

Chemical Analysis Report

WQAP-2023-07-27-01

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

Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2023-06-26-51**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Date Certified: 10-AUG-2023 14:03



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 Seminole - Boat Ramp

Collection Date/Time: 07/26/2023 09:20

Field ID: HAB-SW-0218

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2427168	DEP SOP: NU-094-1	Color (true)	28		PCU	P433135	
2427169	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P433399	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.6		mg N/L	P433217	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P433167	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P433360	
2427170	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P433118	
2427173	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433088	
		Cylindrospermopsin	0.49		ug/L	P433087	
		Desmethyl microcystin LR	0.25	U	ug/L	P433087	
		Microcystin HilR	0.25	U	ug/L	P433087	
		Microcystin HtyR	0.25	U	ug/L	P433087	
		Microcystin LA	0.10	U	ug/L	P433087	
		Microcystin LF	0.10	U	ug/L	P433087	
		Microcystin LR	0.25	U	ug/L	P433087	
		Microcystin LW	0.25	U	ug/L	P433087	
		Microcystin LY	0.10	U	ug/L	P433087	
		Microcystin RR	0.10	U	ug/L	P433087	
		Microcystin WR	0.50	U	ug/L	P433087	
		Neosaxitoxin	0.50	U	ug/L	P433088	
		Microcystin YR	0.25	U	ug/L	P433087	
		Saxitoxin	0.50	U	ug/L	P433088	
		Nodularin-R	0.10	U	ug/L	P433087	

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P433135

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433399

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433217

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433167

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433360

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433118

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

Reference Method: EPA 8321B
Batch ID: P433087

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: P433088

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: P433135

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433399

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433217

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433167

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433360

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: P433118

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

Reference Method: EPA 8321B
Batch ID: P433087

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	105		P	40 - 160
Desmethyl microcystin LR	102		P	40 - 160
Microcystin HILR	100		P	40 - 160
Microcystin HtyR	93.7		P	40 - 160
Microcystin LA	105		P	40 - 160
Microcystin LF	87.2		P	40 - 160
Microcystin LR	97.9		P	40 - 160
Microcystin LW	94.5		P	40 - 160
Microcystin LY	107		P	40 - 160
Microcystin RR	95.5		P	40 - 160
Microcystin WR	106		P	40 - 160
Microcystin YR	89.1		P	40 - 160
Nodularin-R	92.9		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P433088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	118		P	40 - 150
Neosaxitoxin	103		P	40 - 150
Saxitoxin	90.4		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433399

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427169	Ammonia-N	99.2	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433217

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427054	Kjeldahl Nitrogen	98.3	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433167

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427059	NO2NO3-N	96.0	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433360

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427098	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433118

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427020	O-Phosphate-P	97.3	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P433087

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427160	Cylindrospermopsin	96.6	100	P/P	40 - 160
2427160	Desmethyl microcystin LR	101	103	P/P	40 - 160
2427160	Microcystin HiLR	96.0	103	P/P	40 - 160
2427160	Microcystin HtyR	88.4	90.9	P/P	40 - 160
2427160	Microcystin LA	96.3	103	P/P	40 - 160
2427160	Microcystin LF	94.3	96.9	P/P	40 - 160
2427160	Microcystin LR	91.2	90.9	P/P	40 - 160
2427160	Microcystin LW	95.9	100	P/P	40 - 160
2427160	Microcystin LY	96.0	98.3	P/P	40 - 160
2427160	Microcystin RR	91.7	93.4	P/P	40 - 160
2427160	Microcystin WR	103	104	P/P	40 - 160
2427160	Microcystin YR	83.8	87.0	P/P	40 - 160
2427160	Nodularin-R	88.4	91.8	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427160	Anatoxin-a	111	112	P/P	40 - 150
2427160	Neosaxitoxin	80.6	81.9	P/P	40 - 150
2427160	Saxitoxin	79.5	62.3	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P433135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427087	Color (true)	2.89	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P433399

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427169	Ammonia-N	0.501	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P433217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427054	Kjeldahl Nitrogen	3.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P433167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427059	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433360

