

Chemical Analysis Report

WQAP-2021-06-02-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-05-17-30**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 25-JUN-2021 10:28

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: Little Lake Conway - near Lake Conway Woods Community dock **Collection Date/Time: 06/01/2021 10:25**

Field ID: HABOC0003_LittleLakeConway

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2251419	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P399065	
		Cylindrospermopsin	0.10	U	ug/L	P399065	
		Desmethyl microcystin LR	0.25	U	ug/L	P399065	
		Microcystin HilR**	0.25	U	ug/L	P399065	
		Microcystin HtyR**	0.25	U	ug/L	P399065	
		Microcystin LA	0.10	U	ug/L	P399065	
		Microcystin LF	0.10	U	ug/L	P399065	
		Microcystin LR	0.25	U	ug/L	P399065	
		Microcystin LW	0.25	U	ug/L	P399065	
		Microcystin LY	0.10	U	ug/L	P399065	
		Microcystin RR	0.10	U	ug/L	P399065	
		Microcystin WR	0.50	U	ug/L	P399065	
		Microcystin YR	0.25	U	ug/L	P399065	
		Nodularin-R**	0.10	U	ug/L	P399065	
2251420	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P399412	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P399152	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P399216	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P399488	
2251421	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P399120	

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: P399412

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399152

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399216

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399488

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399120

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

Reference Method: EPA 8321B
Batch ID: P399065

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 HlIR	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: P399412

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399152

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399216

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399488

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399120

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

Reference Method: EPA 8321B
Batch ID: P399065

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	113		P	40 - 150
Cylindrospermopsin	119		P	40 - 150
Desmethyl microcystin LR	97.1		P	40 - 150
Microcystin HIR	97.3		P	40 - 150
Microcystin HtyR	96.0		P	40 - 150
Microcystin LA	101		P	40 - 150
Microcystin LF	99.9		P	40 - 150
Microcystin LR	95.4		P	40 - 150
Microcystin LW	91.1		P	40 - 150
Microcystin LY	111		P	40 - 150
Microcystin RR	111		P	40 - 150
Microcystin WR	102		P	40 - 150
Microcystin YR	98.0		P	40 - 150
Nodularin-R	110		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399412

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2251420	Ammonia-N	99.6	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2251286	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399488

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2251301	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399120

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2251421	O-Phosphate-P	99.0	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P399065

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2251269	Anatoxin-a	104	118	P/P	40 - 150
2251269	Cylindrospermopsin	94.0	107	P/P	40 - 150
2251269	Desmethyl microcystin LR	83.4	100	P/P	40 - 150
2251269	Microcystin HilR	84.6	96.7	P/P	40 - 150
2251269	Microcystin HtyR	85.9	103	P/P	40 - 150
2251269	Microcystin LA	87.5	105	P/P	40 - 150
2251269	Microcystin LF	83.5	101	P/P	40 - 150
2251269	Microcystin LR	85.5	92.4	P/P	40 - 150
2251269	Microcystin LW	80.5	97.6	P/P	40 - 150
2251269	Microcystin LY	87.7	103	P/P	40 - 150
2251269	Microcystin RR	95.1	107	P/P	40 - 150
2251269	Microcystin WR	102	111	P/P	40 - 150
2251269	Microcystin YR	84.2	99.1	P/P	40 - 150
2251269	Nodularin-R	97.0	111	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P399412

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2251420	Ammonia-N	0.184	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P399152

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2251297	Kjeldahl Nitrogen	7.89	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P399216

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2251286	NO2NO3-N	1.97	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P399488

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2251301	Total-P	0.989	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P399120

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2251421	O-Phosphate-P	1.22	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P399065

