

Chemical Analysis Report

WQAP-2021-07-08-02

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-06-21-09**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd Ste 232
Orlando, FL 32803
Attn: Leif Boman

For additional information please contact
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 02-AUG-2021 10:45



NON-CONFORMANCE REPORT INCLUDED

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 Rowena - NE Corner

Collection Date/Time: 07/06/2021 15:00

Field ID: HABCE0085_LakeRowena2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2260679	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P400676	
		Cylindrospermopsin	0.18	I	ug/L	P400676	
		Desmethyl microcystin LR	0.25	U	ug/L	P400676	
		Microcystin HIR**	0.25	U	ug/L	P400676	
		Microcystin HtyR**	0.25	U	ug/L	P400676	
		Microcystin LA	0.10	U	ug/L	P400676	
		Microcystin LF	0.10	U	ug/L	P400676	
		Microcystin LR	0.25	U	ug/L	P400676	
		Microcystin LW	0.25	U	ug/L	P400676	
		Microcystin LY	0.10	U	ug/L	P400676	
		Microcystin RR	0.10	U	ug/L	P400676	
		Microcystin WR	0.50	U	ug/L	P400676	
		Microcystin YR	0.25	U	ug/L	P400676	
		Nodularin-R**	0.10	U	ug/L	P400676	
2260680	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P401168	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P401034	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P400727	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P400750	
2260681	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P400696	

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.

Non-Conformance Report

NCR ID: 8925

Event(s)

WQAP-2021-07-08-02

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived late, samples received within the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.

Authorized by/Date: Kerry Tate, Ph.D. 7/9/2021

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401168

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401034

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400727

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400750

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400696

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

Reference Method: EPA 8321B
Batch ID: P400676

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HIR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401168

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401034

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400727

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400750

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: P400696

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	95.0		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P400676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	108		P	40 - 150
Cylindrospermopsin	116		P	40 - 150
Desmethyl microcystin LR	103		P	40 - 150
Microcystin HIR	99.6		P	40 - 150
Microcystin HtyR	110		P	40 - 150
Microcystin LA	107		P	40 - 150
Microcystin LF	102		P	40 - 150
Microcystin LR	100		P	40 - 150
Microcystin LW	101		P	40 - 150
Microcystin LY	106		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	106		P	40 - 150
Microcystin YR	91.9		P	40 - 150
Nodularin-R	112		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P401168

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260603	Ammonia-N	97.4	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P400727

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260649	NO2NO3-N	95.9	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P400750

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260680	Total-P	109	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P400696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260681	O-Phosphate-P	92.7	94.4	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P400676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260576	Anatoxin-a	94.6	84.5	P/P	40 - 150
2260576	Cylindrospermopsin	96.7	86.1	P/P	40 - 150
2260576	Desmethyl microcystin LR	84.1	82.5	P/P	40 - 150
2260576	Microcystin HilR	79.1	74.1	P/P	40 - 150
2260576	Microcystin HtyR	80.5	85.1	P/P	40 - 150
2260576	Microcystin LA	88.4	90.2	P/P	40 - 150
2260576	Microcystin LF	80.9	77.7	P/P	40 - 150
2260576	Microcystin LR	78.8	80.2	P/P	40 - 150
2260576	Microcystin LW	76.6	82.3	P/P	40 - 150
2260576	Microcystin LY	81.0	87.0	P/P	40 - 150
2260576	Microcystin RR	90.5	87.3	P/P	40 - 150
2260576	Microcystin WR	82.8	83.8	P/P	40 - 150
2260576	Microcystin YR	77.3	75.1	P/P	40 - 150
2260576	Nodularin-R	95.9	95.3	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P401168

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260603	Ammonia-N	0.255	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P401034

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260885	Kjeldahl Nitrogen	1.36	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P400727

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260649	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P400750

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260680	Total-P	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P400696

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260681	O-Phosphate-P	1.82	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P400676

