

Chemical Analysis Report

WQAP-2023-03-21-02

Florida DEP Laboratory
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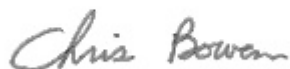
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-02-27-49**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 17-APR-2023 13:34



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: John's Lake - W Lobe

Collection Date/Time: 03/20/2023 12:11

Field ID: HABCE0186_JohnsLake2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2395105	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P427536	
		Cylindrospermopsin	0.10	U	ug/L	P427444	
		Desmethyl microcystin LR	0.25	U	ug/L	P427444	
		Microcystin HIR	0.25	U	ug/L	P427444	
		Microcystin HtyR	0.25	U	ug/L	P427444	
		Microcystin LA	0.10	U	ug/L	P427444	
		Microcystin LF	0.10	U	ug/L	P427444	
		Microcystin LR	0.25	U	ug/L	P427444	
		Microcystin LW	0.25	U	ug/L	P427444	
		Microcystin LY	0.10	U	ug/L	P427444	
		Microcystin RR	0.10	U	ug/L	P427444	
		Microcystin WR	0.50	U	ug/L	P427444	
		Neosaxitoxin	0.50	U	ug/L	P427536	
		Microcystin YR	0.25	U	ug/L	P427444	
		Saxitoxin	0.50	U	ug/L	P427536	
		Nodularin-R	0.10	U	ug/L	P427444	
2395106	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P427572	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P428403	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P427548	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P427533	
2395107	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P427427	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427572

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428403

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427548

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427533

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427427

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

Reference Method: EPA 8321B
Batch ID: P427444

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

Reference Method: EPA 8321B
Batch ID: P427536

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: P427572

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: P428403

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: P427548

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427533

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427427

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

Reference Method: EPA 8321B
Batch ID: P427444

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	96.2		P	40 - 150
Desmethyl microcystin LR	103		P	40 - 150
Microcystin H1R	103		P	40 - 150
Microcystin HtyR	104		P	40 - 150
Microcystin LA	100		P	40 - 150
Microcystin LF	110		P	40 - 150
Microcystin LR	95.9		P	40 - 150
Microcystin LW	99.5		P	40 - 150
Microcystin LY	91.4		P	40 - 150
Microcystin RR	95.7		P	40 - 150
Microcystin WR	93.1		P	40 - 150
Microcystin YR	95.5		P	40 - 150
Nodularin-R	97.5		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427536

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	72.2		P	40 - 150
Neosaxitoxin	101		P	40 - 150
Saxitoxin	77.9		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395080	Ammonia-N	101	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395054	NO2NO3-N	91.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395051	Total-P	99.5	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395057	O-Phosphate-P	99.6	98.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P427444

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395004	Cylindrospermopsin	102	104	P/P	40 - 150
2395004	Desmethyl microcystin LR	105	115	P/P	40 - 150
2395004	Microcystin HilR	106	113	P/P	40 - 150
2395004	Microcystin HtyR	109	115	P/P	40 - 150
2395004	Microcystin LA	95.7	126	P/P	40 - 150
2395004	Microcystin LF	103	112	P/P	40 - 150
2395004	Microcystin LR	99.8	111	P/P	40 - 150
2395004	Microcystin LW	95.0	96.3	P/P	40 - 150
2395004	Microcystin LY	94.0	95.4	P/P	40 - 150
2395004	Microcystin RR	103	109	P/P	40 - 150
2395004	Microcystin WR	98.8	93.5	P/P	40 - 150
2395004	Microcystin YR	101	106	P/P	40 - 150
2395004	Nodularin-R	104	110	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395004	Anatoxin-a	70.6	67.4	P/P	40 - 150
2395004	Neosaxitoxin	82.8	78.0	P/P	40 - 150
2395004	Saxitoxin	67.8	64.0	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P427572

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395080	Ammonia-N	1.57	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P428403

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395167	Kjeldahl Nitrogen	0.551	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P427548

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395054	NO2NO3-N	0.204	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P427533

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395051	Total-P	2.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P427427

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395057	O-Phosphate-P	1.25	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P427444

