

Chemical Analysis Report

WQAP-2021-11-10-02

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-2021-10-25-53**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Date Certified: 30-NOV-2021 17:41



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 Eustis - canal near Linda Lane

Collection Date/Time: 11/09/2021 11:30

Field ID: HABCE0092_Lake Eustis2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2289173	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P406088	
		Cylindrospermopsin	0.10	U	ug/L	P406088	
		Desmethyl microcystin LR	0.25	U	ug/L	P406088	
		Microcystin HIR**	0.25	U	ug/L	P406088	
		Microcystin HtyR**	0.25	U	ug/L	P406088	
		Microcystin LA	0.10	U	ug/L	P406088	
		Microcystin LF	0.10	U	ug/L	P406088	
		Microcystin LR	0.25	U	ug/L	P406088	RPD
		Microcystin LW	0.25	U	ug/L	P406088	
		Microcystin LY	0.10	U	ug/L	P406088	
		Microcystin RR	0.10	U	ug/L	P406088	
		Microcystin WR	0.50	U	ug/L	P406088	
		Microcystin YR	0.25	U	ug/L	P406088	
		Nodularin-R**	0.10	U	ug/L	P406088	
2289178	EPA 350.1 Rev. 2.0	Ammonia-N	0.049		mg N/L	P406594	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P406661	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P406303	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P406373	
2289179	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P406251	

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: P406594

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406661

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406303

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P406373

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406251

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

Reference Method: EPA 8321B
Batch ID: P406088

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: P406594

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: P406661

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P406303

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: P406373

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P406251

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

Reference Method: EPA 8321B
Batch ID: P406088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	100		P	40 - 150
Cylindrospermopsin	102		P	40 - 150
Desmethyl microcystin LR	110		P	40 - 150
Microcystin HIR	104		P	40 - 150
Microcystin HtyR	94.2		P	40 - 150
Microcystin LA	101		P	40 - 150
Microcystin LF	101		P	40 - 150
Microcystin LR	102		P	40 - 150
Microcystin LW	93.9		P	40 - 150
Microcystin LY	97.5		P	40 - 150
Microcystin RR	99.1		P	40 - 150
Microcystin WR	97.6		P	40 - 150
Microcystin YR	95.6		P	40 - 150
Nodularin-R	100		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P406594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289066	Ammonia-N	91.8	93.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P406303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289163	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P406373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289065	Total-P	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P406251

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289179	O-Phosphate-P	98.1	100	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P406088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2288376	Anatoxin-a	91.3	115	P/P	40 - 150
2288376	Cylindrospermopsin	92.0	118	P/P	40 - 150
2288376	Desmethyl microcystin LR	92.1	115	P/P	40 - 150
2288376	Microcystin HilR	89.6	120	P/P	40 - 150
2288376	Microcystin HtyR	84.0	109	P/P	40 - 150
2288376	Microcystin LA	85.1	110	P/P	40 - 150
2288376	Microcystin LF	85.7	100	P/P	40 - 150
2288376	Microcystin LR	77.4	107	P/P	40 - 150
2288376	Microcystin LW	90.1	113	P/P	40 - 150
2288376	Microcystin LY	83.0	111	P/P	40 - 150
2288376	Microcystin RR	86.0	112	P/P	40 - 150
2288376	Microcystin WR	85.0	112	P/P	40 - 150
2288376	Microcystin YR	88.6	104	P/P	40 - 150
2288376	Nodularin-R	92.6	110	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P406594

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289066	Ammonia-N	1.43	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P406661

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289178	Kjeldahl Nitrogen	5.42	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P406303

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289163	NO2NO3-N	0.976	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P406373

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289065	Total-P	0.884	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P406251

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289179	O-Phosphate-P	2.02	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P406088

