

Chemical Analysis Report

WQAP-2022-09-13-01

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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Date Certified: 23-SEP-2022 10:41



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: 09/12/2022 09:45

Field ID: SEHAB0083

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2355700	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P419476	
		Cylindrospermopsin	0.10	U	ug/L	P419474	
		Desmethyl microcystin LR	0.25	U	ug/L	P419474	
		Microcystin HILR	0.25	U	ug/L	P419474	
		Microcystin HtyR	0.25	U	ug/L	P419474	
		Microcystin LA	1.1		ug/L	P419474	
		Microcystin LF	0.14	I	ug/L	P419474	
		Microcystin LR	1.2		ug/L	P419474	
		Microcystin LW	0.25	U	ug/L	P419474	
		Microcystin LY	0.34	I	ug/L	P419474	
		Microcystin RR	0.15	I	ug/L	P419474	
		Microcystin WR	0.50	U	ug/L	P419474	
		Microcystin YR	0.25	U	ug/L	P419474	
		Nodularin-R	0.10	U	ug/L	P419474	
2355701	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P419720	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.7		mg N/L	P419582	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P419704	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P419596	
2355702	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P419501	

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: P419720

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419582

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419704

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419596

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419501

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

Reference Method: EPA 8321B
Batch ID: P419474

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: P419476

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: P419720

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: P419582

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419704

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419596

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: P419501

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

Reference Method: EPA 8321B
Batch ID: P419474

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	83.4		P	40 - 150
Desmethyl microcystin LR	96.0		P	40 - 150
Microcystin HILR	103		P	40 - 150
Microcystin HtyR	100		P	40 - 150
Microcystin LA	112		P	40 - 150
Microcystin LF	117		P	40 - 150
Microcystin LR	104		P	40 - 150
Microcystin LW	109		P	40 - 150
Microcystin LY	114		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	99.7		P	40 - 150
Microcystin YR	97.8		P	40 - 150
Nodularin-R	99.1		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419476

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	80.2		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419720

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355256	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355643	NO2NO3-N	92.7	90.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419596

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355701	Total-P	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419501

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355702	O-Phosphate-P	95.0	94.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P419474

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355681	Cylindrospermopsin	93.1	106	P/P	40 - 150
2355681	Desmethyl microcystin LR	126	121	P/P	40 - 150
2355681	Microcystin HilR	121	121	P/P	40 - 150
2355681	Microcystin HtyR	126	122	P/P	40 - 150
2355681	Microcystin LA	123	117	P/P	40 - 150
2355681	Microcystin LF	132	137	P/P	40 - 150
2355681	Microcystin LR	124	122	P/P	40 - 150
2355681	Microcystin LW	124	124	P/P	40 - 150
2355681	Microcystin LY	126	124	P/P	40 - 150
2355681	Microcystin RR	127	121	P/P	40 - 150
2355681	Microcystin WR	119	121	P/P	40 - 150
2355681	Microcystin YR	119	116	P/P	40 - 150
2355681	Nodularin-R	131	127	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419476

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355681	Anatoxin-a	79.4	82.2	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P419720

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355256	Ammonia-N	0.786	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P419582

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355701	Kjeldahl Nitrogen	0.979	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P419704

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355643	NO2NO3-N	1.70	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P419596

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355701	Total-P	0.799	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P419501

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355702	O-Phosphate-P	0.0995	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P419474

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355681	Cylindrospermopsin	12.3	Spike	P	0 - 30
2355681	Desmethyl microcystin LR	3.72	Spike	P	0 - 30
2355681	Microcystin H1LR	0.0497	Spike	P	0 - 30
2355681	Microcystin HtyR	2.79	Spike	P	0 - 30
2355681	Microcystin LA	5.48	Spike	P	0 - 30
2355681	Microcystin LF	3.95	Spike	P	0 - 30
2355681	Microcystin LR	1.19	Spike	P	0 - 30
2355681	Microcystin LW	0.0547	Spike	P	0 - 30
2355681	Microcystin LY	1.81	Spike	P	0 - 30
2355681	Microcystin RR	4.32	Spike	P	0 - 30
2355681	Microcystin WR	2.15	Spike	P	0 - 30
2355681	Microcystin YR	3.17	Spike	P	0 - 30
2355681	Nodularin-R	3.18	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P419476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355681	Anatoxin-a	3.42	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2355700
Field Sample ID: SEHAB0083