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2251269	Anatoxin-a	12.4	Spike	P	0 - 30
2251269	Cylindrospermopsin	12.0	Spike	P	0 - 30
2251269	Desmethyl microcystin LR	18.4	Spike	P	0 - 30
2251269	Microcystin HtIR	13.4	Spike	P	0 - 30
2251269	Microcystin HtyR	18.6	Spike	P	0 - 30
2251269	Microcystin LA	18.3	Spike	P	0 - 30
2251269	Microcystin LF	19.0	Spike	P	0 - 30
2251269	Microcystin LR	7.70	Spike	P	0 - 30
2251269	Microcystin LW	19.2	Spike	P	0 - 30
2251269	Microcystin LY	16.1	Spike	P	0 - 30
2251269	Microcystin RR	11.4	Spike	P	0 - 30
2251269	Microcystin WR	8.57	Spike	P	0 - 30
2251269	Microcystin YR	16.2	Spike	P	0 - 30
2251269	Nodularin-R	13.1	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: 2251419

Field Sample ID: HABOC0003_LittleLakeConway

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	139	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	132	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A105817
Included Lab Sample IDs: 2251419

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	98.7	94.4	P/P	50 - 160
Cylindrospermopsin	105	88.0	P/P	50 - 160
Desmethyl microcystin LR	89.8	80.7	P/P	50 - 160
Microcystin HIR	96.3	89.7	P/P	50 - 160
Microcystin HtyR	103	87.8	P/P	50 - 160
Microcystin LA	107	91.8	P/P	50 - 160
Microcystin LF	99.4	91.5	P/P	50 - 160
Microcystin LR	95.1	78.9	P/P	50 - 160
Microcystin LW	94.3	82.0	P/P	50 - 160
Microcystin LY	110	93.9	P/P	50 - 160
Microcystin RR	107	89.7	P/P	50 - 160
Microcystin WR	97.6	92.6	P/P	50 - 160
Microcystin YR	95.1	83.7	P/P	50 - 160
Nodularin-R	108	94.8	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105826
Included Lab Sample IDs: 2251421

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105874
Included Lab Sample IDs: 2251420

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105879
Included Lab Sample IDs: 2251420

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.1	95.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105961
Included Lab Sample IDs: 2251420

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	96.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106021
Included Lab Sample IDs: 2251420

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.0	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	104	99.6	99.8			0.184
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106					7.89
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	102			1.97
EPA 365.1 Rev. 2.0	Total-P	103	104	105			0.989
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.0	97.8			1.22
EPA 8321B	Anatoxin-a	113	104	118			12.4
	Cylindrospermopsin	119	94.0	107			12.0
	Desmethyl microcystin LR	97.1	83.4	100			18.4
	Microcystin HiLR	97.3	84.6	96.7			13.4
	Microcystin HtyR	96.0	85.9	103			18.6
	Microcystin LA	101	87.5	105			18.3
	Microcystin LF	99.9	83.5	101			19.0
	Microcystin LR	95.4	85.5	92.4			7.70
	Microcystin LW	91.1	80.5	97.6			19.2
	Microcystin LY	111	87.7	103			16.1
	Microcystin RR	111	95.1	107			11.4
	Microcystin WR	102	102	111			8.57
	Microcystin YR	98.0	84.2	99.1			16.2
	Nodularin-R	110	97.0	111			13.1

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2251420
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2251420
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2251420
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2251420
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2251421
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2251419

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	06/02/2021			06/08/2021 12:24	Ping Hua	2251420
EPA 351.2 Rev. 2.0	06/02/2021	06/03/2021 13:01	Benjamin T. Nordmann	06/04/2021 13:39	Virginia P. Brown	2251420
EPA 353.2 Rev. 2.0	06/02/2021			06/04/2021 10:06	Beverly Y. Sanders	2251420
EPA 365.1 Rev. 2.0	06/02/2021	06/10/2021 12:25	Yen Ta	06/11/2021 12:30	Shengyu Ding	2251420
EPA 365.1 Rev. 2.0 dissolved	06/02/2021			06/02/2021 16:57	Ping Hua	2251421
EPA 8321B	06/02/2021	06/02/2021 11:00	Pramila Ghimire	06/02/2021 16:21	Pramila Ghimire	2251419