

Chemical Analysis Report

CEN-DIST-2023-09-21-01

Review Copy

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-07-03-19**
Customer: **CEN-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
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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: Pioneer Lake - NE Shore

Collection Date/Time: 09/20/2023 11:43

Field ID: HABCE0190

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2438808	DEP SOP: NU-094-1	Color (true)	21		PCU	P435344	
2438809	EPA 350.1 Rev. 2.0	Ammonia-N	0.045		mg N/L	P435505	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P436037	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.48		mg N/L	P436059	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P435422	
2438810	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P435347	
2438811	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P435290	
		Cylindrospermopsin	0.10	U	ug/L	P435288	
		Desmethyl microcystin LR	0.25	U	ug/L	P435288	
		Microcystin HiLR	0.25	U	ug/L	P435288	
		Microcystin HtyR	0.25	U	ug/L	P435288	
		Microcystin LA	0.10	U	ug/L	P435288	
		Microcystin LF	0.10	U	ug/L	P435288	
		Microcystin LR	0.25	U	ug/L	P435288	
		Microcystin LW	0.25	U	ug/L	P435288	
		Microcystin LY	0.10	U	ug/L	P435288	
		Microcystin RR	0.10	U	ug/L	P435288	
		Microcystin WR	0.50	U	ug/L	P435288	
		Neosaxitoxin	0.50	U	ug/L	P435290	
		Microcystin YR	0.25	U	ug/L	P435288	
		Saxitoxin	0.50	U	ug/L	P435290	
		Nodularin-R	0.10	U	ug/L	P435288	

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P435344

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435505

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436037

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436059

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435422

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435347

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

Reference Method: EPA 8321B
Batch ID: P435288

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: P435290

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: P435344

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435505

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436037

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436059

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435422

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435347

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

Reference Method: EPA 8321B
Batch ID: P435288

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	92.5		P	40 - 160
Desmethyl microcystin LR	120		P	40 - 160
Microcystin H1LR	114		P	40 - 160
Microcystin HtyR	112		P	40 - 160
Microcystin LA	108		P	40 - 160
Microcystin LF	96.2		P	40 - 160
Microcystin LR	108		P	40 - 160
Microcystin LW	97.7		P	40 - 160
Microcystin LY	104		P	40 - 160
Microcystin RR	115		P	40 - 160
Microcystin WR	115		P	40 - 160
Microcystin YR	101		P	40 - 160
Nodularin-R	113		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P435290

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	96.6		P	40 - 150
Neosaxitoxin	81.1		P	40 - 150
Saxitoxin	99.2		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438818	Ammonia-N	99.6	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436037

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438916	Kjeldahl Nitrogen	106	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436059

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438786	NO2NO3-N	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435422

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438809	Total-P	107	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438698	O-Phosphate-P	98.9	99.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P435288

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438216	Cylindrospermopsin	109	106	P/P	40 - 160
2438216	Desmethyl microcystin LR	128	124	P/P	40 - 160
2438216	Microcystin HiLR	119	120	P/P	40 - 160
2438216	Microcystin HtyR	117	120	P/P	40 - 160
2438216	Microcystin LA	110	104	P/P	40 - 160
2438216	Microcystin LF	117	115	P/P	40 - 160
2438216	Microcystin LR	110	108	P/P	40 - 160
2438216	Microcystin LW	110	104	P/P	40 - 160
2438216	Microcystin LY	100	112	P/P	40 - 160
2438216	Microcystin RR	106	114	P/P	40 - 160
2438216	Microcystin WR	117	114	P/P	40 - 160
2438216	Microcystin YR	103	104	P/P	40 - 160
2438216	Nodularin-R	107	108	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P435290

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2438216	Anatoxin-a	95.9	101	P/P	40 - 150
2438216	Neosaxitoxin	78.2	80.5	P/P	40 - 150
2438216	Saxitoxin	101	103	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P435344

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438736	Color (true)	2.44	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438818	Ammonia-N	1.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P436037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438916	Kjeldahl Nitrogen	5.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P436059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438786	NO2NO3-N	1.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438809	Total-P	0.294	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P435347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438698	O-Phosphate-P	0.539	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P435288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438216	Cylindrospermopsin	3.09	Spike	P	0 - 30
2438216	Desmethyl microcystin LR	3.02	Spike	P	0 - 30
2438216	Microcystin HtIR	1.47	Spike	P	0 - 30
2438216	Microcystin HtyR	2.59	Spike	P	0 - 30
2438216	Microcystin LA	5.57	Spike	P	0 - 30
2438216	Microcystin LF	1.38	Spike	P	0 - 30
2438216	Microcystin LR	2.57	Spike	P	0 - 30
2438216	Microcystin LW	4.90	Spike	P	0 - 30
2438216	Microcystin LY	11.1	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P435288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438216	Microcystin RR	7.48	Spike	P	0 - 30
2438216	Microcystin WR	3.12	Spike	P	0 - 30
2438216	Microcystin YR	1.10	Spike	P	0 - 30
2438216	Nodularin-R	0.585	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P435290

