Chemical Analysis Report

WQAP-2022-01-13-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-12-20-06**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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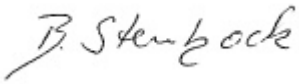
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 27-JAN-2022 15:39



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 Estelle- NE lobe **Collection Date/Time: 01/12/2022 14:05**

Field ID: HABCE0103_LakeEstelle1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299513	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P408489	
		Cylindrospermopsin	0.10	U	ug/L	P408489	
		Desmethyl microcystin LR	0.25	U	ug/L	P408489	
		Microcystin HilR**	0.25	U	ug/L	P408489	
		Microcystin HtyR**	0.25	U	ug/L	P408489	
		Microcystin LA	2.5		ug/L	P408489	
		Microcystin LF	0.10	U	ug/L	P408489	
		Microcystin LR	3.6		ug/L	P408489	
		Microcystin LW	0.25	U	ug/L	P408489	
		Microcystin LY	0.11	I	ug/L	P408489	
		Microcystin RR	0.27	I	ug/L	P408489	
		Microcystin WR	0.70	I	ug/L	P408489	
		Microcystin YR	0.25	U	ug/L	P408489	
		Nodularin-R**	0.10	U	ug/L	P408489	
2299521	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P408881	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P408850	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P408680	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P408648	
2299522	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P408503	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408680

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408648

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408503

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

Reference Method: EPA 8321B
Batch ID: P408489

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408680

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408648

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: P408503

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

Reference Method: EPA 8321B
Batch ID: P408489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	94.7		P	40 - 150
Cylindrospermopsin	102		P	40 - 150
Desmethyl microcystin LR	81.3		P	40 - 150
Microcystin HilR	84.4		P	40 - 150
Microcystin HtyR	95.1		P	40 - 150
Microcystin LA	87.6		P	40 - 150
Microcystin LF	95.4		P	40 - 150
Microcystin LR	101		P	40 - 150
Microcystin LW	85.8		P	40 - 150
Microcystin LY	88.7		P	40 - 150
Microcystin RR	104		P	40 - 150
Microcystin WR	92.7		P	40 - 150
Microcystin YR	115		P	40 - 150
Nodularin-R	99.6		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299333	Ammonia-N	99.6	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299453	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299475	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408648

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299446	Total-P	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408503

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299455	O-Phosphate-P	97.5	98.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P408489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299408	Anatoxin-a	101	104	P/P	40 - 150
2299408	Cylindrospermopsin	105	103	P/P	40 - 150
2299408	Desmethyl microcystin LR	80.7	85.8	P/P	40 - 150
2299408	Microcystin HilR	95.4	95.0	P/P	40 - 150
2299408	Microcystin HtyR	96.0	98.8	P/P	40 - 150
2299408	Microcystin LA	89.1	88.8	P/P	40 - 150
2299408	Microcystin LF	84.0	85.0	P/P	40 - 150
2299408	Microcystin LR	119	116	P/P	40 - 150
2299408	Microcystin LW	75.6	70.1	P/P	40 - 150
2299408	Microcystin LY	91.3	100	P/P	40 - 150
2299408	Microcystin RR	109	107	P/P	40 - 150
2299408	Microcystin WR	85.6	90.3	P/P	40 - 150
2299408	Microcystin YR	116	117	P/P	40 - 150
2299408	Nodularin-R	103	98.3	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299333	Ammonia-N	1.73	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299453	Kjeldahl Nitrogen	1.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299475	NO2NO3-N	0.484	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408648

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299446	Total-P	0.229	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408503