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	107	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	44.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A114695

Included Lab Sample IDs: 2355702

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

Reference Method: EPA 8321B

Run ID: A114726

Included Lab Sample IDs: 2355700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	84.4	74.5	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A114729

Included Lab Sample IDs: 2355700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	85.0	89.4	P/P	60 - 160
Desmethyl microcystin LR	89.9	90.5	P/P	60 - 160
Microcystin HII R	93.4	103	P/P	60 - 160
Microcystin HtyR	93.5	97.5	P/P	60 - 160
Microcystin LA	105	109	P/P	50 - 160
Microcystin LF	90.9	106	P/P	60 - 160
Microcystin LR	92.8	94.7	P/P	60 - 160
Microcystin LW	83.2	84.2	P/P	60 - 160
Microcystin LY	107	108	P/P	60 - 160
Microcystin RR	95.9	97.5	P/P	60 - 160
Microcystin WR	90.4	94.1	P/P	60 - 160
Microcystin YR	94.6	90.3	P/P	60 - 160
Nodularin-R	94.2	93.7	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114761

Included Lab Sample IDs: 2355701

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114777

Included Lab Sample IDs: 2355701

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114783

Included Lab Sample IDs: 2355701

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.9	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114800

Included Lab Sample IDs: 2355701

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	100	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	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	101	102			0.786
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107					0.979
EPA 353.2 Rev. 2.0	NO2NO3-N	103	92.7	90.7			1.70
EPA 365.1 Rev. 2.0	Total-P	102	102	100			0.799
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	95.0	94.9			0.0995
EPA 8321B	Anatoxin-a	80.2	79.4	82.2			3.42
	Cylindrospermopsin	83.4	93.1	106			12.3
	Desmethyl microcystin LR	96.0	126	121			3.72
	Microcystin HiLR	103	121	121			0.0497
	Microcystin HtyR	100	126	122			2.79
	Microcystin LA	112	123	117			5.48
	Microcystin LF	117	132	137			3.95
	Microcystin LR	104	124	122			1.19
	Microcystin LW	109	124	124			0.0547
	Microcystin LY	114	126	124			1.81
	Microcystin RR	101	127	121			4.32
	Microcystin WR	99.7	119	121			2.15
	Microcystin YR	97.8	119	116			3.17
	Nodularin-R	99.1	131	127			3.18

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2355701
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2355701
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2355701
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2355701
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2355702
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2355700
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2355700

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	09/13/2022			09/16/2022 10:15	Judith K. Clark	2355701
EPA 351.2 Rev. 2.0	09/13/2022	09/15/2022 13:57	Alexandra J Mattheus	09/16/2022 13:35	Alexandra J Mattheus	2355701
EPA 353.2 Rev. 2.0	09/13/2022			09/15/2022 13:26	Judith K. Clark	2355701
EPA 365.1 Rev. 2.0	09/13/2022	09/15/2022 15:47	Adam P Silver	09/15/2022 19:55	James L Waggeberby	2355701
EPA 365.1 Rev. 2.0 dissolved	09/13/2022			09/13/2022 15:35	Elise M. Gillis	2355702
EPA 8321B	09/13/2022	09/14/2022 09:00	Manjita Shrestha	09/14/2022 13:01	Umesh Chiluwal	2355700
	09/13/2022	09/14/2022 13:00	Manjita Shrestha	09/14/2022 15:28	Manjita Shrestha	2355700