Chemical Analysis Report

WQAP-2023-05-10-04

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-04-24-31**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 19-MAY-2023 14:20

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 Ola - NE Shore **Collection Date/Time: 05/09/2023 13:26**

Field ID: HABCE0164_LakeOla Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2408180	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P429587	
		Cylindrospermopsin	0.10	U	ug/L	P429586	
		Desmethyl microcystin LR	0.25	U	ug/L	P429586	
		Microcystin HilR	0.25	U	ug/L	P429586	
		Microcystin HtyR	0.25	U	ug/L	P429586	
		Microcystin LA	0.10	U	ug/L	P429586	
		Microcystin LF	0.10	U	ug/L	P429586	
		Microcystin LR	0.25	U	ug/L	P429586	
		Microcystin LW	0.25	U	ug/L	P429586	
		Microcystin LY	0.10	U	ug/L	P429586	
		Microcystin RR	0.10	U	ug/L	P429586	
		Microcystin WR	0.50	U	ug/L	P429586	
		Neosaxitoxin	0.50	U	ug/L	P429587	
		Microcystin YR	0.25	U	ug/L	P429586	
		Saxitoxin	0.50	U	ug/L	P429587	
		Nodularin-R	0.10	U	ug/L	P429586	
2408225	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P429775	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P429952	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P429983	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P429802	
2408226	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P429685	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429775

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429952

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429983

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429802

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429685

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

Reference Method: EPA 8321B
Batch ID: P429586

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: P429587

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429983

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429802

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429685

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.1		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429586

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	91.4		P	40 - 150
Desmethyl microcystin LR	99.2		P	40 - 150
Microcystin HilR	97.9		P	40 - 150
Microcystin HtyR	101		P	40 - 150
Microcystin LA	102		P	40 - 150
Microcystin LF	97.5		P	40 - 150
Microcystin LR	93.6		P	40 - 150
Microcystin LW	93.4		P	40 - 150
Microcystin LY	84.6		P	40 - 150
Microcystin RR	98.5		P	40 - 150
Microcystin WR	95.4		P	40 - 150
Microcystin YR	104		P	40 - 150
Nodularin-R	94.3		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429587

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	95.6		P	40 - 150
Neosaxitoxin	77.3		P	40 - 150
Saxitoxin	80.2		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408159	Ammonia-N	98.6	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408313	Kjeldahl Nitrogen	98.4	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408159	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429802

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408225	Total-P	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429685

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2408226	O-Phosphate-P	96.8	97.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429586

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2407483	Cylindrospermopsin	62.5	59.3	P/P	40 - 150
2407483	Desmethyl microcystin LR	80.0	90.6	P/P	40 - 150
2407483	Microcystin HilR	84.4	87.2	P/P	40 - 150
2407483	Microcystin HtyR	83.0	93.2	P/P	40 - 150
2407483	Microcystin LA	94.8	87.9	P/P	40 - 150
2407483	Microcystin LF	67.2	71.8	P/P	40 - 150
2407483	Microcystin LR	77.5	82.5	P/P	40 - 150
2407483	Microcystin LW	58.9	74.1	P/P	40 - 150
2407483	Microcystin LY	83.5	92.2	P/P	40 - 150
2407483	Microcystin RR	87.1	92.5	P/P	40 - 150
2407483	Microcystin WR	74.7	82.9	P/P	40 - 150
2407483	Microcystin YR	91.7	91.2	P/P	40 - 150
2407483	Nodularin-R	83.4	90.2	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429587

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2407483	Anatoxin-a	63.4	65.9	P/P	40 - 150
2407483	Neosaxitoxin	40.2	40.6	P/P	40 - 150
2407483	Saxitoxin	40.4	42.9	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408159	Ammonia-N	0.793	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408313	Kjeldahl Nitrogen	6.12	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408159	NO2NO3-N	0.267	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429802

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408225	Total-P	0.234	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429685

