Chemical Analysis Report

WQAP-2021-04-16-02

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-2021-03-29-07**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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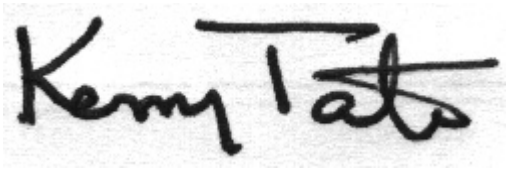
Date Certified: 07-MAY-2021 08:07



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: Caloosahatchee River @ Franklin Locks **Collection Date/Time: 04/15/2021 12:40**

Field ID: HAB-SD-041521-01 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2240251	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P396673	
		Cylindrospermopsin	0.25	U	ug/L	P396673	
		Desmethyl microcystin LR	0.25	U	ug/L	P396673	
		Microcystin HilR**	0.25	U	ug/L	P396673	
		Microcystin HtyR**	0.25	U	ug/L	P396673	
		Microcystin LA	0.25	U	ug/L	P396673	
		Microcystin LF	0.25	U	ug/L	P396673	
		Microcystin LR	0.59	I	ug/L	P396673	
		Microcystin LW	0.25	U	ug/L	P396673	
		Microcystin LY	0.25	U	ug/L	P396673	
		Microcystin RR	0.25	U	ug/L	P396673	
		Microcystin WR	0.50	U	ug/L	P396673	
		Microcystin YR	0.25	U	ug/L	P396673	
		Nodularin-R**	0.25	U	ug/L	P396673	
2240252	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P397363	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P397068	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.045		mg N/L	P397034	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P396857	
2240253	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.053		mg P/L	P396706	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397363

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397068

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397034

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P396857

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396706

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

Reference Method: EPA 8321B
Batch ID: P396673

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	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	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397363

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: P397068

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397034

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: P396857

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396706

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

Reference Method: EPA 8321B
Batch ID: P396673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	119		P	40 - 150
Cylindrospermopsin	109		P	40 - 150
Desmethyl microcystin LR	134		P	40 - 150
Microcystin HilR	140		P	40 - 150
Microcystin HtyR	141		P	40 - 150
Microcystin LA	125		P	40 - 150
Microcystin LF	133		P	40 - 150
Microcystin LR	145		P	40 - 150
Microcystin LW	128		P	40 - 150
Microcystin LY	115		P	40 - 150
Microcystin RR	118		P	40 - 150
Microcystin WR	130		P	40 - 150
Microcystin YR	130		P	40 - 150
Nodularin-R	124		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397363

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240261	Ammonia-N	97.8	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397068

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240168	Kjeldahl Nitrogen	98.4	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240211	NO2NO3-N	95.3	94.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P396857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240212	Total-P	107	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240300	O-Phosphate-P	96.9	97.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P396673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240239	Anatoxin-a	113	97.6	P/P	40 - 150
2240239	Cylindrospermopsin	107	98.4	P/P	40 - 150
2240239	Desmethyl microcystin LR	131	135	P/P	40 - 150
2240239	Microcystin HilR	136	132	P/P	40 - 150
2240239	Microcystin HtyR	133	133	P/P	40 - 150
2240239	Microcystin LA	131	125	P/P	40 - 150
2240239	Microcystin LF	113	113	P/P	40 - 150
2240239	Microcystin LR	144	135	P/P	40 - 150
2240239	Microcystin LW	106	100	P/P	40 - 150
2240239	Microcystin LY	115	108	P/P	40 - 150
2240239	Microcystin RR	114	107	P/P	40 - 150
2240239	Microcystin WR	134	121	P/P	40 - 150
2240239	Microcystin YR	138	125	P/P	40 - 150
2240239	Nodularin-R	129	124	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240261	Ammonia-N	0.242	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240168	Kjeldahl Nitrogen	0.00626	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240211	NO2NO3-N	0.952	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P396857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240212	Total-P	1.43	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240300	O-Phosphate-P	0.588	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P396673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240239	Anatoxin-a	14.4	Spike	P	0 - 30
2240239	Cylindrospermopsin	8.81	Spike	P	0 - 30
2240239	Desmethyl microcystin LR	3.39	Spike	P	0 - 30
2240239	Microcystin HilR	2.97	Spike	P	0 - 30
2240239	Microcystin HtyR	0.100	Spike	P	0 - 30
2240239	Microcystin LA	4.80	Spike	P	0 - 30
2240239	Microcystin LF	0.102	Spike	P	0 - 30
2240239	Microcystin LR	6.11	Spike	P	0 - 30
2240239	Microcystin LW	5.05	Spike	P	0 - 30
2240239	Microcystin LY	5.85	Spike	P	0 - 30
2240239	Microcystin RR	5.03	Spike	P	0 - 30
2240239	Microcystin WR	9.94	Spike	P	0 - 30
2240239	Microcystin YR	10.1	Spike	P	0 - 30
2240239	Nodularin-R	3.99	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: 2240251
Field Sample ID: HAB-SD-041521-01

