Chemical Analysis Report

WQAP-2021-04-29-02

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-2021-04-26-62**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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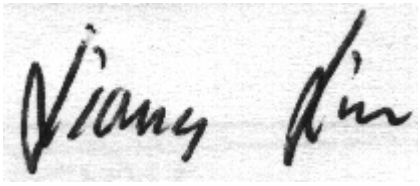
Date Certified: 18-MAY-2021 13:30



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 Eustis @ NW Corner **Collection Date/Time: 04/28/2021 11:58**

Field ID: HABCE0075_LakeEustis Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2243726	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P397378	
		Cylindrospermopsin	0.25	U	ug/L	P397378	
		Desmethyl microcystin LR	0.25	U	ug/L	P397378	
		Microcystin HilR**	0.25	U	ug/L	P397378	
		Microcystin HtyR**	0.25	U	ug/L	P397378	
		Microcystin LA	0.25	U	ug/L	P397378	
		Microcystin LF	0.25	U	ug/L	P397378	
		Microcystin LR	0.25	U	ug/L	P397378	
		Microcystin LW	0.25	U	ug/L	P397378	
		Microcystin LY	0.25	U	ug/L	P397378	
		Microcystin RR	0.25	U	ug/L	P397378	
		Microcystin WR	0.50	U	ug/L	P397378	
		Microcystin YR	0.25	U	ug/L	P397378	
		Nodularin-R**	0.25	U	ug/L	P397378	
2243727	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P398133	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P397759	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P397640	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P397676	
2243728	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P397421	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398133

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397759

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397640

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397676

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397421

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

Reference Method: EPA 8321B
Batch ID: P397378

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398133

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397759

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397640

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: P397676

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: P397421

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.4		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P397378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	116		P	40 - 150
Cylindrospermopsin	109		P	40 - 150
Desmethyl microcystin LR	94.2		P	40 - 150
Microcystin HilR	85.8		P	40 - 150
Microcystin HtyR	92.8		P	40 - 150
Microcystin LA	101		P	40 - 150
Microcystin LF	94.7		P	40 - 150
Microcystin LR	90.9		P	40 - 150
Microcystin LW	93.4		P	40 - 150
Microcystin LY	90.6		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	95.3		P	40 - 150
Microcystin YR	91.6		P	40 - 150
Nodularin-R	90.5		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243618	Ammonia-N	93.2	93.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243638	Kjeldahl Nitrogen	115	107	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397640

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243727	NO2NO3-N	93.5	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243689	Total-P	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397421

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243728	O-Phosphate-P	93.4	94.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P397378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243662	Anatoxin-a	114	119	P/P	40 - 150
2243662	Cylindrospermopsin	97.1	96.7	P/P	40 - 150
2243662	Desmethyl microcystin LR	93.0	92.1	P/P	40 - 150
2243662	Microcystin HilR	97.1	95.1	P/P	40 - 150
2243662	Microcystin HtyR	92.5	89.2	P/P	40 - 150
2243662	Microcystin LA	93.0	98.7	P/P	40 - 150
2243662	Microcystin LF	81.7	88.0	P/P	40 - 150
2243662	Microcystin LR	87.1	89.7	P/P	40 - 150
2243662	Microcystin LW	90.1	92.6	P/P	40 - 150
2243662	Microcystin LY	87.6	89.6	P/P	40 - 150
2243662	Microcystin RR	102	101	P/P	40 - 150
2243662	Microcystin WR	89.1	92.6	P/P	40 - 150
2243662	Microcystin YR	91.1	93.0	P/P	40 - 150
2243662	Nodularin-R	98.5	96.7	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243618	Ammonia-N	0.421	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243638	Kjeldahl Nitrogen	5.03	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243727	NO2NO3-N	0.519	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243689	Total-P	0.341	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243728	O-Phosphate-P	1.28	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P397378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243662	Anatoxin-a	3.92	Spike	P	0 - 30
2243662	Cylindrospermopsin	0.410	Spike	P	0 - 30
2243662	Desmethyl microcystin LR	0.915	Spike	P	0 - 30
2243662	Microcystin HilR	2.06	Spike	P	0 - 30
2243662	Microcystin HtyR	3.71	Spike	P	0 - 30
2243662	Microcystin LA	5.90	Spike	P	0 - 30
2243662	Microcystin LF	7.40	Spike	P	0 - 30
2243662	Microcystin LR	3.04	Spike	P	0 - 30
2243662	Microcystin LW	2.64	Spike	P	0 - 30
2243662	Microcystin LY	2.21	Spike	P	0 - 30
2243662	Microcystin RR	0.424	Spike	P	0 - 30
2243662	Microcystin WR	3.85	Spike	P	0 - 30
2243662	Microcystin YR	2.05	Spike	P	0 - 30
2243662	Nodularin-R	1.87	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: 2243726
Field Sample ID: HABCE0075_LakeEustis

