

Chemical Analysis Report

WQAP-2020-04-15-01

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

Event Description: **Lee County Bloom Response--As Needed**
Request ID: **RQ-2019-06-24-42**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Attn: Sue Davis

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 04-MAY-2020 09:29



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: Alva Boat Ramp

Collection Date/Time: 04/14/2020 08:42

Field ID: Alva Boat Ramp

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2170424	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P382095	
		Cylindrospermopsin**	0.25	U	ug/L	P382095	
		Desmethyl microcystin LR**	0.25	U	ug/L	P382095	
		Microcystin LA**	0.25	U	ug/L	P382095	
		Microcystin LF**	0.25	U	ug/L	P382095	
		Microcystin LR**	0.25	U	ug/L	P382095	
		Microcystin LW**	0.25	U	ug/L	P382095	
		Microcystin LY**	0.25	U	ug/L	P382095	
		Microcystin RR**	0.25	U	ug/L	P382095	
		Microcystin WR**	0.50	U	ug/L	P382095	
		Microcystin YR**	0.25	U	ug/L	P382095	
2170425	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P382183	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P382174	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P382127	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P382188	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P382183

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P382174

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P382127

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P382188

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

Reference Method: EPA 8321B
Batch ID: P382095

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: P382183

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P382174

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: P382127

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: P382188

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.6		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P382095

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	136		P	40 - 140
Cylindrospermopsin	116		P	40 - 140
Desmethyl microcystin LR	114		P	40 - 140
Microcystin LA	130		P	40 - 140
Microcystin LF	122		P	40 - 140
Microcystin LR	136		P	40 - 140
Microcystin LW	126		P	40 - 140
Microcystin LY	129		P	40 - 140
Microcystin RR	121		P	40 - 140
Microcystin WR	120		P	40 - 140
Microcystin YR	125		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P382183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2170622	Ammonia-N	94.0	92.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P382127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2170425	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P382188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2170425	Total-P	102	100	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P382095

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2170424	Anatoxin-a	109	102	P/P	40 - 140
2170424	Cylindrospermopsin	110	100	P/P	40 - 140
2170424	Desmethyl microcystin LR	107	97.7	P/P	40 - 140
2170424	Microcystin LA	106	106	P/P	40 - 140
2170424	Microcystin LF	107	107	P/P	40 - 140
2170424	Microcystin LR	113	107	P/P	40 - 140
2170424	Microcystin LW	107	103	P/P	40 - 140
2170424	Microcystin LY	121	99.8	P/P	40 - 140
2170424	Microcystin RR	99.3	95.3	P/P	40 - 140
2170424	Microcystin WR	104	95.8	P/P	40 - 140
2170424	Microcystin YR	113	98.6	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P382183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2170622	Ammonia-N	1.13	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P382174

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2170425	Kjeldahl Nitrogen	2.96	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P382127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2170425	NO2NO3-N	0.980	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P382188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2170425	Total-P	0.982	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P382095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2170424	Anatoxin-a	6.79	Spike	P	0 - 30
2170424	Cylindrospermopsin	8.99	Spike	P	0 - 30
2170424	Desmethyl microcystin LR	8.77	Spike	P	0 - 30
2170424	Microcystin LA	0.215	Spike	P	0 - 30
2170424	Microcystin LF	0.103	Spike	P	0 - 30
2170424	Microcystin LR	5.54	Spike	P	0 - 30
2170424	Microcystin LW	3.87	Spike	P	0 - 30
2170424	Microcystin LY	19.5	Spike	P	0 - 30
2170424	Microcystin RR	4.13	Spike	P	0 - 30
2170424	Microcystin WR	8.19	Spike	P	0 - 30
2170424	Microcystin YR	13.9	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2170424
Field Sample ID: Alva Boat Ramp

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	105	P	40 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
 Run ID: A98798
 Included Lab Sample IDs: 2170424

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	83.8	116	P/P	50 - 160
Cylindrospermopsin	95.2	118	P/P	60 - 160
Desmethyl microcystin LR	108	117	P/P	60 - 160
Microcystin LA	113	121	P/P	50 - 160
Microcystin LF	105	121	P/P	60 - 160
Microcystin LR	119	127	P/P	60 - 160
Microcystin LW	113	115	P/P	60 - 160
Microcystin LY	120	133	P/P	60 - 160
Microcystin RR	103	115	P/P	60 - 160
Microcystin WR	107	112	P/P	60 - 160
Microcystin YR	124	125	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
 Run ID: A98814
 Included Lab Sample IDs: 2170425

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

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A98837
 Included Lab Sample IDs: 2170425

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

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A98841
 Included Lab Sample IDs: 2170425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A98849
 Included Lab Sample IDs: 2170425

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	97.5	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 SMP	MS
			LCS	MS		
EPA 350.1 Rev. 2.0	Ammonia-N	103	94.0	92.6		1.13
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100				2.96
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	102		0.980
EPA 365.1 Rev. 2.0	Total-P	99.6	102	100		0.982
EPA 8321B	Anatoxin-a	136	109	102		6.79
	Cylindrospermopsin	116	110	100		8.99
	Desmethyl microcystin LR	114	107	97.7		8.77
	Microcystin LA	130	106	106		0.215
	Microcystin LF	122	107	107		0.103
	Microcystin LR	136	113	107		5.54
	Microcystin LW	126	103	107		3.87
	Microcystin LY	129	121	99.8		19.5
	Microcystin RR	121	99.3	95.3		4.13
	Microcystin WR	120	104	95.8		8.19
	Microcystin YR	125	113	98.6		13.9

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2170425
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2170425
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2170425
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2170425
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2170424

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	04/15/2020			04/23/2020 16:30	Julia Storbeck	2170425
EPA 351.2 Rev. 2.0	04/15/2020	04/23/2020 16:00	Jhamieka S. Greenwood	04/24/2020 11:31	Jhamieka S. Greenwood	2170425
EPA 353.2 Rev. 2.0	04/15/2020			04/17/2020 15:10	Virginia P. Brown	2170425
EPA 365.1 Rev. 2.0	04/15/2020	04/23/2020 11:56	Lipi Saha	04/24/2020 09:44	Lipi Saha	2170425
EPA 8321B	04/15/2020	04/16/2020 09:00	Juyoung Kim	04/16/2020 11:37	Juyoung Kim	2170424