Chemical Analysis Report

WQAP-2023-01-10-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-12-19-32**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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3319 Maguire Blvd. Suite 232
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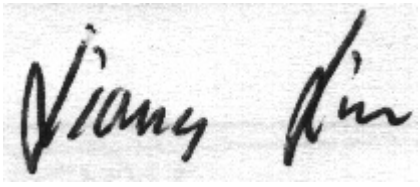
Date Certified: 20-JAN-2023 18:35



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: Starke Lake - Boat Ramp **Collection Date/Time: 01/09/2023 11:09**

Field ID: HABCE0143_StarkeLake Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2378948	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P424343	
		Cylindrospermopsin	0.10	U	ug/L	P424342	
		Desmethyl microcystin LR	0.25	U	ug/L	P424342	
		Microcystin HilR	0.25	U	ug/L	P424342	
		Microcystin HtyR	0.25	U	ug/L	P424342	
		Microcystin LA	0.10	U	ug/L	P424342	
		Microcystin LF	0.10	U	ug/L	P424342	
		Microcystin LR	0.25	U	ug/L	P424342	
		Microcystin LW	0.25	U	ug/L	P424342	
		Microcystin LY	0.10	U	ug/L	P424342	
		Microcystin RR	0.10	U	ug/L	P424342	
		Microcystin WR	0.50	U	ug/L	P424342	
		Neosaxitoxin	0.50	U	ug/L	P424343	
		Microcystin YR	0.25	U	ug/L	P424342	
		Saxitoxin	0.50	U	ug/L	P424343	
		Nodularin-R	0.10	U	ug/L	P424342	
2378949	EPA 350.1 Rev. 2.0	Ammonia-N	0.077		mg N/L	P424559	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P424388	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P424526	
	EPA 365.1 Rev. 2.0	Total-P	0.036		mg P/L	P424379	
2378950	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P424364	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424559

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424388

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424526

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424379

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424364

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

Reference Method: EPA 8321B
Batch ID: P424342

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	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: P424343

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: P424559

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424388

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424526

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: P424379

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: P424364

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P424342

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	103		P	40 - 150
Desmethyl microcystin LR	77.4		P	40 - 150
Microcystin HilR	84.6		P	40 - 150
Microcystin HtyR	73.4		P	40 - 150
Microcystin LA	75.1		P	40 - 150
Microcystin LF	81.8		P	40 - 150
Microcystin LR	83.6		P	40 - 150
Microcystin LW	96.0		P	40 - 150
Microcystin LY	68.2		P	40 - 150
Microcystin RR	82.3		P	40 - 150
Microcystin WR	86.0		P	40 - 150
Microcystin YR	74.4		P	40 - 150
Nodularin-R	77.0		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P424343

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	138		P	40 - 150
Neosaxitoxin	143		P	40 - 150
Saxitoxin	110		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378478	Ammonia-N	100	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378949	Kjeldahl Nitrogen	103	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378763	NO2NO3-N	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424379

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378778	Total-P	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378950	O-Phosphate-P	93.8	94.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P424342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378848	Cylindrospermopsin	105	109	P/P	40 - 150
2378848	Desmethyl microcystin LR	90.3	86.8	P/P	40 - 150
2378848	Microcystin HilR	87.5	93.7	P/P	40 - 150
2378848	Microcystin HtyR	85.9	86.4	P/P	40 - 150
2378848	Microcystin LA	74.8	68.5	P/P	40 - 150
2378848	Microcystin LF	63.8	62.0	P/P	40 - 150
2378848	Microcystin LR	94.9	98.6	P/P	40 - 150
2378848	Microcystin LW	78.3	66.6	P/P	40 - 150
2378848	Microcystin LY	73.6	64.4	P/P	40 - 150
2378848	Microcystin RR	86.4	85.9	P/P	40 - 150
2378848	Microcystin WR	89.5	87.0	P/P	40 - 150
2378848	Microcystin YR	77.9	79.9	P/P	40 - 150
2378848	Nodularin-R	85.0	85.8	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P424343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378454	Anatoxin-a	125	137	P/P	40 - 150
2378454	Neosaxitoxin	93.8	93.5	P/P	40 - 150
2378454	Saxitoxin	73.1	71.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378478	Ammonia-N	0.182	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378949	Kjeldahl Nitrogen	2.74	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P424526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378763	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378778	Total-P	0.561	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P424364