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	97.7	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	77.5	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105087
Included Lab Sample IDs: 2243728

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

Reference Method: EPA 8321B
Run ID: A105092
Included Lab Sample IDs: 2243726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	86.8	86.8	P/P	50 - 160
Cylindrospermopsin	103	104	P/P	50 - 160
Desmethyl microcystin LR	89.7	87.0	P/P	50 - 160
Microcystin HilR	90.1	88.4	P/P	50 - 160
Microcystin HtyR	88.8	84.5	P/P	50 - 160
Microcystin LA	97.0	96.3	P/P	50 - 160
Microcystin LF	90.2	85.2	P/P	50 - 160
Microcystin LR	86.0	81.1	P/P	50 - 160
Microcystin LW	97.3	88.8	P/P	50 - 160
Microcystin LY	99.2	94.9	P/P	50 - 160
Microcystin RR	96.9	96.8	P/P	50 - 160
Microcystin WR	84.4	89.9	P/P	50 - 160
Microcystin YR	89.2	85.0	P/P	50 - 160
Nodularin-R	92.4	88.2	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105164
Included Lab Sample IDs: 2243727

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105214
Included Lab Sample IDs: 2243727

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105283
Included Lab Sample IDs: 2243727

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.2	93.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105402
Included Lab Sample IDs: 2243727

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.0	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	100	93.2	93.8			0.421
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	115	107			5.03
EPA 353.2 Rev. 2.0	NO2NO3-N	97.0	93.5	94.0			0.519
EPA 365.1 Rev. 2.0	Total-P	107	108	108			0.341
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	93.4	94.6			1.28
EPA 8321B	Anatoxin-a	116	114	119			3.92
	Cylindrospermopsin	109	97.1	96.7			0.410
	Desmethyl microcystin LR	94.2	93.0	92.1			0.915
	Microcystin HilR	85.8	97.1	95.1			2.06
	Microcystin HtyR	92.8	92.5	89.2			3.71
	Microcystin LA	101	93.0	98.7			5.90
	Microcystin LF	94.7	81.7	88.0			7.40
	Microcystin LR	90.9	87.1	89.7			3.04
	Microcystin LW	93.4	90.1	92.6			2.64
	Microcystin LY	90.6	87.6	89.6			2.21
	Microcystin RR	101	102	101			0.424
	Microcystin WR	95.3	89.1	92.6			3.85
	Microcystin YR	91.6	91.1	93.0			2.05
	Nodularin-R	90.5	98.5	96.7			1.87

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2243727
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2243727
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2243727
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2243727
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2243728
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2243726

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	04/29/2021			05/12/2021 14:01	Julia Storbeck	2243727
EPA 351.2 Rev. 2.0	04/29/2021	05/06/2021 13:48	Benjamin T. Nordmann	05/07/2021 17:25	Virginia P. Brown	2243727
EPA 353.2 Rev. 2.0	04/29/2021			05/04/2021 11:36	Beverly Y. Sanders	2243727
EPA 365.1 Rev. 2.0	04/29/2021	05/05/2021 14:05	Yen Ta	05/06/2021 10:56	Shengyu Ding	2243727
EPA 365.1 Rev. 2.0 dissolved	04/29/2021			04/29/2021 14:26	Blanca Fach	2243728
EPA 8321B	04/29/2021	04/29/2021 11:00	Pramila Ghimire	04/29/2021 13:35	Pramila Ghimire	2243726