Chemical Analysis Report

WQAP-2022-09-08-02

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

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2022-06-27-47**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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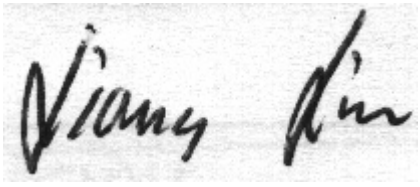
Date Certified: 23-SEP-2022 14:19



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 - near Dimple Canal **Collection Date/Time: 09/07/2022 14:55**

Field ID: HAB-SD-090722-1455 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2354868	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P419196	
		Cylindrospermopsin	0.10	U	ug/L	P419195	
		Desmethyl microcystin LR	0.25	U	ug/L	P419195	
		Microcystin HilR	0.25	U	ug/L	P419195	
		Microcystin HtyR	0.25	U	ug/L	P419195	
		Microcystin LA	0.10	U	ug/L	P419195	
		Microcystin LF	0.10	U	ug/L	P419195	
		Microcystin LR	0.25	U	ug/L	P419195	
		Microcystin LW	0.25	U	ug/L	P419195	
		Microcystin LY	0.10	U	ug/L	P419195	
		Microcystin RR	0.10	U	ug/L	P419195	
		Microcystin WR	0.50	U	ug/L	P419195	
		Microcystin YR	0.25	U	ug/L	P419195	
		Nodularin-R	0.10	U	ug/L	P419195	
2354869	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P419362	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P419516	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.049		mg N/L	P419435	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P419532	
2354870	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P419313	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419362

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419516

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419435

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419532

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419313

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

Reference Method: EPA 8321B
Batch ID: P419195

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: P419196

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: P419362

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419516

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: P419435

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: P419532

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419313

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P419195

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	117		P	40 - 150
Desmethyl microcystin LR	108		P	40 - 150
Microcystin HilR	119		P	40 - 150
Microcystin HtyR	117		P	40 - 150
Microcystin LA	141		P	40 - 150
Microcystin LF	148		P	40 - 150
Microcystin LR	111		P	40 - 150
Microcystin LW	140		P	40 - 150
Microcystin LY	132		P	40 - 150
Microcystin RR	123		P	40 - 150
Microcystin WR	115		P	40 - 150
Microcystin YR	111		P	40 - 150
Nodularin-R	112		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	80.6		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419362

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354820	Ammonia-N	100	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419516

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354650	Kjeldahl Nitrogen	103	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354481	NO2NO3-N	99.7	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419532

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354887	Total-P	94.4	92.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419313

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354931	O-Phosphate-P	98.6	98.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P419195

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354380	Cylindrospermopsin	84.7	90.8	P/P	40 - 150
2354380	Desmethyl microcystin LR	93.8	101	P/P	40 - 150
2354380	Microcystin HilR	96.5	101	P/P	40 - 150
2354380	Microcystin HtyR	97.3	102	P/P	40 - 150
2354380	Microcystin LA	107	112	P/P	40 - 150
2354380	Microcystin LF	109	117	P/P	40 - 150
2354380	Microcystin LR	96.1	94.0	P/P	40 - 150
2354380	Microcystin LW	98.2	108	P/P	40 - 150
2354380	Microcystin LY	110	118	P/P	40 - 150
2354380	Microcystin RR	103	103	P/P	40 - 150
2354380	Microcystin WR	99.3	103	P/P	40 - 150
2354380	Microcystin YR	94.0	93.3	P/P	40 - 150
2354380	Nodularin-R	101	96.9	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2354380	Anatoxin-a	81.2	83.4	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354820	Ammonia-N	0.177	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419516

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354650	Kjeldahl Nitrogen	2.86	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354481	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354887	Total-P	2.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354931	O-Phosphate-P	0.172	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P419195

