

Chemical Analysis Report

WQAP-2023-02-02-01

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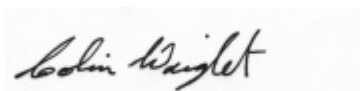
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2022-12-12-33**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
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Certified by: Colin Wright, Program Administrator

Date Certified: 22-FEB-2023 12:07

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: 02/01/2023 10:55

Field ID: SEHAB0090

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2384313	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P425296	
		Cylindrospermopsin	0.10	U	ug/L	P425295	
		Desmethyl microcystin LR	0.25	U	ug/L	P425295	
		Microcystin HllR	0.25	U	ug/L	P425295	
		Microcystin HtyR	0.25	U	ug/L	P425295	
		Microcystin LA	0.10	U	ug/L	P425295	
		Microcystin LF	0.10	U	ug/L	P425295	
		Microcystin LR	0.25	U	ug/L	P425295	
		Microcystin LW	0.25	U	ug/L	P425295	
		Microcystin LY	0.10	U	ug/L	P425295	
		Microcystin RR	0.10	U	ug/L	P425295	
		Microcystin WR	0.50	U	ug/L	P425295	
		Neosaxitoxin	0.50	U	ug/L	P425296	
		Microcystin YR	0.25	U	ug/L	P425295	
		Saxitoxin	0.50	UJ	ug/L	P425296	MS
		Nodularin-R	0.10	U	ug/L	P425295	
2384314	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P425772	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P425342	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P425355	
	EPA 365.1 Rev. 2.0	Total-P	0.042		mg P/L	P425430	
2384315	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P425322	

Ref. Method and Comment:

EPA 8321B: Refer to the Lab Analysis Report for an explanation of QC Codes.

EPA 351.2 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: P425772

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425342

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425355

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425430

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425322

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

Reference Method: EPA 8321B
Batch ID: P425295

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: P425296

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: P425772

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425342

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425355

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425430

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.1		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P425295

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	89.2		P	40 - 150
Desmethyl microcystin LR	88.0		P	40 - 150
Microcystin HILR	90.9		P	40 - 150
Microcystin HtyR	88.3		P	40 - 150
Microcystin LA	73.4		P	40 - 150
Microcystin LF	60.7		P	40 - 150
Microcystin LR	89.5		P	40 - 150
Microcystin LW	61.6		P	40 - 150
Microcystin LY	72.9		P	40 - 150
Microcystin RR	86.7		P	40 - 150
Microcystin WR	91.8		P	40 - 150
Microcystin YR	106		P	40 - 150
Nodularin-R	90.9		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P425296

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	85.1		P	40 - 150
Neosaxitoxin	87.7		P	40 - 150
Saxitoxin	77.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425772

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384223	Ammonia-N	100	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384314	NO2NO3-N	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384223	Total-P	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384315	O-Phosphate-P	99.2	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P425295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384313	Cylindrospermopsin	101	97.1	P/P	40 - 150
2384313	Desmethyl microcystin LR	116	108	P/P	40 - 150
2384313	Microcystin HILR	114	111	P/P	40 - 150
2384313	Microcystin HtyR	111	109	P/P	40 - 150
2384313	Microcystin LA	83.3	74.1	P/P	40 - 150
2384313	Microcystin LF	77.7	71.4	P/P	40 - 150
2384313	Microcystin LR	110	107	P/P	40 - 150
2384313	Microcystin LW	78.5	65.9	P/P	40 - 150
2384313	Microcystin LY	81.1	77.8	P/P	40 - 150
2384313	Microcystin RR	98.9	98.7	P/P	40 - 150
2384313	Microcystin WR	111	110	P/P	40 - 150
2384313	Microcystin YR	125	125	P/P	40 - 150
2384313	Nodularin-R	104	101	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P425296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384313	Anatoxin-a	86.7	93.3	P/P	40 - 150
2384313	Neosaxitoxin	108	125	P/P	40 - 150
2384313	Saxitoxin	36.7	35.5	F/F	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P425772

