Chemical Analysis Report

WQAP-2023-04-21-02

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-04-10-44**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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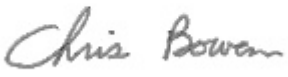
Date Certified: 09-MAY-2023 08:18



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: 04/20/2023 11:37**

Field ID: HABCE0164_LakeOla Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2402148	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P428757	
		Cylindrospermopsin	0.10	U	ug/L	P428756	
		Desmethyl microcystin LR	0.25	U	ug/L	P428756	
		Microcystin HilR	0.25	U	ug/L	P428756	
		Microcystin HtyR	0.25	U	ug/L	P428756	
		Microcystin LA	0.10	U	ug/L	P428756	
		Microcystin LF	0.10	U	ug/L	P428756	
		Microcystin LR	0.25	U	ug/L	P428756	
		Microcystin LW	0.25	U	ug/L	P428756	
		Microcystin LY	0.10	U	ug/L	P428756	
		Microcystin RR	0.10	U	ug/L	P428756	
		Microcystin WR	0.50	U	ug/L	P428756	
		Neosaxitoxin	0.50	U	ug/L	P428757	
		Microcystin YR	0.25	U	ug/L	P428756	
		Saxitoxin	0.50	U	ug/L	P428757	
		Nodularin-R	0.10	U	ug/L	P428756	
2402149	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P429097	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P429164	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P429199	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P428902	
2402150	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P428843	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429097

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429164

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429199

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428902

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428843

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

Reference Method: EPA 8321B
Batch ID: P428756

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: P428757

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: P429097

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429164

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: P429199

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: P428902

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428843

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

Reference Method: EPA 8321B
Batch ID: P428756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	104		P	40 - 150
Desmethyl microcystin LR	99.5		P	40 - 150
Microcystin HilR	104		P	40 - 150
Microcystin HtyR	96.2		P	40 - 150
Microcystin LA	88.0		P	40 - 150
Microcystin LF	72.4		P	40 - 150
Microcystin LR	104		P	40 - 150
Microcystin LW	75.1		P	40 - 150
Microcystin LY	93.7		P	40 - 150
Microcystin RR	99.2		P	40 - 150
Microcystin WR	102		P	40 - 150
Microcystin YR	96.5		P	40 - 150
Nodularin-R	94.2		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P428757

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	126		P	40 - 150
Neosaxitoxin	128		P	40 - 150
Saxitoxin	116		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402101	Ammonia-N	97.0	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429164

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402149	Kjeldahl Nitrogen	106	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429199

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402112	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402161	Total-P	101	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428843

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2401998	O-Phosphate-P	98.8	99.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P428756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2401900	Cylindrospermopsin	105	110	P/P	40 - 150
2401900	Desmethyl microcystin LR	112	117	P/P	40 - 150
2401900	Microcystin HilR	112	110	P/P	40 - 150
2401900	Microcystin HtyR	105	111	P/P	40 - 150
2401900	Microcystin LA	78.7	96.5	P/P	40 - 150
2401900	Microcystin LF	65.1	76.4	P/P	40 - 150
2401900	Microcystin LR	113	127	P/P	40 - 150
2401900	Microcystin LW	81.3	82.7	P/P	40 - 150
2401900	Microcystin LY	76.1	98.7	P/P	40 - 150
2401900	Microcystin RR	101	107	P/P	40 - 150
2401900	Microcystin WR	110	118	P/P	40 - 150
2401900	Microcystin YR	103	107	P/P	40 - 150
2401900	Nodularin-R	103	103	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P428757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2401900	Anatoxin-a	115	116	P/P	40 - 150
2401900	Neosaxitoxin	84.2	84.2	P/P	40 - 150
2401900	Saxitoxin	79.2	80.1	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402101	Ammonia-N	2.12	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429164

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402149	Kjeldahl Nitrogen	0.368	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429199

