

Chemical Analysis Report

WQAP-2022-05-10-01

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-2022-04-18-43**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 31-MAY-2022 09:27

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: Tiger Lake - East Shore

Collection Date/Time: 05/09/2022 12:58

Field ID: HABCE0105_TigerLake

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2325533	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P413727	
		Cylindrospermopsin	0.10	U	ug/L	P413727	
		Desmethyl microcystin LR	0.25	U	ug/L	P413727	
		Microcystin HilR**	0.25	U	ug/L	P413727	
		Microcystin HtyR**	0.25	U	ug/L	P413727	
		Microcystin LA	0.28	I	ug/L	P413727	
		Microcystin LF	0.12	I	ug/L	P413727	
		Microcystin LR	0.92	I	ug/L	P413727	
		Microcystin LW	0.25	U	ug/L	P413727	
		Microcystin LY	0.19	I	ug/L	P413727	
		Microcystin RR	0.11	I	ug/L	P413727	
		Microcystin WR	0.50	U	ug/L	P413727	
		Microcystin YR	0.25	U	ug/L	P413727	
		Nodularin-R**	0.10	U	ug/L	P413727	
2325534	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P413766	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.6		mg N/L	P414005	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P413861	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P413896	
2325535	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P413653	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413766

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414005

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413861

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413896

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413653

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

Reference Method: EPA 8321B
Batch ID: P413727

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 H1R	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: P413766

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	93.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P414005

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P413861

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P413896

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P413653

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

Reference Method: EPA 8321B

Batch ID: P413727

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	118		P	40 - 150
Cylindrospermopsin	110		P	40 - 150
Desmethyl microcystin LR	93.1		P	40 - 150
Microcystin HIR	94.8		P	40 - 150
Microcystin HtyR	95.9		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	124		P	40 - 150
Microcystin LR	100		P	40 - 150
Microcystin LW	115		P	40 - 150
Microcystin LY	122		P	40 - 150
Microcystin RR	106		P	40 - 150
Microcystin WR	90.2		P	40 - 150
Microcystin YR	100		P	40 - 150
Nodularin-R	98.6		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P413766

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325164	Ammonia-N	97.6	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P414005

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324748	Kjeldahl Nitrogen	96.4	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P413861

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325534	NO2NO3-N	97.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P413896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325438	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P413653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325809	O-Phosphate-P	99.4	99.6	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P413727

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325533	Anatoxin-a	131	124	P/P	40 - 150
2325533	Cylindrospermopsin	104	106	P/P	40 - 150
2325533	Desmethyl microcystin LR	105	105	P/P	40 - 150
2325533	Microcystin HiLR	101	95.7	P/P	40 - 150
2325533	Microcystin HtyR	98.4	98.3	P/P	40 - 150
2325533	Microcystin LA	98.5	98.7	P/P	40 - 150
2325533	Microcystin LF	131	116	P/P	40 - 150
2325533	Microcystin LR	114	111	P/P	40 - 150
2325533	Microcystin LW	105	107	P/P	40 - 150
2325533	Microcystin LY	113	124	P/P	40 - 150
2325533	Microcystin RR	101	98.2	P/P	40 - 150
2325533	Microcystin WR	93.4	91.5	P/P	40 - 150
2325533	Microcystin YR	105	106	P/P	40 - 150
2325533	Nodularin-R	101	98.2	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P413766

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325164	Ammonia-N	0.863	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P414005

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324748	Kjeldahl Nitrogen	4.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P413861

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325534	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P413896

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325438	Total-P	1.88	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P413653

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325809	O-Phosphate-P	0.201	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P413727

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325533	Anatoxin-a	5.80	Spike	P	0 - 30
2325533	Cylindrospermopsin	1.98	Spike	P	0 - 30
2325533	Desmethyl microcystin LR	0.00285	Spike	P	0 - 30
2325533	Microcystin H1LR	5.04	Spike	P	0 - 30
2325533	Microcystin HtyR	0.129	Spike	P	0 - 30
2325533	Microcystin LA	0.188	Spike	P	0 - 30
2325533	Microcystin LF	12.5	Spike	P	0 - 30
2325533	Microcystin LR	2.76	Spike	P	0 - 30
2325533	Microcystin LW	2.15	Spike	P	0 - 30
2325533	Microcystin LY	9.25	Spike	P	0 - 30
2325533	Microcystin RR	2.77	Spike	P	0 - 30
2325533	Microcystin WR	2.06	Spike	P	0 - 30
2325533	Microcystin YR	0.867	Spike	P	0 - 30
2325533	Nodularin-R	2.66	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: 2325533
Field Sample ID: HABCE0105_TigerLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	116	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A112038

Included Lab Sample IDs: 2325535

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112099

Included Lab Sample IDs: 2325534

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	97.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A112108

Included Lab Sample IDs: 2325533

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	128	129	P/P	50 - 160
Cylindrospermopsin	105	113	P/P	50 - 160
Desmethyl microcystin LR	88.5	99.7	P/P	50 - 160
Microcystin HILR	99.2	98.8	P/P	50 - 160
Microcystin HtyR	97.3	97.9	P/P	50 - 160
Microcystin LA	99.9	123	P/P	50 - 160
Microcystin LF	141	113	P/P	50 - 160
Microcystin LR	114	110	P/P	50 - 160
Microcystin LW	113	119	P/P	50 - 160
Microcystin LY	136	140	P/P	50 - 160
Microcystin RR	105	110	P/P	50 - 160
Microcystin WR	92.1	99.2	P/P	50 - 160
Microcystin YR	103	99.8	P/P	50 - 160
Nodularin-R	96.9	105	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112168

Included Lab Sample IDs: 2325534

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112260

Included Lab Sample IDs: 2325534

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	101	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	93.6	97.6	96.6			0.863
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.1	96.4	105			4.44
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	97.0	97.0			0.0
EPA 365.1 Rev. 2.0	Total-P	99.5	103	105			1.88
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	99.4	99.6			0.201
EPA 8321B	Anatoxin-a	118	131	124			5.80
	Cylindrospermopsin	110	104	106			1.98
	Desmethyl microcystin LR	93.1	105	105			0.0028
	Microcystin HiLR	94.8	101	95.7			5.04
	Microcystin HtyR	95.9	98.4	98.3			0.129
	Microcystin LA	103	98.5	98.7			0.188
	Microcystin LF	124	131	116			12.5
	Microcystin LR	100	114	111			2.76
	Microcystin LW	115	105	107			2.15
	Microcystin LY	122	113	124			9.25
	Microcystin RR	106	101	98.2			2.77
	Microcystin WR	90.2	93.4	91.5			2.06
	Microcystin YR	100	105	106			0.867
	Nodularin-R	98.6	101	98.2			2.66

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2325534
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2325534
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2325534
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2325534
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2325535
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2325533

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	05/10/2022			05/12/2022 11:20	Ping Hua	2325534
EPA 351.2 Rev. 2.0	05/10/2022	05/19/2022 15:12	Samantha L Bates	05/20/2022 13:42	Samantha L Bates	2325534
EPA 353.2 Rev. 2.0	05/10/2022			05/13/2022 17:04	Nathaniel J Jones	2325534
EPA 365.1 Rev. 2.0	05/10/2022	05/17/2022 14:42	Simonne.V. Calhoun	05/18/2022 19:45	Sarah A Nixon	2325534
EPA 365.1 Rev. 2.0 dissolved	05/10/2022			05/10/2022 16:12	Nathaniel J Jones	2325535
EPA 8321B	05/10/2022	05/12/2022 08:30	Manjita Shrestha	05/12/2022 11:01	Manjita Shrestha	2325533