

Chemical Analysis Report

WQAP-2022-09-23-01

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

Event Description: **Algal Bloom Response - Orange Co**
Request ID: **RQ-2022-09-19-62**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd
Orlando, FL 32083
Attn: Matthew Bearden

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 14-OCT-2022 14:46

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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 Speer - NW Lobe

Collection Date/Time: 09/22/2022 10:15

Field ID: HABOC0009_LakeSpeer1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2358976	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P420021	
		Cylindrospermopsin	0.10	U	ug/L	P420020	
		Desmethyl microcystin LR	0.25	U	ug/L	P420020	
		Microcystin HILR	0.25	U	ug/L	P420020	
		Microcystin HtyR	0.25	U	ug/L	P420020	
		Microcystin LA	0.10	U	ug/L	P420020	
		Microcystin LF	0.10	U	ug/L	P420020	
		Microcystin LR	1.9		ug/L	P420020	
		Microcystin LW	0.25	U	ug/L	P420020	
		Microcystin LY	0.10	U	ug/L	P420020	
		Microcystin RR	0.15	I	ug/L	P420020	
		Microcystin WR	0.50	U	ug/L	P420020	
		Microcystin YR	0.25	U	ug/L	P420020	
		Nodularin-R	0.10	U	ug/L	P420020	
2358977	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P420735	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P420203	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P420412	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P420231	
2358978	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P420061	

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: P420735

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420203

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420412

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420231

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P420061

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

Reference Method: EPA 8321B
Batch ID: P420020

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

Reference Method: EPA 8321B
Batch ID: P420021

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: P420735

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420203

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420412

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: P420231

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: P420061

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

Reference Method: EPA 8321B
Batch ID: P420020

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	83.6		P	40 - 150
Desmethyl microcystin LR	76.4		P	40 - 150
Microcystin HILR	81.5		P	40 - 150
Microcystin HtyR	80.4		P	40 - 150
Microcystin LA	81.0		P	40 - 150
Microcystin LF	83.5		P	40 - 150
Microcystin LR	75.6		P	40 - 150
Microcystin LW	82.5		P	40 - 150
Microcystin LY	86.1		P	40 - 150
Microcystin RR	73.9		P	40 - 150
Microcystin WR	79.2		P	40 - 150
Microcystin YR	81.4		P	40 - 150
Nodularin-R	77.5		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P420021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	112		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420735

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2358910	Ammonia-N	96.6	95.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2358803	NO2NO3-N	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2358977	Total-P	107	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P420061

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2359129	O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P420020

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2358245	Cylindrospermopsin	93.6	90.8	P/P	40 - 150
2358245	Desmethyl microcystin LR	110	107	P/P	40 - 150
2358245	Microcystin HilR	110	107	P/P	40 - 150
2358245	Microcystin HtyR	103	101	P/P	40 - 150
2358245	Microcystin LA	90.4	92.5	P/P	40 - 150
2358245	Microcystin LF	90.4	81.7	P/P	40 - 150
2358245	Microcystin LR	112	107	P/P	40 - 150
2358245	Microcystin LW	84.9	85.0	P/P	40 - 150
2358245	Microcystin LY	91.6	92.0	P/P	40 - 150
2358245	Microcystin RR	84.2	84.0	P/P	40 - 150
2358245	Microcystin WR	100	97.9	P/P	40 - 150
2358245	Microcystin YR	110	106	P/P	40 - 150
2358245	Nodularin-R	119	120	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P420021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2358245	Anatoxin-a	107	97.3	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P420735

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2358910	Ammonia-N	0.922	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P420203

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2359128	Kjeldahl Nitrogen	1.26	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P420412

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2358803	NO2NO3-N	0.175	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P420231

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2358977	Total-P	1.63	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P420061

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2359129	O-Phosphate-P	0.495	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P420020

