

Chemical Analysis Report

SO-DIST-2024-02-20-02

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

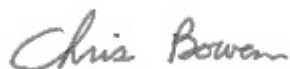
Event Description: **Algal Bloom Response -SOROC- Highlands**
Request ID: **RQ-2023-06-12-72**
Customer: **SO-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 06-MAR-2024 12:03



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: Lake Glenada- Boat Ramp

Collection Date/Time: 02/19/2024 10:42

Field ID: HAB-HC-021924-1042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2469933	DEP SOP: NU-094-1	Color (true)	32		PCU	P441707	
2469934	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P441963	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P441848	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.021		mg N/L	P441777	
	EPA 365.1 Rev. 2.0	Total-P	0.086		mg P/L	P441724	
2469935	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P441702	
2469936	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P441683	
		Cylindrospermopsin	0.10	U	ug/L	P441676	
		Desmethyl microcystin LR	0.25	U	ug/L	P441676	
		Microcystin HilR	0.25	U	ug/L	P441676	
		Microcystin HtyR	0.25	U	ug/L	P441676	
		Microcystin LA	0.10	U	ug/L	P441676	
		Microcystin LF	0.11	I	ug/L	P441676	
		Microcystin LR	0.77	I	ug/L	P441676	
		Microcystin LW	0.25	U	ug/L	P441676	
		Microcystin LY	0.10	U	ug/L	P441676	
		Microcystin RR	0.10	U	ug/L	P441676	
		Microcystin WR	0.50	U	ug/L	P441676	
		Neosaxitoxin	0.50	U	ug/L	P441683	
		Microcystin YR	0.25	U	ug/L	P441676	
		Saxitoxin	0.50	U	ug/L	P441683	
		Nodularin-R	0.10	U	ug/L	P441676	

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P441707

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P441963

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P441848

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P441777

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P441724

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P441702

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

Reference Method: EPA 8321B
Batch ID: P441676

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P441683

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: DEP SOP: NU-094-1
Batch ID: P441707

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P441963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P441848

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P441777

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P441724

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P441702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P441676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	88.7		P	40 - 150
Desmethyl microcystin LR	104		P	40 - 150
Microcystin H1LR	119		P	40 - 150
Microcystin HtyR	104		P	40 - 150
Microcystin LA	115		P	40 - 150
Microcystin LF	101		P	40 - 150
Microcystin LR	107		P	40 - 150
Microcystin LW	99.4		P	40 - 150
Microcystin LY	105		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	106		P	40 - 150
Microcystin YR	95.2		P	40 - 150
Nodularin-R	109		P	40 - 150

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B

Batch ID: P441683

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	98.2		P	40 - 150
Neosaxitoxin	93.2		P	40 - 150
Saxitoxin	94.5		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P441963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2469832	Ammonia-N	97.0	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P441848

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2469942	Kjeldahl Nitrogen	102	97.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P441777

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2469926	NO2NO3-N	97.0	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P441724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2469867	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P441702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2469935	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P441676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2469928	Cylindrospermopsin	92.6	93.2	P/P	40 - 150
2469928	Desmethyl microcystin LR	107	108	P/P	40 - 150
2469928	Microcystin HiLR	115	128	P/P	40 - 150
2469928	Microcystin HtyR	105	101	P/P	40 - 150
2469928	Microcystin LA	112	122	P/P	40 - 150
2469928	Microcystin LF	109	110	P/P	40 - 150
2469928	Microcystin LR	112	116	P/P	40 - 150
2469928	Microcystin LW	98.4	109	P/P	40 - 150
2469928	Microcystin LY	105	109	P/P	40 - 150
2469928	Microcystin RR	104	110	P/P	40 - 150
2469928	Microcystin WR	106	114	P/P	40 - 150
2469928	Microcystin YR	99.8	105	P/P	40 - 150
2469928	Nodularin-R	108	113	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P441683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2469928	Anatoxin-a	102	103	P/P	40 - 150
2469928	Neosaxitoxin	87.7	87.3	P/P	40 - 150
2469928	Saxitoxin	93.5	95.8	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P441707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469940	Color (true)	11.2	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P441963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469832	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P441848

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469942	Kjeldahl Nitrogen	3.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P441777

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469926	NO2NO3-N	0.837	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P441724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469867	Total-P	0.470	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P441702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469935	O-Phosphate-P	0.695	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P441676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469928	Cylindrospermopsin	0.546	Spike	P	0 - 30
2469928	Desmethyl microcystin LR	0.886	Spike	P	0 - 30
2469928	Microcystin HtIR	11.1	Spike	P	0 - 30
2469928	Microcystin HtyR	4.63	Spike	P	0 - 30
2469928	Microcystin LA	8.22	Spike	P	0 - 30
2469928	Microcystin LF	1.20	Spike	P	0 - 30
2469928	Microcystin LR	3.65	Spike	P	0 - 30
2469928	Microcystin LW	10.3	Spike	P	0 - 30
2469928	Microcystin LY	3.81	Spike	P	0 - 30

