Chemical Analysis Report

WQAP-2022-06-10-01

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-2022-05-23-06**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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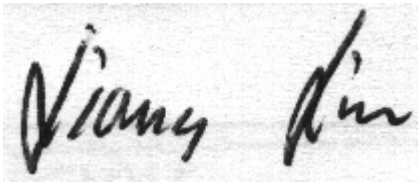
Date Certified: 01-JUL-2022 09:52



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 Harris - S of Monkey Island **Collection Date/Time: 06/09/2022 13:03**

Field ID: HABCE0123_LakeHarris1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2333668	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P415083	
		Cylindrospermopsin	0.10	U	ug/L	P415083	
		Desmethyl microcystin LR	0.25	U	ug/L	P415083	
		Microcystin HilR**	0.25	U	ug/L	P415083	
		Microcystin HtyR**	0.25	U	ug/L	P415083	
		Microcystin LA	0.10	U	ug/L	P415083	
		Microcystin LF	0.10	U	ug/L	P415083	
		Microcystin LR	0.32	I	ug/L	P415083	
		Microcystin LW	0.25	U	ug/L	P415083	
		Microcystin LY	0.10	U	ug/L	P415083	
		Microcystin RR	0.10	U	ug/L	P415083	
		Microcystin WR	0.50	U	ug/L	P415083	
		Microcystin YR	0.25	U	ug/L	P415083	
		Nodularin-R**	0.10	U	ug/L	P415083	
2333672	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P415585	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P415536	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P415739	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P415185	
2333674	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P415057	

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.

Sample Location: Lake Griffin - South Lobe **Collection Date/Time: 06/09/2022 12:20**

Field ID: HABCE0122_LakeGriffinLakeCo Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2333669	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P415083	
		Cylindrospermopsin	0.10	U	ug/L	P415083	
		Desmethyl microcystin LR	0.25	U	ug/L	P415083	
		Microcystin HilR**	0.25	U	ug/L	P415083	
		Microcystin HtyR**	0.25	U	ug/L	P415083	
		Microcystin LA	0.10	U	ug/L	P415083	
		Microcystin LF	0.10	U	ug/L	P415083	
		Microcystin LR	0.29	I	ug/L	P415083	
		Microcystin LW	0.25	U	ug/L	P415083	
		Microcystin LY	0.10	U	ug/L	P415083	
		Microcystin RR	0.10	U	ug/L	P415083	
		Microcystin WR	0.50	U	ug/L	P415083	
		Microcystin YR	0.25	U	ug/L	P415083	
		Nodularin-R**	0.10	U	ug/L	P415083	
2333673	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P415585	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P415536	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P415739	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P415185	
2333675	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P415057	

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: P415585

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415536

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415739

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415185

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P415057

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

Reference Method: EPA 8321B
Batch ID: P415083

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: P415585

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415536

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415739

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415185

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P415057

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

Reference Method: EPA 8321B
Batch ID: P415083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	108		P	40 - 150
Cylindrospermopsin	99.4		P	40 - 150
Desmethyl microcystin LR	125		P	40 - 150
Microcystin HilR	104		P	40 - 150
Microcystin HtyR	110		P	40 - 150
Microcystin LA	108		P	40 - 150
Microcystin LF	131		P	40 - 150
Microcystin LR	117		P	40 - 150
Microcystin LW	125		P	40 - 150
Microcystin LY	136		P	40 - 150
Microcystin RR	92.4		P	40 - 150
Microcystin WR	100		P	40 - 150
Microcystin YR	113		P	40 - 150
Nodularin-R	94.9		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2333672	Ammonia-N	101	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2333673	NO2NO3-N	97.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415185

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2333659	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P415057

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2333675	O-Phosphate-P	95.3	97.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P415083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2333668	Anatoxin-a	114	117	P/P	40 - 150
2333668	Cylindrospermopsin	105	103	P/P	40 - 150
2333668	Desmethyl microcystin LR	135	131	P/P	40 - 150
2333668	Microcystin HilR	108	109	P/P	40 - 150
2333668	Microcystin HtyR	115	119	P/P	40 - 150
2333668	Microcystin LA	115	103	P/P	40 - 150
2333668	Microcystin LF	137	149	P/P	40 - 150
2333668	Microcystin LR	129	130	P/P	40 - 150
2333668	Microcystin LW	111	118	P/P	40 - 150
2333668	Microcystin LY	147	124	P/P	40 - 150
2333668	Microcystin RR	94.9	89.7	P/P	40 - 150
2333668	Microcystin WR	105	103	P/P	40 - 150
2333668	Microcystin YR	108	115	P/P	40 - 150
2333668	Nodularin-R	99.8	101	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333672	Ammonia-N	0.478	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333672	Kjeldahl Nitrogen	5.12	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333673	NO2NO3-N	1.53	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415185