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299455	O-Phosphate-P	0.512	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P408489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299408	Anatoxin-a	2.78	Spike	P	0 - 30
2299408	Cylindrospermopsin	1.92	Spike	P	0 - 30
2299408	Desmethyl microcystin LR	6.15	Spike	P	0 - 30
2299408	Microcystin HilR	0.436	Spike	P	0 - 30
2299408	Microcystin HtyR	2.88	Spike	P	0 - 30
2299408	Microcystin LA	0.317	Spike	P	0 - 30
2299408	Microcystin LF	1.19	Spike	P	0 - 30
2299408	Microcystin LR	2.59	Spike	P	0 - 30
2299408	Microcystin LW	7.59	Spike	P	0 - 30
2299408	Microcystin LY	9.24	Spike	P	0 - 30
2299408	Microcystin RR	2.14	Spike	P	0 - 30
2299408	Microcystin WR	5.38	Spike	P	0 - 30
2299408	Microcystin YR	0.833	Spike	P	0 - 30
2299408	Nodularin-R	5.03	Spike	P	0 - 30

Quality Assurance Report
Precision

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2299513
Field Sample ID: HABCE0103_LakeEstelle1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	115	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	121	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A109853
Included Lab Sample IDs: 2299522

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A109862
Included Lab Sample IDs: 2299513

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	97.0	94.4	P/P	50 - 160
Cylindrospermopsin	102	109	P/P	50 - 160
Desmethyl microcystin LR	77.2	85.1	P/P	50 - 160
Microcystin HilR	90.3	95.9	P/P	50 - 160
Microcystin HtyR	95.5	96.1	P/P	50 - 160
Microcystin LA	89.3	92.0	P/P	50 - 160
Microcystin LF	96.0	94.0	P/P	50 - 160
Microcystin LR	106	112	P/P	50 - 160
Microcystin LW	84.7	80.5	P/P	50 - 160
Microcystin LY	94.5	96.8	P/P	50 - 160
Microcystin RR	108	108	P/P	50 - 160
Microcystin WR	98.6	101	P/P	50 - 160
Microcystin YR	110	108	P/P	50 - 160
Nodularin-R	98.2	100	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A109923
Included Lab Sample IDs: 2299521

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110004
Included Lab Sample IDs: 2299521

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110006
Included Lab Sample IDs: 2299521

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110025
Included Lab Sample IDs: 2299521

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.7	98.3	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	98.2	99.6	97.2			1.73
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	103	104			1.21
EPA 353.2 Rev. 2.0	NO2NO3-N	102	104	103			0.484
EPA 365.1 Rev. 2.0	Total-P	107	107	107			0.229
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	97.5	98.0			0.512
EPA 8321B	Anatoxin-a	94.7	101	104			2.78
	Cylindrospermopsin	102	105	103			1.92
	Desmethyl microcystin LR	81.3	80.7	85.8			6.15
	Microcystin HilR	84.4	95.4	95.0			0.436
	Microcystin HtyR	95.1	96.0	98.8			2.88
	Microcystin LA	87.6	89.1	88.8			0.317
	Microcystin LF	95.4	84.0	85.0			1.19
	Microcystin LR	101	119	116			2.59
	Microcystin LW	85.8	75.6	70.1			7.59
	Microcystin LY	88.7	91.3	100			9.24
	Microcystin RR	104	109	107			2.14
	Microcystin WR	92.7	85.6	90.3			5.38
	Microcystin YR	115	116	117			0.833
	Nodularin-R	99.6	103	98.3			5.03

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2299521
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2299521
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2299521
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2299521
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2299522
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2299513

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	01/13/2022			01/24/2022 13:37	Ping Hua	2299521
EPA 351.2 Rev. 2.0	01/13/2022	01/24/2022 11:42	Samantha L Bates	01/25/2022 11:26	Alexandra J Mattheus	2299521
EPA 353.2 Rev. 2.0	01/13/2022			01/19/2022 12:25	Beverly Y. Sanders	2299521
EPA 365.1 Rev. 2.0	01/13/2022	01/20/2022 17:50	Simonne.V. Calhoun	01/21/2022 12:42	Shengyu Ding	2299521
EPA 365.1 Rev. 2.0 dissolved	01/13/2022			01/13/2022 15:06	Ping Hua	2299522
EPA 8321B	01/13/2022	01/13/2022 13:00	Manjita Shrestha	01/13/2022 18:14	Manjita Shrestha	2299513