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354380	Cylindrospermopsin	6.59	Spike	P	0 - 30
2354380	Desmethyl microcystin LR	7.03	Spike	P	0 - 30
2354380	Microcystin HilR	4.38	Spike	P	0 - 30
2354380	Microcystin HtyR	4.78	Spike	P	0 - 30
2354380	Microcystin LA	4.06	Spike	P	0 - 30
2354380	Microcystin LF	7.11	Spike	P	0 - 30
2354380	Microcystin LR	2.27	Spike	P	0 - 30
2354380	Microcystin LW	9.19	Spike	P	0 - 30
2354380	Microcystin LY	7.05	Spike	P	0 - 30
2354380	Microcystin RR	0.159	Spike	P	0 - 30
2354380	Microcystin WR	3.37	Spike	P	0 - 30
2354380	Microcystin YR	0.723	Spike	P	0 - 30
2354380	Nodularin-R	4.57	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P419196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2354380	Anatoxin-a	2.66	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2354868
Field Sample ID: HAB-SD-090722-1455

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	96.2	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	42.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A114609
Included Lab Sample IDs: 2354868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	81.7	82.4	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A114614
Included Lab Sample IDs: 2354870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.4	98.2	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A114622
Included Lab Sample IDs: 2354868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	114	113	P/P	60 - 160
Desmethyl microcystin LR	112	113	P/P	60 - 160
Microcystin HilR	112	120	P/P	60 - 160
Microcystin HtyR	116	117	P/P	60 - 160
Microcystin LA	137	143	P/P	50 - 160
Microcystin LF	147	145	P/P	60 - 160
Microcystin LR	108	104	P/P	60 - 160
Microcystin LW	132	140	P/P	60 - 160
Microcystin LY	144	137	P/P	60 - 160
Microcystin RR	116	117	P/P	60 - 160
Microcystin WR	123	126	P/P	60 - 160
Microcystin YR	103	102	P/P	60 - 160
Nodularin-R	105	109	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A114639
Included Lab Sample IDs: 2354869

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A114677
Included Lab Sample IDs: 2354869

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114741
Included Lab Sample IDs: 2354869

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.8	97.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A114752
Included Lab Sample IDs: 2354869

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.8	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	95.2	100	99.8			0.177
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	103	99.1			2.86
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.7	100			0.487
EPA 365.1 Rev. 2.0	Total-P	102	94.4	92.5			2.03
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	98.6	98.4			0.172
EPA 8321B	Anatoxin-a	80.6	81.2	83.4			2.66
	Cylindrospermopsin	117	84.7	90.8			6.59
	Desmethyl microcystin LR	108	93.8	101			7.03
	Microcystin HilR	119	96.5	101			4.38
	Microcystin HtyR	117	97.3	102			4.78
	Microcystin LA	141	107	112			4.06
	Microcystin LF	148	109	117			7.11
	Microcystin LR	111	96.1	94.0			2.27
	Microcystin LW	140	98.2	108			9.19
	Microcystin LY	132	110	118			7.05
	Microcystin RR	123	103	103			0.159
	Microcystin WR	115	99.3	103			3.37
	Microcystin YR	111	94.0	93.3			0.723
	Nodularin-R	112	101	96.9			4.57

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2354869
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2354869
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2354869
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2354869
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2354870
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2354868
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2354868

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 10:57	Judith K. Clark	2354869
EPA 351.2 Rev. 2.0	09/08/2022	09/14/2022 13:25	Samantha L Bates	09/15/2022 10:38	Samantha L Bates	2354869
EPA 353.2 Rev. 2.0	09/08/2022			09/12/2022 11:35	Beverly Y. Sanders	2354869
EPA 365.1 Rev. 2.0	09/08/2022	09/14/2022 16:15	Simonne.V. Calhoun	09/15/2022 12:49	Simonne.V. Calhoun	2354869
EPA 365.1 Rev. 2.0 dissolved	09/08/2022			09/08/2022 14:33	James L Waggerby	2354870
EPA 8321B	09/08/2022	09/08/2022 11:00	Umesh Chiluwal	09/08/2022 18:26	Umesh Chiluwal	2354868
	09/08/2022	09/08/2022 13:00	Manjita Shrestha	09/08/2022 20:23	Manjita Shrestha	2354868