Chemical Analysis Report

WQAP-2021-05-13-01

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-2021-05-10-65**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 01-JUN-2021 09:56

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: Little Lake Conway - off FOP Lodge Dock **Collection Date/Time: 05/12/2021 11:02**

Field ID: HABCE0083_LittleLakeConway Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2247232	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P398048	
		Cylindrospermopsin	0.10	U	ug/L	P398048	
		Desmethyl microcystin LR	0.25	U	ug/L	P398048	
		Microcystin HilR**	0.25	U	ug/L	P398048	
		Microcystin HtyR**	0.25	U	ug/L	P398048	
		Microcystin LA	0.10	U	ug/L	P398048	
		Microcystin LF	0.10	U	ug/L	P398048	
		Microcystin LR	0.25	U	ug/L	P398048	
		Microcystin LW	0.25	U	ug/L	P398048	
		Microcystin LY	0.10	U	ug/L	P398048	
		Microcystin RR	0.10	U	ug/L	P398048	
		Microcystin WR	0.50	U	ug/L	P398048	
		Microcystin YR	0.25	U	ug/L	P398048	
		Nodularin-R**	0.10	U	ug/L	P398048	
2247234	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P398596	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P398245	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P398198	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P398285	
2247236	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P398141	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Rowena - 0.1 mile from Mills Ave **Collection Date/Time: 05/12/2021 09:40**

Field ID: HABORL0001_LakeRowena Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2247233	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P398048	
		Cylindrospermopsin	0.74		ug/L	P398048	
		Desmethyl microcystin LR	0.25	U	ug/L	P398048	
		Microcystin HilR**	0.25	U	ug/L	P398048	
		Microcystin HtyR**	0.25	U	ug/L	P398048	
		Microcystin LA	0.10	U	ug/L	P398048	
		Microcystin LF	0.10	U	ug/L	P398048	
		Microcystin LR	0.25	U	ug/L	P398048	
		Microcystin LW	0.25	U	ug/L	P398048	
		Microcystin LY	0.10	U	ug/L	P398048	
		Microcystin RR	0.10	U	ug/L	P398048	
		Microcystin WR	0.50	U	ug/L	P398048	
		Microcystin YR	0.25	U	ug/L	P398048	
		Nodularin-R**	0.10	U	ug/L	P398048	
2247235	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P398596	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P398245	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P398198	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P398285	
2247237	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P398141	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398596

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398245

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398198

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398285

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398141

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

Reference Method: EPA 8321B
Batch ID: P398048

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 HilR	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: P398596

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398198

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398285

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: P398141

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.4		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P398048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	147		P	40 - 150
Cylindrospermopsin	121		P	40 - 150
Desmethyl microcystin LR	114		P	40 - 150
Microcystin HilR	121		P	40 - 150
Microcystin HtyR	114		P	40 - 150
Microcystin LA	126		P	40 - 150
Microcystin LF	140		P	40 - 150
Microcystin LR	104		P	40 - 150
Microcystin LW	135		P	40 - 150
Microcystin LY	125		P	40 - 150
Microcystin RR	125		P	40 - 150
Microcystin WR	120		P	40 - 150
Microcystin YR	119		P	40 - 150
Nodularin-R	123		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398596

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247192	Ammonia-N	96.8	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398198

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247130	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246479	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247236	O-Phosphate-P	97.5	95.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P398048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246435	Anatoxin-a	141	136	P/P	40 - 150
2246435	Cylindrospermopsin	115	112	P/P	40 - 150
2246435	Desmethyl microcystin LR	116	115	P/P	40 - 150
2246435	Microcystin HilR	125	122	P/P	40 - 150
2246435	Microcystin HtyR	120	111	P/P	40 - 150
2246435	Microcystin LA	125	121	P/P	40 - 150
2246435	Microcystin LF	141	133	P/P	40 - 150
2246435	Microcystin LR	112	107	P/P	40 - 150
2246435	Microcystin LW	121	125	P/P	40 - 150
2246435	Microcystin LY	127	117	P/P	40 - 150
2246435	Microcystin RR	126	122	P/P	40 - 150
2246435	Microcystin WR	120	116	P/P	40 - 150
2246435	Microcystin YR	124	117	P/P	40 - 150
2246435	Nodularin-R	138	138	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398596

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247192	Ammonia-N	0.786	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246482	Kjeldahl Nitrogen	1.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398198

