

Chemical Analysis Report

WQAP-2019-08-30-01

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-2019-07-22-63**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
MS #3560
Tallahassee, FL 32399-2400
Attn: Julie Espy

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 16-SEP-2019 16:33



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: Scott Lake-Bloom Response

Collection Date/Time: 08/29/2019 11:15

Field ID: Scott Lake-Bloom Response

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115893	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P370044	
		Cylindrospermopsin**	2.2		ug/L	P370044	
		Microcystin LA**	0.25	U	ug/L	P370044	
		Microcystin LF**	0.25	U	ug/L	P370044	
		Microcystin LR**	0.45	I	ug/L	P370044	
		Microcystin LY**	0.25	U	ug/L	P370044	
		Microcystin RR**	0.25	U	ug/L	P370044	
		Microcystin YR**	0.25	U	ug/L	P370044	
2115894	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P370331	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P370189	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P370182	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P370292	
2115895	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P370007	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370331

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370189

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370182

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370292

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

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

Reference Method: EPA 8321B
Batch ID: P370044

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: P370331

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370189

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370182

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: P370292

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.1		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P370044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	129		P	40 - 140
Cylindrospermopsin	108		P	40 - 140
Microcystin LA	119		P	40 - 140
Microcystin LF	134		P	40 - 140
Microcystin LR	108		P	40 - 140
Microcystin LY	115		P	40 - 140
Microcystin RR	124		P	40 - 140
Microcystin YR	112		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115894	Ammonia-N	91.8	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370189

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116341	Kjeldahl Nitrogen	94.2	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370182

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115894	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370292

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115907	Total-P	97.1	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115908	O-Phosphate-P	98.2	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P370044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115893	Anatoxin-a	134	129	P/P	40 - 140
2115893	Cylindrospermopsin	131	103	P/P	40 - 140
2115893	Microcystin LA	118	102	P/P	40 - 140
2115893	Microcystin LF	131	128	P/P	40 - 140
2115893	Microcystin LR	112	104	P/P	40 - 140
2115893	Microcystin LY	117	98.9	P/P	40 - 140
2115893	Microcystin RR	124	115	P/P	40 - 140
2115893	Microcystin YR	119	108	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115894	Ammonia-N	4.60	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116341	Kjeldahl Nitrogen	5.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370182

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115894	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370292

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115907	Total-P	1.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370007

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115908	O-Phosphate-P	0.102	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P370044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115893	Anatoxin-a	3.95	Spike	P	0 - 30
2115893	Cylindrospermopsin	20.2	Spike	P	0 - 30
2115893	Microcystin LA	14.5	Spike	P	0 - 30
2115893	Microcystin LF	2.92	Spike	P	0 - 30
2115893	Microcystin LR	6.83	Spike	P	0 - 30
2115893	Microcystin LY	17.1	Spike	P	0 - 30
2115893	Microcystin RR	7.44	Spike	P	0 - 30
2115893	Microcystin YR	9.38	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: 2115893

Field Sample ID: Scott Lake-Bloom Response

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	88.3	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A93926

Included Lab Sample IDs: 2115895

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	99.5	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A93949

Included Lab Sample IDs: 2115893

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.6	108	P/P	50 - 160
Cylindrospermopsin	81.7	92.7	P/P	60 - 160
Microcystin LA	103	102	P/P	50 - 160
Microcystin LF	142	104	P/P	60 - 160
Microcystin LR	90.4	92.4	P/P	60 - 160
Microcystin LY	104	89.8	P/P	60 - 160
Microcystin RR	99.7	105	P/P	60 - 160
Microcystin YR	94.5	92.2	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93999

Included Lab Sample IDs: 2115894

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94045

Included Lab Sample IDs: 2115894

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.3	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94059

Included Lab Sample IDs: 2115894

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94092

Included Lab Sample IDs: 2115894

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.4	96.2	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	91.8	96.8			4.60
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	94.2	103			5.02
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	102			0.489
EPA 365.1 Rev. 2.0	Total-P	93.1	97.1	98.4			1.31
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	98.2	98.3			0.102
EPA 8321B	Anatoxin-a	129	134	129			3.95
	Cylindrospermopsin	108	131	103			20.2
	Microcystin LA	119	118	102			14.5
	Microcystin LF	134	131	128			2.92
	Microcystin LR	108	112	104			6.83
	Microcystin LY	115	117	98.9			17.1
	Microcystin RR	124	124	115			7.44
	Microcystin YR	112	119	108			9.38

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2115894
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2115894
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2115894
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2115894
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2115895
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2115893

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	08/30/2019			09/06/2019 11:44	Ping Hua	2115894
EPA 351.2 Rev. 2.0	08/30/2019	09/05/2019 12:00	Sima Feizi	09/06/2019 19:00	Julia Storbeck	2115894
EPA 353.2 Rev. 2.0	08/30/2019			09/05/2019 10:02	Beverly Y. Sanders	2115894
EPA 365.1 Rev. 2.0	08/30/2019	09/06/2019 13:30	Lipi Saha	09/09/2019 15:13	Rosalyn Ballman	2115894
EPA 365.1 Rev. 2.0 dissolved	08/30/2019			08/30/2019 14:43	Jhamieka S. Greenwood	2115895
EPA 8321B	08/30/2019	09/03/2019 09:00	Mohammad Ghaffari	09/03/2019 10:58	Mohammad Ghaffari	2115893