Chemical Analysis Report

WQAP-2022-10-05-01

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2022-08-08-66**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

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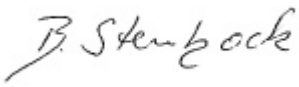
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 21-OCT-2022 16:05



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 Pavilion **Collection Date/Time: 10/04/2022 14:30**

Field ID: SEHAB0083 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2360202	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P420485	
		Cylindrospermopsin	0.10	U	ug/L	P420484	
		Desmethyl microcystin LR	0.25	U	ug/L	P420484	
		Microcystin HilR	0.25	U	ug/L	P420484	
		Microcystin HtyR	0.25	U	ug/L	P420484	
		Microcystin LA	0.81		ug/L	P420484	
		Microcystin LF	0.10	U	ug/L	P420484	
		Microcystin LR	1.0		ug/L	P420484	
		Microcystin LW	0.25	U	ug/L	P420484	
		Microcystin LY	0.25	I	ug/L	P420484	
		Microcystin RR	0.17	I	ug/L	P420484	
		Microcystin WR	0.50	U	ug/L	P420484	
		Microcystin YR	0.25	U	ug/L	P420484	
		Nodularin-R	0.10	U	ug/L	P420484	
2360203	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P421034	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.4		mg N/L	P420547	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P420563	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P420523	
2360204	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.092		mg P/L	P420518	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421034

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420547

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420563

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420523

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P420518

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

Reference Method: EPA 8321B
Batch ID: P420484

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: P420485

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421034

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420547

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420563

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: P420523

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P420518

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

Reference Method: EPA 8321B
Batch ID: P420484

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	94.4		P	40 - 150
Desmethyl microcystin LR	78.3		P	40 - 150
Microcystin HilR	84.3		P	40 - 150
Microcystin HtyR	84.6		P	40 - 150
Microcystin LA	75.8		P	40 - 150
Microcystin LF	125		P	40 - 150
Microcystin LR	89.8		P	40 - 150
Microcystin LW	83.3		P	40 - 150
Microcystin LY	79.7		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	73.3		P	40 - 150
Microcystin YR	87.2		P	40 - 150
Nodularin-R	92.6		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P420485

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	89.8		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360188	Ammonia-N	99.4	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420563

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360203	NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420523

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360188	Total-P	109	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P420518

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360309	O-Phosphate-P	99.5	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P420484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360172	Cylindrospermopsin	100	101	P/P	40 - 150
2360172	Desmethyl microcystin LR	90.3	91.2	P/P	40 - 150
2360172	Microcystin HilR	91.2	95.9	P/P	40 - 150
2360172	Microcystin HtyR	104	102	P/P	40 - 150
2360172	Microcystin LA	89.4	84.2	P/P	40 - 150
2360172	Microcystin LF	94.1	103	P/P	40 - 150
2360172	Microcystin LR	99.5	104	P/P	40 - 150
2360172	Microcystin LW	79.6	74.9	P/P	40 - 150
2360172	Microcystin LY	81.5	91.3	P/P	40 - 150
2360172	Microcystin RR	111	108	P/P	40 - 150
2360172	Microcystin WR	85.4	87.6	P/P	40 - 150
2360172	Microcystin YR	103	109	P/P	40 - 150
2360172	Nodularin-R	101	103	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P420485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360172	Anatoxin-a	81.1	82.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360188	Ammonia-N	1.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420547

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360282	Kjeldahl Nitrogen	2.58	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360203	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360188	Total-P	0.673	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P420518

