

Chemical Analysis Report

WQAP-2020-09-25-02

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-2020-08-31-53**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Date Certified: 15-OCT-2020 12:48



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 Roberts SE

Collection Date/Time: 09/24/2020 10:00

Field ID: 0045-Lake Roberts 2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2198209	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P387854	
		Cylindrospermopsin**	0.25	U	ug/L	P387854	
		Desmethyl microcystin LR**	0.25	U	ug/L	P387854	
		Microcystin LA**	0.25	U	ug/L	P387854	
		Microcystin LF**	0.25	U	ug/L	P387854	
		Microcystin LR**	0.65	I	ug/L	P387854	
		Microcystin LW**	0.25	U	ug/L	P387854	
		Microcystin LY**	0.25	U	ug/L	P387854	
		Microcystin RR**	0.25	U	ug/L	P387854	
		Microcystin WR**	0.50	U	ug/L	P387854	
		Microcystin YR**	0.25	U	ug/L	P387854	
2198210	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P387889	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P387980	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387913	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P387917	
2198211	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P387881	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387889

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387980

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387913

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387917

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387881

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

Reference Method: EPA 8321B
Batch ID: P387854

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: P387889

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387980

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387913

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387917

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: P387881

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

Reference Method: EPA 8321B
Batch ID: P387854

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	92.7		P	40 - 140
Cylindrospermopsin	94.6		P	40 - 140
Desmethyl microcystin LR	104		P	40 - 140
Microcystin LA	90.1		P	40 - 140
Microcystin LF	113		P	40 - 140
Microcystin LR	107		P	40 - 140
Microcystin LW	97.2		P	40 - 140
Microcystin LY	89.6		P	40 - 140
Microcystin RR	101		P	40 - 140
Microcystin WR	105		P	40 - 140
Microcystin YR	87.0		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387889

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197899	Ammonia-N	94.1	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387980

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198295	Kjeldahl Nitrogen	99.2	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387913

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198190	NO2NO3-N	99.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387917

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197051	Total-P	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198233	O-Phosphate-P	99.7	99.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P387854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198152	Anatoxin-a	81.9	75.6	P/P	40 - 140
2198152	Cylindrospermopsin	70.7	73.0	P/P	40 - 140
2198152	Desmethyl microcystin LR	113	109	P/P	40 - 140
2198152	Microcystin LA	101	87.1	P/P	40 - 140
2198152	Microcystin LF	95.2	80.2	P/P	40 - 140
2198152	Microcystin LR	131	117	P/P	40 - 140
2198152	Microcystin LW	98.1	77.7	P/P	40 - 140
2198152	Microcystin LY	95.2	78.2	P/P	40 - 140
2198152	Microcystin RR	127	113	P/P	40 - 140
2198152	Microcystin WR	104	88.2	P/P	40 - 140
2198152	Microcystin YR	110	98.0	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P387889

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197899	Ammonia-N	1.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P387980

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198295	Kjeldahl Nitrogen	3.48	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P387913

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198190	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P387917

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197051	Total-P	0.105	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P387881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198233	O-Phosphate-P	0.100	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P387854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198152	Anatoxin-a	7.99	Spike	P	0 - 30
2198152	Cylindrospermopsin	3.14	Spike	P	0 - 30
2198152	Desmethyl microcystin LR	3.40	Spike	P	0 - 30
2198152	Microcystin LA	14.9	Spike	P	0 - 30
2198152	Microcystin LF	17.1	Spike	P	0 - 30
2198152	Microcystin LR	11.4	Spike	P	0 - 30
2198152	Microcystin LW	23.2	Spike	P	0 - 30
2198152	Microcystin LY	19.6	Spike	P	0 - 30
2198152	Microcystin RR	11.9	Spike	P	0 - 30
2198152	Microcystin WR	16.7	Spike	P	0 - 30
2198152	Microcystin YR	11.3	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2198209
Field Sample ID: 0045-Lake Roberts 2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	90.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101209

Included Lab Sample IDs: 2198211

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101210

Included Lab Sample IDs: 2198210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.1	96.4	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A101219

Included Lab Sample IDs: 2198209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	98.7	93.1	P/P	50 - 160
Cylindrospermopsin	98.7	94.1	P/P	60 - 160
Desmethyl microcystin LR	105	106	P/P	60 - 160
Microcystin LA	102	100	P/P	50 - 160
Microcystin LF	113	106	P/P	60 - 160
Microcystin LR	104	119	P/P	60 - 160
Microcystin LW	105	110	P/P	60 - 160
Microcystin LY	98.2	93.7	P/P	60 - 160
Microcystin RR	109	111	P/P	60 - 160
Microcystin WR	104	109	P/P	60 - 160
Microcystin YR	93.2	95.2	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101223

Included Lab Sample IDs: 2198210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101274

Included Lab Sample IDs: 2198210

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101288

Included Lab Sample IDs: 2198210

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.4	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	98.7	94.1	96.0			1.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.8	99.2	105			3.48
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.0	99.0	98.5			0.506
EPA 365.1 Rev. 2.0	Total-P	106	107	107			0.105
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.7	99.6			0.100
EPA 8321B	Anatoxin-a	92.7	81.9	75.6			7.99
	Cylindrospermopsin	94.6	70.7	73.0			3.14
	Desmethyl microcystin LR	104	113	109			3.40
	Microcystin LA	90.1	101	87.1			14.9
	Microcystin LF	113	95.2	80.2			17.1
	Microcystin LR	107	131	117			11.4
	Microcystin LW	97.2	98.1	77.7			23.2
	Microcystin LY	89.6	95.2	78.2			19.6
	Microcystin RR	101	127	113			11.9
	Microcystin WR	105	104	88.2			16.7
	Microcystin YR	87.0	110	98.0			11.3

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2198210
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2198210
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2198210
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2198210
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2198211
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2198209

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	09/25/2020			09/26/2020 15:14	Ping Hua	2198210
EPA 351.2 Rev. 2.0	09/25/2020	09/29/2020 15:45	David Boose	09/30/2020 13:09	Elliott Rodriguez	2198210
EPA 353.2 Rev. 2.0	09/25/2020			09/28/2020 10:01	Beverly Y. Sanders	2198210
EPA 365.1 Rev. 2.0	09/25/2020	09/28/2020 12:44	Yen Ta	09/29/2020 12:55	Benjamin T. Nordmann	2198210
EPA 365.1 Rev. 2.0 dissolved	09/25/2020			09/25/2020 17:20	Julia Storbeck	2198211
EPA 8321B	09/25/2020	09/25/2020 13:00	Juyoung Kim	09/27/2020 19:48	Juyoung Kim	2198209