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247130	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246479	Total-P	0.777	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247236	O-Phosphate-P	1.65	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P398048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246435	Anatoxin-a	3.66	Spike	P	0 - 30
2246435	Cylindrospermopsin	2.82	Spike	P	0 - 30
2246435	Desmethyl microcystin LR	1.07	Spike	P	0 - 30
2246435	Microcystin HilR	2.68	Spike	P	0 - 30
2246435	Microcystin HtyR	7.89	Spike	P	0 - 30
2246435	Microcystin LA	2.88	Spike	P	0 - 30
2246435	Microcystin LF	5.80	Spike	P	0 - 30
2246435	Microcystin LR	4.21	Spike	P	0 - 30
2246435	Microcystin LW	3.41	Spike	P	0 - 30
2246435	Microcystin LY	7.78	Spike	P	0 - 30
2246435	Microcystin RR	3.03	Spike	P	0 - 30
2246435	Microcystin WR	3.37	Spike	P	0 - 30
2246435	Microcystin YR	5.72	Spike	P	0 - 30
2246435	Nodularin-R	0.250	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: 2247232
Field Sample ID: HABCE0083_LittleLakeConway

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	80.1	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	81.5	P	30 - 160

Lab Sample ID: 2247233
Field Sample ID: HABORL0001_LakeRowena

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	84.1	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	93.1	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105405
Included Lab Sample IDs: 2247236, 2247237

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.9	P/P	90 - 110
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A105411
Included Lab Sample IDs: 2247232, 2247233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	135	133	P/P	50 - 160
Cylindrospermopsin	119	126	P/P	50 - 160
Desmethyl microcystin LR	101	102	P/P	50 - 160
Microcystin HilR	103	106	P/P	50 - 160
Microcystin HtyR	106	106	P/P	50 - 160
Microcystin LA	122	124	P/P	50 - 160
Microcystin LF	119	115	P/P	50 - 160
Microcystin LR	94.0	93.7	P/P	50 - 160
Microcystin LW	127	124	P/P	50 - 160
Microcystin LY	119	119	P/P	50 - 160
Microcystin RR	116	120	P/P	50 - 160
Microcystin WR	105	98.7	P/P	50 - 160
Microcystin YR	102	104	P/P	50 - 160
Nodularin-R	115	119	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105426
Included Lab Sample IDs: 2247234, 2247235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	104	P/P	90 - 110
NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105465
Included Lab Sample IDs: 2247234, 2247235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	93.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105503
Included Lab Sample IDs: 2247234, 2247235

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105595
Included Lab Sample IDs: 2247234, 2247235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105595
Included Lab Sample IDs: 2247234, 2247235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	98.5	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		Precision		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	96.8	97.6			0.786
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.3					1.35
EPA 353.2 Rev. 2.0	NO2NO3-N	105	104	104			0.482
EPA 365.1 Rev. 2.0	Total-P	107	104	105			0.777
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.4	97.5	95.9			1.65
EPA 8321B	Anatoxin-a	147	141	136			3.66
	Cylindrospermopsin	121	115	112			2.82
	Desmethyl microcystin LR	114	116	115			1.07
	Microcystin HilR	121	125	122			2.68
	Microcystin HtyR	114	120	111			7.89
	Microcystin LA	126	125	121			2.88
	Microcystin LF	140	141	133			5.80
	Microcystin LR	104	112	107			4.21
	Microcystin LW	135	121	125			3.41
	Microcystin LY	125	127	117			7.78
	Microcystin RR	125	126	122			3.03
	Microcystin WR	120	120	116			3.37
	Microcystin YR	119	124	117			5.72
	Nodularin-R	123	138	138			0.250

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2247234, 2247235
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2247234, 2247235
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2247234, 2247235
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2247234, 2247235
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2247236, 2247237
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2247232, 2247233

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	05/13/2021			05/21/2021 12:05	Roberta Tatti	2247234
	05/13/2021			05/21/2021 12:06	Roberta Tatti	2247235
EPA 351.2 Rev. 2.0	05/13/2021	05/14/2021 17:30	Benjamin T. Nordmann	05/17/2021 11:22	Virginia P. Brown	2247234
	05/13/2021	05/14/2021 17:30	Benjamin T. Nordmann	05/17/2021 11:23	Virginia P. Brown	2247235
EPA 353.2 Rev. 2.0	05/13/2021			05/14/2021 09:22	Beverly Y. Sanders	2247235
	05/13/2021			05/14/2021 10:04	Beverly Y. Sanders	2247234
EPA 365.1 Rev. 2.0	05/13/2021	05/17/2021 13:26	Yen Ta	05/18/2021 12:05	Shengyu Ding	2247234
	05/13/2021	05/17/2021 13:26	Yen Ta	05/18/2021 12:13	Shengyu Ding	2247235
EPA 365.1 Rev. 2.0 dissolved	05/13/2021			05/13/2021 13:50	Blanca Fach	2247236
	05/13/2021			05/13/2021 13:57	Blanca Fach	2247237
EPA 8321B	05/13/2021	05/13/2021 11:30	Pramila Ghimire	05/13/2021 14:19	Pramila Ghimire	2247232
	05/13/2021	05/13/2021 11:30	Pramila Ghimire	05/13/2021 14:36	Pramila Ghimire	2247233