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378950	O-Phosphate-P	0.426	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P424342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378848	Cylindrospermopsin	4.14	Spike	P	0 - 30
2378848	Desmethyl microcystin LR	3.93	Spike	P	0 - 30
2378848	Microcystin HilR	6.89	Spike	P	0 - 30
2378848	Microcystin HtyR	0.536	Spike	P	0 - 30
2378848	Microcystin LA	8.87	Spike	P	0 - 30
2378848	Microcystin LF	2.81	Spike	P	0 - 30
2378848	Microcystin LR	3.90	Spike	P	0 - 30
2378848	Microcystin LW	16.1	Spike	P	0 - 30
2378848	Microcystin LY	13.4	Spike	P	0 - 30
2378848	Microcystin RR	0.562	Spike	P	0 - 30
2378848	Microcystin WR	2.80	Spike	P	0 - 30
2378848	Microcystin YR	2.52	Spike	P	0 - 30
2378848	Nodularin-R	0.978	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P424343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2378454	Anatoxin-a	9.02	Spike	P	0 - 30
2378454	Neosaxitoxin	0.269	Spike	P	0 - 30
2378454	Saxitoxin	1.81	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2378948
Field Sample ID: HABCE0143_StarkeLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	72.7	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	108	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A116831
Included Lab Sample IDs: 2378950

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	99.9	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A116851
Included Lab Sample IDs: 2378948

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	99.4	103	P/P	50 - 160
Desmethyl microcystin LR	82.9	75.4	P/P	50 - 160
Microcystin HilR	85.1	77.7	P/P	50 - 160
Microcystin HtyR	78.0	73.1	P/P	50 - 160
Microcystin LA	74.8	64.7	P/P	50 - 160
Microcystin LF	76.1	66.0	P/P	50 - 160
Microcystin LR	88.3	80.4	P/P	50 - 160
Microcystin LW	80.1	68.3	P/P	50 - 160
Microcystin LY	74.5	63.8	P/P	50 - 160
Microcystin RR	85.3	77.6	P/P	50 - 160
Microcystin WR	82.6	85.7	P/P	50 - 160
Microcystin YR	74.3	66.4	P/P	50 - 160
Nodularin-R	79.4	76.0	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A116860
Included Lab Sample IDs: 2378948

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	129	116	P/P	50 - 160
Neosaxitoxin	151	128	P/P	50 - 160
Saxitoxin	111	98.6	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116874
Included Lab Sample IDs: 2378949

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116885
Included Lab Sample IDs: 2378949

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116902
Included Lab Sample IDs: 2378949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116926
Included Lab Sample IDs: 2378949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	104	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	102	100	100			0.182
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	103	98.4			2.74
EPA 353.2 Rev. 2.0	NO2NO3-N	106	107	107			0.0
EPA 365.1 Rev. 2.0	Total-P	104	105	104			0.561
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	93.8	94.2			0.426
EPA 8321B	Anatoxin-a	138	125	137			9.02
	Cylindrospermopsin	103	105	109			4.14
	Desmethyl microcystin LR	77.4	90.3	86.8			3.93
	Microcystin HilR	84.6	87.5	93.7			6.89
	Microcystin HtyR	73.4	85.9	86.4			0.536
	Microcystin LA	75.1	74.8	68.5			8.87
	Microcystin LF	81.8	63.8	62.0			2.81
	Microcystin LR	83.6	94.9	98.6			3.90
	Microcystin LW	96.0	78.3	66.6			16.1
	Microcystin LY	68.2	73.6	64.4			13.4
	Microcystin RR	82.3	86.4	85.9			0.562
	Microcystin WR	86.0	89.5	87.0			2.80
	Microcystin YR	74.4	77.9	79.9			2.52
	Neosaxitoxin	143	93.8	93.5			0.269
	Nodularin-R	77.0	85.0	85.8			0.978
	Saxitoxin	110	73.1	71.8			1.81

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2378949
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2378949
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2378949
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2378949
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2378950
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2378948
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2378948

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	01/10/2023			01/13/2023 11:07	Ping Hua	2378949
EPA 351.2 Rev. 2.0	01/10/2023	01/11/2023 13:19	Samantha L Bates	01/17/2023 12:10	Samantha L Bates	2378949
EPA 353.2 Rev. 2.0	01/10/2023			01/12/2023 12:04	Beverly Y. Sanders	2378949
EPA 365.1 Rev. 2.0	01/10/2023	01/11/2023 13:40	Simonne.V. Calhoun	01/12/2023 13:39	Simonne.V. Calhoun	2378949
EPA 365.1 Rev. 2.0 dissolved	01/10/2023			01/10/2023 16:27	Elise M. Gillis	2378950
EPA 8321B	01/10/2023	01/11/2023 09:00	Manjita Shrestha	01/11/2023 12:14	Manjita Shrestha	2378948
	01/10/2023	01/11/2023 12:00	Manjita Shrestha	01/11/2023 22:09	Manjita Shrestha	2378948