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2288376	Anatoxin-a	23.2	Spike	P	0 - 30
2288376	Cylindrospermopsin	24.6	Spike	P	0 - 30
2288376	Desmethyl microcystin LR	21.9	Spike	P	0 - 30
2288376	Microcystin HtIR	29.0	Spike	P	0 - 30
2288376	Microcystin HtyR	25.7	Spike	P	0 - 30
2288376	Microcystin LA	25.8	Spike	P	0 - 30
2288376	Microcystin LF	15.8	Spike	P	0 - 30
2288376	Microcystin LR	30.7	Spike	F	0 - 30
2288376	Microcystin LW	22.6	Spike	P	0 - 30
2288376	Microcystin LY	29.2	Spike	P	0 - 30
2288376	Microcystin RR	25.8	Spike	P	0 - 30
2288376	Microcystin WR	27.4	Spike	P	0 - 30
2288376	Microcystin YR	16.1	Spike	P	0 - 30
2288376	Nodularin-R	17.4	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: 2289173

Field Sample ID: HABCE0092_Lake Eustis2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	95.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	88.2	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A108839

Included Lab Sample IDs: 2289179

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A108849

Included Lab Sample IDs: 2289173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	106	P/P	50 - 160
Cylindrospermopsin	102	104	P/P	60 - 160
Desmethyl microcystin LR	97.7	92.0	P/P	60 - 160
Microcystin HIR	97.7	92.5	P/P	60 - 160
Microcystin HtyR	92.0	85.3	P/P	60 - 160
Microcystin LA	92.9	93.3	P/P	50 - 160
Microcystin LF	95.2	92.3	P/P	60 - 160
Microcystin LR	92.0	82.7	P/P	60 - 160
Microcystin LW	87.2	81.9	P/P	60 - 160
Microcystin LY	89.6	81.8	P/P	60 - 160
Microcystin RR	94.0	93.8	P/P	60 - 160
Microcystin WR	82.9	87.0	P/P	60 - 160
Microcystin YR	82.5	75.3	P/P	60 - 160
Nodularin-R	97.4	93.5	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108873

Included Lab Sample IDs: 2289178

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108998

Included Lab Sample IDs: 2289178

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: A109006

Included Lab Sample IDs: 2289178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A109054

Included Lab Sample IDs: 2289178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	107	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	97.6	91.8	93.2			1.43
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110					5.42
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	103	102			0.976
EPA 365.1 Rev. 2.0	Total-P	104	104	103			0.884
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	98.1	100			2.02
EPA 8321B	Anatoxin-a	100	115	91.3			23.2
	Cylindrospermopsin	102	118	92.0			24.6
	Desmethyl microcystin LR	110	92.1	115			21.9
	Microcystin HiLR	104	89.6	120			29.0
	Microcystin HtyR	94.2	84.0	109			25.7
	Microcystin LA	101	85.1	110			25.8
	Microcystin LF	101	85.7	100			15.8
	Microcystin LR	102	77.4	107			30.7
	Microcystin LW	93.9	90.1	113			22.6
	Microcystin LY	97.5	83.0	111			29.2
	Microcystin RR	99.1	112	86.0			25.8
	Microcystin WR	97.6	85.0	112			27.4
	Microcystin YR	95.6	88.6	104			16.1
	Nodularin-R	100	110	92.6			17.4

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2289178
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2289178
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2289178
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2289178
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2289179
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2289173

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	11/10/2021			11/19/2021 11:48	Roberta Tatti	2289178
EPA 351.2 Rev. 2.0	11/10/2021	11/22/2021 13:28	Benjamin T. Nordmann	11/23/2021 10:54	Alexandra J Mattheus	2289178
EPA 353.2 Rev. 2.0	11/10/2021			11/12/2021 11:23	Beverly Y. Sanders	2289178
EPA 365.1 Rev. 2.0	11/10/2021	11/17/2021 16:55	Simonne.V. Calhoun	11/18/2021 12:20	Sarah A Nixon	2289178
EPA 365.1 Rev. 2.0 dissolved	11/10/2021			11/10/2021 14:46	James L Waggerby	2289179
EPA 8321B	11/10/2021	11/10/2021 11:00	Manjita Shrestha	11/10/2021 13:54	Manjita Shrestha	2289173