Chemical Analysis Report

WQAP-2022-05-20-04

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

Event Description: **Algal Bloom Response- Alachua Co. for NEROC**
Request ID: **RQ-2022-05-30-23**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256
Attn: Jeremy Parrish

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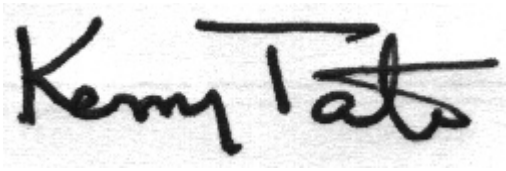
Date Certified: 09-JUN-2022 12:56



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: Bivens Arm at State Road 441 **Collection Date/Time: 05/19/2022 11:00**

Field ID: Bivens Arm @ 441 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2328766	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P414153	
		Cylindrospermopsin	0.10	U	ug/L	P414153	
		Desmethyl microcystin LR	0.25	U	ug/L	P414153	
		Microcystin HilR**	0.25	U	ug/L	P414153	
		Microcystin HtyR**	0.25	U	ug/L	P414153	
		Microcystin LA	4.5		ug/L	P414153	
		Microcystin LF	0.10	U	ug/L	P414153	
		Microcystin LR	0.98	I	ug/L	P414153	
		Microcystin LW	0.25	U	ug/L	P414153	
		Microcystin LY	0.10	U	ug/L	P414153	
		Microcystin RR	0.10	U	ug/L	P414153	
		Microcystin WR	0.50	U	ug/L	P414153	
		Microcystin YR	0.25	U	ug/L	P414153	
		Nodularin-R**	0.10	U	ug/L	P414153	
2328767	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P414590	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	5.5		mg N/L	P414359	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P414341	
	EPA 365.1 Rev. 2.0	Total-P	0.32		mg P/L	P414405	
2328768	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P414222	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P414590

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414359

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414341

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414405

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414222

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

Reference Method: EPA 8321B
Batch ID: P414153

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: P414590

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414359

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: P414341

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414405

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414222

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

Reference Method: EPA 8321B
Batch ID: P414153

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	82.1		P	40 - 150
Cylindrospermopsin	80.5		P	40 - 150
Desmethyl microcystin LR	81.8		P	40 - 150
Microcystin HilR	69.2		P	40 - 150
Microcystin HtyR	70.1		P	40 - 150
Microcystin LA	58.6		P	40 - 150
Microcystin LF	85.6		P	40 - 150
Microcystin LR	73.0		P	40 - 150
Microcystin LW	55.5		P	40 - 150
Microcystin LY	56.2		P	40 - 150
Microcystin RR	81.1		P	40 - 150
Microcystin WR	68.9		P	40 - 150
Microcystin YR	68.5		P	40 - 150
Nodularin-R	65.1		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P414590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2328163	Ammonia-N	92.8	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414359

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2328474	Kjeldahl Nitrogen	106	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414341

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2328632	NO2NO3-N	96.5	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414405

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2328767	Total-P	97.2	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414222

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2328738	O-Phosphate-P	97.3	96.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P414153

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2328629	Anatoxin-a	111	107	P/P	40 - 150
2328629	Cylindrospermopsin	81.5	82.7	P/P	40 - 150
2328629	Desmethyl microcystin LR	86.6	92.0	P/P	40 - 150
2328629	Microcystin HilR	76.5	82.7	P/P	40 - 150
2328629	Microcystin HtyR	75.7	79.3	P/P	40 - 150
2328629	Microcystin LA	64.2	71.6	P/P	40 - 150
2328629	Microcystin LF	60.1	70.4	P/P	40 - 150
2328629	Microcystin LR	94.6	92.1	P/P	40 - 150
2328629	Microcystin LW	54.6	65.3	P/P	40 - 150
2328629	Microcystin LY	60.7	52.2	P/P	40 - 150
2328629	Microcystin RR	88.4	92.6	P/P	40 - 150
2328629	Microcystin WR	78.8	91.1	P/P	40 - 150
2328629	Microcystin YR	76.3	81.4	P/P	40 - 150
2328629	Nodularin-R	72.8	80.0	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P414590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2328163	Ammonia-N	3.97	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414359

