

Chemical Analysis Report

WQAP-2022-12-20-01

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

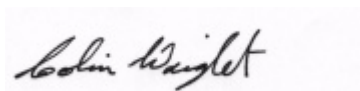
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2022-12-12-33**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 11-JAN-2023 10:32

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light pink 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: Coral Gables Canal - East Side

Collection Date/Time: 12/19/2022 10:30

Field ID: SEHAB0090

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2376469	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P423757	
		Cylindrospermopsin	0.10	U	ug/L	P423756	
		Desmethyl microcystin LR	0.25	U	ug/L	P423756	
		Microcystin HILR	0.25	U	ug/L	P423756	
		Microcystin HtyR	0.25	U	ug/L	P423756	
		Microcystin LA	0.10	U	ug/L	P423756	
		Microcystin LF	0.10	U	ug/L	P423756	
		Microcystin LR	0.25	U	ug/L	P423756	
		Microcystin LW	0.25	U	ug/L	P423756	
		Microcystin LY	0.10	U	ug/L	P423756	
		Microcystin RR	0.27	I	ug/L	P423756	
		Microcystin WR	0.50	U	ug/L	P423756	
		Neosaxitoxin	0.50	U	ug/L	P423757	
		Microcystin YR	0.25	U	ug/L	P423756	
		Saxitoxin	0.50	U	ug/L	P423757	
		Nodularin-R	0.10	U	ug/L	P423756	
2376470	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P424283	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P423873	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P423899	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P424106	
2376471	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P423773	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424283

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423873

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423899

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424106

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423773

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

Reference Method: EPA 8321B
Batch ID: P423756

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: P423757

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: P424283

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423873

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423899

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424106

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423773

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

Reference Method: EPA 8321B
Batch ID: P423756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	116		P	40 - 150
Desmethyl microcystin LR	121		P	40 - 150
Microcystin H1R	117		P	40 - 150
Microcystin HtyR	124		P	40 - 150
Microcystin LA	101		P	40 - 150
Microcystin LF	114		P	40 - 150
Microcystin LR	130		P	40 - 150
Microcystin LW	126		P	40 - 150
Microcystin LY	106		P	40 - 150
Microcystin RR	120		P	40 - 150
Microcystin WR	118		P	40 - 150
Microcystin YR	134		P	40 - 150
Nodularin-R	111		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423757

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	92.8		P	40 - 150
Neosaxitoxin	99.2		P	40 - 150
Saxitoxin	101		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376452	Ammonia-N	97.4	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376452	Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423899

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376298	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424106

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376487	Total-P	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376491	O-Phosphate-P	101	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P423756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376446	Cylindrospermopsin	102	106	P/P	40 - 150
2376446	Desmethyl microcystin LR	136	142	P/P	40 - 150
2376446	Microcystin HiLR	121	128	P/P	40 - 150
2376446	Microcystin HtyR	126	130	P/P	40 - 150
2376446	Microcystin LA	93.8	96.5	P/P	40 - 150
2376446	Microcystin LF	104	90.5	P/P	40 - 150
2376446	Microcystin LR	144	142	P/P	40 - 150
2376446	Microcystin LW	114	119	P/P	40 - 150
2376446	Microcystin LY	110	106	P/P	40 - 150
2376446	Microcystin RR	106	106	P/P	40 - 150
2376446	Microcystin WR	122	124	P/P	40 - 150
2376446	Microcystin YR	132	144	P/P	40 - 150
2376446	Nodularin-R	116	118	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376482	Anatoxin-a	93.7	94.1	P/P	40 - 150
2376482	Neosaxitoxin	83.4	82.0	P/P	40 - 150
2376482	Saxitoxin	78.9	74.0	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P424283

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376452	Ammonia-N	0.285	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P423873

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376452	Kjeldahl Nitrogen	2.19	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P423899

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376298	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P424106

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376487	Total-P	1.32	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P423773

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376491	O-Phosphate-P	0.895	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P423756

