

Chemical Analysis Report

WQAP-2022-02-18-03

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2021-08-16-19**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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2295 Victoria AVE
Suite 364
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 14-MAR-2022 15:40

A handwritten signature in black ink, appearing to read "Liang Lin", 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 Glenada Doc

Collection Date/Time: 02/17/2022 09:40

Field ID: HAB-SD-021722-0940

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306768	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P410163	
		Cylindrospermopsin	0.10	U	ug/L	P410163	
		Desmethyl microcystin LR	0.25	U	ug/L	P410163	
		Microcystin HIR**	0.25	U	ug/L	P410163	
		Microcystin HtyR**	0.25	U	ug/L	P410163	
		Microcystin LA	0.54		ug/L	P410163	
		Microcystin LF	0.10	U	ug/L	P410163	
		Microcystin LR	0.80	I	ug/L	P410163	
		Microcystin LW	0.25	U	ug/L	P410163	
		Microcystin LY	0.10	U	ug/L	P410163	
		Microcystin RR	0.36	I	ug/L	P410163	
		Microcystin WR	0.50	U	ug/L	P410163	
		Microcystin YR	0.25	U	ug/L	P410163	
		Nodularin-R**	0.10	U	ug/L	P410163	
2306769	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P410529	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P410058	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P410432	
	EPA 365.1 Rev. 2.0	Total-P	0.087		mg P/L	P410098	
2306770	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P410069	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410529

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410058

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410432

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410098

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410069

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

Reference Method: EPA 8321B
Batch ID: P410163

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HIR	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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410529

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410058

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410432

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410098

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: P410069

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

Reference Method: EPA 8321B
Batch ID: P410163

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	115		P	40 - 150
Cylindrospermopsin	109		P	40 - 150
Desmethyl microcystin LR	101		P	40 - 150
Microcystin H1R	111		P	40 - 150
Microcystin HtyR	109		P	40 - 150
Microcystin LA	119		P	40 - 150
Microcystin LF	122		P	40 - 150
Microcystin LR	107		P	40 - 150
Microcystin LW	118		P	40 - 150
Microcystin LY	103		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	110		P	40 - 150
Microcystin YR	110		P	40 - 150
Nodularin-R	103		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306541	Ammonia-N	96.4	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306462	Kjeldahl Nitrogen	103	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410432

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306718	NO2NO3-N	94.5	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306769	Total-P	107	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306802	O-Phosphate-P	95.2	96.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P410163

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306717	Anatoxin-a	125	126	P/P	40 - 150
2306717	Cylindrospermopsin	106	102	P/P	40 - 150
2306717	Desmethyl microcystin LR	118	112	P/P	40 - 150
2306717	Microcystin HiLR	103	106	P/P	40 - 150
2306717	Microcystin HtyR	108	101	P/P	40 - 150
2306717	Microcystin LA	105	102	P/P	40 - 150
2306717	Microcystin LF	113	107	P/P	40 - 150
2306717	Microcystin LR	110	98.7	P/P	40 - 150
2306717	Microcystin LW	110	105	P/P	40 - 150
2306717	Microcystin LY	105	95.7	P/P	40 - 150
2306717	Microcystin RR	103	99.0	P/P	40 - 150
2306717	Microcystin WR	101	107	P/P	40 - 150
2306717	Microcystin YR	110	103	P/P	40 - 150
2306717	Nodularin-R	110	104	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P410529

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306541	Ammonia-N	0.358	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P410058

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306462	Kjeldahl Nitrogen	3.83	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P410432

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306718	NO2NO3-N	1.57	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P410098

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306769	Total-P	0.601	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P410069

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306802	O-Phosphate-P	1.14	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P410163

