Chemical Analysis Report

WQAP-2021-12-15-01

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

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2021-03-01-37**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 10-JAN-2022 10:56

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: Lake Trafford Dock **Collection Date/Time: 12/14/2021 11:55**

Field ID: Lake Trafford Dock Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2295185	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P407283	
		Cylindrospermopsin	0.17	I	ug/L	P407283	
		Desmethyl microcystin LR	0.25	U	ug/L	P407283	
		Microcystin HilR**	0.25	U	ug/L	P407283	
		Microcystin HtyR**	0.25	U	ug/L	P407283	
		Microcystin LA	0.10	U	ug/L	P407283	
		Microcystin LF	0.10	U	ug/L	P407283	
		Microcystin LR	0.28	I	ug/L	P407283	
		Microcystin LW	0.25	U	ug/L	P407283	
		Microcystin LY	0.10	U	ug/L	P407283	
		Microcystin RR	0.10	U	ug/L	P407283	
		Microcystin WR	0.50	U	ug/L	P407283	
		Microcystin YR	0.25	U	ug/L	P407283	
		Nodularin-R**	0.10	U	ug/L	P407283	
2295186	EPA 350.1 Rev. 2.0	Ammonia-N	0.091		mg N/L	P408036	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.4		mg N/L	P407954	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P407616	
	EPA 365.1 Rev. 2.0	Total-P	0.15	J	mg P/L	P407842	MS
2295187	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P407492	MS

Ref. Method and Comment:
EPA 365.1 Rev. 2.0: Total-P: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408036

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407954

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407616

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407842

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407492

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

Reference Method: EPA 8321B
Batch ID: P407283

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: P408036

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407954

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: P407616

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407842

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407492

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

Reference Method: EPA 8321B
Batch ID: P407283

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	88.2		P	40 - 150
Cylindrospermopsin	92.1		P	40 - 150
Desmethyl microcystin LR	93.4		P	40 - 150
Microcystin HilR	92.2		P	40 - 150
Microcystin HtyR	83.1		P	40 - 150
Microcystin LA	104		P	40 - 150
Microcystin LF	132		P	40 - 150
Microcystin LR	78.2		P	40 - 150
Microcystin LW	108		P	40 - 150
Microcystin LY	106		P	40 - 150
Microcystin RR	97.1		P	40 - 150
Microcystin WR	87.0		P	40 - 150
Microcystin YR	79.4		P	40 - 150
Nodularin-R	97.4		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408036

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2295158	Ammonia-N	98.2	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2295109	Kjeldahl Nitrogen	97.6	93.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407616

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2295186	NO2NO3-N	97.4	96.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407842

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2295186	Total-P	110	106	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407492

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2295159	O-Phosphate-P	89.9	93.3	F/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P407283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2294531	Anatoxin-a	106	110	P/P	40 - 150
2294531	Cylindrospermopsin	79.4	83.1	P/P	40 - 150
2294531	Desmethyl microcystin LR	99.1	98.9	P/P	40 - 150
2294531	Microcystin HilR	93.0	94.0	P/P	40 - 150
2294531	Microcystin HtyR	88.5	86.3	P/P	40 - 150
2294531	Microcystin LA	101	98.9	P/P	40 - 150
2294531	Microcystin LF	125	107	P/P	40 - 150
2294531	Microcystin LR	79.2	75.9	P/P	40 - 150
2294531	Microcystin LW	96.3	98.1	P/P	40 - 150
2294531	Microcystin LY	93.8	103	P/P	40 - 150
2294531	Microcystin RR	94.1	103	P/P	40 - 150
2294531	Microcystin WR	83.9	87.9	P/P	40 - 150
2294531	Microcystin YR	79.8	80.7	P/P	40 - 150
2294531	Nodularin-R	95.6	94.9	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P408036

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295158	Ammonia-N	0.352	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P407954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295109	Kjeldahl Nitrogen	3.68	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P407616

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295186	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P407842