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2438216	Anatoxin-a	5.68	Spike	P	0 - 30
2438216	Neosaxitoxin	2.90	Spike	P	0 - 30
2438216	Saxitoxin	1.64	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2438811
Field Sample ID: HABCE0190

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	86.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	71.6	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A121635
Included Lab Sample IDs: 2438811

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	82.8	86.3	P/P	50 - 160
Neosaxitoxin	81.8	83.6	P/P	50 - 160
Saxitoxin	101	100	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A121663
Included Lab Sample IDs: 2438811

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	109	109	P/P	60 - 160
Desmethyl microcystin LR	126	118	P/P	50 - 160
Microcystin H1R	111	113	P/P	60 - 160
Microcystin HtyR	120	114	P/P	60 - 160
Microcystin LA	108	106	P/P	50 - 160
Microcystin LF	104	107	P/P	60 - 160
Microcystin LR	98.2	98.6	P/P	60 - 160
Microcystin LW	87.3	86.6	P/P	60 - 160
Microcystin LY	103	97.8	P/P	60 - 160
Microcystin RR	113	112	P/P	60 - 160
Microcystin WR	113	113	P/P	60 - 160
Microcystin YR	103	93.4	P/P	60 - 160
Nodularin-R	109	92.2	P/P	60 - 160

Reference Method: DEP SOP: NU-094-1
Run ID: A121696
Included Lab Sample IDs: 2438808

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A121697
Included Lab Sample IDs: 2438810

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A121764
Included Lab Sample IDs: 2438809

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121830
Included Lab Sample IDs: 2438809

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

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A121981

Included Lab Sample IDs: 2438809

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A122007

Included Lab Sample IDs: 2438809

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	97.1	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	MS
					SMP	
DEP SOP: NU-094-1	Color (true)	101			2.44	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	99.6	102		1.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	106	98.2		5.02
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.0	100		1.01
EPA 365.1 Rev. 2.0	Total-P	107	107	108		0.294
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	98.9	99.6		0.539
EPA 8321B	Anatoxin-a	96.6	95.9	101		5.68
	Cylindrospermopsin	92.5	109	106		3.09
	Desmethyl microcystin LR	120	128	124		3.02
	Microcystin HILR	114	119	120		1.47
	Microcystin HtyR	112	117	120		2.59
	Microcystin LA	108	110	104		5.57
	Microcystin LF	96.2	117	115		1.38
	Microcystin LR	108	110	108		2.57
	Microcystin LW	97.7	110	104		4.90
	Microcystin LY	104	100	112		11.1
	Microcystin RR	115	106	114		7.48
	Microcystin WR	115	117	114		3.12
	Microcystin YR	101	103	104		1.10
	Neosaxitoxin	81.1	78.2	80.5		2.90
	Nodularin-R	113	107	108		0.585
	Saxitoxin	99.2	101	103		1.64

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2438808
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2438809
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2438809
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2438809
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2438809
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2438810
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2438811
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2438811

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	09/21/2023			09/21/2023 15:26	Alexis Price	2438808
EPA 350.1 Rev. 2.0	09/21/2023			09/26/2023 12:44	Ping Hua	2438809
EPA 351.2 Rev. 2.0	09/21/2023	10/05/2023 11:40	Simonne.V. Calhoun	10/06/2023 12:46	Samantha L Bates	2438809
EPA 353.2 Rev. 2.0	09/21/2023			10/05/2023 11:45	Anna M. Plaviak	2438809
EPA 365.1 Rev. 2.0	09/21/2023	09/25/2023 13:35	Adam P Silver	09/28/2023 13:41	James L Waggerby	2438809
EPA 365.1 Rev. 2.0 dissolved	09/21/2023			09/21/2023 15:20	Elise M. Gillis	2438810
EPA 8321B	09/21/2023	09/21/2023 12:00	Tae K Lee	09/21/2023 14:51	Hana Lee	2438811
	09/21/2023	09/21/2023 12:00	Tae K Lee	09/21/2023 17:28	Hana Lee	2438811