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376446	Cylindrospermopsin	3.60	Spike	P	0 - 30
2376446	Desmethyl microcystin LR	4.40	Spike	P	0 - 30
2376446	Microcystin H1LR	5.09	Spike	P	0 - 30
2376446	Microcystin HtyR	3.38	Spike	P	0 - 30
2376446	Microcystin LA	2.85	Spike	P	0 - 30
2376446	Microcystin LF	13.9	Spike	P	0 - 30
2376446	Microcystin LR	1.16	Spike	P	0 - 30
2376446	Microcystin LW	3.63	Spike	P	0 - 30
2376446	Microcystin LY	4.50	Spike	P	0 - 30
2376446	Microcystin RR	0.277	Spike	P	0 - 30
2376446	Microcystin WR	1.53	Spike	P	0 - 30
2376446	Microcystin YR	9.32	Spike	P	0 - 30
2376446	Nodularin-R	1.50	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P423757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376482	Anatoxin-a	0.390	Spike	P	0 - 30
2376482	Neosaxitoxin	1.67	Spike	P	0 - 30
2376482	Saxitoxin	6.35	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2376469
Field Sample ID: SEHAB0090

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	107	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	52.0	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A116573

Included Lab Sample IDs: 2376471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A116604

Included Lab Sample IDs: 2376469

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.2	82.9	P/P	50 - 160
Neosaxitoxin	97.4	90.0	P/P	50 - 160
Saxitoxin	93.7	87.7	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A116616

Included Lab Sample IDs: 2376469

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	122	119	P/P	50 - 160
Desmethyl microcystin LR	123	134	P/P	50 - 160
Microcystin HtIR	117	128	P/P	50 - 160
Microcystin HtyR	120	125	P/P	50 - 160
Microcystin LA	109	112	P/P	50 - 160
Microcystin LF	118	130	P/P	50 - 160
Microcystin LR	128	128	P/P	50 - 160
Microcystin LW	113	134	P/P	50 - 160
Microcystin LY	133	119	P/P	50 - 160
Microcystin RR	122	116	P/P	50 - 160
Microcystin WR	120	130	P/P	50 - 160
Microcystin YR	130	130	P/P	50 - 160
Nodularin-R	118	123	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A116630

Included Lab Sample IDs: 2376470

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A116710

Included Lab Sample IDs: 2376470

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	90.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A116739

Included Lab Sample IDs: 2376470

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

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116800

Included Lab Sample IDs: 2376470

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	97.1	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	99.0	97.4	97.8			0.285
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.8	104	101			2.19
EPA 353.2 Rev. 2.0	NO2NO3-N	107	102				0.0
EPA 365.1 Rev. 2.0	Total-P	102	104	103			1.32
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	101	100			0.895
EPA 8321B	Anatoxin-a	92.8	93.7	94.1			0.390
	Cylindrospermopsin	116	102	106			3.60
	Desmethyl microcystin LR	121	136	142			4.40
	Microcystin HiLR	117	121	128			5.09
	Microcystin HtyR	124	126	130			3.38
	Microcystin LA	101	93.8	96.5			2.85
	Microcystin LF	114	104	90.5			13.9
	Microcystin LR	130	144	142			1.16
	Microcystin LW	126	114	119			3.63
	Microcystin LY	106	110	106			4.50
	Microcystin RR	120	106	106			0.277
	Microcystin WR	118	122	124			1.53
	Microcystin YR	134	132	144			9.32
	Neosaxitoxin	99.2	83.4	82.0			1.67
	Nodularin-R	111	116	118			1.50
	Saxitoxin	101	78.9	74.0			6.35

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2376470
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2376470
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2376470
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2376470
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2376471
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2376469
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2376469

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	12/20/2022			01/09/2023 11:16	Ping Hua	2376470
EPA 351.2 Rev. 2.0	12/20/2022	12/22/2022 12:45	Simonne.V. Calhoun	01/03/2023 14:26	Samantha L Bates	2376470
EPA 353.2 Rev. 2.0	12/20/2022			12/22/2022 11:02	Beverly Y. Sanders	2376470
EPA 365.1 Rev. 2.0	12/20/2022	01/03/2023 14:10	Adam P Silver	01/05/2023 09:27	James L Waggeberby	2376470
EPA 365.1 Rev. 2.0 dissolved	12/20/2022			12/20/2022 14:20	Elise M. Gillis	2376471
EPA 8321B	12/20/2022	12/21/2022 09:00	Manjita Shrestha	12/21/2022 12:33	Manjita Shrestha	2376469
	12/20/2022	12/21/2022 12:00	Manjita Shrestha	12/21/2022 18:01	Manjita Shrestha	2376469