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384223	Ammonia-N	0.158	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P425342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384224	Kjeldahl Nitrogen	6.53	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P425355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384314	NO2NO3-N	1.43	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P425430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384223	Total-P	0.368	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P425322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384315	O-Phosphate-P	1.60	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P425295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384313	Cylindrospermopsin	4.27	Spike	P	0 - 30
2384313	Desmethyl microcystin LR	7.04	Spike	P	0 - 30
2384313	Microcystin H1LR	2.45	Spike	P	0 - 30
2384313	Microcystin HtyR	1.88	Spike	P	0 - 30
2384313	Microcystin LA	11.8	Spike	P	0 - 30
2384313	Microcystin LF	8.41	Spike	P	0 - 30
2384313	Microcystin LR	3.06	Spike	P	0 - 30
2384313	Microcystin LW	17.4	Spike	P	0 - 30
2384313	Microcystin LY	4.08	Spike	P	0 - 30
2384313	Microcystin RR	0.187	Spike	P	0 - 30
2384313	Microcystin WR	1.58	Spike	P	0 - 30
2384313	Microcystin YR	0.625	Spike	P	0 - 30
2384313	Nodularin-R	2.64	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P425296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384313	Anatoxin-a	7.34	Spike	P	0 - 30
2384313	Neosaxitoxin	14.7	Spike	P	0 - 30
2384313	Saxitoxin	3.45	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2384313
Field Sample ID: SEHAB0090

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	105	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	39.9	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A117237

Included Lab Sample IDs: 2384315

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A117253

Included Lab Sample IDs: 2384314

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A117273

Included Lab Sample IDs: 2384314

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.4	102	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A117318

Included Lab Sample IDs: 2384313

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	87.1	93.8	P/P	50 - 160
Desmethyl microcystin LR	87.2	88.7	P/P	50 - 160
Microcystin HILR	93.3	95.2	P/P	50 - 160
Microcystin HtyR	91.5	89.3	P/P	50 - 160
Microcystin LA	78.5	75.8	P/P	50 - 160
Microcystin LF	65.0	60.3	P/P	50 - 160
Microcystin LR	88.9	92.4	P/P	50 - 160
Microcystin LW	62.0	69.7	P/P	50 - 160
Microcystin LY	72.6	64.2	P/P	50 - 160
Microcystin RR	87.4	88.7	P/P	50 - 160
Microcystin WR	88.1	97.0	P/P	50 - 160
Microcystin YR	105	105	P/P	50 - 160
Nodularin-R	92.3	91.5	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A117321

Included Lab Sample IDs: 2384313

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	86.3	89.7	P/P	50 - 160
Neosaxitoxin	82.7	90.2	P/P	50 - 160
Saxitoxin	76.3	79.6	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A117331

Included Lab Sample IDs: 2384314

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	101	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A117429

Included Lab Sample IDs: 2384314

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	97.6	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	98.8	100	100			0.158
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.5					6.53
EPA 353.2 Rev. 2.0	NO2NO3-N	103	104	106			1.43
EPA 365.1 Rev. 2.0	Total-P	106	107	107			0.368
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	99.2	101			1.60
EPA 8321B	Anatoxin-a	85.1	86.7	93.3			7.34
	Cylindrospermopsin	89.2	101	97.1			4.27
	Desmethyl microcystin LR	88.0	116	108			7.04
	Microcystin HiLR	90.9	114	111			2.45
	Microcystin HtyR	88.3	111	109			1.88
	Microcystin LA	73.4	83.3	74.1			11.8
	Microcystin LF	60.7	77.7	71.4			8.41
	Microcystin LR	89.5	110	107			3.06
	Microcystin LW	61.6	78.5	65.9			17.4
	Microcystin LY	72.9	81.1	77.8			4.08
	Microcystin RR	86.7	98.9	98.7			0.187
	Microcystin WR	91.8	111	110			1.58
	Microcystin YR	106	125	125			0.625
	Neosaxitoxin	87.7	108	125			14.7
	Nodularin-R	90.9	104	101			2.64
	Saxitoxin	77.1	36.7	35.5			3.45

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2384314
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2384314
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2384314
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2384314
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2384315
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2384313
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2384313

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	02/02/2023			02/14/2023 10:44	Khloe J Berg	2384314
EPA 351.2 Rev. 2.0	02/02/2023	02/03/2023 11:05	Simonne.V. Calhoun	02/06/2023 11:43	Samantha L Bates	2384314
EPA 353.2 Rev. 2.0	02/02/2023			02/03/2023 10:40	Beverly Y. Sanders	2384314
EPA 365.1 Rev. 2.0	02/02/2023	02/06/2023 03:24	Adam P Silver	02/08/2023 13:43	James L Waggeberby	2384314
EPA 365.1 Rev. 2.0 dissolved	02/02/2023			02/02/2023 14:27	Elise M. Gillis	2384315
EPA 8321B	02/02/2023	02/07/2023 06:00	Manjita Shrestha	02/07/2023 07:44	Manjita Shrestha	2384313
	02/02/2023	02/07/2023 08:00	Manjita Shrestha	02/07/2023 11:56	Manjita Shrestha	2384313