

Chemical Analysis Report

WQAP-2023-04-25-01

Florida DEP Laboratory
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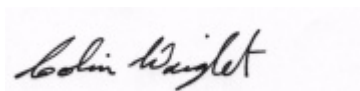
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-04-10-45**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 04-MAY-2023 12:44

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: Wood Lake E Shore

Collection Date/Time: 04/24/2023 13:15

Field ID: HABCE0168_WoodLake2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2402541	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P428985	
		Cylindrospermopsin	0.10	U	ug/L	P428983	
		Desmethyl microcystin LR	0.25	U	ug/L	P428983	
		Microcystin HILR	0.25	U	ug/L	P428983	
		Microcystin HtyR	0.25	U	ug/L	P428983	
		Microcystin LA	0.10	U	ug/L	P428983	
		Microcystin LF	0.10	U	ug/L	P428983	
		Microcystin LR	0.25	U	ug/L	P428983	
		Microcystin LW	0.25	U	ug/L	P428983	
		Microcystin LY	0.10	U	ug/L	P428983	
		Microcystin RR	0.10	U	ug/L	P428983	
		Microcystin WR	0.50	U	ug/L	P428983	
		Neosaxitoxin	0.50	U	ug/L	P428985	
		Microcystin YR	0.25	U	ug/L	P428983	
		Saxitoxin	0.50	U	ug/L	P428985	
		Nodularin-R	0.10	U	ug/L	P428983	
2402545	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P429139	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P428999	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P429247	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P429003	
2402546	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P428970	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429139

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428999

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429247

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429003

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428970

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

Reference Method: EPA 8321B
Batch ID: P428983

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: P428985

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: P429139

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428999

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429247

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429003

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: P428970

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P428983

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	101		P	40 - 150
Desmethyl microcystin LR	102		P	40 - 150
Microcystin H11R	101		P	40 - 150
Microcystin HtyR	99.3		P	40 - 150
Microcystin LA	83.3		P	40 - 150
Microcystin LF	64.5		P	40 - 150
Microcystin LR	105		P	40 - 150
Microcystin LW	82.1		P	40 - 150
Microcystin LY	83.9		P	40 - 150
Microcystin RR	99.5		P	40 - 150
Microcystin WR	116		P	40 - 150
Microcystin YR	99.2		P	40 - 150
Nodularin-R	92.5		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P428985

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	138		P	40 - 150
Neosaxitoxin	149		P	40 - 150
Saxitoxin	126		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429139

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402558	Ammonia-N	96.6	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428999

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402545	Kjeldahl Nitrogen	98.4	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429247

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402598	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429003

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402622	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402546	O-Phosphate-P	94.4	93.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P428983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402541	Cylindrospermopsin	106	105	P/P	40 - 150
2402541	Desmethyl microcystin LR	113	110	P/P	40 - 150
2402541	Microcystin HiLR	110	116	P/P	40 - 150
2402541	Microcystin HtyR	110	104	P/P	40 - 150
2402541	Microcystin LA	123	103	P/P	40 - 150
2402541	Microcystin LF	70.8	70.3	P/P	40 - 150
2402541	Microcystin LR	118	119	P/P	40 - 150
2402541	Microcystin LW	76.0	84.6	P/P	40 - 150
2402541	Microcystin LY	88.0	99.8	P/P	40 - 150
2402541	Microcystin RR	108	105	P/P	40 - 150
2402541	Microcystin WR	122	120	P/P	40 - 150
2402541	Microcystin YR	117	106	P/P	40 - 150
2402541	Nodularin-R	104	107	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P428985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402541	Anatoxin-a	130	130	P/P	40 - 150
2402541	Neosaxitoxin	136	135	P/P	40 - 150
2402541	Saxitoxin	129	127	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402558	Ammonia-N	0.722	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402545	Kjeldahl Nitrogen	1.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402598	NO2NO3-N	0.291	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429003

