Chemical Analysis Report

WQAP-2023-05-11-02

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-01-09-47**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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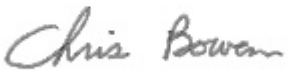
Date Certified: 24-MAY-2023 12:21



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: 05/10/2023 11:50**

Field ID: SEHAB0089 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2409003	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P429692	
		Cylindrospermopsin	0.10	U	ug/L	P429646	
		Desmethyl microcystin LR	0.25	U	ug/L	P429646	
		Microcystin HilR	0.25	U	ug/L	P429646	
		Microcystin HtyR	0.25	U	ug/L	P429646	
		Microcystin LA	1.6		ug/L	P429646	
		Microcystin LF	0.14	I	ug/L	P429646	
		Microcystin LR	0.91	I	ug/L	P429646	
		Microcystin LW	0.25	U	ug/L	P429646	
		Microcystin LY	0.50		ug/L	P429646	
		Microcystin RR	0.11	I	ug/L	P429646	
		Microcystin WR	0.50	U	ug/L	P429646	
		Neosaxitoxin	0.50	U	ug/L	P429692	
		Microcystin YR	0.25	U	ug/L	P429646	
		Saxitoxin	0.50	U	ug/L	P429692	
		Nodularin-R	0.10	U	ug/L	P429646	
2409004	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P430077	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.0		mg N/L	P430086	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P430056	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P429861	
2409005	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P429769	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430077

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430086

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430056

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429861

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429769

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

Reference Method: EPA 8321B
Batch ID: P429646

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: P429692

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 350.1 Rev. 2.0
Batch ID: P430077

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: P430086

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430056

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429861

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: P429769

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

Reference Method: EPA 8321B
Batch ID: P429646

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	82.5		P	40 - 150
Desmethyl microcystin LR	74.7		P	40 - 150
Microcystin HilR	91.7		P	40 - 150
Microcystin HtyR	84.0		P	40 - 150
Microcystin LA	93.5		P	40 - 150
Microcystin LF	93.5		P	40 - 150
Microcystin LR	83.6		P	40 - 150
Microcystin LW	95.5		P	40 - 150
Microcystin LY	123		P	40 - 150
Microcystin RR	79.3		P	40 - 150
Microcystin WR	88.0		P	40 - 150
Microcystin YR	91.4		P	40 - 150
Nodularin-R	75.9		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429692

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	88.0		P	40 - 150
Neosaxitoxin	79.9		P	40 - 150
Saxitoxin	76.8		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408966	Ammonia-N	97.2	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408814	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430056

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408968	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429861

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409029	Total-P	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408936	O-Phosphate-P	100	99.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2407544	Cylindrospermopsin	79.5	80.0	P/P	40 - 150
2407544	Desmethyl microcystin LR	75.9	78.2	P/P	40 - 150
2407544	Microcystin HilR	86.8	96.8	P/P	40 - 150
2407544	Microcystin HtyR	84.7	87.3	P/P	40 - 150
2407544	Microcystin LA	99.6	102	P/P	40 - 150
2407544	Microcystin LF	111	105	P/P	40 - 150
2407544	Microcystin LR	85.3	87.2	P/P	40 - 150
2407544	Microcystin LW	121	96.9	P/P	40 - 150
2407544	Microcystin LY	125	138	P/P	40 - 150
2407544	Microcystin RR	79.8	82.1	P/P	40 - 150
2407544	Microcystin WR	90.8	109	P/P	40 - 150
2407544	Microcystin YR	105	96.1	P/P	40 - 150
2407544	Nodularin-R	73.3	74.2	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2407544	Anatoxin-a	91.3	88.3	P/P	40 - 150
2407544	Neosaxitoxin	65.2	60.8	P/P	40 - 150
2407544	Saxitoxin	66.4	63.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408966	Ammonia-N	0.345	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408814	Kjeldahl Nitrogen	0.844	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430056