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395004	Cylindrospermopsin	1.53	Spike	P	0 - 30
2395004	Desmethyl microcystin LR	9.21	Spike	P	0 - 30
2395004	Microcystin H1LR	6.53	Spike	P	0 - 30
2395004	Microcystin HtyR	5.48	Spike	P	0 - 30
2395004	Microcystin LA	27.0	Spike	P	0 - 30
2395004	Microcystin LF	8.10	Spike	P	0 - 30
2395004	Microcystin LR	10.9	Spike	P	0 - 30
2395004	Microcystin LW	1.39	Spike	P	0 - 30
2395004	Microcystin LY	1.47	Spike	P	0 - 30
2395004	Microcystin RR	5.36	Spike	P	0 - 30
2395004	Microcystin WR	5.57	Spike	P	0 - 30
2395004	Microcystin YR	4.15	Spike	P	0 - 30
2395004	Nodularin-R	5.84	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P427536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395004	Anatoxin-a	4.61	Spike	P	0 - 30
2395004	Neosaxitoxin	5.99	Spike	P	0 - 30
2395004	Saxitoxin	5.85	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2395105

Field Sample ID: HABCE0186_JohnsLake2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	87.1	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	65.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A118088
Included Lab Sample IDs: 2395105

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	70.7	65.9	P/P	50 - 160
Cylindrospermopsin	99.6	93.5	P/P	50 - 160
Desmethyl microcystin LR	97.8	96.7	P/P	50 - 160
Microcystin H1R	99.8	106	P/P	50 - 160
Microcystin HtyR	97.3	102	P/P	50 - 160
Microcystin LA	81.2	102	P/P	50 - 160
Microcystin LF	99.4	80.8	P/P	50 - 160
Microcystin LR	94.5	92.6	P/P	50 - 160
Microcystin LW	94.5	79.2	P/P	50 - 160
Microcystin LY	82.6	98.1	P/P	50 - 160
Microcystin RR	92.1	97.0	P/P	50 - 160
Microcystin WR	76.4	85.5	P/P	50 - 160
Microcystin YR	98.3	98.9	P/P	50 - 160
Neosaxitoxin	101	92.9	P/P	50 - 160
Nodularin-R	96.5	96.1	P/P	50 - 160
Saxitoxin	77.4	74.0	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A118111
Included Lab Sample IDs: 2395107

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.9	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A118155
Included Lab Sample IDs: 2395106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	96.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A118162
Included Lab Sample IDs: 2395106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118186
Included Lab Sample IDs: 2395106

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A118579
Included Lab Sample IDs: 2395106

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	92.1	P/P	90 - 110

Quality Assurance Report

Calibration Verification

* 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	99.2	101	98.8			1.57
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104					0.551
EPA 353.2 Rev. 2.0	NO2NO3-N	96.5	91.0				0.204
EPA 365.1 Rev. 2.0	Total-P	101	99.5	102			2.00
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.6	98.2			1.25
EPA 8321B	Anatoxin-a	72.2	70.6	67.4			4.61
	Cylindrospermopsin	96.2	102	104			1.53
	Desmethyl microcystin LR	103	105	115			9.21
	Microcystin HiLR	103	106	113			6.53
	Microcystin HtyR	104	109	115			5.48
	Microcystin LA	100	95.7	126			27.0
	Microcystin LF	110	103	112			8.10
	Microcystin LR	95.9	99.8	111			10.9
	Microcystin LW	99.5	95.0	96.3			1.39
	Microcystin LY	91.4	94.0	95.4			1.47
	Microcystin RR	95.7	103	109			5.36
	Microcystin WR	93.1	98.8	93.5			5.57
	Microcystin YR	95.5	101	106			4.15
	Neosaxitoxin	101	82.8	78.0			5.99
	Nodularin-R	97.5	104	110			5.84
	Saxitoxin	77.9	67.8	64.0			5.85

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2395106
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2395106
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2395106
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2395106
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2395107
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2395105
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2395105

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	03/21/2023			03/23/2023 13:03	Khloe J Berg	2395106
EPA 351.2 Rev. 2.0	03/21/2023	04/13/2023 11:22	Simonne.V. Calhoun	04/14/2023 11:21	Samantha L Bates	2395106
EPA 353.2 Rev. 2.0	03/21/2023			03/23/2023 09:42	Beverly Y. Sanders	2395106
EPA 365.1 Rev. 2.0	03/21/2023	03/23/2023 14:00	Adam P Silver	03/24/2023 14:26	James L Waggeberby	2395106
EPA 365.1 Rev. 2.0 dissolved	03/21/2023			03/21/2023 16:15	Elise M. Gillis	2395107
EPA 8321B	03/21/2023	03/23/2023 13:00	Manjita Shrestha	03/23/2023 19:42	Manjita Shrestha	2395105
	03/21/2023	03/23/2023 13:00	Manjita Shrestha	03/24/2023 01:29	Manjita Shrestha	2395105