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306717	Anatoxin-a	0.704	Spike	P	0 - 30
2306717	Cylindrospermopsin	3.59	Spike	P	0 - 30
2306717	Desmethyl microcystin LR	5.32	Spike	P	0 - 30
2306717	Microcystin H1LR	2.91	Spike	P	0 - 30
2306717	Microcystin HtyR	6.94	Spike	P	0 - 30
2306717	Microcystin LA	3.14	Spike	P	0 - 30
2306717	Microcystin LF	5.86	Spike	P	0 - 30
2306717	Microcystin LR	10.3	Spike	P	0 - 30
2306717	Microcystin LW	4.49	Spike	P	0 - 30
2306717	Microcystin LY	8.73	Spike	P	0 - 30
2306717	Microcystin RR	3.73	Spike	P	0 - 30
2306717	Microcystin WR	5.64	Spike	P	0 - 30
2306717	Microcystin YR	6.58	Spike	P	0 - 30
2306717	Nodularin-R	6.00	Spike	P	0 - 30

Quality Assurance Report Precision

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

Quality Assurance Report Surrogates

Lab Sample ID: 2306768
Field Sample ID: HAB-SD-021722-0940

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	93.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A110497

Included Lab Sample IDs: 2306770

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110570

Included Lab Sample IDs: 2306769

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110589

Included Lab Sample IDs: 2306769

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.3	94.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A110605

Included Lab Sample IDs: 2306768

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	109	P/P	50 - 160
Cylindrospermopsin	101	103	P/P	60 - 160
Desmethyl microcystin LR	98.0	95.4	P/P	60 - 160
Microcystin H1LR	106	101	P/P	60 - 160
Microcystin HtyR	100	99.7	P/P	60 - 160
Microcystin LA	108	104	P/P	50 - 160
Microcystin LF	112	94.9	P/P	60 - 160
Microcystin LR	100	89.0	P/P	60 - 160
Microcystin LW	111	99.6	P/P	60 - 160
Microcystin LY	101	88.5	P/P	60 - 160
Microcystin RR	101	101	P/P	60 - 160
Microcystin WR	105	88.6	P/P	60 - 160
Microcystin YR	105	89.1	P/P	60 - 160
Nodularin-R	96.9	95.2	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A110660

Included Lab Sample IDs: 2306769

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	97.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110696

Included Lab Sample IDs: 2306769

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.5	97.1	P/P	90 - 110

Quality Assurance Report

Calibration Verification

* 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	95.8	96.4	96.8			0.358
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	103	98.1			3.83
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	97.0	94.5	96.0			1.57
EPA 365.1 Rev. 2.0	Total-P	104	107	108			0.601
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	95.2	96.4			1.14
EPA 8321B	Anatoxin-a	115	125	126			0.704
	Cylindrospermopsin	109	106	102			3.59
	Desmethyl microcystin LR	101	118	112			5.32
	Microcystin HiLR	111	103	106			2.91
	Microcystin HtyR	109	108	101			6.94
	Microcystin LA	119	105	102			3.14
	Microcystin LF	122	113	107			5.86
	Microcystin LR	107	110	98.7			10.3
	Microcystin LW	118	110	105			4.49
	Microcystin LY	103	105	95.7			8.73
	Microcystin RR	105	103	99.0			3.73
	Microcystin WR	110	101	107			5.64
	Microcystin YR	110	110	103			6.58
	Nodularin-R	103	110	104			6.00

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2306769
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2306769
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2306769
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2306769
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2306770
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2306768

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	02/18/2022			03/01/2022 13:15	Ping Hua	2306769
EPA 351.2 Rev. 2.0	02/18/2022	02/22/2022 09:14	Samantha L Bates	02/23/2022 15:14	Alexandra J Mattheus	2306769
EPA 353.2 Rev. 2.0	02/18/2022			02/28/2022 11:20	Beverly Y. Sanders	2306769
EPA 365.1 Rev. 2.0	02/18/2022	02/22/2022 16:05	Simonne.V. Calhoun	02/23/2022 14:26	Shengyu Ding	2306769
EPA 365.1 Rev. 2.0 dissolved	02/18/2022			02/18/2022 15:13	James L Waggerby	2306770
EPA 8321B	02/18/2022	02/24/2022 07:00	Manjita Shrestha	02/24/2022 09:41	Manjita Shrestha	2306768