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408968	NO2NO3-N	0.990	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409029	Total-P	1.69	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408936	O-Phosphate-P	0.500	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P429646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2407544	Cylindrospermopsin	0.618	Spike	P	0 - 30
2407544	Desmethyl microcystin LR	2.98	Spike	P	0 - 30
2407544	Microcystin HilR	10.9	Spike	P	0 - 30
2407544	Microcystin HtyR	2.93	Spike	P	0 - 30
2407544	Microcystin LA	2.69	Spike	P	0 - 30
2407544	Microcystin LF	5.43	Spike	P	0 - 30
2407544	Microcystin LR	2.15	Spike	P	0 - 30
2407544	Microcystin LW	21.9	Spike	P	0 - 30
2407544	Microcystin LY	10.0	Spike	P	0 - 30
2407544	Microcystin RR	2.91	Spike	P	0 - 30
2407544	Microcystin WR	18.1	Spike	P	0 - 30
2407544	Microcystin YR	8.97	Spike	P	0 - 30
2407544	Nodularin-R	1.16	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P429692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2407544	Anatoxin-a	3.35	Spike	P	0 - 30
2407544	Neosaxitoxin	6.91	Spike	P	0 - 30
2407544	Saxitoxin	4.00	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2409003
Field Sample ID: SEHAB0089

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	81.3	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	80.3	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A119111
Included Lab Sample IDs: 2409005

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.2	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A119115
Included Lab Sample IDs: 2409003

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	83.8	78.8	P/P	50 - 160
Desmethyl microcystin LR	70.5	80.0	P/P	50 - 160
Microcystin HilR	88.1	87.8	P/P	50 - 160
Microcystin HtyR	79.5	79.7	P/P	50 - 160
Microcystin LA	101	115	P/P	50 - 160
Microcystin LF	75.2	72.2	P/P	50 - 160
Microcystin LR	82.8	89.3	P/P	50 - 160
Microcystin LW	75.7	82.4	P/P	50 - 160
Microcystin LY	128	118	P/P	50 - 160
Microcystin RR	75.1	76.8	P/P	50 - 160
Microcystin WR	83.8	80.9	P/P	50 - 160
Microcystin YR	81.5	86.1	P/P	50 - 160
Nodularin-R	76.6	80.3	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A119116
Included Lab Sample IDs: 2409003

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	91.1	88.1	P/P	50 - 160
Neosaxitoxin	84.3	88.0	P/P	50 - 160
Saxitoxin	79.4	79.1	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A119188
Included Lab Sample IDs: 2409004

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A119252
Included Lab Sample IDs: 2409004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A119259
Included Lab Sample IDs: 2409004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A119322
Included Lab Sample IDs: 2409004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	93.5	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		Precision		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	96.6	97.2	96.8			0.345
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.5	101	102			0.844
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	102			0.990
EPA 365.1 Rev. 2.0	Total-P	102	104	101			1.69
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	99.7			0.500
EPA 8321B	Anatoxin-a	88.0	91.3	88.3			3.35
	Cylindrospermopsin	82.5	79.5	80.0			0.618
	Desmethyl microcystin LR	74.7	75.9	78.2			2.98
	Microcystin HilR	91.7	86.8	96.8			10.9
	Microcystin HtyR	84.0	84.7	87.3			2.93
	Microcystin LA	93.5	99.6	102			2.69
	Microcystin LF	93.5	111	105			5.43
	Microcystin LR	83.6	85.3	87.2			2.15
	Microcystin LW	95.5	121	96.9			21.9
	Microcystin LY	123	125	138			10.0
	Microcystin RR	79.3	79.8	82.1			2.91
	Microcystin WR	88.0	90.8	109			18.1
	Microcystin YR	91.4	105	96.1			8.97
	Neosaxitoxin	79.9	65.2	60.8			6.91
	Nodularin-R	75.9	73.3	74.2			1.16
	Saxitoxin	76.8	66.4	63.8			4.00

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2409004
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2409004
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2409004
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2409004
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2409005
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2409003
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2409003

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 350.1 Rev. 2.0	05/11/2023			05/18/2023 15:25	Ping Hua	2409004
EPA 351.2 Rev. 2.0	05/11/2023	05/19/2023 08:44	Samantha L Bates	05/22/2023 16:43	Samantha L Bates	2409004
EPA 353.2 Rev. 2.0	05/11/2023			05/18/2023 11:26	Anna M. Plaviak	2409004
EPA 365.1 Rev. 2.0	05/11/2023	05/15/2023 14:57	Adam P Silver	05/16/2023 10:16	James L Waggerby	2409004
EPA 365.1 Rev. 2.0 dissolved	05/11/2023			05/11/2023 14:34	Elise M. Gillis	2409005
EPA 8321B	05/11/2023	05/11/2023 12:00	Manjita Shrestha	05/11/2023 17:22	Manjita Shrestha	2409003
	05/11/2023	05/11/2023 12:00	Manjita Shrestha	05/11/2023 22:07	Manjita Shrestha	2409003