

Chemical Analysis Report

WQAP-2020-08-14-03

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2020-08-17-36**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 28-AUG-2020 15:54

A handwritten signature in black ink, appearing to read "Liang Lin", is shown 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: S-155A SFWMD Structure

Collection Date/Time: 08/13/2020 11:40

Field ID: C-51-Canal

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2190407	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P386052	
		Cylindrospermopsin**	0.25	U	ug/L	P386052	
		Desmethyl microcystin LR**	0.25	U	ug/L	P386052	
		Microcystin LA**	0.25	U	ug/L	P386052	
		Microcystin LF**	0.25	U	ug/L	P386052	
		Microcystin LR**	0.25	U	ug/L	P386052	
		Microcystin LW**	0.25	U	ug/L	P386052	
		Microcystin LY**	0.25	U	ug/L	P386052	
		Microcystin RR**	0.25	U	ug/L	P386052	
		Microcystin WR**	0.50	U	ug/L	P386052	
		Microcystin YR**	0.25	U	ug/L	P386052	
2190408	EPA 350.1 Rev. 2.0	Ammonia-N	0.063		mg N/L	P386241	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.97		mg N/L	P386315	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.060		mg N/L	P386150	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P386108	
2190409	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386069	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386241

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386315

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386150

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386108

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386069

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

Reference Method: EPA 8321B
Batch ID: P386052

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: P386241

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386315

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: P386150

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: P386108

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: P386069

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

Reference Method: EPA 8321B
Batch ID: P386052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	108		P	40 - 140
Cylindrospermopsin	109		P	40 - 140
Desmethyl microcystin LR	99.7		P	40 - 140
Microcystin LA	111		P	40 - 140
Microcystin LF	90.8		P	40 - 140
Microcystin LR	100		P	40 - 140
Microcystin LW	98.5		P	40 - 140
Microcystin LY	93.5		P	40 - 140
Microcystin RR	108		P	40 - 140
Microcystin WR	102		P	40 - 140
Microcystin YR	104		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P386241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190353	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P386315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190290	Kjeldahl Nitrogen	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P386150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190290	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P386108

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190408	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P386069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190293	O-Phosphate-P	97.6	96.6	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P386052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190317	Anatoxin-a	96.6	100	P/P	40 - 140
2190317	Cylindrospermopsin	102	102	P/P	40 - 140
2190317	Desmethyl microcystin LR	99.1	114	P/P	40 - 140
2190317	Microcystin LA	97.9	104	P/P	40 - 140
2190317	Microcystin LF	92.0	98.4	P/P	40 - 140
2190317	Microcystin LR	93.1	96.1	P/P	40 - 140
2190317	Microcystin LW	87.9	88.8	P/P	40 - 140
2190317	Microcystin LY	97.0	96.3	P/P	40 - 140
2190317	Microcystin RR	109	111	P/P	40 - 140
2190317	Microcystin WR	89.7	94.5	P/P	40 - 140
2190317	Microcystin YR	98.9	102	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P386241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190353	Ammonia-N	0.552	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P386315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190290	Kjeldahl Nitrogen	2.51	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P386150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190290	NO2NO3-N	0.387	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P386108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190408	Total-P	0.284	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P386069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190293	O-Phosphate-P	1.03	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P386052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190317	Anatoxin-a	3.43	Spike	P	0 - 30
2190317	Cylindrospermopsin	0.304	Spike	P	0 - 30
2190317	Desmethyl microcystin LR	14.1	Spike	P	0 - 30
2190317	Microcystin LA	5.95	Spike	P	0 - 30
2190317	Microcystin LF	6.70	Spike	P	0 - 30
2190317	Microcystin LR	3.10	Spike	P	0 - 30
2190317	Microcystin LW	1.03	Spike	P	0 - 30
2190317	Microcystin LY	0.728	Spike	P	0 - 30
2190317	Microcystin RR	1.47	Spike	P	0 - 30
2190317	Microcystin WR	5.20	Spike	P	0 - 30
2190317	Microcystin YR	3.21	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2190407
Field Sample ID: C-51-Canal

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	94.7	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	81.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100474

Included Lab Sample IDs: 2190409

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100504

Included Lab Sample IDs: 2190408

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

Reference Method: EPA 8321B

Run ID: A100522

Included Lab Sample IDs: 2190407

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.4	98.0	P/P	50 - 160
Cylindrospermopsin	102	98.7	P/P	60 - 160
Desmethyl microcystin LR	93.7	98.1	P/P	60 - 160
Microcystin LA	98.4	97.2	P/P	50 - 160
Microcystin LF	99.0	77.5	P/P	60 - 160
Microcystin LR	82.2	91.0	P/P	60 - 160
Microcystin LW	88.2	87.1	P/P	60 - 160
Microcystin LY	87.4	87.0	P/P	60 - 160
Microcystin RR	101	101	P/P	60 - 160
Microcystin WR	88.9	96.9	P/P	60 - 160
Microcystin YR	97.8	86.0	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100524

Included Lab Sample IDs: 2190408

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100530

Included Lab Sample IDs: 2190408

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	97.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100590

Included Lab Sample IDs: 2190408

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	100	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	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	100	102	101			0.552
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	104	106			2.51
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	103	102			0.387
EPA 365.1 Rev. 2.0	Total-P	102	106	106			0.284
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.6	96.6			1.03
EPA 8321B	Anatoxin-a	108	96.6	100			3.43
	Cylindrospermopsin	109	102	102			0.304
	Desmethyl microcystin LR	99.7	99.1	114			14.1
	Microcystin LA	111	97.9	104			5.95
	Microcystin LF	90.8	92.0	98.4			6.70
	Microcystin LR	100	93.1	96.1			3.10
	Microcystin LW	98.5	87.9	88.8			1.03
	Microcystin LY	93.5	97.0	96.3			0.728
	Microcystin RR	108	109	111			1.47
	Microcystin WR	102	89.7	94.5			5.20
	Microcystin YR	104	98.9	102			3.21

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2190408
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2190408
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2190408
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2190408
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2190409
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2190407

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	08/14/2020			08/18/2020 15:25	Virginia P. Brown	2190408
EPA 351.2 Rev. 2.0	08/14/2020	08/20/2020 11:10	Sima Feizi	08/21/2020 12:36	Jhamieka S. Greenwood	2190408
EPA 353.2 Rev. 2.0	08/14/2020			08/18/2020 08:55	Beverly Y. Sanders	2190408
EPA 365.1 Rev. 2.0	08/14/2020	08/17/2020 11:03	Shengyu Wang	08/19/2020 08:19	Lipi Saha	2190408
EPA 365.1 Rev. 2.0 dissolved	08/14/2020			08/14/2020 15:17	Virginia P. Brown	2190409
EPA 8321B	08/14/2020	08/18/2020 14:20	Juyoung Kim	08/18/2020 20:30	Mohammad Ghaffari	2190407