

Chemical Analysis Report

WQAP-2022-08-12-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response -SOROC**

Request ID: **RQ-2022-06-27-47**

Customer: **WQAP**

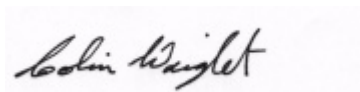
Project ID: **BLOOM-RESP**

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

Date Certified: 31-AUG-2022 10:55

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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: Caloosahatchee River - Eliot - Morley Canal

Collection Date/Time: 08/11/2022 09:52

Field ID: HAB-SD-081122-0952

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2348781	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P418002	
		Cylindrospermopsin	0.10	U	ug/L	P418001	
		Desmethyl microcystin LR	0.25	U	ug/L	P418001	
		Microcystin HIR	0.25	U	ug/L	P418001	
		Microcystin HtyR	0.25	U	ug/L	P418001	MS
		Microcystin LA	0.10	U	ug/L	P418001	
		Microcystin LF	0.10	U	ug/L	P418001	
		Microcystin LR	0.25	U	ug/L	P418001	MS
		Microcystin LW	0.25	U	ug/L	P418001	
		Microcystin LY	0.10	U	ug/L	P418001	
		Microcystin RR	0.10	U	ug/L	P418001	
		Microcystin WR	0.50	U	ug/L	P418001	
		Microcystin YR	0.25	U	ug/L	P418001	MS
		Nodularin-R	0.10	U	ug/L	P418001	MS
2348783	EPA 350.1 Rev. 2.0	Ammonia-N	0.054		mg N/L	P418692	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P418440	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P418378	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P418189	
2348784	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.027		mg P/L	P418059	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418692

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418440

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418378

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418189

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418059

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

Reference Method: EPA 8321B
Batch ID: P418001

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: P418002

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418692

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418440

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418189

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418059

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

Reference Method: EPA 8321B
Batch ID: P418001

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	96.4		P	40 - 150
Desmethyl microcystin LR	91.3		P	40 - 150
Microcystin HILR	97.9		P	40 - 150
Microcystin HtyR	98.6		P	40 - 150
Microcystin LA	91.4		P	40 - 150
Microcystin LF	118		P	40 - 150
Microcystin LR	99.5		P	40 - 150
Microcystin LW	78.9		P	40 - 150
Microcystin LY	103		P	40 - 150
Microcystin RR	91.1		P	40 - 150
Microcystin WR	108		P	40 - 150
Microcystin YR	96.0		P	40 - 150
Nodularin-R	93.0		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P418002

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	120		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2350833	Ammonia-N	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348218	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348766	NO2NO3-N	95.5	95.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418189

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348791	Total-P	94.9	92.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418059

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348770	O-Phosphate-P	100	99.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P418001

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348276	Cylindrospermopsin	84.2	104	P/P	40 - 150
2348276	Desmethyl microcystin LR	144	149	P/P	40 - 150
2348276	Microcystin HiLR	130	138	P/P	40 - 150
2348276	Microcystin HtyR	146	152	P/F	40 - 150
2348276	Microcystin LA	92.1	107	P/P	40 - 150
2348276	Microcystin LF	110	105	P/P	40 - 150
2348276	Microcystin LR	159	157	F/F	40 - 150
2348276	Microcystin LW	96.9	103	P/P	40 - 150
2348276	Microcystin LY	90.0	90.8	P/P	40 - 150
2348276	Microcystin RR	104	101	P/P	40 - 150
2348276	Microcystin WR	121	122	P/P	40 - 150
2348276	Microcystin YR	141	150	P/F	40 - 150
2348276	Nodularin-R	179	182	F/F	40 - 150

Reference Method: EPA 8321B
Batch ID: P418002

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348276	Anatoxin-a	122	129	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2350833	Ammonia-N	1.05	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348218	Kjeldahl Nitrogen	0.740	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348766	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348791	Total-P	2.08	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348770	O-Phosphate-P	0.699	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P418001

