

Chemical Analysis Report

WQAP-2020-10-27-01

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-2020-07-27-32**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-NOV-2020 12:34

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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: Tiger Lake - Near Ramp

Collection Date/Time: 10/26/2020 12:05

Field ID: HAB-SW-0016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2204799	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P389389	
		Cylindrospermopsin**	0.25	U	ug/L	P389389	
		Desmethyl microcystin LR**	0.25	U	ug/L	P389389	
		Microcystin LA**	0.25	U	ug/L	P389389	
		Microcystin LF**	0.25	U	ug/L	P389389	
		Microcystin LR**	0.69	I	ug/L	P389389	
		Microcystin LW**	0.25	U	ug/L	P389389	
		Microcystin LY**	0.25	U	ug/L	P389389	
		Microcystin RR**	0.25	U	ug/L	P389389	
		Microcystin WR**	0.50	U	ug/L	P389389	
		Microcystin YR**	0.25	U	ug/L	P389389	
2204800	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P389579	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P389630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P389368	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P389403	
2204801	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.015		mg P/L	P389358	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389579

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389630

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389368

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389403

Component	Result	Code	Units
Total-P	0.005	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389358

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

Reference Method: EPA 8321B
Batch ID: P389389

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: P389579

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P389630

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P389368

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P389403

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: P389358

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

Reference Method: EPA 8321B
 Batch ID: P389389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	113		P	40 - 150
Cylindrospermopsin	110		P	40 - 150
Desmethyl microcystin LR	112		P	40 - 150
Microcystin LA	109		P	40 - 150
Microcystin LF	112		P	40 - 150
Microcystin LR	119		P	40 - 150
Microcystin LW	123		P	40 - 150
Microcystin LY	114		P	40 - 150
Microcystin RR	103		P	40 - 150
Microcystin WR	95.5		P	40 - 150
Microcystin YR	109		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P389579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204727	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P389630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204630	Kjeldahl Nitrogen	109	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P389368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204719	NO2NO3-N	99.0	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P389403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204422	Total-P	109	110	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P389358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204728	O-Phosphate-P	99.9	98.8	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P389389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204672	Anatoxin-a	89.3	88.1	P/P	40 - 150
2204672	Cylindrospermopsin	88.2	87.5	P/P	40 - 150
2204672	Desmethyl microcystin LR	102	94.0	P/P	40 - 150
2204672	Microcystin LA	90.9	89.3	P/P	40 - 150
2204672	Microcystin LF	65.1	67.8	P/P	40 - 150
2204672	Microcystin LR	107	103	P/P	40 - 150
2204672	Microcystin LW	93.5	79.1	P/P	40 - 150
2204672	Microcystin LY	91.8	91.0	P/P	40 - 150
2204672	Microcystin RR	91.0	91.3	P/P	40 - 150
2204672	Microcystin WR	93.5	80.5	P/P	40 - 150
2204672	Microcystin YR	95.9	87.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P389579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204727	Ammonia-N	0.212	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P389630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204630	Kjeldahl Nitrogen	0.643	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P389368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204719	NO2NO3-N	1.53	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P389403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204422	Total-P	0.206	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P389358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204728	O-Phosphate-P	0.911	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P389389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204672	Anatoxin-a	1.43	Spike	P	0 - 30
2204672	Cylindrospermopsin	0.815	Spike	P	0 - 30
2204672	Desmethyl microcystin LR	7.75	Spike	P	0 - 30
2204672	Microcystin LA	1.76	Spike	P	0 - 30
2204672	Microcystin LF	3.98	Spike	P	0 - 30
2204672	Microcystin LR	4.09	Spike	P	0 - 30
2204672	Microcystin LW	16.7	Spike	P	0 - 30
2204672	Microcystin LY	0.879	Spike	P	0 - 30
2204672	Microcystin RR	0.333	Spike	P	0 - 30
2204672	Microcystin WR	14.9	Spike	P	0 - 30
2204672	Microcystin YR	9.20	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2204799
Field Sample ID: HAB-SW-0016

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	102	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	118	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101806

Included Lab Sample IDs: 2204801

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101812

Included Lab Sample IDs: 2204800

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

Reference Method: EPA 8321B

Run ID: A101854

Included Lab Sample IDs: 2204799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	107	108	P/P	50 - 160
Cylindrospermopsin	103	110	P/P	60 - 160
Desmethyl microcystin LR	103	114	P/P	60 - 160
Microcystin LA	103	108	P/P	50 - 160
Microcystin LF	89.0	93.7	P/P	50 - 160
Microcystin LR	115	110	P/P	60 - 160
Microcystin LW	115	100	P/P	60 - 160
Microcystin LY	108	101	P/P	60 - 160
Microcystin RR	97.9	102	P/P	60 - 160
Microcystin WR	101	101	P/P	60 - 160
Microcystin YR	107	97.3	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101879

Included Lab Sample IDs: 2204800

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101890

Included Lab Sample IDs: 2204800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101932

Included Lab Sample IDs: 2204800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	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	101	104	104			0.212
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	109	110			0.643
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	99.0	97.5			1.53
EPA 365.1 Rev. 2.0	Total-P	105	109	110			0.206
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	99.9	98.8			0.911
EPA 8321B	Anatoxin-a	113	89.3	88.1			1.43
	Cylindrospermopsin	110	88.2	87.5			0.815
	Desmethyl microcystin LR	112	102	94.0			7.75
	Microcystin LA	109	90.9	89.3			1.76
	Microcystin LF	112	65.1	67.8			3.98
	Microcystin LR	119	107	103			4.09
	Microcystin LW	123	93.5	79.1			16.7
	Microcystin LY	114	91.8	91.0			0.879
	Microcystin RR	103	91.0	91.3			0.333
	Microcystin WR	95.5	93.5	80.5			14.9
	Microcystin YR	109	95.9	87.5			9.20

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2204800
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2204800
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2204800
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2204800
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2204801
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2204799

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	10/27/2020			10/31/2020 15:11	Ping Hua	2204800
EPA 351.2 Rev. 2.0	10/27/2020	11/02/2020 13:30	David Boose	11/03/2020 14:39	Elliott Rodriguez	2204800
EPA 353.2 Rev. 2.0	10/27/2020			10/28/2020 09:31	Beverly Y. Sanders	2204800
EPA 365.1 Rev. 2.0	10/27/2020	10/28/2020 13:34	Yen Ta	10/30/2020 13:00	Benjamin T. Nordmann	2204800
EPA 365.1 Rev. 2.0 dissolved	10/27/2020			10/27/2020 16:09	Blanca Fach	2204801
EPA 8321B	10/27/2020	10/29/2020 07:00	Pramila Ghimire	10/29/2020 08:42	Pramila Ghimire	2204799