

Chemical Analysis Report

WQAP-2022-05-27-03

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

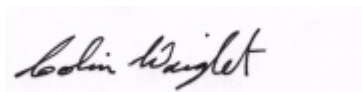
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-03-14-19**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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3319 Maguire Blvd. Suite 232
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Attn: Matt Bearden

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Certified by: Colin Wright, Program Administrator

Date Certified: 20-JUN-2022 09:17

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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 Ivanhoe - 100m E of Poinsetta Ave

Collection Date/Time: 05/26/2022 11:10

Field ID: HABCE0126_Lakelvanhoe2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2330437	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P414416	
		Cylindrospermopsin	0.50		ug/L	P414416	
		Desmethyl microcystin LR	0.25	U	ug/L	P414416	
		Microcystin HIR**	0.25	U	ug/L	P414416	
		Microcystin HtyR**	0.25	U	ug/L	P414416	
		Microcystin LA	0.10	U	ug/L	P414416	
		Microcystin LF	0.10	U	ug/L	P414416	
		Microcystin LR	0.25	U	ug/L	P414416	
		Microcystin LW	0.25	U	ug/L	P414416	
		Microcystin LY	0.10	U	ug/L	P414416	
		Microcystin RR	0.10	U	ug/L	P414416	
		Microcystin WR	0.50	U	ug/L	P414416	
		Microcystin YR	0.25	U	ug/L	P414416	
		Nodularin-R**	0.10	U	ug/L	P414416	
2330438	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P415078	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P414622	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P415069	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P414629	
2330439	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P414497	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415078

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414622

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415069

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414629

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414497

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

Reference Method: EPA 8321B
Batch ID: P414416

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: P415078

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414622

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: P415069

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414629

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: P414497

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P414416

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	81.0		P	40 - 150
Cylindrospermopsin	72.3		P	40 - 150
Desmethyl microcystin LR	83.2		P	40 - 150
Microcystin HIR	65.2		P	40 - 150
Microcystin HtyR	70.0		P	40 - 150
Microcystin LA	70.8		P	40 - 150
Microcystin LF	61.5		P	40 - 150
Microcystin LR	81.6		P	40 - 150
Microcystin LW	53.9		P	40 - 150
Microcystin LY	57.9		P	40 - 150
Microcystin RR	79.1		P	40 - 150
Microcystin WR	70.3		P	40 - 150
Microcystin YR	68.2		P	40 - 150
Nodularin-R	66.9		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330246	Ammonia-N	95.6	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414622

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330438	Kjeldahl Nitrogen	104	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330100	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330561	Total-P	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414497

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330300	O-Phosphate-P	97.7	98.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P414416

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330004	Anatoxin-a	84.1	85.2	P/P	40 - 150
2330004	Cylindrospermopsin	71.7	71.7	P/P	40 - 150
2330004	Desmethyl microcystin LR	86.0	96.1	P/P	40 - 150
2330004	Microcystin HiLR	73.2	77.5	P/P	40 - 150
2330004	Microcystin HtyR	68.0	69.2	P/P	40 - 150
2330004	Microcystin LA	71.7	64.9	P/P	40 - 150
2330004	Microcystin LF	67.5	64.7	P/P	40 - 150
2330004	Microcystin LR	85.5	88.0	P/P	40 - 150
2330004	Microcystin LW	56.8	60.0	P/P	40 - 150
2330004	Microcystin LY	56.3	58.6	P/P	40 - 150
2330004	Microcystin RR	73.6	76.1	P/P	40 - 150
2330004	Microcystin WR	76.8	72.2	P/P	40 - 150
2330004	Microcystin YR	71.2	72.7	P/P	40 - 150
2330004	Nodularin-R	64.5	66.0	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330246	Ammonia-N	0.780	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414622

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330438	Kjeldahl Nitrogen	1.06	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330100	NO2NO3-N	0.382	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330561	Total-P	0.0219	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414497

