

Chemical Analysis Report

WQAP-2022-02-22-02

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-2022-01-24-06**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Date Certified: 16-MAR-2022 09:53



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 Hermosa - North Shore

Collection Date/Time: 02/21/2022 11:30

Field ID: HABCE0109_LakeHermosa

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2307176	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P410163	
		Cylindrospermopsin	0.10	U	ug/L	P410163	
		Desmethyl microcystin LR	0.25	U	ug/L	P410163	
		Microcystin HIR**	0.25	U	ug/L	P410163	
		Microcystin HtyR**	0.25	U	ug/L	P410163	
		Microcystin LA	0.10	U	ug/L	P410163	
		Microcystin LF	0.10	U	ug/L	P410163	
		Microcystin LR	0.25	U	ug/L	P410163	
		Microcystin LW	0.25	U	ug/L	P410163	
		Microcystin LY	0.10	U	ug/L	P410163	
		Microcystin RR	0.10	U	ug/L	P410163	
		Microcystin WR	0.50	U	ug/L	P410163	
		Microcystin YR	0.25	U	ug/L	P410163	
		Nodularin-R**	0.10	U	ug/L	P410163	
2307183	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P410528	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P410282	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P410544	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P410215	
2307184	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P410206	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410528

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410544

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410215

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410206

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

Reference Method: EPA 8321B
Batch ID: P410163

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 HIR	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: P410528

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410544

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: P410215

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410206

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

Reference Method: EPA 8321B
Batch ID: P410163

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	115		P	40 - 150
Cylindrospermopsin	109		P	40 - 150
Desmethyl microcystin LR	101		P	40 - 150
Microcystin H1R	111		P	40 - 150
Microcystin HtyR	109		P	40 - 150
Microcystin LA	119		P	40 - 150
Microcystin LF	122		P	40 - 150
Microcystin LR	107		P	40 - 150
Microcystin LW	118		P	40 - 150
Microcystin LY	103		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	110		P	40 - 150
Microcystin YR	110		P	40 - 150
Nodularin-R	103		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410528

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306542	Ammonia-N	95.0	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P410282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306954	Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410544

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307180	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P410215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307183	Total-P	107	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P410206

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307184	O-Phosphate-P	97.2	97.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P410163

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306717	Anatoxin-a	125	126	P/P	40 - 150
2306717	Cylindrospermopsin	106	102	P/P	40 - 150
2306717	Desmethyl microcystin LR	118	112	P/P	40 - 150
2306717	Microcystin HiLR	103	106	P/P	40 - 150
2306717	Microcystin HtyR	108	101	P/P	40 - 150
2306717	Microcystin LA	105	102	P/P	40 - 150
2306717	Microcystin LF	113	107	P/P	40 - 150
2306717	Microcystin LR	110	98.7	P/P	40 - 150
2306717	Microcystin LW	110	105	P/P	40 - 150
2306717	Microcystin LY	105	95.7	P/P	40 - 150
2306717	Microcystin RR	103	99.0	P/P	40 - 150
2306717	Microcystin WR	101	107	P/P	40 - 150
2306717	Microcystin YR	110	103	P/P	40 - 150
2306717	Nodularin-R	110	104	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P410528

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306542	Ammonia-N	7.89	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P410282

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306954	Kjeldahl Nitrogen	1.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P410544

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307180	NO2NO3-N	0.962	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P410215

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307183	Total-P	0.922	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P410206

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2307184	O-Phosphate-P	0.718	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P410163

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306717	Anatoxin-a	0.704	Spike	P	0 - 30
2306717	Cylindrospermopsin	3.59	Spike	P	0 - 30
2306717	Desmethyl microcystin LR	5.32	Spike	P	0 - 30
2306717	Microcystin H1LR	2.91	Spike	P	0 - 30
2306717	Microcystin HtyR	6.94	Spike	P	0 - 30
2306717	Microcystin LA	3.14	Spike	P	0 - 30
2306717	Microcystin LF	5.86	Spike	P	0 - 30
2306717	Microcystin LR	10.3	Spike	P	0 - 30
2306717	Microcystin LW	4.49	Spike	P	0 - 30
2306717	Microcystin LY	8.73	Spike	P	0 - 30
2306717	Microcystin RR	3.73	Spike	P	0 - 30
2306717	Microcystin WR	5.64	Spike	P	0 - 30
2306717	Microcystin YR	6.58	Spike	P	0 - 30
2306717	Nodularin-R	6.00	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: 2307176

Field Sample ID: HABCE0109_LakeHermosa

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	94.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A110552

Included Lab Sample IDs: 2307184

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.5	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A110605

Included Lab Sample IDs: 2307176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	109	P/P	50 - 160
Cylindrospermopsin	101	103	P/P	60 - 160
Desmethyl microcystin LR	98.0	95.4	P/P	60 - 160
Microcystin HIR	106	101	P/P	60 - 160
Microcystin HtyR	100	99.7	P/P	60 - 160
Microcystin LA	108	104	P/P	50 - 160
Microcystin LF	112	94.9	P/P	60 - 160
Microcystin LR	100	89.0	P/P	60 - 160
Microcystin LW	111	99.6	P/P	60 - 160
Microcystin LY	101	88.5	P/P	60 - 160
Microcystin RR	101	101	P/P	60 - 160
Microcystin WR	105	88.6	P/P	60 - 160
Microcystin YR	105	89.1	P/P	60 - 160
Nodularin-R	96.9	95.2	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110630

Included Lab Sample IDs: 2307183

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A110682

Included Lab Sample IDs: 2307183

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110688

Included Lab Sample IDs: 2307183

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110696

Included Lab Sample IDs: 2307183

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	96.5	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	95.4	95.0	103			7.89
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	100	103			1.73
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	104	104			0.962
EPA 365.1 Rev. 2.0	Total-P	105	107	106			0.922
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	97.2	97.9			0.718
EPA 8321B	Anatoxin-a	115	125	126			0.704
	Cylindrospermopsin	109	106	102			3.59
	Desmethyl microcystin LR	101	118	112			5.32
	Microcystin HiLR	111	103	106			2.91
	Microcystin HtyR	109	108	101			6.94
	Microcystin LA	119	105	102			3.14
	Microcystin LF	122	113	107			5.86
	Microcystin LR	107	110	98.7			10.3
	Microcystin LW	118	110	105			4.49
	Microcystin LY	103	105	95.7			8.73
	Microcystin RR	105	103	99.0			3.73
	Microcystin WR	110	101	107			5.64
	Microcystin YR	110	110	103			6.58
	Nodularin-R	103	110	104			6.00

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2307183
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2307183
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2307183
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2307183
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2307184
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2307176

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	02/22/2022			03/01/2022 12:47	Ping Hua	2307183
EPA 351.2 Rev. 2.0	02/22/2022	02/25/2022 10:06	Samantha L Bates	03/01/2022 12:23	Alexandra J Mattheus	2307183
EPA 353.2 Rev. 2.0	02/22/2022			03/01/2022 10:26	Beverly Y. Sanders	2307183
EPA 365.1 Rev. 2.0	02/22/2022	02/23/2022 15:05	Simonne.V. Calhoun	02/24/2022 14:42	Sarah A Nixon	2307183
EPA 365.1 Rev. 2.0 dissolved	02/22/2022			02/22/2022 16:22	James L Waggerby	2307184
EPA 8321B	02/22/2022	02/24/2022 07:00	Manjita Shrestha	02/24/2022 10:14	Manjita Shrestha	2307176