Chemical Analysis Report

WQAP-2023-05-03-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-04-24-09**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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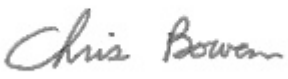
Date Certified: 11-MAY-2023 12:15



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 Center **Collection Date/Time: 05/02/2023 11:53**

Field ID: HABCE0185_TigerLake2 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2405012	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P429212	
		Cylindrospermopsin	0.10	U	ug/L	P429211	
		Desmethyl microcystin LR	0.25	U	ug/L	P429211	
		Microcystin HilR	0.25	U	ug/L	P429211	
		Microcystin HtyR	0.25	U	ug/L	P429211	
		Microcystin LA	0.36	I	ug/L	P429211	
		Microcystin LF	0.22	I	ug/L	P429211	
		Microcystin LR	2.2		ug/L	P429211	
		Microcystin LW	0.25	U	ug/L	P429211	
		Microcystin LY	0.69		ug/L	P429211	MS
		Microcystin RR	0.38	I	ug/L	P429211	
		Microcystin WR	0.50	U	ug/L	P429211	
		Neosaxitoxin	0.50	U	ug/L	P429212	
		Microcystin YR	0.25	U	ug/L	P429211	
		Saxitoxin	0.50	U	ug/L	P429212	
		Nodularin-R	0.10	U	ug/L	P429211	
2405013	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P429430	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.1		mg N/L	P429518	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P429543	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P429401	
2405014	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P429363	

Ref. Method and Comment:
EPA 353.2 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: P429430

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429518

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429543

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429401

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429363

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

Reference Method: EPA 8321B
Batch ID: P429211

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: P429212

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: P429430

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429518

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.7		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429543

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: P429401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429363

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	83.5		P	40 - 150
Desmethyl microcystin LR	93.6		P	40 - 150
Microcystin HilR	101		P	40 - 150
Microcystin HtyR	107		P	40 - 150
Microcystin LA	120		P	40 - 150
Microcystin LF	91.8		P	40 - 150
Microcystin LR	108		P	40 - 150
Microcystin LW	126		P	40 - 150
Microcystin LY	139		P	40 - 150
Microcystin RR	108		P	40 - 150
Microcystin WR	111		P	40 - 150
Microcystin YR	116		P	40 - 150
Nodularin-R	104		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429212

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	117		P	40 - 150
Neosaxitoxin	130		P	40 - 150
Saxitoxin	112		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404877	Ammonia-N	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429518

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404878	Kjeldahl Nitrogen	99.4	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405039	Total-P	98.6	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429363

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405063	O-Phosphate-P	98.3	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404340	Cylindrospermopsin	95.5	96.0	P/P	40 - 150
2404340	Desmethyl microcystin LR	102	108	P/P	40 - 150
2404340	Microcystin HilR	114	118	P/P	40 - 150
2404340	Microcystin HtyR	127	121	P/P	40 - 150
2404340	Microcystin LA	127	136	P/P	40 - 150
2404340	Microcystin LF	114	117	P/P	40 - 150
2404340	Microcystin LR	116	119	P/P	40 - 150
2404340	Microcystin LW	130	140	P/P	40 - 150
2404340	Microcystin LY	152	147	F/P	40 - 150
2404340	Microcystin RR	116	125	P/P	40 - 150
2404340	Microcystin WR	110	116	P/P	40 - 150
2404340	Microcystin YR	127	128	P/P	40 - 150
2404340	Nodularin-R	112	114	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404340	Anatoxin-a	128	122	P/P	40 - 150
2404340	Neosaxitoxin	92.9	94.0	P/P	40 - 150
2404340	Saxitoxin	80.0	75.1	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404877	Ammonia-N	0.110	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429518