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260576	Anatoxin-a	11.3	Spike	P	0 - 30
2260576	Cylindrospermopsin	11.6	Spike	P	0 - 30
2260576	Desmethyl microcystin LR	1.90	Spike	P	0 - 30
2260576	Microcystin HtIR	6.51	Spike	P	0 - 30
2260576	Microcystin HtyR	5.56	Spike	P	0 - 30
2260576	Microcystin LA	2.00	Spike	P	0 - 30
2260576	Microcystin LF	4.03	Spike	P	0 - 30
2260576	Microcystin LR	0.904	Spike	P	0 - 30
2260576	Microcystin LW	7.15	Spike	P	0 - 30
2260576	Microcystin LY	7.19	Spike	P	0 - 30
2260576	Microcystin RR	3.61	Spike	P	0 - 30
2260576	Microcystin WR	1.21	Spike	P	0 - 30
2260576	Microcystin YR	2.83	Spike	P	0 - 30
2260576	Nodularin-R	0.543	Spike	P	0 - 30

Quality Assurance Report Precision

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

Quality Assurance Report Surrogates

Lab Sample ID: 2260679

Field Sample ID: HABCE0085_LakeRowena2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	96.1	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	72.2	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A106501

Included Lab Sample IDs: 2260681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.0	95.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A106510

Included Lab Sample IDs: 2260679

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	95.1	95.4	P/P	50 - 160
Cylindrospermopsin	98.5	100	P/P	50 - 160
Desmethyl microcystin LR	95.4	90.2	P/P	50 - 160
Microcystin HIR	91.7	84.8	P/P	50 - 160
Microcystin HtyR	85.2	93.4	P/P	50 - 160
Microcystin LA	96.2	89.6	P/P	50 - 160
Microcystin LF	81.9	82.9	P/P	50 - 160
Microcystin LR	82.4	88.5	P/P	50 - 160
Microcystin LW	81.7	80.4	P/P	50 - 160
Microcystin LY	89.0	81.6	P/P	50 - 160
Microcystin RR	92.9	97.3	P/P	50 - 160
Microcystin WR	87.1	81.3	P/P	50 - 160
Microcystin YR	78.0	72.8	P/P	50 - 160
Nodularin-R	101	98.3	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A106525

Included Lab Sample IDs: 2260680

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A106559

Included Lab Sample IDs: 2260680

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A106665

Included Lab Sample IDs: 2260680

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A106691

Included Lab Sample IDs: 2260680

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.8	97.1	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	101	97.4	97.0			0.255
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103					1.36
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	97.5	95.9	96.4			0.499
EPA 365.1 Rev. 2.0	Total-P	109	109	109			0.0
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.0	92.7	94.4			1.82
EPA 8321B	Anatoxin-a	108	94.6	84.5			11.3
	Cylindrospermopsin	116	96.7	86.1			11.6
	Desmethyl microcystin LR	103	84.1	82.5			1.90
	Microcystin HiLR	99.6	79.1	74.1			6.51
	Microcystin HtyR	110	80.5	85.1			5.56
	Microcystin LA	107	88.4	90.2			2.00
	Microcystin LF	102	80.9	77.7			4.03
	Microcystin LR	100	78.8	80.2			0.904
	Microcystin LW	101	76.6	82.3			7.15
	Microcystin LY	106	81.0	87.0			7.19
	Microcystin RR	105	90.5	87.3			3.61
	Microcystin WR	106	82.8	83.8			1.21
	Microcystin YR	91.9	77.3	75.1			2.83
	Nodularin-R	112	95.9	95.3			0.543

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2260680
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2260680
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2260680
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2260680
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2260681
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2260679

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	07/08/2021			07/19/2021 14:13	Roberta Tatti	2260680
EPA 351.2 Rev. 2.0	07/08/2021	07/15/2021 13:51	Benjamin T. Nordmann	07/16/2021 15:21	Letuzia M De Oliveira	2260680
EPA 353.2 Rev. 2.0	07/08/2021			07/09/2021 09:52	Beverly Y. Sanders	2260680
EPA 365.1 Rev. 2.0	07/08/2021	07/09/2021 14:46	Simonne.V. Calhoun	07/12/2021 14:25	Shengyu Ding	2260680
EPA 365.1 Rev. 2.0 dissolved	07/08/2021			07/08/2021 14:49	Ping Hua	2260681
EPA 8321B	07/08/2021	07/08/2021 12:00	Pramila Ghimire	07/08/2021 22:59	Pramila Ghimire	2260679