

Chemical Analysis Report

WQAP-2021-08-18-02

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-2021-06-28-06**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Date Certified: 13-SEP-2021 10:33



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 Lorraine -West

Collection Date/Time: 08/17/2021 09:30

Field ID: HABCE0091_Lake Lorraine

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2269990	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P402549	
		Cylindrospermopsin	0.10	U	ug/L	P402549	
		Desmethyl microcystin LR	0.25	U	ug/L	P402549	
		Microcystin HIR**	0.25	U	ug/L	P402549	
		Microcystin HtyR**	0.25	U	ug/L	P402549	
		Microcystin LA	0.10	U	ug/L	P402549	
		Microcystin LF	0.10	U	ug/L	P402549	
		Microcystin LR	0.83	I	ug/L	P402549	
		Microcystin LW	0.25	U	ug/L	P402549	
		Microcystin LY	0.10	U	ug/L	P402549	
		Microcystin RR	0.10	U	ug/L	P402549	
		Microcystin WR	0.50	U	ug/L	P402549	
		Microcystin YR	0.25	U	ug/L	P402549	
		Nodularin-R**	0.10	U	ug/L	P402549	
2269991	EPA 350.1 Rev. 2.0	Ammonia-N	0.085		mg N/L	P402877	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P403352	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.01	I	mg N/L	P402811	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P402924	
2269992	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P402649	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402877

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403352

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402811

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402924

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402649

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

Reference Method: EPA 8321B
Batch ID: P402549

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: P402877

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403352

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402811

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402924

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402649

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.0		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P402549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	101		P	40 - 150
Cylindrospermopsin	86.8		P	40 - 150
Desmethyl microcystin LR	111		P	40 - 150
Microcystin HIR	118		P	40 - 150
Microcystin HtyR	114		P	40 - 150
Microcystin LA	111		P	40 - 150
Microcystin LF	120		P	40 - 150
Microcystin LR	111		P	40 - 150
Microcystin LW	128		P	40 - 150
Microcystin LY	120		P	40 - 150
Microcystin RR	106		P	40 - 150
Microcystin WR	114		P	40 - 150
Microcystin YR	108		P	40 - 150
Nodularin-R	104		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402877

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269927	Ammonia-N	92.6	92.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403352

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272419	Kjeldahl Nitrogen	101	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402811

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269943	NO2NO3-N	96.2	96.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402924

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269998	Total-P	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402649

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269899	O-Phosphate-P	96.3	97.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P402549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2269751	Anatoxin-a	94.8	99.1	P/P	40 - 150
2269751	Cylindrospermopsin	81.7	82.2	P/P	40 - 150
2269751	Desmethyl microcystin LR	110	112	P/P	40 - 150
2269751	Microcystin HiLR	102	114	P/P	40 - 150
2269751	Microcystin HtyR	108	110	P/P	40 - 150
2269751	Microcystin LA	111	116	P/P	40 - 150
2269751	Microcystin LF	96.0	99.7	P/P	40 - 150
2269751	Microcystin LR	104	109	P/P	40 - 150
2269751	Microcystin LW	95.7	104	P/P	40 - 150
2269751	Microcystin LY	110	113	P/P	40 - 150
2269751	Microcystin RR	97.9	103	P/P	40 - 150
2269751	Microcystin WR	106	114	P/P	40 - 150
2269751	Microcystin YR	102	103	P/P	40 - 150
2269751	Nodularin-R	95.5	104	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P402877

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269927	Ammonia-N	0.156	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P403352

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272419	Kjeldahl Nitrogen	1.87	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P402811

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269943	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P402924

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269998	Total-P	0.182	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P402649

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269899	O-Phosphate-P	0.827	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P402549