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348276	Cylindrospermopsin	21.2	Spike	P	0 - 30
2348276	Desmethyl microcystin LR	3.95	Spike	P	0 - 30
2348276	Microcystin H1LR	6.27	Spike	P	0 - 30
2348276	Microcystin HtyR	4.14	Spike	P	0 - 30
2348276	Microcystin LA	14.6	Spike	P	0 - 30
2348276	Microcystin LF	5.30	Spike	P	0 - 30
2348276	Microcystin LR	0.739	Spike	P	0 - 30
2348276	Microcystin LW	6.55	Spike	P	0 - 30
2348276	Microcystin LY	0.873	Spike	P	0 - 30
2348276	Microcystin RR	3.30	Spike	P	0 - 30
2348276	Microcystin WR	0.452	Spike	P	0 - 30
2348276	Microcystin YR	6.52	Spike	P	0 - 30
2348276	Nodularin-R	1.33	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P418002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348276	Anatoxin-a	4.92	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2348781

Field Sample ID: HAB-SD-081122-0952

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	98.0	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	68.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A114066

Included Lab Sample IDs: 2348784

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

Reference Method: EPA 8321B

Run ID: A114072

Included Lab Sample IDs: 2348781

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	112	110	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A114077

Included Lab Sample IDs: 2348781

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	87.7	85.0	P/P	50 - 160
Desmethyl microcystin LR	88.9	82.0	P/P	50 - 160
Microcystin HII R	86.4	81.5	P/P	50 - 160
Microcystin HtyR	92.7	92.4	P/P	50 - 160
Microcystin LA	87.8	92.8	P/P	50 - 160
Microcystin LF	95.8	78.9	P/P	50 - 160
Microcystin LR	92.5	93.0	P/P	50 - 160
Microcystin LW	80.8	77.2	P/P	50 - 160
Microcystin LY	90.4	93.1	P/P	50 - 160
Microcystin RR	82.0	80.3	P/P	50 - 160
Microcystin WR	85.8	85.4	P/P	50 - 160
Microcystin YR	81.5	86.2	P/P	50 - 160
Nodularin-R	90.1	82.9	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114163

Included Lab Sample IDs: 2348783

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114209

Included Lab Sample IDs: 2348783

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114279

Included Lab Sample IDs: 2348783

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	94.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114346

Included Lab Sample IDs: 2348783

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	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 SMP	MS
					LCS	
EPA 350.1 Rev. 2.0	Ammonia-N	96.6	104	105		1.05
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	102	101		0.740
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	95.5	95.0		0.501
EPA 365.1 Rev. 2.0	Total-P	103	94.9	92.2		2.08
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	100	99.8		0.699
EPA 8321B	Anatoxin-a	120	122	129		4.92
	Cylindrospermopsin	96.4	84.2	104		21.2
	Desmethyl microcystin LR	91.3	144	149		3.95
	Microcystin HiLR	97.9	130	138		6.27
	Microcystin HtyR	98.6	146	152		4.14
	Microcystin LA	91.4	92.1	107		14.6
	Microcystin LF	118	110	105		5.30
	Microcystin LR	99.5	159	157		0.739
	Microcystin LW	78.9	96.9	103		6.55
	Microcystin LY	103	90.0	90.8		0.873
	Microcystin RR	91.1	104	101		3.30
	Microcystin WR	108	121	122		0.452
	Microcystin YR	96.0	141	150		6.52
	Nodularin-R	93.0	179	182		1.33

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2348783
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2348783
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2348783
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2348783
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2348784
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2348781
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2348781

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	08/12/2022			08/25/2022 14:03	Ping Hua	2348783
EPA 351.2 Rev. 2.0	08/12/2022	08/22/2022 16:54	Samantha L Bates	08/23/2022 14:27	Alexandra J Mattheus	2348783
EPA 353.2 Rev. 2.0	08/12/2022			08/19/2022 11:02	Beverly Y. Sanders	2348783
EPA 365.1 Rev. 2.0	08/12/2022	08/17/2022 08:50	Simonne.V. Calhoun	08/17/2022 14:43	James L Waggeberby	2348783
EPA 365.1 Rev. 2.0 dissolved	08/12/2022			08/12/2022 14:13	Elise M. Gillis	2348784
EPA 8321B	08/12/2022	08/12/2022 12:00	Manjita Shrestha	08/12/2022 19:28	Manjita Shrestha	2348781
	08/12/2022	08/12/2022 12:00	Manjita Shrestha	08/13/2022 01:20	Manjita Shrestha	2348781