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	117	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	108	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A104789
Included Lab Sample IDs: 2240253

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	96.1	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A104800
Included Lab Sample IDs: 2240251

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	106	106	P/P	50 - 160
Cylindrospermopsin	103	103	P/P	60 - 160
Desmethyl microcystin LR	129	130	P/P	60 - 160
Microcystin HilR	128	126	P/P	60 - 160
Microcystin HtyR	123	128	P/P	60 - 160
Microcystin LA	116	113	P/P	50 - 160
Microcystin LF	117	114	P/P	50 - 160
Microcystin LR	146	128	P/P	60 - 160
Microcystin LW	124	110	P/P	60 - 160
Microcystin LY	117	103	P/P	60 - 160
Microcystin RR	111	106	P/P	60 - 160
Microcystin WR	120	129	P/P	60 - 160
Microcystin YR	131	112	P/P	60 - 160
Nodularin-R	119	119	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A104877
Included Lab Sample IDs: 2240252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	106	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A104904
Included Lab Sample IDs: 2240252

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105021
Included Lab Sample IDs: 2240252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	98.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105064
Included Lab Sample IDs: 2240252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	98.7	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	97.8	98.2			0.242
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	98.4	98.4			0.0062
EPA 353.2 Rev. 2.0	NO2NO3-N	102	95.3	94.3			0.952
EPA 365.1 Rev. 2.0	Total-P	106	107	109			1.43
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	96.9	97.5			0.588
EPA 8321B	Anatoxin-a	119	113	97.6			14.4
	Cylindrospermopsin	109	107	98.4			8.81
	Desmethyl microcystin LR	134	131	135			3.39
	Microcystin HilR	140	136	132			2.97
	Microcystin HtyR	141	133	133			0.100
	Microcystin LA	125	131	125			4.80
	Microcystin LF	133	113	113			0.102
	Microcystin LR	145	144	135			6.11
	Microcystin LW	128	106	100			5.05
	Microcystin LY	115	115	108			5.85
	Microcystin RR	118	114	107			5.03
	Microcystin WR	130	134	121			9.94
	Microcystin YR	130	138	125			10.1
	Nodularin-R	124	129	124			3.99

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2240252
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2240252
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2240252
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2240252
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2240253
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2240251

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	04/16/2021			04/28/2021 18:18	Ping Hua	2240252
EPA 351.2 Rev. 2.0	04/16/2021	04/23/2021 14:33	Benjamin T. Nordmann	04/27/2021 12:09	Virginia P. Brown	2240252
EPA 353.2 Rev. 2.0	04/16/2021			04/22/2021 10:30	Beverly Y. Sanders	2240252
EPA 365.1 Rev. 2.0	04/16/2021	04/20/2021 14:25	Yen Ta	04/21/2021 11:53	Shengyu Ding	2240252
EPA 365.1 Rev. 2.0 dissolved	04/16/2021			04/16/2021 14:35	Blanca Fach	2240253
EPA 8321B	04/16/2021	04/16/2021 12:00	Pramila Ghimire	04/17/2021 07:52	Pramila Ghimire	2240251