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2269751	Anatoxin-a	4.46	Spike	P	0 - 30
2269751	Cylindrospermopsin	0.626	Spike	P	0 - 30
2269751	Desmethyl microcystin LR	2.01	Spike	P	0 - 30
2269751	Microcystin HtIR	11.0	Spike	P	0 - 30
2269751	Microcystin HtyR	1.55	Spike	P	0 - 30
2269751	Microcystin LA	4.94	Spike	P	0 - 30
2269751	Microcystin LF	3.78	Spike	P	0 - 30
2269751	Microcystin LR	4.81	Spike	P	0 - 30
2269751	Microcystin LW	8.57	Spike	P	0 - 30
2269751	Microcystin LY	2.38	Spike	P	0 - 30
2269751	Microcystin RR	5.10	Spike	P	0 - 30
2269751	Microcystin WR	6.92	Spike	P	0 - 30
2269751	Microcystin YR	0.969	Spike	P	0 - 30
2269751	Nodularin-R	8.46	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: 2269990

Field Sample ID: HABCE0091_Lake Lorraine

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	126	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	131	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A107318

Included Lab Sample IDs: 2269992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.6	97.2	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A107346

Included Lab Sample IDs: 2269990

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	95.8	104	P/P	50 - 160
Cylindrospermopsin	89.8	95.6	P/P	60 - 160
Desmethyl microcystin LR	107	134	P/P	60 - 160
Microcystin HIR	101	139	P/P	60 - 160
Microcystin HtyR	99.9	138	P/P	60 - 160
Microcystin LA	122	147	P/P	50 - 160
Microcystin LF	96.6	125	P/P	60 - 160
Microcystin LR	97.4	127	P/P	60 - 160
Microcystin LW	123	150	P/P	60 - 160
Microcystin LY	104	133	P/P	60 - 160
Microcystin RR	104	111	P/P	60 - 160
Microcystin WR	102	147	P/P	60 - 160
Microcystin YR	100	112	P/P	60 - 160
Nodularin-R	102	114	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107385

Included Lab Sample IDs: 2269991

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107428

Included Lab Sample IDs: 2269991

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107485

Included Lab Sample IDs: 2269991

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107660

Included Lab Sample IDs: 2269991

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.3	98.7	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	95.2	92.6	92.8			0.156
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.0	101	105			1.87
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.0	96.2	96.6			0.482
EPA 365.1 Rev. 2.0	Total-P	107	107	107			0.182
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.0	96.3	97.1			0.827
EPA 8321B	Anatoxin-a	101	94.8	99.1			4.46
	Cylindrospermopsin	86.8	81.7	82.2			0.626
	Desmethyl microcystin LR	111	110	112			2.01
	Microcystin HiLR	118	102	114			11.0
	Microcystin HtyR	114	108	110			1.55
	Microcystin LA	111	111	116			4.94
	Microcystin LF	120	96.0	99.7			3.78
	Microcystin LR	111	104	109			4.81
	Microcystin LW	128	95.7	104			8.57
	Microcystin LY	120	110	113			2.38
	Microcystin RR	106	97.9	103			5.10
	Microcystin WR	114	106	114			6.92
	Microcystin YR	108	102	103			0.969
	Nodularin-R	104	95.5	104			8.46

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2269991
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2269991
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2269991
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2269991
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2269992
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2269990

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	08/18/2021			08/24/2021 12:31	Roberta Tatti	2269991
EPA 351.2 Rev. 2.0	08/18/2021	09/03/2021 17:03	Benjamin T. Nordmann	09/07/2021 09:42	Alexandra J Mattheus	2269991
EPA 353.2 Rev. 2.0	08/18/2021			08/23/2021 09:53	Beverly Y. Sanders	2269991
EPA 365.1 Rev. 2.0	08/18/2021	08/25/2021 14:45	Simonne.V. Calhoun	08/26/2021 15:04	Shengyu Ding	2269991
EPA 365.1 Rev. 2.0 dissolved	08/18/2021			08/18/2021 13:01	Patrick M. Roche	2269992
EPA 8321B	08/18/2021	08/19/2021 11:00	Pramila Ghimire	08/19/2021 17:25	Pramila Ghimire	2269990