

Chemical Analysis Report

WQAP-2021-11-04-01

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

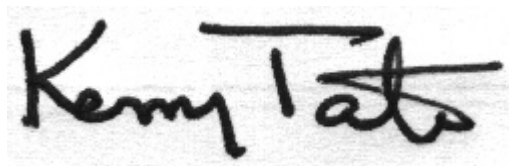
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-10-25-53**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd. Suite 232
Orlando, FL 32803
Attn: Matt Bearden

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 23-NOV-2021 13:04

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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 Haines - Four Lakes Dock

Collection Date/Time: 11/03/2021 11:30

Field ID: HABCE0078_Lake Haines

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2288210	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P405989	
		Cylindrospermopsin	0.10	U	ug/L	P405989	
		Desmethyl microcystin LR	0.25	U	ug/L	P405989	
		Microcystin HIR**	0.25	U	ug/L	P405989	
		Microcystin HtyR**	0.25	U	ug/L	P405989	
		Microcystin LA	0.10	U	ug/L	P405989	
		Microcystin LF	0.10	U	ug/L	P405989	
		Microcystin LR	0.25	U	ug/L	P405989	
		Microcystin LW	0.25	U	ug/L	P405989	
		Microcystin LY	0.10	U	ug/L	P405989	
		Microcystin RR	0.10	U	ug/L	P405989	
		Microcystin WR	0.50	U	ug/L	P405989	
		Microcystin YR	0.25	U	ug/L	P405989	
		Nodularin-R**	0.10	U	ug/L	P405989	
2288211	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P406535	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P406326	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P406130	
	EPA 365.1 Rev. 2.0	Total-P	0.053		mg P/L	P406138	
2288212	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P406022	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406535

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406326

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406130

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406138

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406022

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

Reference Method: EPA 8321B
Batch ID: P405989

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: P406535

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406326

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406130

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406138

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406022

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.0		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P405989

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	106		P	40 - 150
Cylindrospermopsin	106		P	40 - 150
Desmethyl microcystin LR	95.8		P	40 - 150
Microcystin HIR	94.9		P	40 - 150
Microcystin HtyR	100		P	40 - 150
Microcystin LA	110		P	40 - 150
Microcystin LF	108		P	40 - 150
Microcystin LR	88.1		P	40 - 150
Microcystin LW	107		P	40 - 150
Microcystin LY	112		P	40 - 150
Microcystin RR	97.6		P	40 - 150
Microcystin WR	98.6		P	40 - 150
Microcystin YR	103		P	40 - 150
Nodularin-R	100		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P406535

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2288313	Ammonia-N	97.0	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P406326

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2288150	Kjeldahl Nitrogen	99.4	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P406130

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2288150	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P406138

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2288211	Total-P	102	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P406022

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2288350	O-Phosphate-P	90.5	92.1	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P405989

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2288099	Anatoxin-a	116	113	P/P	40 - 150
2288099	Cylindrospermopsin	105	109	P/P	40 - 150
2288099	Desmethyl microcystin LR	92.2	105	P/P	40 - 150
2288099	Microcystin HiLR	103	107	P/P	40 - 150
2288099	Microcystin HtyR	96.5	105	P/P	40 - 150
2288099	Microcystin LA	107	114	P/P	40 - 150
2288099	Microcystin LF	116	132	P/P	40 - 150
2288099	Microcystin LR	92.8	107	P/P	40 - 150
2288099	Microcystin LW	110	119	P/P	40 - 150
2288099	Microcystin LY	111	122	P/P	40 - 150
2288099	Microcystin RR	97.4	106	P/P	40 - 150
2288099	Microcystin WR	89.4	101	P/P	40 - 150
2288099	Microcystin YR	104	106	P/P	40 - 150
2288099	Nodularin-R	107	112	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P406535

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288313	Ammonia-N	0.955	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P406326

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288150	Kjeldahl Nitrogen	0.0938	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P406130

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288150	NO2NO3-N	0.943	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P406138

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288211	Total-P	2.82	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P406022

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288350	O-Phosphate-P	1.57	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P405989

