

Chemical Analysis Report

WQAP-2023-05-16-01

Florida DEP Laboratory
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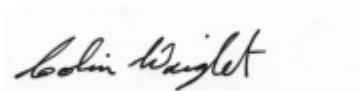
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-04-24-32**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 25-MAY-2023 09:22

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light blue rectangular 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: Caywood Pond - SW Dock

Collection Date/Time: 05/15/2023 13:58

Field ID: HABCE0193_CaywoodPond

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2409602	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P429910	
		Cylindrospermopsin	0.10	U	ug/L	P429909	
		Desmethyl microcystin LR	0.25	U	ug/L	P429909	
		Microcystin HILR	0.25	U	ug/L	P429909	
		Microcystin HtyR	0.25	U	ug/L	P429909	
		Microcystin LA	0.10	U	ug/L	P429909	
		Microcystin LF	0.10	U	ug/L	P429909	
		Microcystin LR	1.2		ug/L	P429909	
		Microcystin LW	0.25	U	ug/L	P429909	
		Microcystin LY	0.10	U	ug/L	P429909	
		Microcystin RR	0.10	U	ug/L	P429909	
		Microcystin WR	0.50	U	ug/L	P429909	
		Neosaxitoxin	0.50	U	ug/L	P429910	
		Microcystin YR	0.25	U	ug/L	P429909	
		Saxitoxin	0.50	U	ug/L	P429910	
		Nodularin-R	0.10	U	ug/L	P429909	
2409603	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P429973	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P430045	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P430228	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P429968	
2409604	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P429925	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429973

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430045

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430228

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429968

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429925

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

Reference Method: EPA 8321B
Batch ID: P429909

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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: P429910

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: P429973

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: P430045

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: P430228

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429968

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429925

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

Reference Method: EPA 8321B
Batch ID: P429909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	115		P	40 - 150
Desmethyl microcystin LR	105		P	40 - 150
Microcystin HILR	109		P	40 - 150
Microcystin HtyR	97.7		P	40 - 150
Microcystin LA	122		P	40 - 150
Microcystin LF	107		P	40 - 150
Microcystin LR	98.0		P	40 - 150
Microcystin LW	99.7		P	40 - 150
Microcystin LY	127		P	40 - 150
Microcystin RR	96.0		P	40 - 150
Microcystin WR	103		P	40 - 150
Microcystin YR	108		P	40 - 150
Nodularin-R	97.4		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	108		P	40 - 150
Neosaxitoxin	90.5		P	40 - 150
Saxitoxin	92.4		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409580	Ammonia-N	99.2	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430045

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409603	Kjeldahl Nitrogen	91.0	91.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430228

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409583	NO2NO3-N	92.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409603	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429925

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409604	O-Phosphate-P	97.0	97.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409602	Cylindrospermopsin	110	117	P/P	40 - 150
2409602	Desmethyl microcystin LR	118	126	P/P	40 - 150
2409602	Microcystin HiLR	120	119	P/P	40 - 150
2409602	Microcystin HtyR	113	116	P/P	40 - 150
2409602	Microcystin LA	125	132	P/P	40 - 150
2409602	Microcystin LF	126	133	P/P	40 - 150
2409602	Microcystin LR	106	120	P/P	40 - 150
2409602	Microcystin LW	110	127	P/P	40 - 150
2409602	Microcystin LY	129	128	P/P	40 - 150
2409602	Microcystin RR	102	110	P/P	40 - 150
2409602	Microcystin WR	120	110	P/P	40 - 150
2409602	Microcystin YR	111	118	P/P	40 - 150
2409602	Nodularin-R	102	104	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2409602	Anatoxin-a	104	103	P/P	40 - 150
2409602	Neosaxitoxin	84.6	76.9	P/P	40 - 150
2409602	Saxitoxin	79.5	83.9	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409580	Ammonia-N	0.805	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409603	Kjeldahl Nitrogen	0.235	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430228

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409583	NO2NO3-N	0.176	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409603	Total-P	0.773	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429925