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330300	O-Phosphate-P	0.369	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P414416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330004	Anatoxin-a	1.23	Spike	P	0 - 30
2330004	Cylindrospermopsin	0.0541	Spike	P	0 - 30
2330004	Desmethyl microcystin LR	11.1	Spike	P	0 - 30
2330004	Microcystin HtIR	5.63	Spike	P	0 - 30
2330004	Microcystin HtyR	1.68	Spike	P	0 - 30
2330004	Microcystin LA	10.0	Spike	P	0 - 30
2330004	Microcystin LF	4.16	Spike	P	0 - 30
2330004	Microcystin LR	2.91	Spike	P	0 - 30
2330004	Microcystin LW	5.46	Spike	P	0 - 30
2330004	Microcystin LY	4.06	Spike	P	0 - 30
2330004	Microcystin RR	3.42	Spike	P	0 - 30
2330004	Microcystin WR	6.09	Spike	P	0 - 30
2330004	Microcystin YR	2.18	Spike	P	0 - 30
2330004	Nodularin-R	2.20	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: 2330437

Field Sample ID: HABCE0126_Lakelvanhoe2

Reference Method

EPA 8321B

Surrogate

Microcystin LR ethyl-d5

% Rec.

75.6

Pass/Fail

P

Control Limits

30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A112468

Included Lab Sample IDs: 2330439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	97.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A112533

Included Lab Sample IDs: 2330437

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	81.7	82.6	P/P	50 - 160
Cylindrospermopsin	88.6	87.5	P/P	50 - 160
Desmethyl microcystin LR	86.2	88.8	P/P	50 - 160
Microcystin HIR	75.6	75.0	P/P	50 - 160
Microcystin HtyR	74.2	72.8	P/P	50 - 160
Microcystin LA	72.2	76.8	P/P	50 - 160
Microcystin LF	82.2	79.5	P/P	50 - 160
Microcystin LR	80.2	76.0	P/P	50 - 160
Microcystin LW	66.0	61.2	P/P	50 - 160
Microcystin LY	68.3	76.9	P/P	50 - 160
Microcystin RR	81.2	79.4	P/P	50 - 160
Microcystin WR	85.2	80.3	P/P	50 - 160
Microcystin YR	72.0	71.4	P/P	50 - 160
Nodularin-R	67.0	66.3	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112626

Included Lab Sample IDs: 2330438

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112631

Included Lab Sample IDs: 2330438

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	109	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112751

Included Lab Sample IDs: 2330438

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112754

Included Lab Sample IDs: 2330438

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.1	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		Precision LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	95.6	95.6	96.4			0.780
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	104	102			1.06
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	102			0.382
EPA 365.1 Rev. 2.0	Total-P	103	104	104			0.0219
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	97.7	98.2			0.369
EPA 8321B	Anatoxin-a	81.0	84.1	85.2			1.23
	Cylindrospermopsin	72.3	71.7	71.7			0.0541
	Desmethyl microcystin LR	83.2	86.0	96.1			11.1
	Microcystin HiLR	65.2	73.2	77.5			5.63
	Microcystin HtyR	70.0	68.0	69.2			1.68
	Microcystin LA	70.8	71.7	64.9			10.0
	Microcystin LF	61.5	67.5	64.7			4.16
	Microcystin LR	81.6	85.5	88.0			2.91
	Microcystin LW	53.9	56.8	60.0			5.46
	Microcystin LY	57.9	56.3	58.6			4.06
	Microcystin RR	79.1	73.6	76.1			3.42
	Microcystin WR	70.3	76.8	72.2			6.09
	Microcystin YR	68.2	71.2	72.7			2.18
	Nodularin-R	66.9	64.5	66.0			2.20

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2330438
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2330438
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2330438
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2330438
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2330439
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2330437

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	05/27/2022			06/10/2022 15:20	Ping Hua	2330438
EPA 351.2 Rev. 2.0	05/27/2022	06/03/2022 11:25	Samantha L Bates	06/06/2022 14:36	Alexandra J Mattheus	2330438
EPA 353.2 Rev. 2.0	05/27/2022			06/10/2022 17:32	Nathaniel J Jones	2330438
EPA 365.1 Rev. 2.0	05/27/2022	06/03/2022 15:50	Adam P Silver	06/06/2022 13:47	James L Waggeberby	2330438
EPA 365.1 Rev. 2.0 dissolved	05/27/2022			05/27/2022 16:24	Nathaniel J Jones	2330439
EPA 8321B	05/27/2022	05/31/2022 14:00	Manjita Shrestha	05/31/2022 17:53	Manjita Shrestha	2330437