Chemical Analysis Report

WQAP-2021-05-14-02

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

Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2021-03-15-58**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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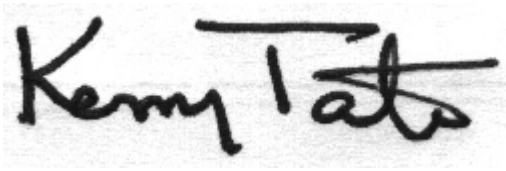
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 01-JUN-2021 11:02



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: Manatee River 1220 Mill Creek by Dock **Collection Date/Time: 05/13/2021 10:00**

Field ID: HAB-SW-0038 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2247501	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P398253	
		Cylindrospermopsin	0.10	U	ug/L	P398253	
		Desmethyl microcystin LR	0.25	U	ug/L	P398253	
		Microcystin HilR**	0.25	U	ug/L	P398253	
		Microcystin HtyR**	0.25	U	ug/L	P398253	
		Microcystin LA	0.10	U	ug/L	P398253	
		Microcystin LF	0.10	U	ug/L	P398253	
		Microcystin LR	0.25	U	ug/L	P398253	
		Microcystin LW	0.25	U	ug/L	P398253	
		Microcystin LY	0.10	U	ug/L	P398253	
		Microcystin RR	0.10	U	ug/L	P398253	
		Microcystin WR	0.50	U	ug/L	P398253	
		Microcystin YR	0.25	U	ug/L	P398253	
		Nodularin-R**	0.10	U	ug/L	P398253	
2247502	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P398518	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P398424	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P398267	
	EPA 365.1 Rev. 2.0	Total-P	0.46		mg P/L	P398287	
2247503	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.37		mg P/L	P398219	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398518

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398424

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398267

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398287

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398219

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

Reference Method: EPA 8321B
Batch ID: P398253

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: P398518

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398424

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398267

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398287

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: P398219

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

Reference Method: EPA 8321B
Batch ID: P398253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	98.1		P	40 - 150
Cylindrospermopsin	98.6		P	40 - 150
Desmethyl microcystin LR	90.6		P	40 - 150
Microcystin HilR	95.3		P	40 - 150
Microcystin HtyR	95.0		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	109		P	40 - 150
Microcystin LR	93.6		P	40 - 150
Microcystin LW	123		P	40 - 150
Microcystin LY	114		P	40 - 150
Microcystin RR	115		P	40 - 150
Microcystin WR	94.6		P	40 - 150
Microcystin YR	95.5		P	40 - 150
Nodularin-R	102		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398518

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247023	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398424

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247079	Kjeldahl Nitrogen	107	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247465	NO2NO3-N	97.1	96.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398287

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246677	Total-P	97.8	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398219

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247633	O-Phosphate-P	97.3	97.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P398253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247433	Anatoxin-a	97.2	102	P/P	40 - 150
2247433	Cylindrospermopsin	101	101	P/P	40 - 150
2247433	Desmethyl microcystin LR	83.2	90.5	P/P	40 - 150
2247433	Microcystin HilR	91.5	96.9	P/P	40 - 150
2247433	Microcystin HtyR	87.9	88.7	P/P	40 - 150
2247433	Microcystin LA	96.2	101	P/P	40 - 150
2247433	Microcystin LF	66.7	68.9	P/P	40 - 150
2247433	Microcystin LR	95.7	94.1	P/P	40 - 150
2247433	Microcystin LW	61.7	59.3	P/P	40 - 150
2247433	Microcystin LY	97.1	98.7	P/P	40 - 150
2247433	Microcystin RR	108	111	P/P	40 - 150
2247433	Microcystin WR	79.4	80.4	P/P	40 - 150
2247433	Microcystin YR	98.3	97.0	P/P	40 - 150
2247433	Nodularin-R	102	104	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398518

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247023	Ammonia-N	0.547	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247079	Kjeldahl Nitrogen	0.374	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247465	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246677	Total-P	0.325	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398219

