

Chemical Analysis Report

WQAP-2022-08-26-01

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

Event Description: **Algae Bloom Response NEROC-as needed**
Request ID: **RQ-2022-08-22-52**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-SEP-2022 10:34

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: Guana Lake 400 m N of Ramp

Collection Date/Time: 08/25/2022 10:33

Field ID: NEHAB0092

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2352556	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P418629	
		Cylindrospermopsin	0.10	U	ug/L	P418629	
		Desmethyl microcystin LR	0.25	U	ug/L	P418629	
		Microcystin HILR	0.25	U	ug/L	P418629	
		Microcystin HtyR	0.25	U	ug/L	P418629	
		Microcystin LA	0.10	U	ug/L	P418629	
		Microcystin LF	0.10	U	ug/L	P418629	
		Microcystin LR	0.25	U	ug/L	P418629	
		Microcystin LW	0.25	U	ug/L	P418629	
		Microcystin LY	0.10	U	ug/L	P418629	
		Microcystin RR	0.10	U	ug/L	P418629	
		Microcystin WR	0.50	U	ug/L	P418629	
		Neosaxitoxin	0.50	U	ug/L	P418629	
		Microcystin YR	0.25	U	ug/L	P418629	
		Saxitoxin	0.50	U	ug/L	P418629	
		Nodularin-R	0.10	U	ug/L	P418629	
2352557	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P418992	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.9		mg N/L	P418821	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P418994	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P418985	
2352558	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P418759	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418992

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418821

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418994

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418985

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418759

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

Reference Method: EPA 8321B
Batch ID: P418629

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1R	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
Neosaxitoxin	0.50	U	ug/L
Nodularin-R	0.10	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: P418992

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418821

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418994

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418985

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418759

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P418629

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	88.5		P	40 - 150
Cylindrospermopsin	76.2		P	40 - 150
Desmethyl microcystin LR	81.9		P	40 - 150
Microcystin HIR	92.0		P	40 - 150
Microcystin HtyR	89.8		P	40 - 150
Microcystin LA	102		P	40 - 150
Microcystin LF	73.0		P	40 - 150
Microcystin LR	85.7		P	40 - 150
Microcystin LW	82.8		P	40 - 150
Microcystin LY	75.2		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	85.5		P	40 - 150
Microcystin YR	84.4		P	40 - 150
Neosaxitoxin	76.7		P	40 - 150
Nodularin-R	96.9		P	40 - 150
Saxitoxin	81.7		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418992

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352460	Ammonia-N	98.8	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352339	Kjeldahl Nitrogen	101	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352460	NO2NO3-N	98.4	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352345	Total-P	97.0	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352574	O-Phosphate-P	95.6	96.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P418629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352524	Anatoxin-a	101	95.8	P/P	40 - 150
2352524	Cylindrospermopsin	87.7	93.6	P/P	40 - 150
2352524	Desmethyl microcystin LR	99.0	98.1	P/P	40 - 150
2352524	Microcystin HiLR	103	105	P/P	40 - 150
2352524	Microcystin HtyR	109	107	P/P	40 - 150
2352524	Microcystin LA	111	121	P/P	40 - 150
2352524	Microcystin LF	78.3	72.3	P/P	40 - 150
2352524	Microcystin LR	100	97.3	P/P	40 - 150
2352524	Microcystin LW	82.6	87.5	P/P	40 - 150
2352524	Microcystin LY	86.8	78.9	P/P	40 - 150
2352524	Microcystin RR	107	105	P/P	40 - 150
2352524	Microcystin WR	97.5	98.3	P/P	40 - 150
2352524	Microcystin YR	104	104	P/P	40 - 150
2352524	Neosaxitoxin	65.5	61.6	P/P	40 - 150
2352524	Nodularin-R	108	108	P/P	40 - 150
2352524	Saxitoxin	59.3	55.7	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418992

