Chemical Analysis Report

WQAP-2023-01-31-01

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2022-12-12-33**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Colin Wright, Program Administrator

Date Certified: 15-FEB-2023 08:52

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: 01/30/2023 11:30**

Field ID: SEHAB0089 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383911	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P425246	
		Cylindrospermopsin	0.10	U	ug/L	P425245	
		Desmethyl microcystin LR	0.25	U	ug/L	P425245	
		Microcystin HilR	0.25	U	ug/L	P425245	
		Microcystin HtyR	0.25	U	ug/L	P425245	
		Microcystin LA	0.64		ug/L	P425245	
		Microcystin LF	0.15	I	ug/L	P425245	
		Microcystin LR	1.2		ug/L	P425245	
		Microcystin LW	0.25	U	ug/L	P425245	
		Microcystin LY	0.30	I	ug/L	P425245	
		Microcystin RR	0.24	I	ug/L	P425245	
		Microcystin WR	0.50	U	ug/L	P425245	
		Neosaxitoxin	0.50	U	ug/L	P425246	
		Microcystin YR	0.25	U	ug/L	P425245	
		Saxitoxin	0.50	U	ug/L	P425246	
		Nodularin-R	0.10	U	ug/L	P425245	
2383912	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P425723	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.1		mg N/L	P425244	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P425306	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P425402	
2383913	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P425227	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425723

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425244

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425306

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425402

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425227

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

Reference Method: EPA 8321B
Batch ID: P425245

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: P425246

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: P425723

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425244

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	105		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425306

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425402

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425227

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

Reference Method: EPA 8321B
Batch ID: P425245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	100		P	40 - 150
Desmethyl microcystin LR	94.7		P	40 - 150
Microcystin HilR	96.5		P	40 - 150
Microcystin HtyR	100		P	40 - 150
Microcystin LA	99.7		P	40 - 150
Microcystin LF	97.0		P	40 - 150
Microcystin LR	97.9		P	40 - 150
Microcystin LW	87.4		P	40 - 150
Microcystin LY	89.8		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	95.6		P	40 - 150
Microcystin YR	95.7		P	40 - 150
Nodularin-R	103		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P425246

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	86.6		P	40 - 150
Neosaxitoxin	92.3		P	40 - 150
Saxitoxin	76.6		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383888	Ammonia-N	99.8	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425244

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383940	Kjeldahl Nitrogen	110	107	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383912	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383890	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383919	O-Phosphate-P	96.3	96.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P425245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383704	Cylindrospermopsin	105	120	P/P	40 - 150
2383704	Desmethyl microcystin LR	123	127	P/P	40 - 150
2383704	Microcystin HilR	119	127	P/P	40 - 150
2383704	Microcystin HtyR	118	124	P/P	40 - 150
2383704	Microcystin LA	95.7	105	P/P	40 - 150
2383704	Microcystin LF	102	97.9	P/P	40 - 150
2383704	Microcystin LR	127	133	P/P	40 - 150
2383704	Microcystin LW	102	108	P/P	40 - 150
2383704	Microcystin LY	95.2	102	P/P	40 - 150
2383704	Microcystin RR	105	109	P/P	40 - 150
2383704	Microcystin WR	113	117	P/P	40 - 150
2383704	Microcystin YR	123	127	P/P	40 - 150
2383704	Nodularin-R	129	139	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P425246

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383704	Anatoxin-a	88.3	91.9	P/P	40 - 150
2383704	Neosaxitoxin	53.1	58.0	P/P	40 - 150
2383704	Saxitoxin	43.9	46.6	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383888	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425244

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383940	Kjeldahl Nitrogen	1.92	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383912	NO2NO3-N	0.484	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383890	Total-P	1.42	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383919	O-Phosphate-P	0.415	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P425245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383704	Cylindrospermopsin	13.1	Spike	P	0 - 30
2383704	Desmethyl microcystin LR	3.71	Spike	P	0 - 30
2383704	Microcystin HilR	6.32	Spike	P	0 - 30
2383704	Microcystin HtyR	4.49	Spike	P	0 - 30
2383704	Microcystin LA	9.14	Spike	P	0 - 30
2383704	Microcystin LF	4.56	Spike	P	0 - 30
2383704	Microcystin LR	4.08	Spike	P	0 - 30
2383704	Microcystin LW	5.64	Spike	P	0 - 30
2383704	Microcystin LY	6.59	Spike	P	0 - 30
2383704	Microcystin RR	4.20	Spike	P	0 - 30
2383704	Microcystin WR	3.68	Spike	P	0 - 30
2383704	Microcystin YR	2.93	Spike	P	0 - 30
2383704	Nodularin-R	7.50	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P425246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383704	Anatoxin-a	4.06	Spike	P	0 - 30
2383704	Neosaxitoxin	8.74	Spike	P	0 - 30
2383704	Saxitoxin	6.06	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2383911
Field Sample ID: SEHAB0089

