

Chemical Analysis Report

WQAP-2022-11-01-03

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-09-05-38**
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

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 15-NOV-2022 15:33

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: 10/31/2022 12:23

Field ID: HABCE0105_TigerLake

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2366232	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P421759	
		Cylindrospermopsin	0.10	U	ug/L	P421758	
		Desmethyl microcystin LR	0.25	U	ug/L	P421758	
		Microcystin HILR	0.25	U	ug/L	P421758	
		Microcystin HtyR	0.25	U	ug/L	P421758	
		Microcystin LA	0.10	U	ug/L	P421758	
		Microcystin LF	0.10	U	ug/L	P421758	
		Microcystin LR	0.25	U	ug/L	P421758	
		Microcystin LW	0.25	U	ug/L	P421758	
		Microcystin LY	0.10	U	ug/L	P421758	
		Microcystin RR	0.10	U	ug/L	P421758	
		Microcystin WR	0.50	U	ug/L	P421758	
		Microcystin YR	0.25	U	ug/L	P421758	
		Nodularin-R	0.10	U	ug/L	P421758	
2366233	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P422035	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P421877	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P421939	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P422073	
2366234	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.065		mg P/L	P421739	

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: P422035

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421877

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421939

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422073

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421739

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

Reference Method: EPA 8321B
Batch ID: P421758

Component	Result	Code	Units
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

Reference Method: EPA 8321B
Batch ID: P421759

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P422035

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421877

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P421939

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: P422073

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P421739

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

Reference Method: EPA 8321B

Batch ID: P421758

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	113		P	40 - 150
Desmethyl microcystin LR	116		P	40 - 150
Microcystin HILR	119		P	40 - 150
Microcystin HtyR	123		P	40 - 150
Microcystin LA	106		P	40 - 150
Microcystin LF	129		P	40 - 150
Microcystin LR	103		P	40 - 150
Microcystin LW	97.8		P	40 - 150
Microcystin LY	94.6		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	119		P	40 - 150
Microcystin YR	103		P	40 - 150
Nodularin-R	111		P	40 - 150

Reference Method: EPA 8321B

Batch ID: P421759

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	96.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366203	Ammonia-N	96.6	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366191	NO2NO3-N	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366218	Total-P	106	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P421739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366168	O-Phosphate-P	99.2	98.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P421758

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366202	Cylindrospermopsin	114	119	P/P	40 - 150
2366202	Desmethyl microcystin LR	140	141	P/P	40 - 150
2366202	Microcystin HilR	131	145	P/P	40 - 150
2366202	Microcystin HtyR	141	140	P/P	40 - 150
2366202	Microcystin LA	110	104	P/P	40 - 150
2366202	Microcystin LF	125	96.2	P/P	40 - 150
2366202	Microcystin LR	125	126	P/P	40 - 150
2366202	Microcystin LW	89.9	108	P/P	40 - 150
2366202	Microcystin LY	120	106	P/P	40 - 150
2366202	Microcystin RR	101	102	P/P	40 - 150
2366202	Microcystin WR	133	134	P/P	40 - 150
2366202	Microcystin YR	121	127	P/P	40 - 150
2366202	Nodularin-R	119	120	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P421759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2366202	Anatoxin-a	105	104	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P422035

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366203	Ammonia-N	1.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P421877

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366203	Kjeldahl Nitrogen	3.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P421939

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366191	NO2NO3-N	0.464	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P422073

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366218	Total-P	2.66	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P421739

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366168	O-Phosphate-P	0.407	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P421758

