Chemical Analysis Report

WQAP-2022-09-21-01

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

Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2022-09-19-68**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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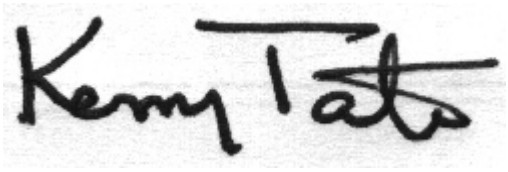
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 13-OCT-2022 11:49



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 - N Canal Circle **Collection Date/Time: 09/20/2022 13:40**

Field ID: HAB-SD-092022-1340 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2357986	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P419900	
		Cylindrospermopsin	0.10	U	ug/L	P419887	
		Desmethyl microcystin LR	0.25	U	ug/L	P419887	
		Microcystin HilR	0.25	U	ug/L	P419887	
		Microcystin HtyR	0.25	U	ug/L	P419887	
		Microcystin LA	0.10	U	ug/L	P419887	
		Microcystin LF	0.10	U	ug/L	P419887	
		Microcystin LR	0.25	U	ug/L	P419887	
		Microcystin LW	0.25	U	ug/L	P419887	
		Microcystin LY	0.10	U	ug/L	P419887	
		Microcystin RR	0.10	U	ug/L	P419887	
		Microcystin WR	0.50	U	ug/L	P419887	
		Neosaxitoxin	0.50	U	ug/L	P419900	
		Microcystin YR	0.25	U	ug/L	P419887	
		Saxitoxin	0.50	U	ug/L	P419900	
		Nodularin-R	0.10	U	ug/L	P419887	
2357987	EPA 350.1 Rev. 2.0	Ammonia-N	0.092		mg N/L	P420346	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P420024	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P420322	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P419995	
2357988	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.073		mg P/L	P419926	

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: P420346

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420024

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420322

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419995

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419926

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

Reference Method: EPA 8321B
Batch ID: P419887

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: P419900

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420346

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420024

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419995

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: P419926

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

Reference Method: EPA 8321B
Batch ID: P419887

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	88.1		P	40 - 150
Desmethyl microcystin LR	80.7		P	40 - 150
Microcystin HilR	84.2		P	40 - 150
Microcystin HtyR	90.2		P	40 - 150
Microcystin LA	80.9		P	40 - 150
Microcystin LF	74.3		P	40 - 150
Microcystin LR	83.2		P	40 - 150
Microcystin LW	71.9		P	40 - 150
Microcystin LY	83.4		P	40 - 150
Microcystin RR	87.6		P	40 - 150
Microcystin WR	79.8		P	40 - 150
Microcystin YR	81.9		P	40 - 150
Nodularin-R	84.6		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	89.6		P	40 - 150
Neosaxitoxin	88.5		P	40 - 150
Saxitoxin	84.0		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357833	Ammonia-N	98.6	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357987	NO2NO3-N	96.0	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419995

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2358019	Total-P	109	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419926

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357790	O-Phosphate-P	99.8	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P419887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357949	Cylindrospermopsin	83.2	91.1	P/P	40 - 150
2357949	Desmethyl microcystin LR	88.6	100	P/P	40 - 150
2357949	Microcystin HilR	90.9	94.3	P/P	40 - 150
2357949	Microcystin HtyR	91.8	97.3	P/P	40 - 150
2357949	Microcystin LA	83.1	99.7	P/P	40 - 150
2357949	Microcystin LF	88.3	78.2	P/P	40 - 150
2357949	Microcystin LR	92.5	97.2	P/P	40 - 150
2357949	Microcystin LW	67.5	66.6	P/P	40 - 150
2357949	Microcystin LY	103	92.1	P/P	40 - 150
2357949	Microcystin RR	91.4	95.2	P/P	40 - 150
2357949	Microcystin WR	76.2	83.5	P/P	40 - 150
2357949	Microcystin YR	91.4	95.2	P/P	40 - 150
2357949	Nodularin-R	99.1	102	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357949	Anatoxin-a	83.0	86.3	P/P	40 - 150
2357949	Neosaxitoxin	56.1	60.4	P/P	40 - 150
2357949	Saxitoxin	54.2	54.7	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357833	Ammonia-N	2.43	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357987	Kjeldahl Nitrogen	3.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357987	NO2NO3-N	0.309	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2358019	Total-P	2.20	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357790	O-Phosphate-P	1.51	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P419887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357949	Cylindrospermopsin	8.97	Spike	P	0 - 30
2357949	Desmethyl microcystin LR	12.1	Spike	P	0 - 30
2357949	Microcystin HilR	3.64	Spike	P	0 - 30
2357949	Microcystin HtyR	5.77	Spike	P	0 - 30
2357949	Microcystin LA	18.1	Spike	P	0 - 30
2357949	Microcystin LF	12.1	Spike	P	0 - 30
2357949	Microcystin LR	4.96	Spike	P	0 - 30
2357949	Microcystin LW	1.33	Spike	P	0 - 30
2357949	Microcystin LY	10.9	Spike	P	0 - 30
2357949	Microcystin RR	4.05	Spike	P	0 - 30
2357949	Microcystin WR	9.23	Spike	P	0 - 30
2357949	Microcystin YR	4.08	Spike	P	0 - 30
2357949	Nodularin-R	2.46	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P419900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357949	Anatoxin-a	3.91	Spike	P	0 - 30
2357949	Neosaxitoxin	7.41	Spike	P	0 - 30
2357949	Saxitoxin	1.01	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2357986
Field Sample ID: HAB-SD-092022-1340