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288099	Anatoxin-a	2.38	Spike	P	0 - 30
2288099	Cylindrospermopsin	3.74	Spike	P	0 - 30
2288099	Desmethyl microcystin LR	12.9	Spike	P	0 - 30
2288099	Microcystin HtIR	3.86	Spike	P	0 - 30
2288099	Microcystin HtyR	8.75	Spike	P	0 - 30
2288099	Microcystin LA	6.46	Spike	P	0 - 30
2288099	Microcystin LF	12.8	Spike	P	0 - 30
2288099	Microcystin LR	13.8	Spike	P	0 - 30
2288099	Microcystin LW	7.54	Spike	P	0 - 30
2288099	Microcystin LY	9.83	Spike	P	0 - 30
2288099	Microcystin RR	7.97	Spike	P	0 - 30
2288099	Microcystin WR	11.9	Spike	P	0 - 30
2288099	Microcystin YR	1.61	Spike	P	0 - 30
2288099	Nodularin-R	4.03	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: 2288210

Field Sample ID: HABCE0078_Lake Haines

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	110	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	95.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A108723

Included Lab Sample IDs: 2288212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	98.5	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A108727

Included Lab Sample IDs: 2288210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	128	127	P/P	50 - 160
Cylindrospermopsin	111	112	P/P	60 - 160
Desmethyl microcystin LR	106	112	P/P	60 - 160
Microcystin HIR	101	106	P/P	60 - 160
Microcystin HtyR	104	103	P/P	60 - 160
Microcystin LA	121	119	P/P	50 - 160
Microcystin LF	143	129	P/P	60 - 160
Microcystin LR	108	95.0	P/P	60 - 160
Microcystin LW	126	121	P/P	60 - 160
Microcystin LY	128	116	P/P	60 - 160
Microcystin RR	107	105	P/P	60 - 160
Microcystin WR	98.1	101	P/P	60 - 160
Microcystin YR	103	103	P/P	60 - 160
Nodularin-R	112	105	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108779

Included Lab Sample IDs: 2288211

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108896

Included Lab Sample IDs: 2288211

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108930

Included Lab Sample IDs: 2288211

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108981

Included Lab Sample IDs: 2288211

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	100	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	98.8	97.0	98.0			0.955
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	99.4	99.3			0.0938
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	104	103			0.943
EPA 365.1 Rev. 2.0	Total-P	102	102	106			2.82
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.0	90.5	92.1			1.57
EPA 8321B	Anatoxin-a	106	116	113			2.38
	Cylindrospermopsin	106	105	109			3.74
	Desmethyl microcystin LR	95.8	92.2	105			12.9
	Microcystin HiLR	94.9	103	107			3.86
	Microcystin HtyR	100	96.5	105			8.75
	Microcystin LA	110	107	114			6.46
	Microcystin LF	108	116	132			12.8
	Microcystin LR	88.1	92.8	107			13.8
	Microcystin LW	107	110	119			7.54
	Microcystin LY	112	111	122			9.83
	Microcystin RR	97.6	97.4	106			7.97
	Microcystin WR	98.6	89.4	101			11.9
	Microcystin YR	103	104	106			1.61
	Nodularin-R	100	107	112			4.03

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2288211
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2288211
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2288211
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2288211
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2288212
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2288210

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	11/04/2021			11/18/2021 14:43	Ping Hua	2288211
EPA 351.2 Rev. 2.0	11/04/2021	11/15/2021 12:43	Benjamin T. Nordmann	11/16/2021 12:40	Alexandra J Mattheus	2288211
EPA 353.2 Rev. 2.0	11/04/2021			11/08/2021 12:59	Beverly Y. Sanders	2288211
EPA 365.1 Rev. 2.0	11/04/2021	11/08/2021 16:19	Simonne.V. Calhoun	11/10/2021 19:19	Sarah A Nixon	2288211
EPA 365.1 Rev. 2.0 dissolved	11/04/2021			11/04/2021 14:57	James L Waggerby	2288212
EPA 8321B	11/04/2021	11/04/2021 11:00	Manjita Shrestha	11/04/2021 14:12	Manjita Shrestha	2288210