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360309	O-Phosphate-P	1.15	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P420484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360172	Cylindrospermopsin	0.164	Spike	P	0 - 30
2360172	Desmethyl microcystin LR	1.04	Spike	P	0 - 30
2360172	Microcystin HilR	5.01	Spike	P	0 - 30
2360172	Microcystin HtyR	1.06	Spike	P	0 - 30
2360172	Microcystin LA	5.94	Spike	P	0 - 30
2360172	Microcystin LF	8.62	Spike	P	0 - 30
2360172	Microcystin LR	4.48	Spike	P	0 - 30
2360172	Microcystin LW	6.06	Spike	P	0 - 30
2360172	Microcystin LY	11.4	Spike	P	0 - 30
2360172	Microcystin RR	3.30	Spike	P	0 - 30
2360172	Microcystin WR	2.55	Spike	P	0 - 30
2360172	Microcystin YR	5.56	Spike	P	0 - 30
2360172	Nodularin-R	2.45	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P420485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360172	Anatoxin-a	2.02	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2360202
Field Sample ID: SEHAB0083

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	105	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	53.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A115140
Included Lab Sample IDs: 2360204

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

Reference Method: EPA 8321B
Run ID: A115149
Included Lab Sample IDs: 2360202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	98.2	98.9	P/P	50 - 160
Desmethyl microcystin LR	82.2	83.0	P/P	50 - 160
Microcystin HilR	83.1	85.4	P/P	50 - 160
Microcystin HtyR	87.3	87.7	P/P	50 - 160
Microcystin LA	80.2	79.8	P/P	50 - 160
Microcystin LF	110	102	P/P	50 - 160
Microcystin LR	91.0	85.9	P/P	50 - 160
Microcystin LW	84.4	83.9	P/P	50 - 160
Microcystin LY	82.8	71.0	P/P	50 - 160
Microcystin RR	108	105	P/P	50 - 160
Microcystin WR	75.4	77.1	P/P	50 - 160
Microcystin YR	101	98.5	P/P	50 - 160
Nodularin-R	90.4	93.4	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A115151
Included Lab Sample IDs: 2360202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.9	82.0	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115154
Included Lab Sample IDs: 2360203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115165
Included Lab Sample IDs: 2360203

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115180
Included Lab Sample IDs: 2360203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	107	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115365
Included Lab Sample IDs: 2360203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	99.3	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	96.4	99.4	98.4			1.01
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101					2.58
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.5	100			0.501
EPA 365.1 Rev. 2.0	Total-P	108	109	108			0.673
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.5	101			1.15
EPA 8321B	Anatoxin-a	89.8	81.1	82.8			2.02
	Cylindrospermopsin	94.4	100	101			0.164
	Desmethyl microcystin LR	78.3	90.3	91.2			1.04
	Microcystin HilR	84.3	91.2	95.9			5.01
	Microcystin HtyR	84.6	104	102			1.06
	Microcystin LA	75.8	89.4	84.2			5.94
	Microcystin LF	125	94.1	103			8.62
	Microcystin LR	89.8	99.5	104			4.48
	Microcystin LW	83.3	79.6	74.9			6.06
	Microcystin LY	79.7	81.5	91.3			11.4
	Microcystin RR	105	111	108			3.30
	Microcystin WR	73.3	85.4	87.6			2.55
	Microcystin YR	87.2	103	109			5.56
	Nodularin-R	92.6	101	103			2.45

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2360203
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2360203
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2360203
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2360203
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2360204
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2360202
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2360202

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	10/05/2022			10/18/2022 13:23	Ping Hua	2360203
EPA 351.2 Rev. 2.0	10/05/2022	10/06/2022 10:45	Alexandra J Mattheus	10/07/2022 11:03	Alexandra J Mattheus	2360203
EPA 353.2 Rev. 2.0	10/05/2022			10/06/2022 10:18	Beverly Y. Sanders	2360203
EPA 365.1 Rev. 2.0	10/05/2022	10/05/2022 13:12	Adam P Silver	10/06/2022 17:23	James L Waggerby	2360203
EPA 365.1 Rev. 2.0 dissolved	10/05/2022			10/05/2022 13:58	Elise M. Gillis	2360204
EPA 8321B	10/05/2022	10/06/2022 10:00	Manjita Shrestha	10/06/2022 14:24	Manjita Shrestha	2360202
	10/05/2022	10/06/2022 13:00	Manjita Shrestha	10/06/2022 23:27	Manjita Shrestha	2360202