

Chemical Analysis Report

WQAP-2023-07-13-01

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-2023-05-22-64**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 24-JUL-2023 11:27

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

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: Ortega River - Imperial Cove Rd

Collection Date/Time: 07/12/2023 09:40

Field ID: NEHAB0059

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2423507	DEP SOP: NU-094-1	Color (true)	130		PCU	P432435	
2423508	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P432620	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P432459	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P432588	
	EPA 365.1 Rev. 2.0	Total-P	0.34		mg P/L	P432534	
2423509	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.088		mg P/L	P432440	
2423510	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432401	
		Cylindrospermopsin	0.10	U	ug/L	P432398	
		Desmethyl microcystin LR	0.25	U	ug/L	P432398	
		Microcystin HiLR	0.25	U	ug/L	P432398	
		Microcystin HtyR	0.25	U	ug/L	P432398	
		Microcystin LA	0.10	U	ug/L	P432398	
		Microcystin LF	0.10	U	ug/L	P432398	
		Microcystin LR	0.25	U	ug/L	P432398	
		Microcystin LW	0.25	U	ug/L	P432398	
		Microcystin LY	0.10	U	ug/L	P432398	
		Microcystin RR	0.10	U	ug/L	P432398	
		Microcystin WR	0.50	U	ug/L	P432398	
		Neosaxitoxin	0.50	U	ug/L	P432401	
		Microcystin YR	0.25	U	ug/L	P432398	
		Saxitoxin	0.50	U	ug/L	P432401	
		Nodularin-R	0.10	U	ug/L	P432398	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P432435

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432620

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432459

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432588

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432534

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432440

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

Reference Method: EPA 8321B
Batch ID: P432398

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P432401

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: DEP SOP: NU-094-1
Batch ID: P432435

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432459

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432588

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432534

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432440

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.3		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P432398

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	105		P	40 - 160
Desmethyl microcystin LR	105		P	40 - 160
Microcystin HILR	105		P	40 - 160
Microcystin HtyR	95.8		P	40 - 160
Microcystin LA	104		P	40 - 160
Microcystin LF	103		P	40 - 160
Microcystin LR	112		P	40 - 160
Microcystin LW	91.9		P	40 - 160
Microcystin LY	117		P	40 - 160
Microcystin RR	98.4		P	40 - 160
Microcystin WR	97.0		P	40 - 160
Microcystin YR	95.8		P	40 - 160
Nodularin-R	96.5		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P432401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	98.5		P	40 - 150
Neosaxitoxin	106		P	40 - 150
Saxitoxin	104		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423421	Ammonia-N	97.4	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423379	Kjeldahl Nitrogen	95.1	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423508	NO2NO3-N	98.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423442	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423380	O-Phosphate-P	97.0	96.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P432398

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423444	Cylindrospermopsin	107	109	P/P	40 - 160
2423444	Desmethyl microcystin LR	114	115	P/P	40 - 160
2423444	Microcystin HiLR	109	113	P/P	40 - 160
2423444	Microcystin HtyR	101	104	P/P	40 - 160
2423444	Microcystin LA	110	113	P/P	40 - 160
2423444	Microcystin LF	117	125	P/P	40 - 160
2423444	Microcystin LR	122	122	P/P	40 - 160
2423444	Microcystin LW	103	110	P/P	40 - 160
2423444	Microcystin LY	110	117	P/P	40 - 160
2423444	Microcystin RR	102	107	P/P	40 - 160
2423444	Microcystin WR	108	106	P/P	40 - 160
2423444	Microcystin YR	103	103	P/P	40 - 160
2423444	Nodularin-R	101	104	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2423444	Anatoxin-a	94.8	101	P/P	40 - 150
2423444	Neosaxitoxin	93.1	99.8	P/P	40 - 150
2423444	Saxitoxin	96.9	106	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P432435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423441	Color (true)	0.448	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423421	Ammonia-N	0.818	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423379	Kjeldahl Nitrogen	4.67	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423508	NO2NO3-N	1.47	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423442	Total-P	0.677	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423380	O-Phosphate-P	0.103	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P432398

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423444	Cylindrospermopsin	1.70	Spike	P	0 - 30
2423444	Desmethyl microcystin LR	1.08	Spike	P	0 - 30
2423444	Microcystin HtIR	3.46	Spike	P	0 - 30
2423444	Microcystin HtyR	2.96	Spike	P	0 - 30
2423444	Microcystin LA	3.39	Spike	P	0 - 30
2423444	Microcystin LF	6.81	Spike	P	0 - 30
2423444	Microcystin LR	0.152	Spike	P	0 - 30
2423444	Microcystin LW	5.90	Spike	P	0 - 30
2423444	Microcystin LY	6.38	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P432398