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402112	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402161	Total-P	1.86	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2401998	O-Phosphate-P	0.247	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P428756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2401900	Cylindrospermopsin	4.05	Spike	P	0 - 30
2401900	Desmethyl microcystin LR	4.02	Spike	P	0 - 30
2401900	Microcystin HilR	2.11	Spike	P	0 - 30
2401900	Microcystin HtyR	5.65	Spike	P	0 - 30
2401900	Microcystin LA	20.4	Spike	P	0 - 30
2401900	Microcystin LF	15.9	Spike	P	0 - 30
2401900	Microcystin LR	11.9	Spike	P	0 - 30
2401900	Microcystin LW	1.67	Spike	P	0 - 30
2401900	Microcystin LY	25.8	Spike	P	0 - 30
2401900	Microcystin RR	5.42	Spike	P	0 - 30
2401900	Microcystin WR	7.15	Spike	P	0 - 30
2401900	Microcystin YR	4.22	Spike	P	0 - 30
2401900	Nodularin-R	0.158	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P428757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2401900	Anatoxin-a	1.09	Spike	P	0 - 30
2401900	Neosaxitoxin	0.0190	Spike	P	0 - 30
2401900	Saxitoxin	1.09	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2402148
Field Sample ID: HABCE0164_LakeOla

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	89.9	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	102	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A118715
Included Lab Sample IDs: 2402150

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A118739
Included Lab Sample IDs: 2402148

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	102	101	P/P	50 - 160
Desmethyl microcystin LR	93.1	97.9	P/P	50 - 160
Microcystin HilR	101	98.2	P/P	50 - 160
Microcystin HtyR	98.1	98.6	P/P	50 - 160
Microcystin LA	78.2	80.1	P/P	50 - 160
Microcystin LF	68.5	70.3	P/P	50 - 160
Microcystin LR	99.3	101	P/P	50 - 160
Microcystin LW	74.6	69.2	P/P	50 - 160
Microcystin LY	72.2	79.3	P/P	50 - 160
Microcystin RR	91.1	95.7	P/P	50 - 160
Microcystin WR	97.1	102	P/P	50 - 160
Microcystin YR	86.3	92.0	P/P	50 - 160
Nodularin-R	94.0	94.5	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A118743
Included Lab Sample IDs: 2402148

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	111	106	P/P	50 - 160
Neosaxitoxin	112	107	P/P	50 - 160
Saxitoxin	105	101	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118791
Included Lab Sample IDs: 2402149

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A118827
Included Lab Sample IDs: 2402149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A118876
Included Lab Sample IDs: 2402149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	106	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A118934
Included Lab Sample IDs: 2402149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	101	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	95.6	97.0	99.4			2.12
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	106	105			0.368
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	104			0.482
EPA 365.1 Rev. 2.0	Total-P	101	101	98.6			1.86
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	98.8	99.1			0.247
EPA 8321B	Anatoxin-a	126	115	116			1.09
	Cylindrospermopsin	104	105	110			4.05
	Desmethyl microcystin LR	99.5	112	117			4.02
	Microcystin HilR	104	112	110			2.11
	Microcystin HtyR	96.2	105	111			5.65
	Microcystin LA	88.0	78.7	96.5			20.4
	Microcystin LF	72.4	65.1	76.4			15.9
	Microcystin LR	104	113	127			11.9
	Microcystin LW	75.1	81.3	82.7			1.67
	Microcystin LY	93.7	76.1	98.7			25.8
	Microcystin RR	99.2	101	107			5.42
	Microcystin WR	102	110	118			7.15
	Microcystin YR	96.5	103	107			4.22
	Neosaxitoxin	128	84.2	84.2			0.0190
	Nodularin-R	94.2	103	103			0.158
	Saxitoxin	116	79.2	80.1			1.09

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2402149
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2402149
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2402149
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2402149
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2402150
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2402148
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2402148

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	04/21/2023			04/27/2023 12:57	Khloe J Berg	2402149
EPA 351.2 Rev. 2.0	04/21/2023	05/01/2023 12:40	Simonne.V. Calhoun	05/03/2023 11:52	Samantha L Bates	2402149
EPA 353.2 Rev. 2.0	04/21/2023			05/01/2023 10:14	Beverly Y. Sanders	2402149
EPA 365.1 Rev. 2.0	04/21/2023	04/24/2023 14:38	Adam P Silver	04/26/2023 13:33	Simonne.V. Calhoun	2402149
EPA 365.1 Rev. 2.0 dissolved	04/21/2023			04/21/2023 14:29	Elise M. Gillis	2402150
EPA 8321B	04/21/2023	04/24/2023 09:00	Manjita Shrestha	04/24/2023 18:27	Manjita Shrestha	2402148
	04/21/2023	04/24/2023 09:00	Manjita Shrestha	04/25/2023 02:47	Manjita Shrestha	2402148