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2358245	Cylindrospermopsin	3.07	Spike	P	0 - 30
2358245	Desmethyl microcystin LR	2.84	Spike	P	0 - 30
2358245	Microcystin H1LR	2.77	Spike	P	0 - 30
2358245	Microcystin HtyR	2.60	Spike	P	0 - 30
2358245	Microcystin LA	2.32	Spike	P	0 - 30
2358245	Microcystin LF	10.0	Spike	P	0 - 30
2358245	Microcystin LR	4.60	Spike	P	0 - 30
2358245	Microcystin LW	0.156	Spike	P	0 - 30
2358245	Microcystin LY	0.533	Spike	P	0 - 30
2358245	Microcystin RR	0.218	Spike	P	0 - 30
2358245	Microcystin WR	2.38	Spike	P	0 - 30
2358245	Microcystin YR	3.80	Spike	P	0 - 30
2358245	Nodularin-R	0.315	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P420021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2358245	Anatoxin-a	9.39	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2358976

Field Sample ID: HABOC0009_LakeSpeer1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	60.4	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	87.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A114901
Included Lab Sample IDs: 2358976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	93.3	91.0	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A114920
Included Lab Sample IDs: 2358978

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

Reference Method: EPA 8321B
Run ID: A114934
Included Lab Sample IDs: 2358976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	75.4	78.6	P/P	50 - 160
Desmethyl microcystin LR	81.9	85.3	P/P	50 - 160
Microcystin HILR	83.4	80.1	P/P	50 - 160
Microcystin HtyR	86.0	83.9	P/P	50 - 160
Microcystin LA	78.1	77.0	P/P	50 - 160
Microcystin LF	92.2	77.1	P/P	50 - 160
Microcystin LR	75.4	78.3	P/P	50 - 160
Microcystin LW	83.8	84.8	P/P	50 - 160
Microcystin LY	79.3	93.7	P/P	50 - 160
Microcystin RR	77.7	78.1	P/P	50 - 160
Microcystin WR	82.7	78.4	P/P	50 - 160
Microcystin YR	78.9	85.0	P/P	50 - 160
Nodularin-R	80.2	82.2	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115018
Included Lab Sample IDs: 2358977

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115093
Included Lab Sample IDs: 2358977

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115115
Included Lab Sample IDs: 2358977

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	102	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A115220

Included Lab Sample IDs: 2358977

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	98.3	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 SMP	MS
			LCS			
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	96.6	95.6		0.922
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100				1.26
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	95.5			0.175
EPA 365.1 Rev. 2.0	Total-P	104	107	105		1.63
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	101	101		0.495
EPA 8321B	Anatoxin-a	112	107	97.3		9.39
	Cylindrospermopsin	83.6	93.6	90.8		3.07
	Desmethyl microcystin LR	76.4	110	107		2.84
	Microcystin HiLR	81.5	110	107		2.77
	Microcystin HtyR	80.4	103	101		2.60
	Microcystin LA	81.0	90.4	92.5		2.32
	Microcystin LF	83.5	90.4	81.7		10.0
	Microcystin LR	75.6	112	107		4.60
	Microcystin LW	82.5	84.9	85.0		0.156
	Microcystin LY	86.1	91.6	92.0		0.533
	Microcystin RR	73.9	84.2	84.0		0.218
	Microcystin WR	79.2	100	97.9		2.38
	Microcystin YR	81.4	110	106		3.80
	Nodularin-R	77.5	119	120		0.315

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2358977
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2358977
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2358977
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2358977
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2358978
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2358976
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2358976

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	09/23/2022			10/11/2022 14:09	Judith K. Clark	2358977
EPA 351.2 Rev. 2.0	09/23/2022	09/28/2022 12:10	Alexandra J Mattheus	10/04/2022 09:41	Samantha L Bates	2358977
EPA 353.2 Rev. 2.0	09/23/2022			10/03/2022 12:41	Beverly Y. Sanders	2358977
EPA 365.1 Rev. 2.0	09/23/2022	09/28/2022 14:15	Simonne.V. Calhoun	09/29/2022 10:37	James L Waggeberby	2358977
EPA 365.1 Rev. 2.0 dissolved	09/23/2022			09/23/2022 15:25	Elise M. Gillis	2358978
EPA 8321B	09/23/2022	09/23/2022 12:00	Umesh Chiluwal	09/23/2022 16:16	Manjita Shrestha	2358976
	09/23/2022	09/23/2022 12:00	Umesh Chiluwal	09/24/2022 03:07	Manjita Shrestha	2358976