Chemical Analysis Report

WQAP-2022-07-06-01

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-2022-06-06-26**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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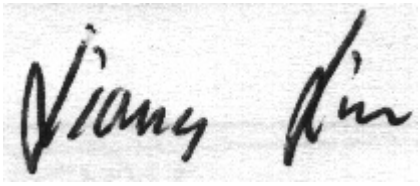
Date Certified: 21-JUL-2022 10:50



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 Speer - NW Lobe **Collection Date/Time: 07/05/2022 11:07**

Field ID: HABCE0131_LakeSpeer1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2338853	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416134	
		Cylindrospermopsin	0.10	U	ug/L	P416213	
		Desmethyl microcystin LR	0.25	U	ug/L	P416213	
		Microcystin HilR	0.25	U	ug/L	P416213	
		Microcystin HtyR	0.25	U	ug/L	P416213	
		Microcystin LA	0.10	U	ug/L	P416213	
		Microcystin LF	0.10	U	ug/L	P416213	
		Microcystin LR	2.5		ug/L	P416213	
		Microcystin LW	0.25	U	ug/L	P416213	
		Microcystin LY	0.10	U	ug/L	P416213	
		Microcystin RR	0.71		ug/L	P416213	
		Microcystin WR	0.50	U	ug/L	P416213	
		Microcystin YR	0.25	U	ug/L	P416213	
		Nodularin-R	0.10	U	ug/L	P416213	
2338860	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P416349	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P416575	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.035		mg N/L	P416483	
	EPA 365.1 Rev. 2.0	Total-P	0.061		mg P/L	P416187	
2338861	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P416214	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416349

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416575

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416483

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416187

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416214

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

Reference Method: EPA 8321B
Batch ID: P416134

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

Reference Method: EPA 8321B
Batch ID: P416213

Component	Result	Code	Units
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: P416349

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416575

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: P416483

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416187

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: P416214

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

Reference Method: EPA 8321B
Batch ID: P416134

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	93.8		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416213

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	82.4		P	40 - 150
Desmethyl microcystin LR	79.3		P	40 - 150
Microcystin HilR	82.2		P	40 - 150
Microcystin HtyR	89.3		P	40 - 150
Microcystin LA	91.7		P	40 - 150
Microcystin LF	89.4		P	40 - 150
Microcystin LR	75.0		P	40 - 150
Microcystin LW	95.0		P	40 - 150
Microcystin LY	91.0		P	40 - 150
Microcystin RR	78.5		P	40 - 150
Microcystin WR	81.0		P	40 - 150
Microcystin YR	100		P	40 - 150
Nodularin-R	76.2		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416349

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338860	Ammonia-N	94.8	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416575

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2339024	Kjeldahl Nitrogen	90.9	94.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416483

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338860	NO2NO3-N	92.8	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338756	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338861	O-Phosphate-P	99.9	99.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P416134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338525	Anatoxin-a	92.9	112	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416213

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338853	Cylindrospermopsin	86.1	88.1	P/P	40 - 150
2338853	Desmethyl microcystin LR	91.2	88.4	P/P	40 - 150
2338853	Microcystin HilR	90.5	93.0	P/P	40 - 150
2338853	Microcystin HtyR	98.8	97.9	P/P	40 - 150
2338853	Microcystin LA	94.9	100	P/P	40 - 150
2338853	Microcystin LF	103	101	P/P	40 - 150
2338853	Microcystin LR	85.4	88.4	P/P	40 - 150
2338853	Microcystin LW	108	107	P/P	40 - 150
2338853	Microcystin LY	93.5	101	P/P	40 - 150
2338853	Microcystin RR	84.1	85.7	P/P	40 - 150
2338853	Microcystin WR	97.6	94.3	P/P	40 - 150
2338853	Microcystin YR	115	114	P/P	40 - 150
2338853	Nodularin-R	86.4	86.4	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338860	Ammonia-N	0.946	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2339024	Kjeldahl Nitrogen	3.87	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338860	NO2NO3-N	2.68	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338756	Total-P	2.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338861	O-Phosphate-P	0.100	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P416134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338525	Anatoxin-a	18.6	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P416213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338853	Cylindrospermopsin	2.28	Spike	P	0 - 30
2338853	Desmethyl microcystin LR	3.06	Spike	P	0 - 30
2338853	Microcystin HilR	2.78	Spike	P	0 - 30
2338853	Microcystin HtyR	0.939	Spike	P	0 - 30
2338853	Microcystin LA	5.55	Spike	P	0 - 30
2338853	Microcystin LF	2.40	Spike	P	0 - 30
2338853	Microcystin LR	2.76	Spike	P	0 - 30
2338853	Microcystin LW	0.359	Spike	P	0 - 30
2338853	Microcystin LY	7.93	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P416213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338853	Microcystin RR	1.76	Spike	P	0 - 30
2338853	Microcystin WR	3.45	Spike	P	0 - 30
2338853	Microcystin YR	0.863	Spike	P	0 - 30
2338853	Nodularin-R	0.00486	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2338853
Field Sample ID: HABCE0131_LakeSpeer1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	111	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	64.8	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A113308
Included Lab Sample IDs: 2338861

