Chemical Analysis Report

WQAP-2022-09-07-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2022-06-27-19**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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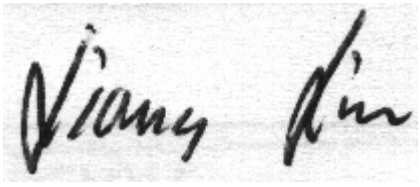
Date Certified: 21-SEP-2022 14:47



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 - Shell Point Blvd **Collection Date/Time: 09/06/2022 09:30**

Field ID: HAB-SD-09062022-0930 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2354248	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P419180	
		Cylindrospermopsin	0.10	U	ug/L	P419179	
		Desmethyl microcystin LR	0.25	U	ug/L	P419179	
		Microcystin HilR	0.25	U	ug/L	P419179	
		Microcystin HtyR	0.25	U	ug/L	P419179	
		Microcystin LA	0.10	U	ug/L	P419179	
		Microcystin LF	0.10	U	ug/L	P419179	
		Microcystin LR	0.25	U	ug/L	P419179	
		Microcystin LW	0.25	U	ug/L	P419179	
		Microcystin LY	0.10	U	ug/L	P419179	
		Microcystin RR	0.10	U	ug/L	P419179	MS
		Microcystin WR	0.50	U	ug/L	P419179	
		Microcystin YR	0.25	U	ug/L	P419179	
		Nodularin-R	0.10	U	ug/L	P419179	
2354249	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P419361	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P419244	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P419329	
	EPA 365.1 Rev. 2.0	Total-P	0.092		mg P/L	P419462	
2354250	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.065		mg P/L	P419234	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419361

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419244

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419329

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419462

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419234

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

Reference Method: EPA 8321B
Batch ID: P419179

Component	Result	Code	Units
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

Reference Method: EPA 8321B
Batch ID: P419180

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419361

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419244

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	100		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419329

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419462

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: P419234

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

Reference Method: EPA 8321B
Batch ID: P419179

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	95.4		P	40 - 150
Desmethyl microcystin LR	79.5		P	40 - 150
Microcystin HilR	85.0		P	40 - 150
Microcystin HtyR	79.7		P	40 - 150
Microcystin LA	86.0		P	40 - 150
Microcystin LF	74.8		P	40 - 150
Microcystin LR	85.4		P	40 - 150
Microcystin LW	70.8		P	40 - 150
Microcystin LY	67.0		P	40 - 150
Microcystin RR	142		P	40 - 150
Microcystin WR	81.0		P	40 - 150
Microcystin YR	75.2		P	40 - 150
Nodularin-R	114		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	92.6		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419361

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354888	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419244

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354322	Kjeldahl Nitrogen	103	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419329

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354249	NO2NO3-N	105	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419462

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354470	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354658	O-Phosphate-P	94.4	95.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P419179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354194	Cylindrospermopsin	99.3	100	P/P	40 - 150
2354194	Desmethyl microcystin LR	95.4	97.9	P/P	40 - 150
2354194	Microcystin HilR	101	105	P/P	40 - 150
2354194	Microcystin HtyR	104	99.5	P/P	40 - 150
2354194	Microcystin LA	85.3	81.8	P/P	40 - 150
2354194	Microcystin LF	75.6	69.4	P/P	40 - 150
2354194	Microcystin LR	115	115	P/P	40 - 150
2354194	Microcystin LW	71.6	65.7	P/P	40 - 150
2354194	Microcystin LY	64.9	78.8	P/P	40 - 150
2354194	Microcystin RR	158	160	F/F	40 - 150
2354194	Microcystin WR	88.9	92.7	P/P	40 - 150
2354194	Microcystin YR	101	102	P/P	40 - 150
2354194	Nodularin-R	140	147	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354194	Anatoxin-a	91.3	91.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419361

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354888	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419244

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354322	Kjeldahl Nitrogen	4.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419329

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354249	NO2NO3-N	4.25	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419462

