

Chemical Analysis Report

WQAP-2023-06-14-03

Florida DEP Laboratory
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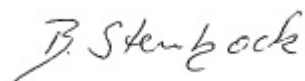
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-01-09-47**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Date Certified: 29-JUN-2023 17:42



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: Lake Okeechobee - Pahokee Marina

Collection Date/Time: 06/13/2023 11:30

Field ID: SEHAB0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2417141	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P431232	
		Cylindrospermopsin	0.10	U	ug/L	P431184	
		Desmethyl microcystin LR	0.31	I	ug/L	P431184	
		Microcystin HllR	0.25	U	ug/L	P431184	
		Microcystin HtyR	0.25	U	ug/L	P431184	
		Microcystin LA	0.22	I	ug/L	P431184	
		Microcystin LF	0.10	U	ug/L	P431184	
		Microcystin LR	9.8		ug/L	P431184	
		Microcystin LW	0.25	U	ug/L	P431184	
		Microcystin LY	0.10	U	ug/L	P431184	
		Microcystin RR	0.10	U	ug/L	P431184	
		Microcystin WR	0.50	U	ug/L	P431184	
		Neosaxitoxin	0.50	U	ug/L	P431232	
		Microcystin YR	0.25	U	ug/L	P431184	
		Saxitoxin	0.50	U	ug/L	P431232	
		Nodularin-R	0.10	U	ug/L	P431184	
2417142	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P431488	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P431639	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P431472	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P431372	
2417143	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.075		mg P/L	P431269	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431488

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431639

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431472

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431372

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431269

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

Reference Method: EPA 8321B
Batch ID: P431184

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: P431232

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: P431488

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431639

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431472

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431372

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: P431269

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

Reference Method: EPA 8321B
Batch ID: P431184

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	102		P	40 - 160
Desmethyl microcystin LR	93.0		P	40 - 160
Microcystin HILR	86.8		P	40 - 160
Microcystin HtyR	92.3		P	40 - 160
Microcystin LA	103		P	40 - 160
Microcystin LF	88.2		P	40 - 160
Microcystin LR	98.4		P	40 - 160
Microcystin LW	93.0		P	40 - 160
Microcystin LY	98.1		P	40 - 160
Microcystin RR	93.0		P	40 - 160
Microcystin WR	96.6		P	40 - 160
Microcystin YR	86.7		P	40 - 160
Nodularin-R	92.3		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P431232

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	81.1		P	40 - 150
Neosaxitoxin	83.0		P	40 - 150
Saxitoxin	82.6		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431488

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417042	Ammonia-N	96.0	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417221	Kjeldahl Nitrogen	104	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417089	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431372

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417147	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431269

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2417143	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P431184

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2416612	Cylindrospermopsin	105	104	P/P	40 - 160
2416612	Desmethyl microcystin LR	115	108	P/P	40 - 160
2416612	Microcystin HiLR	92.6	101	P/P	40 - 160
2416612	Microcystin HtyR	108	105	P/P	40 - 160
2416612	Microcystin LA	101	100	P/P	40 - 160
2416612	Microcystin LF	89.5	84.3	P/P	40 - 160
2416612	Microcystin LR	112	113	P/P	40 - 160
2416612	Microcystin LW	89.6	87.1	P/P	40 - 160
2416612	Microcystin LY	103	101	P/P	40 - 160
2416612	Microcystin RR	108	94.3	P/P	40 - 160
2416612	Microcystin WR	96.7	98.3	P/P	40 - 160
2416612	Microcystin YR	92.6	93.7	P/P	40 - 160
2416612	Nodularin-R	99.7	101	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P431232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2416612	Anatoxin-a	79.5	84.1	P/P	40 - 150
2416612	Neosaxitoxin	73.5	76.7	P/P	40 - 150
2416612	Saxitoxin	74.6	71.1	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P431488

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417042	Ammonia-N	2.40	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P431639

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417221	Kjeldahl Nitrogen	2.58	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P431472

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417089	NO2NO3-N	0.641	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P431372

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417147	Total-P	0.235	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P431269

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2417143	O-Phosphate-P	0.114	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P431184

