Chemical Analysis Report

WQAP-2022-05-11-01

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

Event Description: **Algal Bloom Response -SOROC- Highlands**
Request ID: **RQ-2022-02-07-25**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2295 Victoria AVE
Suite 364
Fort Myers, FL 33901
Attn: Kirby Wolfe

For additional information please contact
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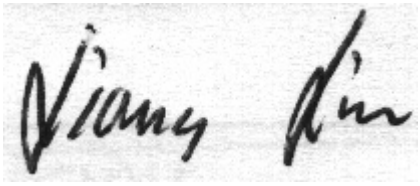
Certified by: Liang Lin, Environmental Administrator

Date Certified: 06-JUN-2022 09:13



NON-CONFORMANCE REPORT INCLUDED

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 Iotela **Collection Date/Time: 05/09/2022 13:22**

Field ID: HAB-HC-050922-1320 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2326161	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P413727	
		Cylindrospermopsin	0.10	U	ug/L	P413727	
		Desmethyl microcystin LR	0.25	U	ug/L	P413727	
		Microcystin HilR**	0.25	U	ug/L	P413727	
		Microcystin HtyR**	0.25	U	ug/L	P413727	
		Microcystin LA	0.10	U	ug/L	P413727	
		Microcystin LF	0.10	U	ug/L	P413727	
		Microcystin LR	0.25	U	ug/L	P413727	
		Microcystin LW	0.25	U	ug/L	P413727	
		Microcystin LY	0.10	U	ug/L	P413727	
		Microcystin RR	0.10	U	ug/L	P413727	
		Microcystin WR	0.50	U	ug/L	P413727	
		Microcystin YR	0.25	U	ug/L	P413727	
		Nodularin-R**	0.10	U	ug/L	P413727	
2326162	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P413902	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P414005	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P413861	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P413990	
2326163	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P413696	

Non-Conformance Report

NCR ID: 9374

Event(s)	Job(s)	Sample(s)	Test(s)
WQAP-2022-05-11-01			

NCR Type: SHIPPING/RECEIVING **NCR Category: Samples arrived late**

Observation: Samples arrived late, samples received within the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.
Customer contacted, email correspondence attached to sample submittal forms.
Biology and Chemistry supervisors were notified by email.
The algae were not degraded and were able to be analyzed. The result will not be qualified. -AGR

Authorized by/Date: Kerry Tate, Ph.D. 5/13/2022

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413902

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414005

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413861

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413990

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413696

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

Reference Method: EPA 8321B
Batch ID: P413727

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: P413902

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414005

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413861

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413990

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413696

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

Reference Method: EPA 8321B
Batch ID: P413727

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	118		P	40 - 150
Cylindrospermopsin	110		P	40 - 150
Desmethyl microcystin LR	93.1		P	40 - 150
Microcystin HilR	94.8		P	40 - 150
Microcystin HtyR	95.9		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	124		P	40 - 150
Microcystin LR	100		P	40 - 150
Microcystin LW	115		P	40 - 150
Microcystin LY	122		P	40 - 150
Microcystin RR	106		P	40 - 150
Microcystin WR	90.2		P	40 - 150
Microcystin YR	100		P	40 - 150
Nodularin-R	98.6		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325169	Ammonia-N	101	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414005

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324748	Kjeldahl Nitrogen	96.4	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413861

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325534	NO2NO3-N	97.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2326082	Total-P	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2326163	O-Phosphate-P	97.3	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P413727

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2325533	Anatoxin-a	131	124	P/P	40 - 150
2325533	Cylindrospermopsin	104	106	P/P	40 - 150
2325533	Desmethyl microcystin LR	105	105	P/P	40 - 150
2325533	Microcystin HilR	101	95.7	P/P	40 - 150
2325533	Microcystin HtyR	98.4	98.3	P/P	40 - 150
2325533	Microcystin LA	98.5	98.7	P/P	40 - 150
2325533	Microcystin LF	131	116	P/P	40 - 150
2325533	Microcystin LR	114	111	P/P	40 - 150
2325533	Microcystin LW	105	107	P/P	40 - 150
2325533	Microcystin LY	113	124	P/P	40 - 150
2325533	Microcystin RR	101	98.2	P/P	40 - 150
2325533	Microcystin WR	93.4	91.5	P/P	40 - 150
2325533	Microcystin YR	105	106	P/P	40 - 150
2325533	Nodularin-R	101	98.2	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325169	Ammonia-N	0.553	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414005