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354470	Total-P	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354658	O-Phosphate-P	1.47	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P419179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354194	Cylindrospermopsin	1.13	Spike	P	0 - 30
2354194	Desmethyl microcystin LR	2.58	Spike	P	0 - 30
2354194	Microcystin HilR	4.10	Spike	P	0 - 30
2354194	Microcystin HtyR	4.41	Spike	P	0 - 30
2354194	Microcystin LA	4.17	Spike	P	0 - 30
2354194	Microcystin LF	8.56	Spike	P	0 - 30
2354194	Microcystin LR	0.0964	Spike	P	0 - 30
2354194	Microcystin LW	8.60	Spike	P	0 - 30
2354194	Microcystin LY	19.4	Spike	P	0 - 30
2354194	Microcystin RR	1.30	Spike	P	0 - 30
2354194	Microcystin WR	4.20	Spike	P	0 - 30
2354194	Microcystin YR	0.988	Spike	P	0 - 30
2354194	Nodularin-R	4.79	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P419180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354194	Anatoxin-a	0.480	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Surrogates

Lab Sample ID: 2354248
Field Sample ID: HAB-SD-09062022-0930

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	65.6	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	30.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A114585
Included Lab Sample IDs: 2354250

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	97.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A114589
Included Lab Sample IDs: 2354248

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	97.6	102	P/P	50 - 160
Desmethyl microcystin LR	88.9	87.2	P/P	50 - 160
Microcystin HilR	96.9	91.7	P/P	50 - 160
Microcystin HtyR	92.5	93.0	P/P	50 - 160
Microcystin LA	109	94.9	P/P	50 - 160
Microcystin LF	82.3	83.3	P/P	50 - 160
Microcystin LR	92.8	93.6	P/P	50 - 160
Microcystin LW	79.0	85.0	P/P	50 - 160
Microcystin LY	77.5	78.6	P/P	50 - 160
Microcystin RR	152	148	P/P	50 - 160
Microcystin WR	99.2	92.3	P/P	50 - 160
Microcystin YR	93.3	91.3	P/P	50 - 160
Nodularin-R	130	127	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A114609
Included Lab Sample IDs: 2354248

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	98.0	94.6	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A114620
Included Lab Sample IDs: 2354249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A114639
Included Lab Sample IDs: 2354249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114661
Included Lab Sample IDs: 2354249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	96.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A114718
Included Lab Sample IDs: 2354249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.2	P/P	90 - 110

* 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	98.4	105	105			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	103	109			4.17
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	105			4.25
EPA 365.1 Rev. 2.0	Total-P	106	106	105			1.39
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	94.4	95.8			1.47
EPA 8321B	Anatoxin-a	92.6	91.3	91.8			0.480
	Cylindrospermopsin	95.4	99.3	100			1.13
	Desmethyl microcystin LR	79.5	95.4	97.9			2.58
	Microcystin HilR	85.0	101	105			4.10
	Microcystin HtyR	79.7	104	99.5			4.41
	Microcystin LA	86.0	85.3	81.8			4.17
	Microcystin LF	74.8	75.6	69.4			8.56
	Microcystin LR	85.4	115	115			0.0964
	Microcystin LW	70.8	71.6	65.7			8.60
	Microcystin LY	67.0	64.9	78.8			19.4
	Microcystin RR	142	158	160			1.30
	Microcystin WR	81.0	88.9	92.7			4.20
	Microcystin YR	75.2	101	102			0.988
	Nodularin-R	114	140	147			4.79

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2354249
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2354249
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2354249
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2354249
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2354250
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2354248
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2354248

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	09/07/2022			09/09/2022 10:29	Judith K. Clark	2354249
EPA 351.2 Rev. 2.0	09/07/2022	09/08/2022 10:30	Alexandra J Mattheus	09/09/2022 15:26	Alexandra J Mattheus	2354249
EPA 353.2 Rev. 2.0	09/07/2022			09/08/2022 15:46	Touraj Touran	2354249
EPA 365.1 Rev. 2.0	09/07/2022	09/13/2022 15:30	Simonne.V. Calhoun	09/14/2022 11:51	James L Waggerby	2354249
EPA 365.1 Rev. 2.0 dissolved	09/07/2022			09/07/2022 16:24	Elise M. Gillis	2354250
EPA 8321B	09/07/2022	09/07/2022 12:00	Manjita Shrestha	09/07/2022 20:11	Manjita Shrestha	2354248
	09/07/2022	09/07/2022 13:00	Manjita Shrestha	09/08/2022 04:49	Manjita Shrestha	2354248