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247633	O-Phosphate-P	0.325	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P398253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247433	Anatoxin-a	4.59	Spike	P	0 - 30
2247433	Cylindrospermopsin	0.437	Spike	P	0 - 30
2247433	Desmethyl microcystin LR	8.38	Spike	P	0 - 30
2247433	Microcystin HilR	5.72	Spike	P	0 - 30
2247433	Microcystin HtyR	0.874	Spike	P	0 - 30
2247433	Microcystin LA	5.21	Spike	P	0 - 30
2247433	Microcystin LF	3.15	Spike	P	0 - 30
2247433	Microcystin LR	1.66	Spike	P	0 - 30
2247433	Microcystin LW	4.06	Spike	P	0 - 30
2247433	Microcystin LY	1.66	Spike	P	0 - 30
2247433	Microcystin RR	2.56	Spike	P	0 - 30
2247433	Microcystin WR	1.21	Spike	P	0 - 30
2247433	Microcystin YR	1.29	Spike	P	0 - 30
2247433	Nodularin-R	1.77	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: 2247501
Field Sample ID: HAB-SW-0038

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	86.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	85.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105435
Included Lab Sample IDs: 2247503

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105456
Included Lab Sample IDs: 2247502

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105495
Included Lab Sample IDs: 2247502

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

Reference Method: EPA 8321B
Run ID: A105508
Included Lab Sample IDs: 2247501

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	101	P/P	50 - 160
Cylindrospermopsin	95.4	113	P/P	60 - 160
Desmethyl microcystin LR	85.3	88.3	P/P	60 - 160
Microcystin HilR	87.1	99.2	P/P	60 - 160
Microcystin HtyR	90.8	93.7	P/P	60 - 160
Microcystin LA	97.0	97.5	P/P	50 - 160
Microcystin LF	128	99.3	P/P	60 - 160
Microcystin LR	91.1	96.8	P/P	60 - 160
Microcystin LW	109	89.4	P/P	60 - 160
Microcystin LY	100	103	P/P	60 - 160
Microcystin RR	95.1	110	P/P	60 - 160
Microcystin WR	75.1	86.1	P/P	60 - 160
Microcystin YR	88.5	91.9	P/P	60 - 160
Nodularin-R	93.5	101	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105562
Included Lab Sample IDs: 2247502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.3	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105623
Included Lab Sample IDs: 2247502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	99.3	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	98.8	105	105			0.547
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	107	107			0.374
EPA 353.2 Rev. 2.0	NO2NO3-N	102	97.1	96.6			0.494
EPA 365.1 Rev. 2.0	Total-P	105	97.8	98.1			0.325
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	97.3	97.7			0.325
EPA 8321B	Anatoxin-a	98.1	97.2	102			4.59
	Cylindrospermopsin	98.6	101	101			0.437
	Desmethyl microcystin LR	90.6	83.2	90.5			8.38
	Microcystin HilR	95.3	91.5	96.9			5.72
	Microcystin HtyR	95.0	87.9	88.7			0.874
	Microcystin LA	103	96.2	101			5.21
	Microcystin LF	109	66.7	68.9			3.15
	Microcystin LR	93.6	95.7	94.1			1.66
	Microcystin LW	123	61.7	59.3			4.06
	Microcystin LY	114	97.1	98.7			1.66
	Microcystin RR	115	108	111			2.56
	Microcystin WR	94.6	79.4	80.4			1.21
	Microcystin YR	95.5	98.3	97.0			1.29
	Nodularin-R	102	102	104			1.77

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2247502
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2247502
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2247502
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2247502
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2247503
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2247501

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	05/14/2021			05/20/2021 13:37	Roberta Tatti	2247502
EPA 351.2 Rev. 2.0	05/14/2021	05/19/2021 14:18	Benjamin T. Nordmann	05/24/2021 14:32	Virginia P. Brown	2247502
EPA 353.2 Rev. 2.0	05/14/2021			05/17/2021 10:38	Beverly Y. Sanders	2247502
EPA 365.1 Rev. 2.0	05/14/2021	05/17/2021 13:26	Yen Ta	05/18/2021 11:21	Shengyu Ding	2247502
EPA 365.1 Rev. 2.0 dissolved	05/14/2021			05/14/2021 14:10	Lipi Saha	2247503
EPA 8321B	05/14/2021	05/18/2021 08:30	Pramila Ghimire	05/18/2021 11:24	Pramila Ghimire	2247501