

Chemical Analysis Report

SE-DIST-2023-08-22-01

Florida DEP Laboratory
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DOH Accreditation E31780

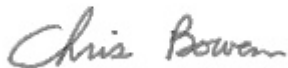
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-07-10-63**
Customer: **SE-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
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2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 15-SEP-2023 08:32



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 Marian - Boat Ramp

Collection Date/Time: 08/21/2023 10:15

Field ID: SEHAB0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2432439	DEP SOP: NU-094-1	Color (true)	49		PCU	P434183	
2432440	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P434442	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.8		mg N/L	P434765	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P434739	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P434210	
2432441	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.01	I	mg P/L	P434178	
2432443	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P434153	
		Cylindrospermopsin	0.10	U	ug/L	P434152	
		Desmethyl microcystin LR	0.25	U	ug/L	P434152	
		Microcystin HiLR	0.25	U	ug/L	P434152	
		Microcystin HtyR	0.25	U	ug/L	P434152	
		Microcystin LA	0.16	I	ug/L	P434152	
		Microcystin LF	0.18	I	ug/L	P434152	
		Microcystin LR	1.3		ug/L	P434152	
		Microcystin LW	0.25	U	ug/L	P434152	
		Microcystin LY	0.45		ug/L	P434152	
		Microcystin RR	0.21	I	ug/L	P434152	
		Microcystin WR	0.50	U	ug/L	P434152	
		Neosaxitoxin	0.50	U	ug/L	P434153	
		Microcystin YR	0.25	U	ug/L	P434152	
		Saxitoxin	0.50	U	ug/L	P434153	
		Nodularin-R	0.10	U	ug/L	P434152	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P434183

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434442

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434765

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434739

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434210

Component	Result	Code	Units
Total-P	0.010	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P434178

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

Reference Method: EPA 8321B
Batch ID: P434152

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: P434153

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: P434183

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434442

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434765

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434739

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434210

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P434178

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P434152

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	88.5		P	40 - 160
Desmethyl microcystin LR	104		P	40 - 160
Microcystin H1LR	95.7		P	40 - 160
Microcystin HtyR	91.2		P	40 - 160
Microcystin LA	103		P	40 - 160
Microcystin LF	89.8		P	40 - 160
Microcystin LR	95.9		P	40 - 160
Microcystin LW	84.2		P	40 - 160
Microcystin LY	94.4		P	40 - 160
Microcystin RR	95.0		P	40 - 160
Microcystin WR	91.3		P	40 - 160
Microcystin YR	87.3		P	40 - 160
Nodularin-R	97.5		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P434153

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	102		P	40 - 150
Neosaxitoxin	88.1		P	40 - 150
Saxitoxin	85.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434442

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432436	Ammonia-N	97.8	98.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432393	NO2NO3-N	98.8	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432436	Total-P	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P434178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432437	O-Phosphate-P	97.4	98.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P434152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432442	Cylindrospermopsin	97.0	85.2	P/P	40 - 160
2432442	Desmethyl microcystin LR	109	103	P/P	40 - 160
2432442	Microcystin HILR	102	90.4	P/P	40 - 160
2432442	Microcystin HtyR	94.7	87.1	P/P	40 - 160
2432442	Microcystin LA	108	100	P/P	40 - 160
2432442	Microcystin LF	102	105	P/P	40 - 160
2432442	Microcystin LR	104	95.0	P/P	40 - 160
2432442	Microcystin LW	98.1	101	P/P	40 - 160
2432442	Microcystin LY	96.9	96.2	P/P	40 - 160
2432442	Microcystin RR	97.9	97.4	P/P	40 - 160
2432442	Microcystin WR	101	97.3	P/P	40 - 160
2432442	Microcystin YR	89.1	84.2	P/P	40 - 160
2432442	Nodularin-R	99.0	94.4	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P434153

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432442	Anatoxin-a	98.1	97.3	P/P	40 - 150
2432442	Neosaxitoxin	85.3	85.2	P/P	40 - 150
2432442	Saxitoxin	88.4	87.0	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P434183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432404	Color (true)	1.35	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432436	Ammonia-N	0.749	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432393	NO2NO3-N	0.312	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432436	Total-P	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P434178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432437	O-Phosphate-P	1.53	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P434152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432442	Cylindrospermopsin	12.7	Spike	P	0 - 30
2432442	Desmethyl microcystin LR	5.97	Spike	P	0 - 30
2432442	Microcystin H1LR	12.4	Spike	P	0 - 30
2432442	Microcystin HtyR	8.32	Spike	P	0 - 30
2432442	Microcystin LA	7.98	Spike	P	0 - 30
2432442	Microcystin LF	3.02	Spike	P	0 - 30
2432442	Microcystin LR	9.16	Spike	P	0 - 30
2432442	Microcystin LW	3.26	Spike	P	0 - 30
2432442	Microcystin LY	0.730	Spike	P	0 - 30
2432442	Microcystin RR	0.473	Spike	P	0 - 30
2432442	Microcystin WR	4.13	Spike	P	0 - 30
2432442	Microcystin YR	5.63	Spike	P	0 - 30
2432442	Nodularin-R	4.73	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P434153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432442	Anatoxin-a	0.758	Spike	P	0 - 30
2432442	Neosaxitoxin	0.123	Spike	P	0 - 30
2432442	Saxitoxin	1.66	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2432443
Field Sample ID: SEHAB0089

