

Chemical Analysis Report

WQAP-2020-08-03-01

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

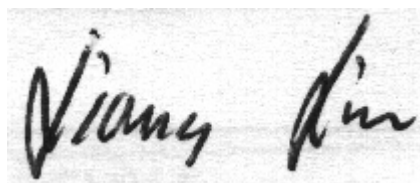
Event Description: **Algal Bloom Response - NW ROC**
Request ID: **RQ-2020-02-03-37**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 18-AUG-2020 12:09

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: Boat Lake

Collection Date/Time: 08/03/2020 12:50

Field ID: HAB_BOAT_LAKE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2187920	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P385666	
		Cylindrospermopsin**	0.25	U	ug/L	P385666	
		Desmethyl microcystin LR**	0.25	U	ug/L	P385666	
		Microcystin LA**	0.25	U	ug/L	P385666	
		Microcystin LF**	0.25	U	ug/L	P385666	
		Microcystin LR**	0.25	U	ug/L	P385666	
		Microcystin LW**	0.25	U	ug/L	P385666	
		Microcystin LY**	0.25	U	ug/L	P385666	
		Microcystin RR**	0.25	U	ug/L	P385666	
		Microcystin WR**	0.50	U	ug/L	P385666	
		Microcystin YR**	0.25	U	ug/L	P385666	
2187922	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P385799	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P385732	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P385717	
	EPA 365.1 Rev. 2.0	Total-P	0.005		mg P/L	P385645	
2187923	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P385599	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385799

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385732

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385717

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385645

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385599

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

Reference Method: EPA 8321B
Batch ID: P385666

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: P385799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P385732

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P385717

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P385645

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: P385599

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

Reference Method: EPA 8321B
 Batch ID: P385666

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	89.6		P	40 - 140
Cylindrospermopsin	88.6		P	40 - 140
Desmethyl microcystin LR	94.7		P	40 - 140
Microcystin LA	92.6		P	40 - 140
Microcystin LF	94.8		P	40 - 140
Microcystin LR	84.4		P	40 - 140
Microcystin LW	85.6		P	40 - 140
Microcystin LY	101		P	40 - 140
Microcystin RR	102		P	40 - 140
Microcystin WR	87.6		P	40 - 140
Microcystin YR	87.1		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187922	Ammonia-N	101	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385732

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187930	Kjeldahl Nitrogen	106	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187910	NO2NO3-N	97.8	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187870	Total-P	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385599

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2187919	O-Phosphate-P	98.2	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P385666

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188488	Anatoxin-a	82.9	83.7	P/P	40 - 140
2188488	Cylindrospermopsin	81.8	84.2	P/P	40 - 140
2188488	Desmethyl microcystin LR	108	107	P/P	40 - 140
2188488	Microcystin LA	89.4	91.0	P/P	40 - 140
2188488	Microcystin LF	87.1	87.0	P/P	40 - 140
2188488	Microcystin LR	110	106	P/P	40 - 140
2188488	Microcystin LW	81.0	84.4	P/P	40 - 140
2188488	Microcystin LY	89.6	85.4	P/P	40 - 140
2188488	Microcystin RR	115	118	P/P	40 - 140
2188488	Microcystin WR	99.5	101	P/P	40 - 140
2188488	Microcystin YR	105	110	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187922	Ammonia-N	1.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385732

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187930	Kjeldahl Nitrogen	0.611	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187910	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187870	Total-P	1.78	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385599

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2187919	O-Phosphate-P	0.102	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P385666

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188488	Anatoxin-a	0.968	Spike	P	0 - 30
2188488	Cylindrospermopsin	2.90	Spike	P	0 - 30
2188488	Desmethyl microcystin LR	0.900	Spike	P	0 - 30
2188488	Microcystin LA	1.80	Spike	P	0 - 30
2188488	Microcystin LF	0.178	Spike	P	0 - 30
2188488	Microcystin LR	3.17	Spike	P	0 - 30
2188488	Microcystin LW	4.12	Spike	P	0 - 30
2188488	Microcystin LY	4.77	Spike	P	0 - 30
2188488	Microcystin RR	2.15	Spike	P	0 - 30
2188488	Microcystin WR	1.80	Spike	P	0 - 30
2188488	Microcystin YR	4.89	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2187920
Field Sample ID: HAB_BOAT_LAKE

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	87.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100258

Included Lab Sample IDs: 2187923

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100311

Included Lab Sample IDs: 2187922

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A100318

Included Lab Sample IDs: 2187920

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	87.1	90.3	P/P	50 - 160
Cylindrospermopsin	102	98.8	P/P	60 - 160
Desmethyl microcystin LR	101	105	P/P	60 - 160
Microcystin LA	105	105	P/P	50 - 160
Microcystin LF	104	98.0	P/P	60 - 160
Microcystin LR	101	102	P/P	60 - 160
Microcystin LW	102	107	P/P	60 - 160
Microcystin LY	110	106	P/P	60 - 160
Microcystin RR	105	96.3	P/P	60 - 160
Microcystin WR	92.5	103	P/P	60 - 160
Microcystin YR	91.6	97.7	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100334

Included Lab Sample IDs: 2187922

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	94.2	94.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100344

Included Lab Sample IDs: 2187922

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.6	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100352

Included Lab Sample IDs: 2187922

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	99.0	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	99.8	101	99.6			1.47
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	106	107			0.611
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	97.8	97.8			0.0
EPA 365.1 Rev. 2.0	Total-P	102	106	104			1.78
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.2	98.3			0.102
EPA 8321B	Anatoxin-a	89.6	82.9	83.7			0.968
	Cylindrospermopsin	88.6	81.8	84.2			2.90
	Desmethyl microcystin LR	94.7	108	107			0.900
	Microcystin LA	92.6	89.4	91.0			1.80
	Microcystin LF	94.8	87.1	87.0			0.178
	Microcystin LR	84.4	110	106			3.17
	Microcystin LW	85.6	81.0	84.4			4.12
	Microcystin LY	101	89.6	85.4			4.77
	Microcystin RR	102	115	118			2.15
	Microcystin WR	87.6	99.5	101			1.80
	Microcystin YR	87.1	105	110			4.89

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2187922
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2187922
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2187922
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2187922
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2187923
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2187920

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	08/03/2020			08/08/2020 12:22	Ping Hua	2187922
EPA 351.2 Rev. 2.0	08/03/2020	08/06/2020 10:53	Sima Feizi	08/07/2020 12:38	Jhamieka S. Greenwood	2187922
EPA 353.2 Rev. 2.0	08/03/2020			08/06/2020 09:43	Beverly Y. Sanders	2187922
EPA 365.1 Rev. 2.0	08/03/2020	08/05/2020 10:35	Lipi Saha	08/07/2020 09:44	Lipi Saha	2187922
EPA 365.1 Rev. 2.0 dissolved	08/03/2020			08/04/2020 14:40	Samantha Davila	2187923
EPA 8321B	08/03/2020	08/05/2020 13:00	Juyoung Kim	08/06/2020 08:42	Juyoung Kim	2187920