Chemical Analysis Report

WQAP-2021-06-23-01

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-2021-06-14-22**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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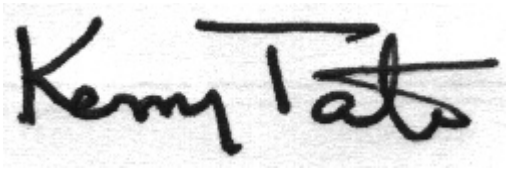
Date Certified: 16-JUL-2021 13:24



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: Buck Creek Baytree Dr **Collection Date/Time: 06/22/2021 10:00**

Field ID: HAB-SD-062221-001 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2256620	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P400099	
		Cylindrospermopsin	0.10	U	ug/L	P400099	
		Desmethyl microcystin LR	0.25	U	ug/L	P400099	
		Microcystin HilR**	0.25	U	ug/L	P400099	
		Microcystin HtyR**	0.25	U	ug/L	P400099	
		Microcystin LA	0.10	U	ug/L	P400099	
		Microcystin LF	0.10	U	ug/L	P400099	
		Microcystin LR	0.25	U	ug/L	P400099	
		Microcystin LW	0.25	U	ug/L	P400099	
		Microcystin LY	0.10	U	ug/L	P400099	
		Microcystin RR	0.10	U	ug/L	P400099	
		Microcystin WR	0.50	U	ug/L	P400099	
		Microcystin YR	0.25	U	ug/L	P400099	
		Nodularin-R**	0.10	U	ug/L	P400099	
2256621	EPA 350.1 Rev. 2.0	Ammonia-N	0.27		mg N/L	P400572	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.2		mg N/L	P400322	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P400149	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P400301	
2256622	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P400130	

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: P400572

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400322

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400149

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400301

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400130

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

Reference Method: EPA 8321B
Batch ID: P400099

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: P400572

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400322

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400149

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: P400301

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400130

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	102		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P400099

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	133		P	40 - 150
Cylindrospermopsin	131		P	40 - 150
Desmethyl microcystin LR	90.9		P	40 - 150
Microcystin HilR	92.3		P	40 - 150
Microcystin HtyR	96.4		P	40 - 150
Microcystin LA	117		P	40 - 150
Microcystin LF	122		P	40 - 150
Microcystin LR	88.5		P	40 - 150
Microcystin LW	97.1		P	40 - 150
Microcystin LY	125		P	40 - 150
Microcystin RR	138		P	40 - 150
Microcystin WR	91.9		P	40 - 150
Microcystin YR	107		P	40 - 150
Nodularin-R	126		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256913	Ammonia-N	96.6	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256349	NO2NO3-N	97.8	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400301

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256630	Total-P	102	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400130

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256631	O-Phosphate-P	97.2	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P400099

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256574	Anatoxin-a	114	121	P/P	40 - 150
2256574	Cylindrospermopsin	99.5	106	P/P	40 - 150
2256574	Desmethyl microcystin LR	73.8	74.9	P/P	40 - 150
2256574	Microcystin HilR	73.8	79.3	P/P	40 - 150
2256574	Microcystin HtyR	81.1	86.0	P/P	40 - 150
2256574	Microcystin LA	105	109	P/P	40 - 150
2256574	Microcystin LF	81.6	81.9	P/P	40 - 150
2256574	Microcystin LR	72.4	82.4	P/P	40 - 150
2256574	Microcystin LW	71.9	74.2	P/P	40 - 150
2256574	Microcystin LY	102	113	P/P	40 - 150
2256574	Microcystin RR	120	126	P/P	40 - 150
2256574	Microcystin WR	76.5	84.1	P/P	40 - 150
2256574	Microcystin YR	96.1	104	P/P	40 - 150
2256574	Nodularin-R	111	116	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256913	Ammonia-N	0.998	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256291	Kjeldahl Nitrogen	0.359	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256349	NO2NO3-N	0.418	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256630	Total-P	2.76	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256631	O-Phosphate-P	0.829	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P400099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256574	Anatoxin-a	5.97	Spike	P	0 - 30
2256574	Cylindrospermopsin	5.87	Spike	P	0 - 30
2256574	Desmethyl microcystin LR	1.51	Spike	P	0 - 30
2256574	Microcystin HilR	7.16	Spike	P	0 - 30
2256574	Microcystin HtyR	5.90	Spike	P	0 - 30
2256574	Microcystin LA	3.81	Spike	P	0 - 30
2256574	Microcystin LF	0.400	Spike	P	0 - 30
2256574	Microcystin LR	13.0	Spike	P	0 - 30
2256574	Microcystin LW	3.04	Spike	P	0 - 30
2256574	Microcystin LY	10.3	Spike	P	0 - 30
2256574	Microcystin RR	4.71	Spike	P	0 - 30
2256574	Microcystin WR	9.52	Spike	P	0 - 30
2256574	Microcystin YR	7.73	Spike	P	0 - 30
2256574	Nodularin-R	4.33	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: 2256620
Field Sample ID: HAB-SD-062221-001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	86.6	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	95.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A106235
Included Lab Sample IDs: 2256622