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2408226	O-Phosphate-P	0.721	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P429586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2407483	Cylindrospermopsin	5.25	Spike	P	0 - 30
2407483	Desmethyl microcystin LR	12.5	Spike	P	0 - 30
2407483	Microcystin HilR	3.24	Spike	P	0 - 30
2407483	Microcystin HtyR	11.6	Spike	P	0 - 30
2407483	Microcystin LA	7.51	Spike	P	0 - 30
2407483	Microcystin LF	6.56	Spike	P	0 - 30
2407483	Microcystin LR	6.21	Spike	P	0 - 30
2407483	Microcystin LW	22.8	Spike	P	0 - 30
2407483	Microcystin LY	9.82	Spike	P	0 - 30
2407483	Microcystin RR	6.05	Spike	P	0 - 30
2407483	Microcystin WR	10.4	Spike	P	0 - 30
2407483	Microcystin YR	0.622	Spike	P	0 - 30
2407483	Nodularin-R	7.83	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P429587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2407483	Anatoxin-a	3.85	Spike	P	0 - 30
2407483	Neosaxitoxin	1.02	Spike	P	0 - 30
2407483	Saxitoxin	6.01	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2408180
Field Sample ID: HABCE0164_LakeOla

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	78.3	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	75.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A119074
Included Lab Sample IDs: 2408226

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	99.1	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A119079
Included Lab Sample IDs: 2408180

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.7	87.5	P/P	50 - 160
Neosaxitoxin	77.9	78.7	P/P	50 - 160
Saxitoxin	76.9	78.3	P/P	50 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A119099
Included Lab Sample IDs: 2408225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A119172
Included Lab Sample IDs: 2408225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A119221
Included Lab Sample IDs: 2408225

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A119245
Included Lab Sample IDs: 2408225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	99.2	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A119446
Included Lab Sample IDs: 2408180

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	88.6	95.2	P/P	50 - 160
Desmethyl microcystin LR	92.1	94.4	P/P	50 - 160
Microcystin HilR	93.2	97.9	P/P	50 - 160
Microcystin HtyR	84.2	92.1	P/P	50 - 160
Microcystin LA	104	106	P/P	50 - 160
Microcystin LF	78.4	81.8	P/P	50 - 160
Microcystin LR	81.7	94.1	P/P	50 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A119446
Included Lab Sample IDs: 2408180

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Microcystin LW	84.0	69.6	P/P	50 - 160
Microcystin LY	90.2	93.6	P/P	50 - 160
Microcystin RR	87.1	98.0	P/P	50 - 160
Microcystin WR	89.9	86.5	P/P	50 - 160
Microcystin YR	81.4	92.3	P/P	50 - 160
Nodularin-R	87.7	94.3	P/P	50 - 160

* 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	98.2	98.6	99.6			0.793
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	98.4	107			6.12
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	100			0.267
EPA 365.1 Rev. 2.0	Total-P	103	104	104			0.234
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	96.8	97.5			0.721
EPA 8321B	Anatoxin-a	95.6	63.4	65.9			3.85
	Cylindrospermopsin	91.4	62.5	59.3			5.25
	Desmethyl microcystin LR	99.2	80.0	90.6			12.5
	Microcystin HilR	97.9	84.4	87.2			3.24
	Microcystin HtyR	101	83.0	93.2			11.6
	Microcystin LA	102	94.8	87.9			7.51
	Microcystin LF	97.5	67.2	71.8			6.56
	Microcystin LR	93.6	77.5	82.5			6.21
	Microcystin LW	93.4	58.9	74.1			22.8
	Microcystin LY	84.6	83.5	92.2			9.82
	Microcystin RR	98.5	87.1	92.5			6.05
	Microcystin WR	95.4	74.7	82.9			10.4
	Microcystin YR	104	91.7	91.2			0.622
	Neosaxitoxin	77.3	40.2	40.6			1.02
	Nodularin-R	94.3	83.4	90.2			7.83
	Saxitoxin	80.2	40.4	42.9			6.01

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2408225
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2408225
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2408225
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2408225
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2408226
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2408180
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2408180

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	05/10/2023			05/11/2023 14:11	Khloe J Berg	2408225
EPA 351.2 Rev. 2.0	05/10/2023	05/17/2023 10:59	Dana G. Hughes	05/18/2023 10:03	Samantha L Bates	2408225
EPA 353.2 Rev. 2.0	05/10/2023			05/17/2023 10:57	Beverly Y. Sanders	2408225
EPA 365.1 Rev. 2.0	05/10/2023	05/12/2023 12:59	Adam P Silver	05/15/2023 15:05	James L Waggerby	2408225
EPA 365.1 Rev. 2.0 dissolved	05/10/2023			05/10/2023 15:15	Elise M. Gillis	2408226
EPA 8321B	05/10/2023	05/10/2023 13:00	Manjita Shrestha	05/10/2023 16:48	Manjita Shrestha	2408180
	05/10/2023	05/10/2023 13:00	Manjita Shrestha	05/11/2023 00:52	Manjita Shrestha	2408180