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295186	Total-P	2.50	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P407492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2295159	O-Phosphate-P	3.05	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P407283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2294531	Anatoxin-a	3.08	Spike	P	0 - 30
2294531	Cylindrospermopsin	4.61	Spike	P	0 - 30
2294531	Desmethyl microcystin LR	0.204	Spike	P	0 - 30
2294531	Microcystin HilR	1.11	Spike	P	0 - 30
2294531	Microcystin HtyR	2.56	Spike	P	0 - 30
2294531	Microcystin LA	2.39	Spike	P	0 - 30
2294531	Microcystin LF	16.0	Spike	P	0 - 30
2294531	Microcystin LR	3.82	Spike	P	0 - 30
2294531	Microcystin LW	1.79	Spike	P	0 - 30
2294531	Microcystin LY	9.02	Spike	P	0 - 30
2294531	Microcystin RR	8.64	Spike	P	0 - 30
2294531	Microcystin WR	4.66	Spike	P	0 - 30
2294531	Microcystin YR	1.17	Spike	P	0 - 30
2294531	Nodularin-R	0.780	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: 2295185
Field Sample ID: Lake Trafford Dock

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	90.4	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	79.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A109401
Included Lab Sample IDs: 2295187

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.8	98.7	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A109441
Included Lab Sample IDs: 2295185

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	71.3	60.9	P/P	50 - 160
Cylindrospermopsin	90.3	89.8	P/P	60 - 160
Desmethyl microcystin LR	93.0	90.5	P/P	60 - 160
Microcystin HilR	89.6	84.0	P/P	60 - 160
Microcystin HtyR	84.0	81.3	P/P	60 - 160
Microcystin LA	103	109	P/P	50 - 160
Microcystin LF	134	132	P/P	60 - 160
Microcystin LR	76.2	74.5	P/P	60 - 160
Microcystin LW	99.9	102	P/P	60 - 160
Microcystin LY	99.6	99.6	P/P	60 - 160
Microcystin RR	98.8	92.4	P/P	60 - 160
Microcystin WR	81.0	82.3	P/P	60 - 160
Microcystin YR	74.8	72.2	P/P	60 - 160
Nodularin-R	91.7	90.7	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A109457
Included Lab Sample IDs: 2295186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A109584
Included Lab Sample IDs: 2295186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A109640
Included Lab Sample IDs: 2295186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.3	95.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A109647
Included Lab Sample IDs: 2295186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	97.6	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	99.0	98.2	98.6			0.352
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	97.6	93.7			3.68
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	97.4	96.9			0.487
EPA 365.1 Rev. 2.0	Total-P	108	110	106			2.50
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	89.9	93.3			3.05
EPA 8321B	Anatoxin-a	88.2	106	110			3.08
	Cylindrospermopsin	92.1	79.4	83.1			4.61
	Desmethyl microcystin LR	93.4	99.1	98.9			0.204
	Microcystin HilR	92.2	93.0	94.0			1.11
	Microcystin HtyR	83.1	88.5	86.3			2.56
	Microcystin LA	104	101	98.9			2.39
	Microcystin LF	132	125	107			16.0
	Microcystin LR	78.2	79.2	75.9			3.82
	Microcystin LW	108	96.3	98.1			1.79
	Microcystin LY	106	93.8	103			9.02
	Microcystin RR	97.1	94.1	103			8.64
	Microcystin WR	87.0	83.9	87.9			4.66
	Microcystin YR	79.4	79.8	80.7			1.17
	Nodularin-R	97.4	95.6	94.9			0.780

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2295186
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2295186
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2295186
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2295186
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2295187
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2295185

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	12/15/2021			01/03/2022 12:24	Ping Hua	2295186
EPA 351.2 Rev. 2.0	12/15/2021	12/29/2021 11:36	Samantha L Bates	01/03/2022 15:32	Alexandra J Mattheus	2295186
EPA 353.2 Rev. 2.0	12/15/2021			12/17/2021 10:44	Beverly Y. Sanders	2295186
EPA 365.1 Rev. 2.0	12/15/2021	12/27/2021 15:00	Simonne.V. Calhoun	12/28/2021 10:26	Shengyu Ding	2295186
EPA 365.1 Rev. 2.0 dissolved	12/15/2021			12/15/2021 14:50	James L Waggerby	2295187
EPA 8321B	12/15/2021	12/16/2021 12:00	Manjita Shrestha	12/16/2021 17:01	Manjita Shrestha	2295185