Chemical Analysis Report

WQAP-2019-06-11-01

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

Event Description: **Algal Bloom Response - as needed**
Request ID: **RQ-2019-06-03-42**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 02-JUL-2019 18:18

B. Steinbock

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: MANATEE RIVER NEAR ROBINSON PRESERVE BLOOM RESPONSE

Collection Date/Time: 06/10/2019 09:45

Field ID: ROBINSON PRESERVE

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2094154	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P365381	
		Cylindrospermopsin**	0.25	U	ug/L	P365381	
		Microcystin LA**	0.25	U	ug/L	P365381	
		Microcystin LF**	0.25	U	ug/L	P365381	
		Microcystin LR**	0.25	U	ug/L	P365381	
		Microcystin LY**	0.25	U	ug/L	P365381	
		Microcystin RR**	0.25	U	ug/L	P365381	
		Microcystin YR**	0.25	U	ug/L	P365381	

Sample Location: MANATEE RIVER NEAR ROBINSON PRESERVE BLOOM RESPONSE

Collection Date/Time: 06/10/2019 09:45

Field ID: ROBINSON PRESERVE

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2094156	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P365764	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P365979	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P365482	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P365682	
2094158	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.052		mg P/L	P365437	

Sample Location: LYONS BAY BLOOM RESPONSE **Collection Date/Time: 06/10/2019 11:10**

Field ID: LYONS BAY Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2094155	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P365381	
		Cylindrospermopsin**	0.25	U	ug/L	P365381	
		Microcystin LA**	0.25	U	ug/L	P365381	
		Microcystin LF**	0.25	U	ug/L	P365381	
		Microcystin LR**	0.25	U	ug/L	P365381	
		Microcystin LY**	0.25	U	ug/L	P365381	
		Microcystin RR**	0.25	U	ug/L	P365381	
		Microcystin YR**	0.25	U	ug/L	P365381	

Sample Location: LYONS BAY BLOOM RESPONSE **Collection Date/Time: 06/10/2019 11:10**

Field ID: LYONS BAY Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2094157	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P365764	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P365979	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P365482	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P365682	
2094159	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P365437	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365764

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365979

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365482

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365682

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365437

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

Reference Method: EPA 8321B
Batch ID: P365381

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	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 LY	0.25	U	ug/L
Microcystin RR	0.25	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: P365764

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365979

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: P365482

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365682

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365437

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

Reference Method: EPA 8321B
Batch ID: P365381

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	96.8		P	40 - 140
Cylindrospermopsin	92.1		P	40 - 140
Microcystin LA	119		P	40 - 140
Microcystin LF	126		P	40 - 140
Microcystin LR	87.1		P	40 - 140
Microcystin LY	130		P	40 - 140
Microcystin RR	96.6		P	40 - 140
Microcystin YR	99.1		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2093119	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365979

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2094157	Kjeldahl Nitrogen	107	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2093088	NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2093116	Total-P	92.6	94.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365437

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2094159	O-Phosphate-P	96.3	97.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P365381

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2093065	Anatoxin-a	90.0	101	P/P	40 - 140
2093065	Cylindrospermopsin	102	99.2	P/P	40 - 140
2093065	Microcystin LA	114	109	P/P	40 - 140
2093065	Microcystin LF	119	127	P/P	40 - 140
2093065	Microcystin LR	96.5	100	P/P	40 - 140
2093065	Microcystin LY	127	130	P/P	40 - 140
2093065	Microcystin RR	107	108	P/P	40 - 140
2093065	Microcystin YR	112	108	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2093119	Ammonia-N	0.267	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365979

