

Chemical Analysis Report

WQAP-2020-03-04-01

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

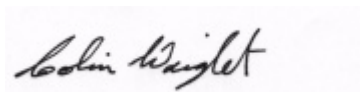
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2020-02-24-36**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 23-MAR-2020 15:05

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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: Lake Arnold @ 70m from W Shore

Collection Date/Time: 03/03/2020 10:16

Field ID: HABCE0011_Lake Arnold

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2161945	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P380084	
		Cylindrospermopsin**	0.25	U	ug/L	P380084	
		Desmethyl microcystin LR**	0.25	U	ug/L	P380084	
		Microcystin LA**	0.26	I	ug/L	P380084	
		Microcystin LF**	0.25	U	ug/L	P380084	
		Microcystin LR**	0.54	I	ug/L	P380084	
		Microcystin LW**	0.25	U	ug/L	P380084	
		Microcystin LY**	0.25	U	ug/L	P380084	
		Microcystin RR**	0.95	I	ug/L	P380084	
		Microcystin WR**	0.50	U	ug/L	P380084	
		Microcystin YR**	0.25	U	ug/L	P380084	
2161949	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P380469	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P380193	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P380286	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P380138	
2161950	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P380062	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380469

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380193

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380286

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380138

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380062

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

Reference Method: EPA 8321B
Batch ID: P380084

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: P380469

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: P380193

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: P380286

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380138

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380062

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.5		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P380084

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	95.4		P	40 - 140
Cylindrospermopsin	96.3		P	40 - 140
Desmethyl microcystin LR	111		P	40 - 140
Microcystin LA	90.8		P	40 - 140
Microcystin LF	115		P	40 - 140
Microcystin LR	105		P	40 - 140
Microcystin LW	93.6		P	40 - 140
Microcystin LY	101		P	40 - 140
Microcystin RR	94.7		P	40 - 140
Microcystin WR	98.3		P	40 - 140
Microcystin YR	88.0		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161949	Ammonia-N	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161949	Kjeldahl Nitrogen	95.8	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380286

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161941	NO2NO3-N	96.4	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380138

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2160934	Total-P	108	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380062

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161950	O-Phosphate-P	96.6	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P380084

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161945	Anatoxin-a	111	104	P/P	40 - 140
2161945	Cylindrospermopsin	99.3	97.4	P/P	40 - 140
2161945	Desmethyl microcystin LR	119	103	P/P	40 - 140
2161945	Microcystin LA	101	93.1	P/P	40 - 140
2161945	Microcystin LF	91.7	97.1	P/P	40 - 140
2161945	Microcystin LR	106	99.5	P/P	40 - 140
2161945	Microcystin LW	89.8	85.1	P/P	40 - 140
2161945	Microcystin LY	102	105	P/P	40 - 140
2161945	Microcystin RR	96.3	89.7	P/P	40 - 140
2161945	Microcystin WR	102	78.3	P/P	40 - 140
2161945	Microcystin YR	96.0	88.8	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P380469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161949	Ammonia-N	0.596	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P380193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161949	Kjeldahl Nitrogen	4.69	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P380286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161941	NO2NO3-N	0.425	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P380138

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2160934	Total-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P380062

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161950	O-Phosphate-P	1.23	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P380084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161945	Anatoxin-a	6.65	Spike	P	0 - 30
2161945	Cylindrospermopsin	1.83	Spike	P	0 - 30
2161945	Desmethyl microcystin LR	14.5	Spike	P	0 - 30
2161945	Microcystin LA	7.54	Spike	P	0 - 30
2161945	Microcystin LF	5.65	Spike	P	0 - 30
2161945	Microcystin LR	6.36	Spike	P	0 - 30
2161945	Microcystin LW	5.42	Spike	P	0 - 30
2161945	Microcystin LY	3.36	Spike	P	0 - 30
2161945	Microcystin RR	6.47	Spike	P	0 - 30
2161945	Microcystin WR	26.0	Spike	P	0 - 30
2161945	Microcystin YR	7.77	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2161945

Field Sample ID: HABCE0011_Lake Arnold

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	111	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A97998

Included Lab Sample IDs: 2161950

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	97.5	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A98013

Included Lab Sample IDs: 2161945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	96.3	92.3	P/P	50 - 160
Cylindrospermopsin	100	104	P/P	60 - 160
Desmethyl microcystin LR	109	116	P/P	60 - 160
Microcystin LA	97.2	98.1	P/P	50 - 160
Microcystin LF	111	112	P/P	60 - 160
Microcystin LR	104	92.4	P/P	60 - 160
Microcystin LW	90.9	102	P/P	60 - 160
Microcystin LY	82.8	111	P/P	60 - 160
Microcystin RR	97.7	96.9	P/P	60 - 160
Microcystin WR	107	101	P/P	60 - 160
Microcystin YR	100	102	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A98061

Included Lab Sample IDs: 2161949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A98065

Included Lab Sample IDs: 2161949

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A98071

Included Lab Sample IDs: 2161949

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A98131

Included Lab Sample IDs: 2161949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	99.7	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	99.8	101	100			0.596
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	95.8	103			4.69
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	96.4	96.8			0.425
EPA 365.1 Rev. 2.0	Total-P	107	108	107			1.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.5	96.6	97.8			1.23
EPA 8321B	Anatoxin-a	95.4	111	104			6.65
	Cylindrospermopsin	96.3	99.3	97.4			1.83
	Desmethyl microcystin LR	111	119	103			14.5
	Microcystin LA	90.8	101	93.1			7.54
	Microcystin LF	115	91.7	97.1			5.65
	Microcystin LR	105	106	99.5			6.36
	Microcystin LW	93.6	89.8	85.1			5.42
	Microcystin LY	101	102	105			3.36
	Microcystin RR	94.7	96.3	89.7			6.47
	Microcystin WR	98.3	102	78.3			26.0
	Microcystin YR	88.0	96.0	88.8			7.77

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2161949
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2161949
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2161949
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2161949
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2161950
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2161945

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	03/04/2020			03/09/2020 15:02	Ping Hua	2161949
EPA 351.2 Rev. 2.0	03/04/2020	03/06/2020 12:00	Sima Feizi	03/09/2020 11:54	Jhamieka S. Greenwood	2161949
EPA 353.2 Rev. 2.0	03/04/2020			03/09/2020 10:31	Beverly Y. Sanders	2161949
EPA 365.1 Rev. 2.0	03/04/2020	03/05/2020 13:48	Yen Ta	03/09/2020 13:31	Benjamin T. Nordmann	2161949
EPA 365.1 Rev. 2.0 dissolved	03/04/2020			03/04/2020 15:48	Carlos Miranda	2161950
EPA 8321B	03/04/2020	03/05/2020 09:00	Juyoung Kim	03/05/2020 11:02	Juyoung Kim	2161945