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402622	Total-P	0.873	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P428970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402546	O-Phosphate-P	0.531	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P428983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402541	Cylindrospermopsin	0.842	Spike	P	0 - 30
2402541	Desmethyl microcystin LR	3.17	Spike	P	0 - 30
2402541	Microcystin H1LR	5.33	Spike	P	0 - 30
2402541	Microcystin HtyR	5.59	Spike	P	0 - 30
2402541	Microcystin LA	17.0	Spike	P	0 - 30
2402541	Microcystin LF	0.707	Spike	P	0 - 30
2402541	Microcystin LR	0.962	Spike	P	0 - 30
2402541	Microcystin LW	10.8	Spike	P	0 - 30
2402541	Microcystin LY	12.6	Spike	P	0 - 30
2402541	Microcystin RR	2.79	Spike	P	0 - 30
2402541	Microcystin WR	2.01	Spike	P	0 - 30
2402541	Microcystin YR	9.79	Spike	P	0 - 30
2402541	Nodularin-R	2.72	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P428985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402541	Anatoxin-a	0.334	Spike	P	0 - 30
2402541	Neosaxitoxin	0.601	Spike	P	0 - 30
2402541	Saxitoxin	1.64	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2402541

Field Sample ID: HABCE0168_WoodLake2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	91.6	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	117	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A118769

Included Lab Sample IDs: 2402546

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	97.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A118803

Included Lab Sample IDs: 2402541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	103	105	P/P	50 - 160
Desmethyl microcystin LR	97.7	110	P/P	50 - 160
Microcystin HIR	108	103	P/P	50 - 160
Microcystin HtyR	105	101	P/P	50 - 160
Microcystin LA	99.1	91.4	P/P	50 - 160
Microcystin LF	89.0	91.0	P/P	50 - 160
Microcystin LR	106	111	P/P	50 - 160
Microcystin LW	71.4	85.4	P/P	50 - 160
Microcystin LY	81.7	103	P/P	50 - 160
Microcystin RR	97.5	106	P/P	50 - 160
Microcystin WR	110	106	P/P	50 - 160
Microcystin YR	105	98.8	P/P	50 - 160
Nodularin-R	98.6	98.1	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A118813

Included Lab Sample IDs: 2402545

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A118819

Included Lab Sample IDs: 2402541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	129	118	P/P	50 - 160
Neosaxitoxin	145	135	P/P	50 - 160
Saxitoxin	115	115	P/P	50 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A118835

Included Lab Sample IDs: 2402545

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.1	96.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A118854

Included Lab Sample IDs: 2402545

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	98.8	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A118899

Included Lab Sample IDs: 2402545

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	106	106	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	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	99.8	96.6	95.8			0.722
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.1	98.4	100			1.33
EPA 353.2 Rev. 2.0	NO2NO3-N	105	104	103			0.291
EPA 365.1 Rev. 2.0	Total-P	101	102	102			0.873
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	94.4	93.9			0.531
EPA 8321B	Anatoxin-a	138	130	130			0.334
	Cylindrospermopsin	101	106	105			0.842
	Desmethyl microcystin LR	102	113	110			3.17
	Microcystin HiLR	101	110	116			5.33
	Microcystin HtyR	99.3	110	104			5.59
	Microcystin LA	83.3	123	103			17.0
	Microcystin LF	64.5	70.8	70.3			0.707
	Microcystin LR	105	118	119			0.962
	Microcystin LW	82.1	76.0	84.6			10.8
	Microcystin LY	83.9	88.0	99.8			12.6
	Microcystin RR	99.5	108	105			2.79
	Microcystin WR	116	122	120			2.01
	Microcystin YR	99.2	117	106			9.79
	Neosaxitoxin	149	136	135			0.601
	Nodularin-R	92.5	104	107			2.72
	Saxitoxin	126	129	127			1.64

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2402545
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2402545
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2402545
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2402545
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2402546
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2402541
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2402541

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	04/25/2023			04/28/2023 13:19	Ping Hua	2402545
EPA 351.2 Rev. 2.0	04/25/2023	04/26/2023 12:25	Dana G. Hughes	04/27/2023 16:47	Ping Hua	2402545
EPA 353.2 Rev. 2.0	04/25/2023			05/02/2023 11:42	Beverly Y. Sanders	2402545
EPA 365.1 Rev. 2.0	04/25/2023	04/26/2023 14:50	Adam P Silver	04/27/2023 09:42	Simonne.V. Calhoun	2402545
EPA 365.1 Rev. 2.0 dissolved	04/25/2023			04/25/2023 15:35	Elise M. Gillis	2402546
EPA 8321B	04/25/2023	04/26/2023 12:00	Manjita Shrestha	04/26/2023 16:08	Manjita Shrestha	2402541
	04/25/2023	04/26/2023 12:00	Manjita Shrestha	04/27/2023 01:27	Manjita Shrestha	2402541