88.2			6.21
	Microcystin YR	120	117	119			1.43
	Neosaxitoxin	135	66.7	77.5			15.0
	Nodularin-R	125	121	137			12.6
	Saxitoxin	128	81.6	92.6			12.6

Reference Method Descriptions

Method	Description	Associated Samples
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2256841
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2256841

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	06/24/2021	06/24/2021 10:30	Pramila Ghimire	06/24/2021 13:24	Pramila Ghimire	2256841
	06/24/2021	06/24/2021 10:30	Pramila Ghimire	06/24/2021 23:39	Pramila Ghimire	2256841