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352460	Ammonia-N	0.158	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352339	Kjeldahl Nitrogen	1.56	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352460	NO2NO3-N	1.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352345	Total-P	0.116	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352574	O-Phosphate-P	0.626	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P418629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352524	Anatoxin-a	5.59	Spike	P	0 - 30
2352524	Cylindrospermopsin	6.50	Spike	P	0 - 30
2352524	Desmethyl microcystin LR	0.974	Spike	P	0 - 30
2352524	Microcystin H1LR	2.04	Spike	P	0 - 30
2352524	Microcystin HtyR	2.09	Spike	P	0 - 30
2352524	Microcystin LA	8.62	Spike	P	0 - 30
2352524	Microcystin LF	7.85	Spike	P	0 - 30
2352524	Microcystin LR	2.73	Spike	P	0 - 30
2352524	Microcystin LW	5.76	Spike	P	0 - 30
2352524	Microcystin LY	8.75	Spike	P	0 - 30
2352524	Microcystin RR	1.64	Spike	P	0 - 30
2352524	Microcystin WR	0.828	Spike	P	0 - 30
2352524	Microcystin YR	0.154	Spike	P	0 - 30
2352524	Neosaxitoxin	6.19	Spike	P	0 - 30
2352524	Nodularin-R	0.130	Spike	P	0 - 30
2352524	Saxitoxin	6.34	Spike	P	0 - 30

Quality Assurance Report Precision

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

Quality Assurance Report Surrogates

Lab Sample ID: 2352556
Field Sample ID: NEHAB0092

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	90.5	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	31.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A114380

Included Lab Sample IDs: 2352558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A114387

Included Lab Sample IDs: 2352556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	94.4	88.2	P/P	50 - 160
Neosaxitoxin	82.7	87.2	P/P	50 - 160
Saxitoxin	85.1	86.5	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A114389

Included Lab Sample IDs: 2352556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	87.4	82.8	P/P	50 - 160
Desmethyl microcystin LR	84.8	93.7	P/P	50 - 160
Microcystin H1IR	102	99.0	P/P	50 - 160
Microcystin HtyR	94.8	98.8	P/P	50 - 160
Microcystin LA	118	100	P/P	50 - 160
Microcystin LF	60.0	68.5	P/P	50 - 160
Microcystin LR	85.0	92.7	P/P	50 - 160
Microcystin LW	78.8	76.7	P/P	50 - 160
Microcystin LY	89.8	75.2	P/P	50 - 160
Microcystin RR	103	104	P/P	50 - 160
Microcystin WR	90.2	95.8	P/P	50 - 160
Microcystin YR	93.1	90.2	P/P	50 - 160
Nodularin-R	103	100	P/P	50 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114457

Included Lab Sample IDs: 2352557

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	96.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114480

Included Lab Sample IDs: 2352557

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114483

Included Lab Sample IDs: 2352557

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	106	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114512

Included Lab Sample IDs: 2352557

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	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	101	98.8	99.0			0.158
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	101	98.8			1.56
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	106	98.4	99.4			1.01
EPA 365.1 Rev. 2.0	Total-P	104	97.0	96.8			0.116
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	95.6	96.2			0.626
EPA 8321B	Anatoxin-a	88.5	101	95.8			5.59
	Cylindrospermopsin	76.2	87.7	93.6			6.50
	Desmethyl microcystin LR	81.9	99.0	98.1			0.974
	Microcystin HiLR	92.0	103	105			2.04
	Microcystin HtyR	89.8	109	107			2.09
	Microcystin LA	102	111	121			8.62
	Microcystin LF	73.0	78.3	72.3			7.85
	Microcystin LR	85.7	100	97.3			2.73
	Microcystin LW	82.8	82.6	87.5			5.76
	Microcystin LY	75.2	86.8	78.9			8.75
	Microcystin RR	101	107	105			1.64
	Microcystin WR	85.5	97.5	98.3			0.828
	Microcystin YR	84.4	104	104			0.154
	Neosaxitoxin	76.7	65.5	61.6			6.19
	Nodularin-R	96.9	108	108			0.130
	Saxitoxin	81.7	59.3	55.7			6.34

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2352557
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2352557
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2352557
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2352557
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2352558
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2352556
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2352556

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	08/26/2022			09/01/2022 10:44	Ping Hua	2352557
EPA 351.2 Rev. 2.0	08/26/2022	08/30/2022 14:31	Samantha L Bates	08/31/2022 13:04	Alexandra J Mattheus	2352557
EPA 353.2 Rev. 2.0	08/26/2022			09/01/2022 12:21	Judith K. Clark	2352557
EPA 365.1 Rev. 2.0	08/26/2022	09/01/2022 15:55	Simonne.V. Calhoun	09/02/2022 10:45	Simonne.V. Calhoun	2352557
EPA 365.1 Rev. 2.0 dissolved	08/26/2022			08/26/2022 13:40	Elise M. Gillis	2352558
EPA 8321B	08/26/2022	08/26/2022 14:00	Manjita Shrestha	08/26/2022 20:57	Manjita Shrestha	2352556
	08/26/2022	08/26/2022 14:00	Manjita Shrestha	08/27/2022 04:34	Manjita Shrestha	2352556