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	72.8	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	52.9	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A114862
Included Lab Sample IDs: 2357988

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A114870
Included Lab Sample IDs: 2357986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	94.1	91.3	P/P	50 - 160
Desmethyl microcystin LR	87.5	89.6	P/P	50 - 160
Microcystin HilR	91.5	87.2	P/P	50 - 160
Microcystin HtyR	95.2	92.8	P/P	50 - 160
Microcystin LA	91.9	105	P/P	50 - 160
Microcystin LF	89.7	77.1	P/P	50 - 160
Microcystin LR	89.9	89.4	P/P	50 - 160
Microcystin LW	78.9	75.4	P/P	50 - 160
Microcystin LY	104	95.7	P/P	50 - 160
Microcystin RR	95.7	93.0	P/P	50 - 160
Microcystin WR	85.4	87.9	P/P	50 - 160
Microcystin YR	86.9	94.8	P/P	50 - 160
Nodularin-R	95.3	94.4	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A114901
Included Lab Sample IDs: 2357986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	94.0	91.4	P/P	50 - 160
Neosaxitoxin	93.9	92.2	P/P	50 - 160
Saxitoxin	87.6	84.4	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A114922
Included Lab Sample IDs: 2357987

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114938
Included Lab Sample IDs: 2357987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115032
Included Lab Sample IDs: 2357987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	98.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115055
Included Lab Sample IDs: 2357987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	98.2	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	98.0	98.6	101			2.43
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104					3.05
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	96.0	96.5			0.309
EPA 365.1 Rev. 2.0	Total-P	105	109	107			2.20
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	99.8	98.3			1.51
EPA 8321B	Anatoxin-a	89.6	83.0	86.3			3.91
	Cylindrospermopsin	88.1	83.2	91.1			8.97
	Desmethyl microcystin LR	80.7	88.6	100			12.1
	Microcystin HilR	84.2	90.9	94.3			3.64
	Microcystin HtyR	90.2	91.8	97.3			5.77
	Microcystin LA	80.9	83.1	99.7			18.1
	Microcystin LF	74.3	88.3	78.2			12.1
	Microcystin LR	83.2	92.5	97.2			4.96
	Microcystin LW	71.9	67.5	66.6			1.33
	Microcystin LY	83.4	103	92.1			10.9
	Microcystin RR	87.6	91.4	95.2			4.05
	Microcystin WR	79.8	76.2	83.5			9.23
	Microcystin YR	81.9	91.4	95.2			4.08
	Neosaxitoxin	88.5	56.1	60.4			7.41
	Nodularin-R	84.6	99.1	102			2.46
	Saxitoxin	84.0	54.2	54.7			1.01

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2357987
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2357987
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2357987
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2357987
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2357988
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2357986
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2357986

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	09/21/2022			09/30/2022 13:13	Ping Hua	2357987
EPA 351.2 Rev. 2.0	09/21/2022	09/23/2022 11:15	Simonne.V. Calhoun	09/26/2022 12:22	Samantha L Bates	2357987
EPA 353.2 Rev. 2.0	09/21/2022			09/29/2022 15:17	Judith K. Clark	2357987
EPA 365.1 Rev. 2.0	09/21/2022	09/23/2022 12:15	Adam P Silver	09/23/2022 16:44	Simonne.V. Calhoun	2357987
EPA 365.1 Rev. 2.0 dissolved	09/21/2022			09/21/2022 14:26	Elise M. Gillis	2357988
EPA 8321B	09/21/2022	09/21/2022 13:00	Manjita Shrestha	09/21/2022 22:05	Manjita Shrestha	2357986
	09/21/2022	09/21/2022 13:00	Manjita Shrestha	09/22/2022 19:02	Manjita Shrestha	2357986