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324748	Kjeldahl Nitrogen	4.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325534	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2326082	Total-P	0.732	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2326163	O-Phosphate-P	2.24	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P413727

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2325533	Anatoxin-a	5.80	Spike	P	0 - 30
2325533	Cylindrospermopsin	1.98	Spike	P	0 - 30
2325533	Desmethyl microcystin LR	0.00285	Spike	P	0 - 30
2325533	Microcystin HilR	5.04	Spike	P	0 - 30
2325533	Microcystin HtyR	0.129	Spike	P	0 - 30
2325533	Microcystin LA	0.188	Spike	P	0 - 30
2325533	Microcystin LF	12.5	Spike	P	0 - 30
2325533	Microcystin LR	2.76	Spike	P	0 - 30
2325533	Microcystin LW	2.15	Spike	P	0 - 30
2325533	Microcystin LY	9.25	Spike	P	0 - 30
2325533	Microcystin RR	2.77	Spike	P	0 - 30
2325533	Microcystin WR	2.06	Spike	P	0 - 30
2325533	Microcystin YR	0.867	Spike	P	0 - 30
2325533	Nodularin-R	2.66	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: 2326161
Field Sample ID: HAB-HC-050922-1320

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	89.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A112063
Included Lab Sample IDs: 2326163

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	99.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A112108
Included Lab Sample IDs: 2326161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	129	125	P/P	50 - 160
Cylindrospermopsin	113	107	P/P	50 - 160
Desmethyl microcystin LR	99.7	102	P/P	50 - 160
Microcystin HilR	98.8	102	P/P	50 - 160
Microcystin HtyR	97.9	99.5	P/P	50 - 160
Microcystin LA	123	109	P/P	50 - 160
Microcystin LF	113	100	P/P	50 - 160
Microcystin LR	110	110	P/P	50 - 160
Microcystin LW	119	87.5	P/P	50 - 160
Microcystin LY	140	140	P/P	50 - 160
Microcystin RR	110	113	P/P	50 - 160
Microcystin WR	99.2	96.9	P/P	50 - 160
Microcystin YR	99.8	93.3	P/P	50 - 160
Nodularin-R	105	101	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A112168
Included Lab Sample IDs: 2326162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A112183
Included Lab Sample IDs: 2326162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A112292
Included Lab Sample IDs: 2326162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A112314
Included Lab Sample IDs: 2326162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	102	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	97.0	101	99.6			0.553
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.1	96.4	105			4.44
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	97.0	97.0			0.0
EPA 365.1 Rev. 2.0	Total-P	101	105	104			0.732
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	97.3	99.5			2.24
EPA 8321B	Anatoxin-a	118	131	124			5.80
	Cylindrospermopsin	110	104	106			1.98
	Desmethyl microcystin LR	93.1	105	105			0.0028
	Microcystin HilR	94.8	101	95.7			5.04
	Microcystin HtyR	95.9	98.4	98.3			0.129
	Microcystin LA	103	98.5	98.7			0.188
	Microcystin LF	124	131	116			12.5
	Microcystin LR	100	114	111			2.76
	Microcystin LW	115	105	107			2.15
	Microcystin LY	122	113	124			9.25
	Microcystin RR	106	101	98.2			2.77
	Microcystin WR	90.2	93.4	91.5			2.06
	Microcystin YR	100	105	106			0.867
	Nodularin-R	98.6	101	98.2			2.66

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2326162
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2326162
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2326162
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2326162
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2326163
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2326161

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	05/11/2022			05/16/2022 14:12	Judith K. Clark	2326162
EPA 351.2 Rev. 2.0	05/11/2022	05/19/2022 15:12	Samantha L Bates	05/20/2022 13:52	Samantha L Bates	2326162
EPA 353.2 Rev. 2.0	05/11/2022			05/13/2022 17:12	Nathaniel J Jones	2326162
EPA 365.1 Rev. 2.0	05/11/2022	05/18/2022 16:09	Simonne.V. Calhoun	05/20/2022 11:57	James L Waggerby	2326162
EPA 365.1 Rev. 2.0 dissolved	05/11/2022			05/11/2022 11:25	James L Waggerby	2326163
EPA 8321B	05/11/2022	05/12/2022 08:30	Manjita Shrestha	05/12/2022 13:34	Manjita Shrestha	2326161