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404878	Kjeldahl Nitrogen	2.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404880	NO2NO3-N	0.131	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405039	Total-P	1.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405063	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P429211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404340	Cylindrospermopsin	0.582	Spike	P	0 - 30
2404340	Desmethyl microcystin LR	5.88	Spike	P	0 - 30
2404340	Microcystin HilR	3.30	Spike	P	0 - 30
2404340	Microcystin HtyR	4.57	Spike	P	0 - 30
2404340	Microcystin LA	7.32	Spike	P	0 - 30
2404340	Microcystin LF	2.72	Spike	P	0 - 30
2404340	Microcystin LR	2.78	Spike	P	0 - 30
2404340	Microcystin LW	6.76	Spike	P	0 - 30
2404340	Microcystin LY	3.26	Spike	P	0 - 30
2404340	Microcystin RR	7.39	Spike	P	0 - 30
2404340	Microcystin WR	5.00	Spike	P	0 - 30
2404340	Microcystin YR	1.04	Spike	P	0 - 30
2404340	Nodularin-R	2.36	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P429212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404340	Anatoxin-a	4.76	Spike	P	0 - 30
2404340	Neosaxitoxin	1.19	Spike	P	0 - 30
2404340	Saxitoxin	6.38	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2405012
Field Sample ID: HABCE0185_TigerLake2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	113	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	89.5	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A118883
Included Lab Sample IDs: 2405012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	86.8	84.0	P/P	50 - 160
Desmethyl microcystin LR	96.1	98.5	P/P	50 - 160
Microcystin HilR	107	104	P/P	50 - 160
Microcystin HtyR	111	112	P/P	50 - 160
Microcystin LA	120	118	P/P	50 - 160
Microcystin LF	111	114	P/P	50 - 160
Microcystin LR	102	106	P/P	50 - 160
Microcystin LW	114	122	P/P	50 - 160
Microcystin LY	143	152	P/P	50 - 160
Microcystin RR	113	108	P/P	50 - 160
Microcystin WR	107	108	P/P	50 - 160
Microcystin YR	110	108	P/P	50 - 160
Nodularin-R	105	109	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A118886
Included Lab Sample IDs: 2405012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	105	101	P/P	50 - 160
Neosaxitoxin	112	107	P/P	50 - 160
Saxitoxin	97.1	95.1	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A118942
Included Lab Sample IDs: 2405014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	97.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A118958
Included Lab Sample IDs: 2405013

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118970
Included Lab Sample IDs: 2405013

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A119010
Included Lab Sample IDs: 2405013

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A119051
Included Lab Sample IDs: 2405013

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	98.4	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	99.4	101	100			0.110
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7	99.4	102			2.05
EPA 353.2 Rev. 2.0	NO2NO3-N	102					0.131
EPA 365.1 Rev. 2.0	Total-P	99.6	98.6	97.4			1.03
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	98.3	98.3			0.0
EPA 8321B	Anatoxin-a	117	128	122			4.76
	Cylindrospermopsin	83.5	95.5	96.0			0.582
	Desmethyl microcystin LR	93.6	102	108			5.88
	Microcystin HilR	101	114	118			3.30
	Microcystin HtyR	107	127	121			4.57
	Microcystin LA	120	127	136			7.32
	Microcystin LF	91.8	114	117			2.72
	Microcystin LR	108	116	119			2.78
	Microcystin LW	126	130	140			6.76
	Microcystin LY	139	152	147			3.26
	Microcystin RR	108	116	125			7.39
	Microcystin WR	111	110	116			5.00
	Microcystin YR	116	127	128			1.04
	Neosaxitoxin	130	92.9	94.0			1.19
	Nodularin-R	104	112	114			2.36
	Saxitoxin	112	80.0	75.1			6.38

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2405013
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2405013
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2405013
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2405013
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2405014
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2405012
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2405012

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	05/03/2023			05/04/2023 14:30	Ping Hua	2405013
EPA 351.2 Rev. 2.0	05/03/2023	05/08/2023 15:11	Simonne.V. Calhoun	05/09/2023 12:26	Ping Hua	2405013
EPA 353.2 Rev. 2.0	05/03/2023			05/08/2023 10:43	Beverly Y. Sanders	2405013
EPA 365.1 Rev. 2.0	05/03/2023	05/04/2023 13:50	Alexis Price	05/05/2023 09:57	James L Waggerby	2405013
EPA 365.1 Rev. 2.0 dissolved	05/03/2023			05/03/2023 14:42	James L Waggerby	2405014
EPA 8321B	05/03/2023	05/03/2023 11:00	Manjita Shrestha	05/03/2023 16:15	Manjita Shrestha	2405012
	05/03/2023	05/03/2023 11:00	Manjita Shrestha	05/04/2023 00:38	Manjita Shrestha	2405012