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106247
Included Lab Sample IDs: 2256621

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

Reference Method: EPA 8321B
Run ID: A106269
Included Lab Sample IDs: 2256620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	123	120	P/P	50 - 160
Cylindrospermopsin	127	125	P/P	50 - 160
Desmethyl microcystin LR	77.5	76.8	P/P	50 - 160
Microcystin HilR	86.0	83.3	P/P	50 - 160
Microcystin HtyR	87.3	89.1	P/P	50 - 160
Microcystin LA	114	115	P/P	50 - 160
Microcystin LF	115	106	P/P	50 - 160
Microcystin LR	83.0	82.3	P/P	50 - 160
Microcystin LW	87.7	96.1	P/P	50 - 160
Microcystin LY	116	118	P/P	50 - 160
Microcystin RR	132	124	P/P	50 - 160
Microcystin WR	78.6	81.3	P/P	50 - 160
Microcystin YR	106	92.6	P/P	50 - 160
Nodularin-R	117	110	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106339
Included Lab Sample IDs: 2256621

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A106395
Included Lab Sample IDs: 2256621

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106456
Included Lab Sample IDs: 2256621

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	98.2	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	99.2	96.6	97.8			0.998
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107					0.359
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	97.8	98.4			0.418
EPA 365.1 Rev. 2.0	Total-P	105	102	106			2.76
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.2	98.3			0.829
EPA 8321B	Anatoxin-a	133	114	121			5.97
	Cylindrospermopsin	131	99.5	106			5.87
	Desmethyl microcystin LR	90.9	73.8	74.9			1.51
	Microcystin HilR	92.3	73.8	79.3			7.16
	Microcystin HtyR	96.4	81.1	86.0			5.90
	Microcystin LA	117	105	109			3.81
	Microcystin LF	122	81.6	81.9			0.400
	Microcystin LR	88.5	72.4	82.4			13.0
	Microcystin LW	97.1	71.9	74.2			3.04
	Microcystin LY	125	102	113			10.3
	Microcystin RR	138	120	126			4.71
	Microcystin WR	91.9	76.5	84.1			9.52
	Microcystin YR	107	96.1	104			7.73
	Nodularin-R	126	111	116			4.33

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2256621
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2256621
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2256621
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2256621
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2256622
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2256620

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	06/23/2021			07/06/2021 12:11	Roberta Tatti	2256621
EPA 351.2 Rev. 2.0	06/23/2021	06/29/2021 12:58	Benjamin T. Nordmann	06/30/2021 17:27	Letuzia M De Oliveira	2256621
EPA 353.2 Rev. 2.0	06/23/2021			06/24/2021 09:50	Beverly Y. Sanders	2256621
EPA 365.1 Rev. 2.0	06/23/2021	06/28/2021 17:29	Madeline Gruver	06/29/2021 10:46	Shengyu Ding	2256621
EPA 365.1 Rev. 2.0 dissolved	06/23/2021			06/23/2021 14:54	Ping Hua	2256622
EPA 8321B	06/23/2021	06/24/2021 12:00	Pramila Ghimire	06/24/2021 17:15	Pramila Ghimire	2256620