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.8	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A113347
Included Lab Sample IDs: 2338853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	82.7	79.2	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A113348
Included Lab Sample IDs: 2338853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	81.3	89.4	P/P	60 - 160
Desmethyl microcystin LR	81.5	86.4	P/P	60 - 160
Microcystin HilR	81.7	85.4	P/P	60 - 160
Microcystin HtyR	89.9	93.3	P/P	60 - 160
Microcystin LA	95.0	99.2	P/P	50 - 160
Microcystin LF	91.4	92.7	P/P	60 - 160
Microcystin LR	80.4	79.2	P/P	60 - 160
Microcystin LW	92.3	88.1	P/P	60 - 160
Microcystin LY	96.6	101	P/P	60 - 160
Microcystin RR	81.7	81.4	P/P	60 - 160
Microcystin WR	76.4	80.6	P/P	60 - 160
Microcystin YR	107	101	P/P	60 - 160
Nodularin-R	75.2	80.2	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A113377
Included Lab Sample IDs: 2338860

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.0	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113380
Included Lab Sample IDs: 2338860

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.1	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A113433
Included Lab Sample IDs: 2338860

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113548
Included Lab Sample IDs: 2338860

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.5	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		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	94.2	94.8	95.8			0.946
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	90.9	94.5			3.87
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	92.8	95.8			2.68
EPA 365.1 Rev. 2.0	Total-P	101	103	105			2.39
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.9	99.8			0.100
EPA 8321B	Anatoxin-a	93.8	92.9	112			18.6
	Cylindrospermopsin	82.4	86.1	88.1			2.28
	Desmethyl microcystin LR	79.3	91.2	88.4			3.06
	Microcystin HilR	82.2	90.5	93.0			2.78
	Microcystin HtyR	89.3	98.8	97.9			0.939
	Microcystin LA	91.7	94.9	100			5.55
	Microcystin LF	89.4	103	101			2.40
	Microcystin LR	75.0	85.4	88.4			2.76
	Microcystin LW	95.0	108	107			0.359
	Microcystin LY	91.0	93.5	101			7.93
	Microcystin RR	78.5	84.1	85.7			1.76
	Microcystin WR	81.0	97.6	94.3			3.45
	Microcystin YR	100	115	114			0.863
	Nodularin-R	76.2	86.4	86.4			0.0048

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2338860
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2338860
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2338860
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2338860
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2338861
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2338853
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2338853

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	07/06/2022			07/08/2022 11:57	Ping Hua	2338860
EPA 351.2 Rev. 2.0	07/06/2022	07/14/2022 13:49	Samantha L Bates	07/15/2022 18:06	Alexandra J Mattheus	2338860
EPA 353.2 Rev. 2.0	07/06/2022			07/12/2022 11:23	Judith K. Clark	2338860
EPA 365.1 Rev. 2.0	07/06/2022	07/07/2022 16:00	Simonne.V. Calhoun	07/08/2022 11:59	James L Waggerby	2338860
EPA 365.1 Rev. 2.0 dissolved	07/06/2022			07/06/2022 14:11	Chandler E Cox	2338861
EPA 8321B	07/06/2022	07/07/2022 09:00	Manjita Shrestha	07/07/2022 15:25	Manjita Shrestha	2338853
	07/06/2022	07/07/2022 11:00	Umesh Chiluwal	07/07/2022 13:10	Umesh Chiluwal	2338853