

Chemical Analysis Report

WQAP-2020-08-21-01

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-2020-04-13-44**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
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Attn: Matthew Bearden

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 11-SEP-2020 13:05

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Scott Lake - West

Collection Date/Time: 08/20/2020 09:30

Field ID: HAB-SW-0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2191630	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P386558	
		Cylindrospermopsin**	0.25	U	ug/L	P386558	
		Desmethyl microcystin LR**	0.25	U	ug/L	P386558	
		Microcystin LA**	0.25	U	ug/L	P386558	
		Microcystin LF**	0.25	U	ug/L	P386558	
		Microcystin LR**	0.43	I	ug/L	P386558	
		Microcystin LW**	0.25	U	ug/L	P386558	
		Microcystin LY**	0.25	U	ug/L	P386558	
		Microcystin RR**	0.25	U	ug/L	P386558	
		Microcystin WR**	0.50	U	ug/L	P386558	
		Microcystin YR**	0.25	U	ug/L	P386558	
2191631	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P386438	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P386607	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386476	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P386469	
2191632	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386425	

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: P386438

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386607

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386476

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386469

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386425

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

Reference Method: EPA 8321B
Batch ID: P386558

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386438

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386607

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: P386476

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: P386469

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: P386425

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

Reference Method: EPA 8321B
Batch ID: P386558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	95.4		P	40 - 140
Cylindrospermopsin	118		P	40 - 140
Desmethyl microcystin LR	118		P	40 - 140
Microcystin LA	118		P	40 - 140
Microcystin LF	130		P	40 - 140
Microcystin LR	108		P	40 - 140
Microcystin LW	118		P	40 - 140
Microcystin LY	110		P	40 - 140
Microcystin RR	116		P	40 - 140
Microcystin WR	129		P	40 - 140
Microcystin YR	106		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386438

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191434	Ammonia-N	95.2	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386476

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191631	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191592	Total-P	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191593	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P386558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192249	Anatoxin-a	132	127	P/P	40 - 140
2192249	Cylindrospermopsin	128	116	P/P	40 - 140
2192249	Desmethyl microcystin LR	86.0	80.5	P/P	40 - 140
2192249	Microcystin LA	63.8	61.2	P/P	40 - 140
2192249	Microcystin LF	76.5	70.7	P/P	40 - 140
2192249	Microcystin LR	76.5	88.3	P/P	40 - 140
2192249	Microcystin LW	76.2	68.3	P/P	40 - 140
2192249	Microcystin LY	61.1	59.4	P/P	40 - 140
2192249	Microcystin RR	103	98.9	P/P	40 - 140
2192249	Microcystin WR	73.8	76.3	P/P	40 - 140
2192249	Microcystin YR	93.2	83.8	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191434	Ammonia-N	1.34	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386607

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191631	Kjeldahl Nitrogen	3.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191631	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191592	Total-P	0.547	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191593	O-Phosphate-P	0.884	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P386558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192249	Anatoxin-a	3.52	Spike	P	0 - 30
2192249	Cylindrospermopsin	9.68	Spike	P	0 - 30
2192249	Desmethyl microcystin LR	6.67	Spike	P	0 - 30
2192249	Microcystin LA	4.05	Spike	P	0 - 30
2192249	Microcystin LF	7.80	Spike	P	0 - 30
2192249	Microcystin LR	14.4	Spike	P	0 - 30
2192249	Microcystin LW	11.0	Spike	P	0 - 30
2192249	Microcystin LY	2.80	Spike	P	0 - 30
2192249	Microcystin RR	4.24	Spike	P	0 - 30
2192249	Microcystin WR	3.36	Spike	P	0 - 30
2192249	Microcystin YR	10.6	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2191630
Field Sample ID: HAB-SW-0007

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	73.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	115	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100595

Included Lab Sample IDs: 2191632

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100600

Included Lab Sample IDs: 2191631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100618

Included Lab Sample IDs: 2191631

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100645

Included Lab Sample IDs: 2191631

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

Reference Method: EPA 8321B

Run ID: A100674

Included Lab Sample IDs: 2191630

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	134	134	P/P	50 - 160
Cylindrospermopsin	128	123	P/P	60 - 160
Desmethyl microcystin LR	71.4	70.2	P/P	60 - 160
Microcystin LA	63.0	62.8	P/P	50 - 160
Microcystin LF	73.3	69.6	P/P	60 - 160
Microcystin LR	74.5	75.0	P/P	60 - 160
Microcystin LW	74.2	83.6	P/P	60 - 160
Microcystin LY	63.4	61.1	P/P	60 - 160
Microcystin RR	84.9	91.6	P/P	60 - 160
Microcystin WR	67.1	67.6	P/P	60 - 160
Microcystin YR	75.2	75.9	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100700

Included Lab Sample IDs: 2191631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	107	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	97.0	95.2	96.8			1.34
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102					3.45
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	105	105	105			0.547
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	101	102			0.884
EPA 8321B	Anatoxin-a	95.4	132	127			3.52
	Cylindrospermopsin	118	128	116			9.68
	Desmethyl microcystin LR	118	86.0	80.5			6.67
	Microcystin LA	118	63.8	61.2			4.05
	Microcystin LF	130	76.5	70.7			7.80
	Microcystin LR	108	76.5	88.3			14.4
	Microcystin LW	118	76.2	68.3			11.0
	Microcystin LY	110	61.1	59.4			2.80
	Microcystin RR	116	103	98.9			4.24
	Microcystin WR	129	73.8	76.3			3.36
	Microcystin YR	106	93.2	83.8			10.6

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2191631
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2191631
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2191631
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2191631
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2191632
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2191630

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	08/21/2020			08/23/2020 17:06	Ping Hua	2191631
EPA 351.2 Rev. 2.0	08/21/2020	08/27/2020 09:15	Sima Feizi	08/28/2020 09:12	Virginia P. Brown	2191631
EPA 353.2 Rev. 2.0	08/21/2020			08/24/2020 10:54	Beverly Y. Sanders	2191631
EPA 365.1 Rev. 2.0	08/21/2020	08/24/2020 12:04	Yen Ta	08/25/2020 14:28	Benjamin T. Nordmann	2191631
EPA 365.1 Rev. 2.0 dissolved	08/21/2020			08/21/2020 15:11	Virginia P. Brown	2191632
EPA 8321B	08/21/2020	08/26/2020 14:00	Juyoung Kim	08/27/2020 04:18	Juyoung Kim	2191630