

Chemical Analysis Report

WQAP-2022-09-08-03

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

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2022-06-20-29**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Date Certified: 23-SEP-2022 10:41



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 - Killer Canal

Collection Date/Time: 09/07/2022 13:45

Field ID: HAB-SD-090722-1345

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2354988	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P419300	
		Cylindrospermopsin	0.10	U	ug/L	P419299	
		Desmethyl microcystin LR	0.25	U	ug/L	P419299	
		Microcystin HlR	0.25	U	ug/L	P419299	
		Microcystin HtyR	0.25	U	ug/L	P419299	
		Microcystin LA	0.10	U	ug/L	P419299	
		Microcystin LF	0.10	U	ug/L	P419299	
		Microcystin LR	0.25	U	ug/L	P419299	
		Microcystin LW	0.25	U	ug/L	P419299	
		Microcystin LY	0.10	U	ug/L	P419299	
		Microcystin RR	0.10	U	ug/L	P419299	
		Microcystin WR	0.50	U	ug/L	P419299	
		Microcystin YR	0.25	U	ug/L	P419299	
		Nodularin-R	0.10	U	ug/L	P419299	
2354989	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P419364	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P419518	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.027		mg N/L	P419540	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P419533	
2354990	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P419312	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419364

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419518

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419540

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419533

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419312

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

Reference Method: EPA 8321B
Batch ID: P419299

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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: P419300

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: P419364

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419518

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419540

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419533

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419312

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

Reference Method: EPA 8321B
Batch ID: P419299

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	96.6		P	40 - 150
Desmethyl microcystin LR	83.3		P	40 - 150
Microcystin HILR	87.3		P	40 - 150
Microcystin HtyR	92.7		P	40 - 150
Microcystin LA	93.5		P	40 - 150
Microcystin LF	78.2		P	40 - 150
Microcystin LR	93.2		P	40 - 150
Microcystin LW	73.2		P	40 - 150
Microcystin LY	74.1		P	40 - 150
Microcystin RR	147		P	40 - 150
Microcystin WR	85.3		P	40 - 150
Microcystin YR	92.0		P	40 - 150
Nodularin-R	120		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419300

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	102		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354989	Ammonia-N	103	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419518

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354862	Kjeldahl Nitrogen	99.0	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354820	NO2NO3-N	97.8	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355042	Total-P	102	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354990	O-Phosphate-P	95.4	95.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P419299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354988	Cylindrospermopsin	90.1	93.7	P/P	40 - 150
2354988	Desmethyl microcystin LR	86.2	80.0	P/P	40 - 150
2354988	Microcystin HiLR	89.8	91.1	P/P	40 - 150
2354988	Microcystin HtyR	90.6	92.9	P/P	40 - 150
2354988	Microcystin LA	87.3	87.0	P/P	40 - 150
2354988	Microcystin LF	83.1	79.6	P/P	40 - 150
2354988	Microcystin LR	98.9	98.7	P/P	40 - 150
2354988	Microcystin LW	70.6	67.5	P/P	40 - 150
2354988	Microcystin LY	68.1	75.5	P/P	40 - 150
2354988	Microcystin RR	136	141	P/P	40 - 150
2354988	Microcystin WR	83.2	82.5	P/P	40 - 150
2354988	Microcystin YR	90.2	91.3	P/P	40 - 150
2354988	Nodularin-R	123	123	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419300

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354988	Anatoxin-a	95.0	95.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P419364

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354989	Ammonia-N	3.83	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P419518

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354862	Kjeldahl Nitrogen	2.64	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P419540

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354820	NO2NO3-N	0.870	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P419533

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355042	Total-P	2.66	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P419312

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354990	O-Phosphate-P	0.300	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P419299