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366202	Cylindrospermopsin	4.68	Spike	P	0 - 30
2366202	Desmethyl microcystin LR	0.714	Spike	P	0 - 30
2366202	Microcystin H1LR	10.2	Spike	P	0 - 30
2366202	Microcystin HtyR	1.11	Spike	P	0 - 30
2366202	Microcystin LA	5.34	Spike	P	0 - 30
2366202	Microcystin LF	26.0	Spike	P	0 - 30
2366202	Microcystin LR	0.596	Spike	P	0 - 30
2366202	Microcystin LW	17.9	Spike	P	0 - 30
2366202	Microcystin LY	12.2	Spike	P	0 - 30
2366202	Microcystin RR	0.158	Spike	P	0 - 30
2366202	Microcystin WR	0.644	Spike	P	0 - 30
2366202	Microcystin YR	5.31	Spike	P	0 - 30
2366202	Nodularin-R	0.276	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P421759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366202	Anatoxin-a	1.30	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Surrogates

Lab Sample ID: 2366232

Field Sample ID: HABCE0105_TigerLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	107	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	85.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A115661

Included Lab Sample IDs: 2366234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.7	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A115734

Included Lab Sample IDs: 2366232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	116	120	P/P	50 - 160
Desmethyl microcystin LR	106	120	P/P	50 - 160
Microcystin HtR	117	122	P/P	50 - 160
Microcystin HtyR	118	130	P/P	50 - 160
Microcystin LA	85.2	108	P/P	50 - 160
Microcystin LF	98.1	101	P/P	50 - 160
Microcystin LR	99.1	97.6	P/P	50 - 160
Microcystin LW	102	109	P/P	50 - 160
Microcystin LY	95.6	97.8	P/P	50 - 160
Microcystin RR	99.6	104	P/P	50 - 160
Microcystin WR	114	129	P/P	50 - 160
Microcystin YR	104	98.0	P/P	50 - 160
Nodularin-R	110	111	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A115736

Included Lab Sample IDs: 2366232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.3	92.7	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A115752

Included Lab Sample IDs: 2366233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A115789

Included Lab Sample IDs: 2366233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A115808

Included Lab Sample IDs: 2366233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.0	92.4	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A115830

Included Lab Sample IDs: 2366233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.7	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	96.0	96.6	97.8			1.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104					3.33
EPA 353.2 Rev. 2.0	NO2NO3-N	104	108	108			0.464
EPA 365.1 Rev. 2.0	Total-P	106	106	109			2.66
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.2	98.6			0.407
EPA 8321B	Anatoxin-a	96.1	105	104			1.30
	Cylindrospermopsin	113	114	119			4.68
	Desmethyl microcystin LR	116	140	141			0.714
	Microcystin HiLR	119	131	145			10.2
	Microcystin HtyR	123	141	140			1.11
	Microcystin LA	106	110	104			5.34
	Microcystin LF	129	125	96.2			26.0
	Microcystin LR	103	125	126			0.596
	Microcystin LW	97.8	89.9	108			17.9
	Microcystin LY	94.6	120	106			12.2
	Microcystin RR	101	101	102			0.158
	Microcystin WR	119	133	134			0.644
	Microcystin YR	103	121	127			5.31
	Nodularin-R	111	119	120			0.276

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2366233
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2366233
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2366233
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2366233
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2366234
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2366232
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2366232

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	11/01/2022			11/07/2022 13:44	Ping Hua	2366233
EPA 351.2 Rev. 2.0	11/01/2022	11/04/2022 10:30	Simonne.V. Calhoun	11/08/2022 13:17	Samantha L Bates	2366233
EPA 353.2 Rev. 2.0	11/01/2022			11/04/2022 11:28	Beverly Y. Sanders	2366233
EPA 365.1 Rev. 2.0	11/01/2022	11/08/2022 13:18	Adam P Silver	11/09/2022 10:31	James L Waggeberby	2366233
EPA 365.1 Rev. 2.0 dissolved	11/01/2022			11/01/2022 16:05	Elise M. Gillis	2366234
EPA 8321B	11/01/2022	11/03/2022 08:00	Manjita Shrestha	11/03/2022 11:43	Manjita Shrestha	2366232
	11/01/2022	11/03/2022 13:00	Manjita Shrestha	11/03/2022 18:26	Manjita Shrestha	2366232