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2416612	Cylindrospermopsin	1.18	Spike	P	0 - 30
2416612	Desmethyl microcystin LR	5.87	Spike	P	0 - 30
2416612	Microcystin H1LR	9.20	Spike	P	0 - 30
2416612	Microcystin HtyR	3.62	Spike	P	0 - 30
2416612	Microcystin LA	0.675	Spike	P	0 - 30
2416612	Microcystin LF	6.02	Spike	P	0 - 30
2416612	Microcystin LR	1.06	Spike	P	0 - 30
2416612	Microcystin LW	2.89	Spike	P	0 - 30
2416612	Microcystin LY	1.24	Spike	P	0 - 30
2416612	Microcystin RR	13.9	Spike	P	0 - 30
2416612	Microcystin WR	1.65	Spike	P	0 - 30
2416612	Microcystin YR	1.17	Spike	P	0 - 30
2416612	Nodularin-R	1.72	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P431232

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2416612	Anatoxin-a	5.58	Spike	P	0 - 30
2416612	Neosaxitoxin	4.27	Spike	P	0 - 30
2416612	Saxitoxin	4.69	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2417141
Field Sample ID: SEHAB0017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	108	P	30 - 160
EPA 8321B	Saxitoxin-15N7	84.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A119799

Included Lab Sample IDs: 2417143

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.5	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A119837

Included Lab Sample IDs: 2417141

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	86.8	81.8	P/P	50 - 160
Neosaxitoxin	90.1	87.2	P/P	50 - 160
Saxitoxin	87.1	84.0	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A119839

Included Lab Sample IDs: 2417141

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	114	112	P/P	60 - 160
Desmethyl microcystin LR	107	103	P/P	50 - 160
Microcystin HIIIR	99.0	89.0	P/P	60 - 160
Microcystin HtyR	91.8	99.2	P/P	60 - 160
Microcystin LA	110	103	P/P	50 - 160
Microcystin LF	95.3	83.7	P/P	60 - 160
Microcystin LR	113	104	P/P	60 - 160
Microcystin LW	84.3	83.1	P/P	60 - 160
Microcystin LY	105	118	P/P	60 - 160
Microcystin RR	101	113	P/P	60 - 160
Microcystin WR	101	108	P/P	60 - 160
Microcystin YR	90.7	95.2	P/P	60 - 160
Nodularin-R	105	98.8	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A119884

Included Lab Sample IDs: 2417142

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A119894

Included Lab Sample IDs: 2417142

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A119904

Included Lab Sample IDs: 2417142

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.5	97.8	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A119992

Included Lab Sample IDs: 2417142

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	110	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	97.4	96.0	98.6			2.40
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	104	107			2.58
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102	102			0.641
EPA 365.1 Rev. 2.0	Total-P	102	106	106			0.235
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	100			0.114
EPA 8321B	Anatoxin-a	81.1	79.5	84.1			5.58
	Cylindrospermopsin	102	105	104			1.18
	Desmethyl microcystin LR	93.0	115	108			5.87
	Microcystin HiLR	86.8	92.6	101			9.20
	Microcystin HtyR	92.3	108	105			3.62
	Microcystin LA	103	101	100			0.675
	Microcystin LF	88.2	89.5	84.3			6.02
	Microcystin LR	98.4	112	113			1.06
	Microcystin LW	93.0	89.6	87.1			2.89
	Microcystin LY	98.1	103	101			1.24
	Microcystin RR	93.0	108	94.3			13.9
	Microcystin WR	96.6	96.7	98.3			1.65
	Microcystin YR	86.7	92.6	93.7			1.17
	Neosaxitoxin	83.0	73.5	76.7			4.27
	Nodularin-R	92.3	99.7	101			1.72
	Saxitoxin	82.6	74.6	71.1			4.69

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2417142
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2417142
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2417142
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2417142
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2417143
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2417141
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2417141

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	06/14/2023			06/16/2023 12:16	Khloe J Berg	2417142
EPA 351.2 Rev. 2.0	06/14/2023	06/22/2023 12:16	Dana G. Hughes	06/23/2023 09:06	Ping Hua	2417142
EPA 353.2 Rev. 2.0	06/14/2023			06/20/2023 08:19	Beverly Y. Sanders	2417142
EPA 365.1 Rev. 2.0	06/14/2023	06/16/2023 15:00	Alexis Price	06/19/2023 11:21	Chandler E Cox	2417142
EPA 365.1 Rev. 2.0 dissolved	06/14/2023			06/14/2023 13:30	Adam P Silver	2417143
EPA 8321B	06/14/2023	06/15/2023 13:00	Touraj Touran	06/15/2023 21:33	Touraj Touran	2417141
	06/14/2023	06/15/2023 13:00	Touraj Touran	06/15/2023 22:47	Touraj Touran	2417141