Quality Assurance Report

Precision

Reference Method: EPA 8321B
Batch ID: P441676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469928	Microcystin RR	5.47	Spike	P	0 - 30
2469928	Microcystin WR	7.47	Spike	P	0 - 30
2469928	Microcystin YR	4.95	Spike	P	0 - 30
2469928	Nodularin-R	4.09	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P441683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2469928	Anatoxin-a	0.544	Spike	P	0 - 30
2469928	Neosaxitoxin	0.463	Spike	P	0 - 30
2469928	Saxitoxin	2.50	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2469936
Field Sample ID: HAB-HC-021924-1042

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	105	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	133	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A124264

Included Lab Sample IDs: 2469935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.7	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A124268

Included Lab Sample IDs: 2469933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A124314

Included Lab Sample IDs: 2469934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A124317

Included Lab Sample IDs: 2469934

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

Reference Method: EPA 8321B

Run ID: A124326

Included Lab Sample IDs: 2469936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	107	103	P/P	50 - 160
Neosaxitoxin	114	104	P/P	50 - 160
Saxitoxin	112	110	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A124341

Included Lab Sample IDs: 2469936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	95.3	93.7	P/P	50 - 160
Desmethyl microcystin LR	106	121	P/P	50 - 160
Microcystin HiIR	121	132	P/P	50 - 160
Microcystin HtyR	109	121	P/P	50 - 160
Microcystin LA	120	135	P/P	50 - 160
Microcystin LF	108	113	P/P	50 - 160
Microcystin LR	103	125	P/P	50 - 160
Microcystin LW	98.3	108	P/P	50 - 160
Microcystin LY	109	120	P/P	50 - 160
Microcystin RR	113	114	P/P	50 - 160
Microcystin WR	106	117	P/P	50 - 160
Microcystin YR	103	116	P/P	50 - 160
Nodularin-R	116	118	P/P	50 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A124389
Included Lab Sample IDs: 2469934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.2	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A124410
Included Lab Sample IDs: 2469934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.0	99.4	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		LCS	Precision	MS
						SMP	
DEP SOP: NU-094-1	Color (true)	100				11.2	
EPA 350.1 Rev. 2.0	Ammonia-N	95.2	97.0	97.0			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	102	97.1			3.21
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	97.0	98.0			0.837
EPA 365.1 Rev. 2.0	Total-P	99.9	104	105			0.470
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	100	101			0.695
EPA 8321B	Anatoxin-a	98.2	102	103			0.544
	Cylindrospermopsin	88.7	92.6	93.2			0.546
	Desmethyl microcystin LR	104	107	108			0.886
	Microcystin H1LR	119	115	128			11.1
	Microcystin HtyR	104	105	101			4.63
	Microcystin LA	115	112	122			8.22
	Microcystin LF	101	109	110			1.20
	Microcystin LR	107	112	116			3.65
	Microcystin LW	99.4	98.4	109			10.3
	Microcystin LY	105	105	109			3.81
	Microcystin RR	105	104	110			5.47
	Microcystin WR	106	106	114			7.47
	Microcystin YR	95.2	99.8	105			4.95
	Neosaxitoxin	93.2	87.7	87.3			0.463
	Nodularin-R	109	108	113			4.09
	Saxitoxin	94.5	93.5	95.8			2.50

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2469933
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2469934
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2469934
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2469934
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2469934
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2469935
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2469936
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2469936

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	02/20/2024			02/20/2024 14:16	Jessica K Wilks	2469933
EPA 350.1 Rev. 2.0	02/20/2024			02/26/2024 13:02	Kenneth H Lee	2469934
EPA 351.2 Rev. 2.0	02/20/2024	02/23/2024 11:55	Simonne.V. Calhoun	02/27/2024 10:43	Robyn Blevins	2469934
EPA 353.2 Rev. 2.0	02/20/2024			02/21/2024 11:09	Fadila Guebre	2469934
EPA 365.1 Rev. 2.0	02/20/2024	02/21/2024 13:37	Adam P Silver	02/22/2024 09:56	James L Waggeberby	2469934
EPA 365.1 Rev. 2.0 dissolved	02/20/2024			02/20/2024 13:26	Elise M. Gillis	2469935
EPA 8321B	02/20/2024	02/22/2024 08:00	Hana Lee	02/22/2024 10:23	Hana Lee	2469936
	02/20/2024	02/22/2024 12:00	Hana Lee	02/22/2024 20:47	Hana Lee	2469936