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423444	Microcystin RR	4.22	Spike	P	0 - 30
2423444	Microcystin WR	1.88	Spike	P	0 - 30
2423444	Microcystin YR	0.313	Spike	P	0 - 30
2423444	Nodularin-R	2.71	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P432401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2423444	Anatoxin-a	6.06	Spike	P	0 - 30
2423444	Neosaxitoxin	6.98	Spike	P	0 - 30
2423444	Saxitoxin	8.79	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2423510
Field Sample ID: NEHAB0059

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	111	P	30 - 160
EPA 8321B	Saxitoxin-15N7	33.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A120354

Included Lab Sample IDs: 2423507

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120355

Included Lab Sample IDs: 2423509

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	99.0	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120356

Included Lab Sample IDs: 2423510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	122	121	P/P	60 - 160
Desmethyl microcystin LR	121	119	P/P	50 - 160
Microcystin HiiR	122	119	P/P	60 - 160
Microcystin HtyR	111	110	P/P	60 - 160
Microcystin LA	122	125	P/P	50 - 160
Microcystin LF	112	108	P/P	60 - 160
Microcystin LR	120	120	P/P	60 - 160
Microcystin LW	92.7	94.1	P/P	60 - 160
Microcystin LY	121	124	P/P	60 - 160
Microcystin RR	113	112	P/P	60 - 160
Microcystin WR	104	108	P/P	60 - 160
Microcystin YR	106	109	P/P	60 - 160
Nodularin-R	110	108	P/P	60 - 160

Reference Method: EPA 8321B

Run ID: A120360

Included Lab Sample IDs: 2423510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	105	100	P/P	50 - 160
Neosaxitoxin	96.1	95.8	P/P	50 - 160
Saxitoxin	96.1	93.2	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120440

Included Lab Sample IDs: 2423508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120446

Included Lab Sample IDs: 2423508

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A120453
Included Lab Sample IDs: 2423508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A120475
Included Lab Sample IDs: 2423508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.4	94.8	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	
DEP SOP: NU-094-1	Color (true)	99.6				0.448	
EPA 350.1 Rev. 2.0	Ammonia-N	94.8	97.4	98.2			0.818
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	95.1	100			4.67
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.8	100			1.47
EPA 365.1 Rev. 2.0	Total-P	98.1	101	102			0.677
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	97.0	96.9			0.103
EPA 8321B	Anatoxin-a	98.5	94.8	101			6.06
	Cylindrospermopsin	105	107	109			1.70
	Desmethyl microcystin LR	105	114	115			1.08
	Microcystin H ₁ LR	105	109	113			3.46
	Microcystin H ₂ LR	95.8	101	104			2.96
	Microcystin LA	104	110	113			3.39
	Microcystin LF	103	117	125			6.81
	Microcystin LR	112	122	122			0.152
	Microcystin LW	91.9	103	110			5.90
	Microcystin LY	117	110	117			6.38
	Microcystin RR	98.4	102	107			4.22
	Microcystin WR	97.0	108	106			1.88
	Microcystin YR	95.8	103	103			0.313
	Neosaxitoxin	106	93.1	99.8			6.98
	Nodularin-R	96.5	101	104			2.71
	Saxitoxin	104	96.9	106			8.79

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2423507
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2423508
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2423508
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2423508
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2423508
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2423509
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2423510
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2423510

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	07/13/2023			07/13/2023 14:37	Samantha L Bates	2423507
EPA 350.1 Rev. 2.0	07/13/2023			07/18/2023 11:09	Khloe J Berg	2423508
EPA 351.2 Rev. 2.0	07/13/2023	07/14/2023 12:31	Simonne.V. Calhoun	07/18/2023 17:10	Samantha L Bates	2423508
EPA 353.2 Rev. 2.0	07/13/2023			07/17/2023 13:59	Judith K. Clark	2423508
EPA 365.1 Rev. 2.0	07/13/2023	07/17/2023 13:00	Alexis Price	07/18/2023 09:35	Simonne.V. Calhoun	2423508
EPA 365.1 Rev. 2.0 dissolved	07/13/2023			07/13/2023 14:50	Elise M. Gillis	2423509
EPA 8321B	07/13/2023	07/13/2023 12:00	Hana Lee	07/13/2023 22:09	Tae K Lee	2423510
	07/13/2023	07/13/2023 12:00	Hana Lee	07/14/2023 01:59	Tae K Lee	2423510