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2094157	Kjeldahl Nitrogen	4.34	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P365482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2093088	NO2NO3-N	0.976	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P365682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2093116	Total-P	1.95	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P365437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2094159	O-Phosphate-P	1.25	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P365381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2093065	Anatoxin-a	11.7	Spike	P	0 - 30
2093065	Cylindrospermopsin	2.55	Spike	P	0 - 30
2093065	Microcystin LA	4.22	Spike	P	0 - 30
2093065	Microcystin LF	6.24	Spike	P	0 - 30
2093065	Microcystin LR	3.95	Spike	P	0 - 30
2093065	Microcystin LY	2.05	Spike	P	0 - 30
2093065	Microcystin RR	0.581	Spike	P	0 - 30
2093065	Microcystin YR	3.48	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Surrogates

Lab Sample ID: 2094154
Field Sample ID: ROBINSON PRESERVE

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	104	P	30 - 165

Lab Sample ID: 2094155
Field Sample ID: LYONS BAY

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	110	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A92017
Included Lab Sample IDs: 2094158, 2094159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	99.8	P/P	90 - 110
O-Phosphate-P	99.8	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A92038
Included Lab Sample IDs: 2094156, 2094157

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

Reference Method: EPA 8321B
Run ID: A92040
Included Lab Sample IDs: 2094154, 2094155

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	83.7	93.0	P/P	50 - 160
Cylindrospermopsin	79.8	96.8	P/P	60 - 160
Microcystin LA	85.8	115	P/P	50 - 160
Microcystin LF	149	112	P/P	60 - 160
Microcystin LR	83.4	97.1	P/P	60 - 160
Microcystin LY	113	119	P/P	60 - 160
Microcystin RR	86.0	98.1	P/P	60 - 160
Microcystin YR	88.6	100	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A92142
Included Lab Sample IDs: 2094156, 2094157

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A92150
Included Lab Sample IDs: 2094156

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A92151
Included Lab Sample IDs: 2094157

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A92276
Included Lab Sample IDs: 2094156, 2094157

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.6	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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	102	104	104			0.267
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	107	102			4.34
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	103			0.976
EPA 365.1 Rev. 2.0	Total-P	106	92.6	94.4			1.95
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	96.3	97.6			1.25
EPA 8321B	Anatoxin-a	96.8	90.0	101			11.7
	Cylindrospermopsin	92.1	102	99.2			2.55
	Microcystin LA	119	114	109			4.22
	Microcystin LF	126	119	127			6.24
	Microcystin LR	87.1	96.5	100			3.95
	Microcystin LY	130	127	130			2.05
	Microcystin RR	96.6	107	108			0.581
	Microcystin YR	99.1	112	108			3.48

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2094156, 2094157
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2094156, 2094157
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2094156, 2094157
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2094156, 2094157
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2094158, 2094159
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2094154, 2094155

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	06/11/2019			06/14/2019 16:32	Ping Hua	2094156
	06/11/2019			06/14/2019 16:33	Ping Hua	2094157
EPA 351.2 Rev. 2.0	06/11/2019	06/19/2019 12:00	Adrian Shelby	06/21/2019 11:06	Joseph Suarez	2094156
	06/11/2019	06/19/2019 12:00	Adrian Shelby	06/21/2019 11:07	Joseph Suarez	2094157
EPA 353.2 Rev. 2.0	06/11/2019			06/12/2019 11:49	Beverly Y. Sanders	2094156
	06/11/2019			06/12/2019 11:50	Beverly Y. Sanders	2094157
EPA 365.1 Rev. 2.0	06/11/2019	06/14/2019 12:55	Sima Feizi	06/17/2019 12:56	Julia Storbeck	2094156
	06/11/2019	06/14/2019 12:55	Sima Feizi	06/17/2019 17:49	Julia Storbeck	2094157
EPA 365.1 Rev. 2.0 dissolved	06/11/2019			06/11/2019 14:38	Jhamieka S. Greenwood	2094159
	06/11/2019			06/11/2019 15:00	Jhamieka S. Greenwood	2094158
EPA 8321B	06/11/2019	06/12/2019 09:00	Mohammad Ghaffari	06/12/2019 12:12	Mohammad Ghaffari	2094154
	06/11/2019	06/12/2019 09:00	Mohammad Ghaffari	06/12/2019 12:28	Mohammad Ghaffari	2094155