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333659	Total-P	0.803	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P415057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333675	O-Phosphate-P	1.97	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P415083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333668	Anatoxin-a	2.87	Spike	P	0 - 30
2333668	Cylindrospermopsin	2.40	Spike	P	0 - 30
2333668	Desmethyl microcystin LR	3.06	Spike	P	0 - 30
2333668	Microcystin HilR	1.30	Spike	P	0 - 30
2333668	Microcystin HtyR	3.20	Spike	P	0 - 30
2333668	Microcystin LA	10.6	Spike	P	0 - 30
2333668	Microcystin LF	8.16	Spike	P	0 - 30
2333668	Microcystin LR	1.43	Spike	P	0 - 30
2333668	Microcystin LW	5.77	Spike	P	0 - 30
2333668	Microcystin LY	16.6	Spike	P	0 - 30
2333668	Microcystin RR	5.58	Spike	P	0 - 30
2333668	Microcystin WR	1.86	Spike	P	0 - 30
2333668	Microcystin YR	6.15	Spike	P	0 - 30
2333668	Nodularin-R	1.41	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: 2333668
Field Sample ID: HABCE0123_LakeHarris1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	101	P	30 - 160

Lab Sample ID: 2333669
Field Sample ID: HABCE0122_LakeGriffinLakeCo

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	83.1	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A112747
Included Lab Sample IDs: 2333674, 2333675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.3	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A112825
Included Lab Sample IDs: 2333668, 2333669

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.1	105	P/P	50 - 160
Cylindrospermopsin	97.2	96.5	P/P	50 - 160
Desmethyl microcystin LR	129	128	P/P	50 - 160
Microcystin HilR	111	110	P/P	50 - 160
Microcystin HtyR	113	115	P/P	50 - 160
Microcystin LA	124	134	P/P	50 - 160
Microcystin LF	124	131	P/P	50 - 160
Microcystin LR	121	119	P/P	50 - 160
Microcystin LW	127	130	P/P	50 - 160
Microcystin LY	144	134	P/P	50 - 160
Microcystin RR	89.6	95.2	P/P	50 - 160
Microcystin WR	101	100	P/P	50 - 160
Microcystin YR	108	110	P/P	50 - 160
Nodularin-R	98.4	100	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A112938
Included Lab Sample IDs: 2333672, 2333673

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A112990
Included Lab Sample IDs: 2333672, 2333673

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A113060
Included Lab Sample IDs: 2333672, 2333673

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113073
Included Lab Sample IDs: 2333672, 2333673

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	102	P/P	90 - 110
Kjeldahl Nitrogen	104	103	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	97.6	101	100			0.478
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103					5.12
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	97.0	98.5			1.53
EPA 365.1 Rev. 2.0	Total-P	102	102	101			0.803
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	95.3	97.2			1.97
EPA 8321B	Anatoxin-a	108	114	117			2.87
	Cylindrospermopsin	99.4	105	103			2.40
	Desmethyl microcystin LR	125	135	131			3.06
	Microcystin HilR	104	108	109			1.30
	Microcystin HtyR	110	115	119			3.20
	Microcystin LA	108	115	103			10.6
	Microcystin LF	131	137	149			8.16
	Microcystin LR	117	129	130			1.43
	Microcystin LW	125	111	118			5.77
	Microcystin LY	136	147	124			16.6
	Microcystin RR	92.4	94.9	89.7			5.58
	Microcystin WR	100	105	103			1.86
	Microcystin YR	113	108	115			6.15
	Nodularin-R	94.9	99.8	101			1.41

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2333672, 2333673
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2333672, 2333673
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2333672, 2333673
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2333672, 2333673
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2333674, 2333675
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2333668, 2333669

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	06/10/2022			06/22/2022 14:47	Judith K. Clark	2333672
	06/10/2022			06/22/2022 14:53	Judith K. Clark	2333673
EPA 351.2 Rev. 2.0	06/10/2022	06/23/2022 16:39	Samantha L Bates	06/24/2022 15:44	Alexandra J Mattheus	2333672
	06/10/2022	06/23/2022 16:39	Samantha L Bates	06/24/2022 15:52	Alexandra J Mattheus	2333673
EPA 353.2 Rev. 2.0	06/10/2022			06/24/2022 15:55	Touraj Touran	2333673
	06/10/2022			06/24/2022 16:01	Touraj Touran	2333672
EPA 365.1 Rev. 2.0	06/10/2022	06/15/2022 11:23	Simonne.V. Calhoun	06/20/2022 16:45	James L Waggerby	2333672
	06/10/2022	06/15/2022 11:23	Simonne.V. Calhoun	06/20/2022 16:46	James L Waggerby	2333673
EPA 365.1 Rev. 2.0 dissolved	06/10/2022			06/10/2022 14:17	James L Waggerby	2333675
	06/10/2022			06/10/2022 14:20	James L Waggerby	2333674
EPA 8321B	06/10/2022	06/14/2022 09:30	Manjita Shrestha	06/14/2022 12:25	Manjita Shrestha	2333668
	06/10/2022	06/14/2022 09:30	Manjita Shrestha	06/14/2022 12:42	Manjita Shrestha	2333669