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	96.3	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	98.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A121175

Included Lab Sample IDs: 2432441

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.4	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A121178

Included Lab Sample IDs: 2432439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.8	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A121189

Included Lab Sample IDs: 2432443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	104	90.8	P/P	50 - 160
Neosaxitoxin	104	90.5	P/P	50 - 160
Saxitoxin	105	106	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A121192

Included Lab Sample IDs: 2432443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	91.8	91.9	P/P	60 - 160
Desmethyl microcystin LR	95.5	99.7	P/P	50 - 160
Microcystin HILR	93.6	91.0	P/P	60 - 160
Microcystin HtyR	93.4	90.6	P/P	60 - 160
Microcystin LA	99.4	96.0	P/P	50 - 160
Microcystin LF	93.1	86.4	P/P	60 - 160
Microcystin LR	95.7	87.2	P/P	60 - 160
Microcystin LW	87.0	83.1	P/P	60 - 160
Microcystin LY	86.8	92.3	P/P	60 - 160
Microcystin RR	98.0	96.8	P/P	60 - 160
Microcystin WR	92.5	94.1	P/P	60 - 160
Microcystin YR	83.3	82.8	P/P	60 - 160
Nodularin-R	95.5	94.5	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A121224

Included Lab Sample IDs: 2432440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A121292

Included Lab Sample IDs: 2432440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	100	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A121424

Included Lab Sample IDs: 2432440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A121510

Included Lab Sample IDs: 2432440

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.1	95.5	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)	99.6				1.35	
EPA 350.1 Rev. 2.0	Ammonia-N	96.6	97.8	98.6			0.749
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.6					
EPA 353.2 Rev. 2.0	NO2NO3-N	100	98.8	99.3			0.312
EPA 365.1 Rev. 2.0	Total-P	102	105	105			0.0
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	97.4	98.9			1.53
EPA 8321B	Anatoxin-a	102	98.1	97.3			0.758
	Cylindrospermopsin	88.5	97.0	85.2			12.7
	Desmethyl microcystin LR	104	109	103			5.97
	Microcystin HiLR	95.7	102	90.4			12.4
	Microcystin HtyR	91.2	94.7	87.1			8.32
	Microcystin LA	103	108	100			7.98
	Microcystin LF	89.8	102	105			3.02
	Microcystin LR	95.9	104	95.0			9.16
	Microcystin LW	84.2	98.1	101			3.26
	Microcystin LY	94.4	96.9	96.2			0.730
	Microcystin RR	95.0	97.9	97.4			0.473
	Microcystin WR	91.3	101	97.3			4.13
	Microcystin YR	87.3	89.1	84.2			5.63
	Neosaxitoxin	88.1	85.3	85.2			0.123
	Nodularin-R	97.5	99.0	94.4			4.73
	Saxitoxin	85.1	88.4	87.0			1.66

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2432439
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2432440
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2432440
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2432440
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2432440
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2432441
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2432443
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2432443

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	08/22/2023			08/22/2023 15:47	Alexis Price	2432439
EPA 350.1 Rev. 2.0	08/22/2023			08/28/2023 11:55	Ping Hua	2432440
EPA 351.2 Rev. 2.0	08/22/2023	09/11/2023 14:51	Simonne.V. Calhoun	09/13/2023 14:25	Samantha L Bates	2432440
EPA 353.2 Rev. 2.0	08/22/2023			09/07/2023 12:49	Anna M. Plaviak	2432440
EPA 365.1 Rev. 2.0	08/22/2023	08/23/2023 18:21	Adam P Silver	08/24/2023 11:15	Simonne.V. Calhoun	2432440
EPA 365.1 Rev. 2.0 dissolved	08/22/2023			08/22/2023 15:04	Elise M. Gillis	2432441
EPA 8321B	08/22/2023	08/22/2023 12:00	Hana Lee	08/22/2023 20:26	Tae K Lee	2432443
	08/22/2023	08/22/2023 12:00	Hana Lee	08/23/2023 04:20	Tae K Lee	2432443