

Chemical Analysis Report

WQAP-2020-08-11-01

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

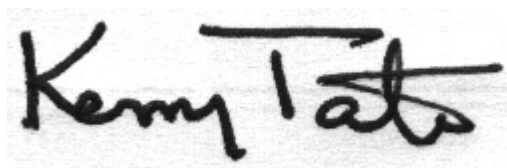
Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2019-12-02-58**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 27-AUG-2020 13:43

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: Imperial River Bonita Bay Outflow

Collection Date/Time: 08/10/2020 10:45

Field ID: SD081020ALG1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2189421	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P385901	
		Cylindrospermopsin**	0.25	U	ug/L	P385901	
		Desmethyl microcystin LR**	0.25	U	ug/L	P385901	
		Microcystin LA**	0.25	U	ug/L	P385901	
		Microcystin LF**	0.25	U	ug/L	P385901	
		Microcystin LR**	0.25	U	ug/L	P385901	
		Microcystin LW**	0.25	U	ug/L	P385901	
		Microcystin LY**	0.25	U	ug/L	P385901	
		Microcystin RR**	0.25	U	ug/L	P385901	
		Microcystin WR**	0.50	U	ug/L	P385901	
		Microcystin YR**	0.25	U	ug/L	P385901	
2189422	EPA 350.1 Rev. 2.0	Ammonia-N	0.67		mg N/L	P386084	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.1		mg N/L	P385978	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P385937	
	EPA 365.1 Rev. 2.0	Total-P	0.60		mg P/L	P385941	
2189423	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.44		mg P/L	P385918	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386084

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385978

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385937

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385941

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385918

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

Reference Method: EPA 8321B
Batch ID: P385901

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: P386084

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P385978

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: P385937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P385941

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P385918

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

Reference Method: EPA 8321B
 Batch ID: P385901

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	93.5		P	40 - 140
Cylindrospermopsin	104		P	40 - 140
Desmethyl microcystin LR	89.4		P	40 - 140
Microcystin LA	98.6		P	40 - 140
Microcystin LF	93.0		P	40 - 140
Microcystin LR	92.3		P	40 - 140
Microcystin LW	92.3		P	40 - 140
Microcystin LY	94.9		P	40 - 140
Microcystin RR	87.0		P	40 - 140
Microcystin WR	97.8		P	40 - 140
Microcystin YR	94.6		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386084

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189372	Ammonia-N	100	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189164	Kjeldahl Nitrogen	108	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189422	NO2NO3-N	97.4	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385941

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189375	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189430	O-Phosphate-P	97.8	99.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P385901

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189132	Anatoxin-a	79.0	77.7	P/P	40 - 140
2189132	Cylindrospermopsin	102	94.9	P/P	40 - 140
2189132	Desmethyl microcystin LR	109	106	P/P	40 - 140
2189132	Microcystin LA	99.0	93.2	P/P	40 - 140
2189132	Microcystin LF	109	97.4	P/P	40 - 140
2189132	Microcystin LR	99.4	100	P/P	40 - 140
2189132	Microcystin LW	83.6	97.1	P/P	40 - 140
2189132	Microcystin LY	96.8	85.3	P/P	40 - 140
2189132	Microcystin RR	103	101	P/P	40 - 140
2189132	Microcystin WR	101	94.6	P/P	40 - 140
2189132	Microcystin YR	101	95.9	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189372	Ammonia-N	0.872	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189164	Kjeldahl Nitrogen	1.04	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189422	NO2NO3-N	0.917	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189375	Total-P	0.0837	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189430	O-Phosphate-P	1.22	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P385901

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189132	Anatoxin-a	1.66	Spike	P	0 - 30
2189132	Cylindrospermopsin	6.86	Spike	P	0 - 30
2189132	Desmethyl microcystin LR	2.58	Spike	P	0 - 30
2189132	Microcystin LA	6.05	Spike	P	0 - 30
2189132	Microcystin LF	11.7	Spike	P	0 - 30
2189132	Microcystin LR	0.613	Spike	P	0 - 30
2189132	Microcystin LW	15.0	Spike	P	0 - 30
2189132	Microcystin LY	12.6	Spike	P	0 - 30
2189132	Microcystin RR	2.42	Spike	P	0 - 30
2189132	Microcystin WR	6.36	Spike	P	0 - 30
2189132	Microcystin YR	4.74	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2189421
Field Sample ID: SD081020ALG1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	95.5	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	90.3	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100394

Included Lab Sample IDs: 2189423

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100406

Included Lab Sample IDs: 2189422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100438

Included Lab Sample IDs: 2189422

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

Reference Method: EPA 8321B

Run ID: A100453

Included Lab Sample IDs: 2189421

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	73.5	71.8	P/P	50 - 160
Cylindrospermopsin	100	102	P/P	60 - 160
Desmethyl microcystin LR	83.3	88.1	P/P	60 - 160
Microcystin LA	91.8	88.4	P/P	50 - 160
Microcystin LF	108	94.2	P/P	60 - 160
Microcystin LR	97.7	84.1	P/P	60 - 160
Microcystin LW	97.2	96.0	P/P	60 - 160
Microcystin LY	90.3	84.6	P/P	60 - 160
Microcystin RR	84.3	88.4	P/P	60 - 160
Microcystin WR	90.8	82.3	P/P	60 - 160
Microcystin YR	83.6	75.0	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100463

Included Lab Sample IDs: 2189422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.6	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100478

Included Lab Sample IDs: 2189422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	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	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	100	98.8			0.872
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	108	110			1.04
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	97.4	98.4			0.917
EPA 365.1 Rev. 2.0	Total-P	103	102	102			0.0837
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	97.8	99.0			1.22
EPA 8321B	Anatoxin-a	93.5	79.0	77.7			1.66
	Cylindrospermopsin	104	102	94.9			6.86
	Desmethyl microcystin LR	89.4	109	106			2.58
	Microcystin LA	98.6	99.0	93.2			6.05
	Microcystin LF	93.0	109	97.4			11.7
	Microcystin LR	92.3	99.4	100			0.613
	Microcystin LW	92.3	83.6	97.1			15.0
	Microcystin LY	94.9	96.8	85.3			12.6
	Microcystin RR	87.0	103	101			2.42
	Microcystin WR	97.8	101	94.6			6.36
	Microcystin YR	94.6	101	95.9			4.74

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2189422
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2189422
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2189422
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2189422
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2189423
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2189421

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	08/11/2020			08/15/2020 16:29	Ping Hua	2189422
EPA 351.2 Rev. 2.0	08/11/2020	08/13/2020 10:15	Sima Feizi	08/14/2020 11:23	Jhamieka S. Greenwood	2189422
EPA 353.2 Rev. 2.0	08/11/2020			08/12/2020 09:02	Beverly Y. Sanders	2189422
EPA 365.1 Rev. 2.0	08/11/2020	08/12/2020 11:41	Yen Ta	08/13/2020 09:32	Benjamin T. Nordmann	2189422
EPA 365.1 Rev. 2.0 dissolved	08/11/2020			08/11/2020 16:11	Jhamieka S. Greenwood	2189423
EPA 8321B	08/11/2020	08/12/2020 09:00	Juyoung Kim	08/13/2020 15:57	Juyoung Kim	2189421