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409604	O-Phosphate-P	0.412	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P429909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409602	Cylindrospermopsin	6.28	Spike	P	0 - 30
2409602	Desmethyl microcystin LR	6.53	Spike	P	0 - 30
2409602	Microcystin H1LR	0.178	Spike	P	0 - 30
2409602	Microcystin HtyR	3.10	Spike	P	0 - 30
2409602	Microcystin LA	5.54	Spike	P	0 - 30
2409602	Microcystin LF	4.95	Spike	P	0 - 30
2409602	Microcystin LR	11.2	Spike	P	0 - 30
2409602	Microcystin LW	14.5	Spike	P	0 - 30
2409602	Microcystin LY	1.03	Spike	P	0 - 30
2409602	Microcystin RR	7.70	Spike	P	0 - 30
2409602	Microcystin WR	9.14	Spike	P	0 - 30
2409602	Microcystin YR	6.06	Spike	P	0 - 30
2409602	Nodularin-R	1.81	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P429910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2409602	Anatoxin-a	0.417	Spike	P	0 - 30
2409602	Neosaxitoxin	9.57	Spike	P	0 - 30
2409602	Saxitoxin	5.34	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2409602

Field Sample ID: HABCE0193_CaywoodPond

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	120	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	72.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A119197

Included Lab Sample IDs: 2409604

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	97.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A119214

Included Lab Sample IDs: 2409603

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.2	98.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A119232

Included Lab Sample IDs: 2409602

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	108	114	P/P	50 - 160
Desmethyl microcystin LR	99.9	101	P/P	50 - 160
Microcystin H1IR	105	113	P/P	50 - 160
Microcystin HtyR	98.1	102	P/P	50 - 160
Microcystin LA	110	123	P/P	50 - 160
Microcystin LF	115	116	P/P	50 - 160
Microcystin LR	94.7	105	P/P	50 - 160
Microcystin LW	101	107	P/P	50 - 160
Microcystin LY	122	120	P/P	50 - 160
Microcystin RR	99.1	101	P/P	50 - 160
Microcystin WR	93.3	108	P/P	50 - 160
Microcystin YR	102	104	P/P	50 - 160
Nodularin-R	93.8	97.4	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A119247

Included Lab Sample IDs: 2409602

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	96.3	P/P	50 - 160
Neosaxitoxin	87.1	84.4	P/P	50 - 160
Saxitoxin	86.0	83.3	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119257

Included Lab Sample IDs: 2409603

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A119280

Included Lab Sample IDs: 2409603

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.2	102	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A119342

Included Lab Sample IDs: 2409603

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	96.0	99.2	98.0			0.805
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	91.0	91.4			0.235
EPA 353.2 Rev. 2.0	NO2NO3-N	101	92.5				0.176
EPA 365.1 Rev. 2.0	Total-P	104	106	107			0.773
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	97.0	97.4			0.412
EPA 8321B	Anatoxin-a	108	104	103			0.417
	Cylindrospermopsin	115	110	117			6.28
	Desmethyl microcystin LR	105	118	126			6.53
	Microcystin HiLR	109	120	119			0.178
	Microcystin HtyR	97.7	113	116			3.10
	Microcystin LA	122	125	132			5.54
	Microcystin LF	107	126	133			4.95
	Microcystin LR	98.0	106	120			11.2
	Microcystin LW	99.7	110	127			14.5
	Microcystin LY	127	129	128			1.03
	Microcystin RR	96.0	102	110			7.70
	Microcystin WR	103	120	110			9.14
	Microcystin YR	108	111	118			6.06
	Neosaxitoxin	90.5	84.6	76.9			9.57
	Nodularin-R	97.4	102	104			1.81
	Saxitoxin	92.4	79.5	83.9			5.34

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2409603
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2409603
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2409603
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2409603
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2409604
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2409602
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2409602

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	05/16/2023			05/17/2023 12:02	Ping Hua	2409603
EPA 351.2 Rev. 2.0	05/16/2023	05/18/2023 11:54	Simonne.V. Calhoun	05/19/2023 11:03	Ping Hua	2409603
EPA 353.2 Rev. 2.0	05/16/2023			05/23/2023 09:39	Beverly Y. Sanders	2409603
EPA 365.1 Rev. 2.0	05/16/2023	05/17/2023 12:30	Alexis Price	05/18/2023 15:20	Chandler E Cox	2409603
EPA 365.1 Rev. 2.0 dissolved	05/16/2023			05/16/2023 15:02	Elise M. Gillis	2409604
EPA 8321B	05/16/2023	05/17/2023 09:00	Manjita Shrestha	05/17/2023 11:41	Manjita Shrestha	2409602
	05/16/2023	05/17/2023 12:00	Manjita Shrestha	05/18/2023 03:48	Manjita Shrestha	2409602