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427098	Total-P	0.345	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427020	O-Phosphate-P	2.56	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P433087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427160	Cylindrospermopsin	3.45	Spike	P	0 - 30
2427160	Desmethyl microcystin LR	2.17	Spike	P	0 - 30
2427160	Microcystin HtLR	6.97	Spike	P	0 - 30
2427160	Microcystin HtyR	2.73	Spike	P	0 - 30
2427160	Microcystin LA	6.49	Spike	P	0 - 30
2427160	Microcystin LF	2.78	Spike	P	0 - 30
2427160	Microcystin LR	0.195	Spike	P	0 - 30
2427160	Microcystin LW	4.60	Spike	P	0 - 30
2427160	Microcystin LY	2.30	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P433087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427160	Microcystin RR	1.80	Spike	P	0 - 30
2427160	Microcystin WR	1.19	Spike	P	0 - 30
2427160	Microcystin YR	3.75	Spike	P	0 - 30
2427160	Nodularin-R	3.80	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P433088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427160	Anatoxin-a	0.413	Spike	P	0 - 30
2427160	Neosaxitoxin	1.66	Spike	P	0 - 30
2427160	Saxitoxin	24.3	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2427173
Field Sample ID: HAB-SW-0218

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	119	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	104	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120685

Included Lab Sample IDs: 2427170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.6	99.8	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A120689

Included Lab Sample IDs: 2427168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	97.0	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120691

Included Lab Sample IDs: 2427173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	122	120	P/P	50 - 160
Neosaxitoxin	103	101	P/P	50 - 160
Saxitoxin	90.8	90.5	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A120692

Included Lab Sample IDs: 2427173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	101	102	P/P	60 - 160
Desmethyl microcystin LR	96.0	96.4	P/P	50 - 160
Microcystin HILR	93.5	92.5	P/P	60 - 160
Microcystin HtyR	86.6	84.0	P/P	60 - 160
Microcystin LA	102	103	P/P	50 - 160
Microcystin LF	84.7	84.4	P/P	60 - 160
Microcystin LR	89.9	87.6	P/P	60 - 160
Microcystin LW	79.7	80.8	P/P	60 - 160
Microcystin LY	96.4	95.9	P/P	60 - 160
Microcystin RR	87.9	87.7	P/P	60 - 160
Microcystin WR	94.9	91.2	P/P	60 - 160
Microcystin YR	79.6	78.7	P/P	60 - 160
Nodularin-R	85.9	88.1	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120701

Included Lab Sample IDs: 2427169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.0	94.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120769

Included Lab Sample IDs: 2427169

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

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120823

Included Lab Sample IDs: 2427169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120855

Included Lab Sample IDs: 2427169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	102	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	
DEP SOP: NU-094-1	Color (true)	97.9			2.89	
EPA 350.1 Rev. 2.0	Ammonia-N	100	99.2	99.8		0.501
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.3	102		3.09
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	95.0	96.0	96.0		0.0
EPA 365.1 Rev. 2.0	Total-P	103	106	106		0.345
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	97.3	101		2.56
EPA 8321B	Anatoxin-a	118	111	112		0.413
	Cylindrospermopsin	105	96.6	100		3.45
	Desmethyl microcystin LR	102	101	103		2.17
	Microcystin H ₁ LR	100	96.0	103		6.97
	Microcystin H ₂ YR	93.7	88.4	90.9		2.73
	Microcystin LA	105	96.3	103		6.49
	Microcystin LF	87.2	94.3	96.9		2.78
	Microcystin LR	97.9	91.2	90.9		0.195
	Microcystin LW	94.5	95.9	100		4.60
	Microcystin LY	107	96.0	98.3		2.30
	Microcystin RR	95.5	91.7	93.4		1.80
	Microcystin WR	106	103	104		1.19
	Microcystin YR	89.1	83.8	87.0		3.75
	Neosaxitoxin	103	80.6	81.9		1.66
	Nodularin-R	92.9	88.4	91.8		3.80
	Saxitoxin	90.4	79.5	62.3		24.3

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2427168
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2427169
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2427169
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2427169
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2427169
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2427170
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2427173
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2427173

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	07/27/2023			07/27/2023 15:59	Alexis Price	2427168
EPA 350.1 Rev. 2.0	07/27/2023			08/03/2023 13:49	Ping Hua	2427169
EPA 351.2 Rev. 2.0	07/27/2023	07/31/2023 10:34	Dana G. Hughes	08/01/2023 14:33	Samantha L Bates	2427169
EPA 353.2 Rev. 2.0	07/27/2023			07/28/2023 10:26	Beverly Y. Sanders	2427169
EPA 365.1 Rev. 2.0	07/27/2023	08/03/2023 13:11	Simonne.V. Calhoun	08/04/2023 14:26	Chandler E Cox	2427169
EPA 365.1 Rev. 2.0 dissolved	07/27/2023			07/27/2023 13:32	Chandler E Cox	2427170
EPA 8321B	07/27/2023	07/27/2023 13:00	Hana Lee	07/27/2023 20:16	Tae K Lee	2427173
	07/27/2023	07/27/2023 13:00	Hana Lee	07/28/2023 02:27	Tae K Lee	2427173