

Chemical Analysis Report

WQAP-2020-07-10-01

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

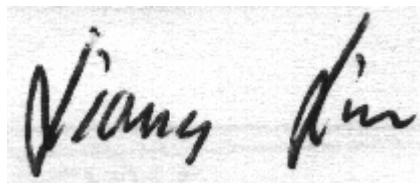
Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2020-03-30-08**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 29-JUL-2020 15:15

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: Hillsborough River-Near Lowry Park

Collection Date/Time: 07/09/2020 12:10

Field ID: HAB-SW-0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2182364	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P384575	
		Cylindrospermopsin**	0.25	U	ug/L	P384575	
		Desmethyl microcystin LR**	0.25	U	ug/L	P384575	
		Microcystin LA**	0.25	U	ug/L	P384575	
		Microcystin LF**	0.25	U	ug/L	P384575	
		Microcystin LR**	0.25	U	ug/L	P384575	
		Microcystin LW**	0.25	U	ug/L	P384575	
		Microcystin LY**	0.25	U	ug/L	P384575	
		Microcystin RR**	0.25	U	ug/L	P384575	
		Microcystin WR**	0.50	U	ug/L	P384575	
		Microcystin YR**	0.25	U	ug/L	P384575	
2182369	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P384455	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P384773	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384645	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P384508	
2182370	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.078		mg P/L	P384521	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384455

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384773

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384645

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384508

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384521

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

Reference Method: EPA 8321B
Batch ID: P384575

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: P384455

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384773

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384645

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384508

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384521

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

Reference Method: EPA 8321B
Batch ID: P384575

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	121		P	40 - 140
Cylindrospermopsin	103		P	40 - 140
Desmethyl microcystin LR	103		P	40 - 140
Microcystin LA	102		P	40 - 140
Microcystin LF	107		P	40 - 140
Microcystin LR	101		P	40 - 140
Microcystin LW	99.5		P	40 - 140
Microcystin LY	111		P	40 - 140
Microcystin RR	104		P	40 - 140
Microcystin WR	97.5		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: P384455

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182516	Ammonia-N	99.6	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183047	Kjeldahl Nitrogen	99.9	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182369	NO2NO3-N	94.9	94.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182132	Total-P	98.2	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182512	O-Phosphate-P	99.6	99.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P384575

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182685	Anatoxin-a	110	114	P/P	40 - 140
2182685	Cylindrospermopsin	91.0	86.5	P/P	40 - 140
2182685	Desmethyl microcystin LR	94.3	94.6	P/P	40 - 140
2182685	Microcystin LA	91.6	89.7	P/P	40 - 140
2182685	Microcystin LF	93.9	101	P/P	40 - 140
2182685	Microcystin LR	93.1	93.6	P/P	40 - 140
2182685	Microcystin LW	89.4	89.0	P/P	40 - 140
2182685	Microcystin LY	107	94.4	P/P	40 - 140
2182685	Microcystin RR	98.4	103	P/P	40 - 140
2182685	Microcystin WR	91.7	90.4	P/P	40 - 140
2182685	Microcystin YR	101	99.6	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P384455

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182516	Ammonia-N	0.803	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P384773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183047	Kjeldahl Nitrogen	2.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P384645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182369	NO2NO3-N	0.528	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P384508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182132	Total-P	0.724	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P384521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182512	O-Phosphate-P	0.301	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P384575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182685	Anatoxin-a	3.37	Spike	P	0 - 30
2182685	Cylindrospermopsin	4.62	Spike	P	0 - 30
2182685	Desmethyl microcystin LR	0.265	Spike	P	0 - 30
2182685	Microcystin LA	2.04	Spike	P	0 - 30
2182685	Microcystin LF	6.81	Spike	P	0 - 30
2182685	Microcystin LR	0.515	Spike	P	0 - 30
2182685	Microcystin LW	0.404	Spike	P	0 - 30
2182685	Microcystin LY	12.5	Spike	P	0 - 30
2182685	Microcystin RR	4.17	Spike	P	0 - 30
2182685	Microcystin WR	1.37	Spike	P	0 - 30
2182685	Microcystin YR	1.34	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2182364
Field Sample ID: HAB-SW-0019

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A99811

Included Lab Sample IDs: 2182369

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A99834

Included Lab Sample IDs: 2182370

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A99862

Included Lab Sample IDs: 2182369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A99885

Included Lab Sample IDs: 2182369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	101	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A99902

Included Lab Sample IDs: 2182364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	96.5	P/P	50 - 160
Cylindrospermopsin	106	98.9	P/P	60 - 160
Desmethyl microcystin LR	98.2	94.8	P/P	50 - 160
Microcystin LA	103	99.5	P/P	50 - 160
Microcystin LF	102	102	P/P	60 - 160
Microcystin LR	98.8	98.7	P/P	60 - 160
Microcystin LW	102	99.5	P/P	50 - 160
Microcystin LY	107	113	P/P	60 - 160
Microcystin RR	100	101	P/P	60 - 160
Microcystin WR	96.7	101	P/P	60 - 160
Microcystin YR	95.2	97.2	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A99971

Included Lab Sample IDs: 2182369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	109	101	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	98.7	99.6	98.8			0.803
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	99.9	104			2.33
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	94.9	94.4			0.528
EPA 365.1 Rev. 2.0	Total-P	109	98.2	98.9			0.724
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.6	99.9			0.301
EPA 8321B	Anatoxin-a	121	110	114			3.37
	Cylindrospermopsin	103	91.0	86.5			4.62
	Desmethyl microcystin LR	103	94.3	94.6			0.265
	Microcystin LA	102	91.6	89.7			2.04
	Microcystin LF	107	93.9	101			6.81
	Microcystin LR	101	93.1	93.6			0.515
	Microcystin LW	99.5	89.4	89.0			0.404
	Microcystin LY	111	107	94.4			12.5
	Microcystin RR	104	98.4	103			4.17
	Microcystin WR	97.5	91.7	90.4			1.37
	Microcystin YR	104	101	99.6			1.34

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2182369
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2182369
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2182369
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2182369
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2182370
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2182364

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	07/10/2020			07/12/2020 18:03	Ping Hua	2182369
EPA 351.2 Rev. 2.0	07/10/2020	07/17/2020 11:15	Jhamieka S. Greenwood	07/20/2020 12:50	Jhamieka S. Greenwood	2182369
EPA 353.2 Rev. 2.0	07/10/2020			07/15/2020 09:56	Beverly Y. Sanders	2182369
EPA 365.1 Rev. 2.0	07/10/2020	07/13/2020 14:29	Yen Ta	07/14/2020 15:44	Benjamin T. Nordmann	2182369
EPA 365.1 Rev. 2.0 dissolved	07/10/2020			07/10/2020 23:55	Jhamieka S. Greenwood	2182370
EPA 8321B	07/10/2020	07/15/2020 12:45	Juyoung Kim	07/15/2020 18:32	Juyoung Kim	2182364