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2328474	Kjeldahl Nitrogen	0.364	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2328632	NO2NO3-N	0.517	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2328767	Total-P	1.89	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2328738	O-Phosphate-P	0.320	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P414153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2328629	Anatoxin-a	3.24	Spike	P	0 - 30
2328629	Cylindrospermopsin	1.47	Spike	P	0 - 30
2328629	Desmethyl microcystin LR	5.99	Spike	P	0 - 30
2328629	Microcystin HilR	7.75	Spike	P	0 - 30
2328629	Microcystin HtyR	4.76	Spike	P	0 - 30
2328629	Microcystin LA	10.8	Spike	P	0 - 30
2328629	Microcystin LF	15.8	Spike	P	0 - 30
2328629	Microcystin LR	2.69	Spike	P	0 - 30
2328629	Microcystin LW	17.8	Spike	P	0 - 30
2328629	Microcystin LY	15.0	Spike	P	0 - 30
2328629	Microcystin RR	4.55	Spike	P	0 - 30
2328629	Microcystin WR	14.5	Spike	P	0 - 30
2328629	Microcystin YR	6.55	Spike	P	0 - 30
2328629	Nodularin-R	9.39	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: 2328766
Field Sample ID: Bivens Arm @ 441

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	90.9	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A112327
Included Lab Sample IDs: 2328768

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A112387
Included Lab Sample IDs: 2328767

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	97.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A112405
Included Lab Sample IDs: 2328766

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	87.7	84.1	P/P	50 - 160
Cylindrospermopsin	82.0	88.3	P/P	50 - 160
Desmethyl microcystin LR	90.4	91.7	P/P	50 - 160
Microcystin HilR	80.5	82.9	P/P	50 - 160
Microcystin HtyR	84.3	84.4	P/P	50 - 160
Microcystin LA	69.1	72.9	P/P	50 - 160
Microcystin LF	115	87.5	P/P	50 - 160
Microcystin LR	89.4	86.2	P/P	50 - 160
Microcystin LW	74.8	72.3	P/P	50 - 160
Microcystin LY	61.6	61.9	P/P	50 - 160
Microcystin RR	92.1	94.4	P/P	50 - 160
Microcystin WR	82.4	81.2	P/P	50 - 160
Microcystin YR	81.5	81.5	P/P	50 - 160
Nodularin-R	75.9	77.5	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A112465
Included Lab Sample IDs: 2328767

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	98.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A112546
Included Lab Sample IDs: 2328767

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.5	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A112589
Included Lab Sample IDs: 2328767

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.2	94.9	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	96.0	92.8	97.0			3.97
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	106	107			0.364
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	96.5	97.0			0.517
EPA 365.1 Rev. 2.0	Total-P	97.8	97.2	101			1.89
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	97.3	96.8			0.320
EPA 8321B	Anatoxin-a	82.1	111	107			3.24
	Cylindrospermopsin	80.5	81.5	82.7			1.47
	Desmethyl microcystin LR	81.8	86.6	92.0			5.99
	Microcystin HilR	69.2	76.5	82.7			7.75
	Microcystin HtyR	70.1	75.7	79.3			4.76
	Microcystin LA	58.6	64.2	71.6			10.8
	Microcystin LF	85.6	60.1	70.4			15.8
	Microcystin LR	73.0	94.6	92.1			2.69
	Microcystin LW	55.5	54.6	65.3			17.8
	Microcystin LY	56.2	60.7	52.2			15.0
	Microcystin RR	81.1	88.4	92.6			4.55
	Microcystin WR	68.9	78.8	91.1			14.5
	Microcystin YR	68.5	76.3	81.4			6.55
	Nodularin-R	65.1	72.8	80.0			9.39

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2328767
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2328767
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2328767
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2328767
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2328768
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2328766

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	05/20/2022			06/01/2022 12:40	Ping Hua	2328767
EPA 351.2 Rev. 2.0	05/20/2022	06/01/2022 12:22	Samantha L Bates	06/02/2022 18:03	Alexandra J Mattheus	2328767
EPA 353.2 Rev. 2.0	05/20/2022			05/24/2022 16:19	Nathaniel J Jones	2328767
EPA 365.1 Rev. 2.0	05/20/2022	05/26/2022 15:35	Simonne.V. Calhoun	05/27/2022 13:32	Sarah A Nixon	2328767
EPA 365.1 Rev. 2.0 dissolved	05/20/2022			05/20/2022 18:47	Nathaniel J Jones	2328768
EPA 8321B	05/20/2022	05/25/2022 09:00	Manjita Shrestha	05/25/2022 19:09	Manjita Shrestha	2328766