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	77.3	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	65.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A117188
Included Lab Sample IDs: 2383913

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A117222
Included Lab Sample IDs: 2383912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	106	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A117229
Included Lab Sample IDs: 2383911

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	86.7	81.2	P/P	50 - 160
Neosaxitoxin	92.6	86.4	P/P	50 - 160
Saxitoxin	76.1	74.3	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A117243
Included Lab Sample IDs: 2383911

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	103	93.6	P/P	60 - 160
Desmethyl microcystin LR	99.8	83.1	P/P	60 - 160
Microcystin HilR	99.6	82.2	P/P	60 - 160
Microcystin HtyR	87.8	69.0	P/P	60 - 160
Microcystin LA	93.0	80.7	P/P	60 - 160
Microcystin LF	84.9	72.1	P/P	60 - 160
Microcystin LR	96.8	83.8	P/P	60 - 160
Microcystin LW	85.4	76.6	P/P	60 - 160
Microcystin LY	96.4	73.9	P/P	60 - 160
Microcystin RR	99.5	89.7	P/P	60 - 160
Microcystin WR	86.5	70.8	P/P	60 - 160
Microcystin YR	93.7	71.8	P/P	60 - 160
Nodularin-R	91.1	83.2	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A117258
Included Lab Sample IDs: 2383912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.0	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A117302
Included Lab Sample IDs: 2383912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117404
Included Lab Sample IDs: 2383912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	97.2	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	98.6	99.8	99.8			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	110	107			1.92
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	103			0.484
EPA 365.1 Rev. 2.0	Total-P	104	105	107			1.42
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	96.3	96.7			0.415
EPA 8321B	Anatoxin-a	86.6	88.3	91.9			4.06
	Cylindrospermopsin	100	105	120			13.1
	Desmethyl microcystin LR	94.7	123	127			3.71
	Microcystin HilR	96.5	119	127			6.32
	Microcystin HtyR	100	118	124			4.49
	Microcystin LA	99.7	95.7	105			9.14
	Microcystin LF	97.0	102	97.9			4.56
	Microcystin LR	97.9	127	133			4.08
	Microcystin LW	87.4	102	108			5.64
	Microcystin LY	89.8	95.2	102			6.59
	Microcystin RR	101	105	109			4.20
	Microcystin WR	95.6	113	117			3.68
	Microcystin YR	95.7	123	127			2.93
	Neosaxitoxin	92.3	53.1	58.0			8.74
	Nodularin-R	103	129	139			7.50
	Saxitoxin	76.6	43.9	46.6			6.06

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2383912
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2383912
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2383912
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2383912
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2383913
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2383911
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2383911

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	01/31/2023			02/13/2023 12:16	Khloe J Berg	2383912
EPA 351.2 Rev. 2.0	01/31/2023	02/01/2023 12:25	Simonne.V. Calhoun	02/03/2023 13:12	Samantha L Bates	2383912
EPA 353.2 Rev. 2.0	01/31/2023			02/02/2023 10:31	Beverly Y. Sanders	2383912
EPA 365.1 Rev. 2.0	01/31/2023	02/06/2023 03:24	Adam P Silver	02/07/2023 14:26	Simonne.V. Calhoun	2383912
EPA 365.1 Rev. 2.0 dissolved	01/31/2023			01/31/2023 14:18	Elise M. Gillis	2383913
EPA 8321B	01/31/2023	02/01/2023 13:00	Manjita Shrestha	02/02/2023 09:03	Manjita Shrestha	2383911
	01/31/2023	02/01/2023 13:00	Manjita Shrestha	02/02/2023 13:49	Manjita Shrestha	2383911