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354988	Cylindrospermopsin	3.99	Spike	P	0 - 30
2354988	Desmethyl microcystin LR	7.43	Spike	P	0 - 30
2354988	Microcystin H1LR	1.51	Spike	P	0 - 30
2354988	Microcystin HtyR	2.50	Spike	P	0 - 30
2354988	Microcystin LA	0.370	Spike	P	0 - 30
2354988	Microcystin LF	4.36	Spike	P	0 - 30
2354988	Microcystin LR	0.126	Spike	P	0 - 30
2354988	Microcystin LW	4.48	Spike	P	0 - 30
2354988	Microcystin LY	10.4	Spike	P	0 - 30
2354988	Microcystin RR	3.34	Spike	P	0 - 30
2354988	Microcystin WR	0.815	Spike	P	0 - 30
2354988	Microcystin YR	1.25	Spike	P	0 - 30
2354988	Nodularin-R	0.370	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P419300

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354988	Anatoxin-a	0.572	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2354988

Field Sample ID: HAB-SD-090722-1345

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	89.0	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	61.9	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A114614

Included Lab Sample IDs: 2354990

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	97.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114639

Included Lab Sample IDs: 2354989

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.0	97.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A114657

Included Lab Sample IDs: 2354988

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	103	92.6	P/P	50 - 160
Desmethyl microcystin LR	74.7	88.1	P/P	50 - 160
Microcystin H1R	81.9	93.7	P/P	50 - 160
Microcystin HtyR	82.9	93.1	P/P	50 - 160
Microcystin LA	95.0	95.7	P/P	50 - 160
Microcystin LF	72.2	82.6	P/P	50 - 160
Microcystin LR	82.9	92.4	P/P	50 - 160
Microcystin LW	75.9	79.2	P/P	50 - 160
Microcystin LY	72.2	78.4	P/P	50 - 160
Microcystin RR	141	147	P/P	50 - 160
Microcystin WR	72.9	104	P/P	50 - 160
Microcystin YR	86.2	90.5	P/P	50 - 160
Nodularin-R	118	121	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A114658

Included Lab Sample IDs: 2354988

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	122	111	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114711

Included Lab Sample IDs: 2354989

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: A114750

Included Lab Sample IDs: 2354989

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	99.5	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114752

Included Lab Sample IDs: 2354989

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	102	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	96.0	103	108			3.83
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.4	99.0	103			2.64
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	97.8	98.8			0.870
EPA 365.1 Rev. 2.0	Total-P	99.8	102	99.0			2.66
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	95.4	95.7			0.300
EPA 8321B	Anatoxin-a	102	95.0	95.5			0.572
	Cylindrospermopsin	96.6	90.1	93.7			3.99
	Desmethyl microcystin LR	83.3	86.2	80.0			7.43
	Microcystin HiLR	87.3	89.8	91.1			1.51
	Microcystin HtyR	92.7	90.6	92.9			2.50
	Microcystin LA	93.5	87.3	87.0			0.370
	Microcystin LF	78.2	83.1	79.6			4.36
	Microcystin LR	93.2	98.9	98.7			0.126
	Microcystin LW	73.2	70.6	67.5			4.48
	Microcystin LY	74.1	68.1	75.5			10.4
	Microcystin RR	147	136	141			3.34
	Microcystin WR	85.3	83.2	82.5			0.815
	Microcystin YR	92.0	90.2	91.3			1.25
	Nodularin-R	120	123	123			0.370

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2354989
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2354989
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2354989
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2354989
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2354990
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2354988
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2354988

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	09/08/2022			09/09/2022 11:18	Judith K. Clark	2354989
EPA 351.2 Rev. 2.0	09/08/2022	09/14/2022 13:25	Samantha L Bates	09/15/2022 12:48	Samantha L Bates	2354989
EPA 353.2 Rev. 2.0	09/08/2022			09/14/2022 09:13	Judith K. Clark	2354989
EPA 365.1 Rev. 2.0	09/08/2022	09/14/2022 16:15	Simonne.V. Calhoun	09/15/2022 13:05	Simonne.V. Calhoun	2354989
EPA 365.1 Rev. 2.0 dissolved	09/08/2022			09/08/2022 14:14	James L Waggerby	2354990
EPA 8321B	09/08/2022	09/09/2022 12:00	Umesh Chiluwal	09/09/2022 14:34	Umesh Chiluwal	2354988
	09/08/2022	09/09/2022 13:00	Umesh Chiluwal	09/09/2022 21:24	Umesh Chiluwal	2354988