Chemical Analysis Report

WQAP-2022-11-09-02

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-09-19-18**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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3319 Maguire Blvd. Suite 232
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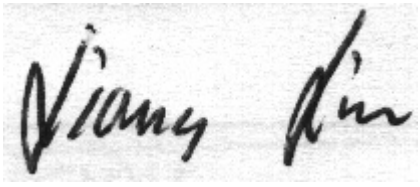
Date Certified: 30-NOV-2022 10:06



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 Ivanhoe - near l4 **Collection Date/Time: 11/08/2022 12:35**

Field ID: HABCE0147_Lake Ivanhoe3 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2368772	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P422102	
		Cylindrospermopsin	0.10	U	ug/L	P422124	
		Desmethyl microcystin LR	0.25	U	ug/L	P422124	
		Microcystin HilR	0.25	U	ug/L	P422124	
		Microcystin HtyR	0.25	U	ug/L	P422124	MS
		Microcystin LA	0.10	U	ug/L	P422124	
		Microcystin LF	0.10	U	ug/L	P422124	
		Microcystin LR	0.25	U	ug/L	P422124	
		Microcystin LW	0.25	U	ug/L	P422124	MS, RPD
		Microcystin LY	0.10	U	ug/L	P422124	
		Microcystin RR	0.10	U	ug/L	P422124	
		Microcystin WR	0.50	U	ug/L	P422124	
		Microcystin YR	0.25	U	ug/L	P422124	
		Nodularin-R	0.10	U	ug/L	P422124	
2368777	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P422215	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P422449	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P422222	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P422383	
2368778	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P422170	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422215

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422449

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422222

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422383

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422170

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

Reference Method: EPA 8321B
Batch ID: P422102

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Reference Method: EPA 8321B
Batch ID: P422124

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	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: P422215

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422449

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422222

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422383

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422170

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.1		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P422102

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	105		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P422124

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	122		P	40 - 150
Desmethyl microcystin LR	118		P	40 - 150
Microcystin HilR	126		P	40 - 150
Microcystin HtyR	127		P	40 - 150
Microcystin LA	136		P	40 - 150
Microcystin LF	132		P	40 - 150
Microcystin LR	117		P	40 - 150
Microcystin LW	118		P	40 - 150
Microcystin LY	132		P	40 - 150
Microcystin RR	111		P	40 - 150
Microcystin WR	115		P	40 - 150
Microcystin YR	115		P	40 - 150
Nodularin-R	120		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2368750	Ammonia-N	98.9	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422449

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2368514	Kjeldahl Nitrogen	99.2	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422222

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2368790	NO2NO3-N	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422383

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2368777	Total-P	98.8	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422170

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2368778	O-Phosphate-P	97.7	98.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P422102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2368176	Anatoxin-a	93.0	96.5	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P422124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2368176	Cylindrospermopsin	121	133	P/P	40 - 150
2368176	Desmethyl microcystin LR	137	149	P/P	40 - 150
2368176	Microcystin HilR	133	147	P/P	40 - 150
2368176	Microcystin HtyR	141	151	P/F	40 - 150
2368176	Microcystin LA	128	116	P/P	40 - 150
2368176	Microcystin LF	135	132	P/P	40 - 150
2368176	Microcystin LR	135	141	P/P	40 - 150
2368176	Microcystin LW	105	153	P/F	40 - 150
2368176	Microcystin LY	125	120	P/P	40 - 150
2368176	Microcystin RR	110	116	P/P	40 - 150
2368176	Microcystin WR	134	145	P/P	40 - 150
2368176	Microcystin YR	128	135	P/P	40 - 150
2368176	Nodularin-R	123	134	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P422215

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368750	Ammonia-N	0.514	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422449

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368514	Kjeldahl Nitrogen	1.12	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368790	NO2NO3-N	0.672	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368777	Total-P	0.795	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368778	O-Phosphate-P	0.612	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P422102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368176	Anatoxin-a	3.70	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P422124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368176	Cylindrospermopsin	9.07	Spike	P	0 - 30
2368176	Desmethyl microcystin LR	8.54	Spike	P	0 - 30
2368176	Microcystin HilR	9.84	Spike	P	0 - 30
2368176	Microcystin HtyR	6.87	Spike	P	0 - 30
2368176	Microcystin LA	10.2	Spike	P	0 - 30
2368176	Microcystin LF	2.47	Spike	P	0 - 30
2368176	Microcystin LR	4.50	Spike	P	0 - 30
2368176	Microcystin LW	36.7	Spike	F	0 - 30
2368176	Microcystin LY	3.79	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P422124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2368176	Microcystin RR	5.23	Spike	P	0 - 30
2368176	Microcystin WR	7.98	Spike	P	0 - 30
2368176	Microcystin YR	5.09	Spike	P	0 - 30
2368176	Nodularin-R	8.27	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2368772
Field Sample ID: HABCE0147_Lake Ivanhoe3

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	120	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	87.1	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A115839
Included Lab Sample IDs: 2368778

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	98.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115861
Included Lab Sample IDs: 2368777

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115863
Included Lab Sample IDs: 2368777

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	108	107	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A115864
Included Lab Sample IDs: 2368772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	122	130	P/P	50 - 160
Desmethyl microcystin LR	134	116	P/P	50 - 160
Microcystin HilR	140	122	P/P	50 - 160
Microcystin HtyR	137	126	P/P	50 - 160
Microcystin LA	139	133	P/P	50 - 160
Microcystin LF	135	134	P/P	50 - 160
Microcystin LR	127	105	P/P	50 - 160
Microcystin LW	143	119	P/P	50 - 160
Microcystin LY	153	131	P/P	50 - 160
Microcystin RR	109	111	P/P	50 - 160
Microcystin WR	130	118	P/P	50 - 160
Microcystin YR	129	102	P/P	50 - 160
Nodularin-R	123	122	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A115865
Included Lab Sample IDs: 2368772

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	96.1	90.8	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116030
Included Lab Sample IDs: 2368777

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116154
Included Lab Sample IDs: 2368777

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.5	91.8	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	99.4	98.9	97.9			0.514
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.5	99.2	98.0			1.12
EPA 353.2 Rev. 2.0	NO2NO3-N	106	99.0	100			0.672
EPA 365.1 Rev. 2.0	Total-P	101	98.8	99.6			0.795
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	97.7	98.3			0.612
EPA 8321B	Anatoxin-a	105	93.0	96.5			3.70
	Cylindrospermopsin	122	121	133			9.07
	Desmethyl microcystin LR	118	137	149			8.54
	Microcystin HilR	126	133	147			9.84
	Microcystin HtyR	127	141	151			6.87
	Microcystin LA	136	128	116			10.2
	Microcystin LF	132	135	132			2.47
	Microcystin LR	117	135	141			4.50
	Microcystin LW	118	105	153			36.7
	Microcystin LY	132	125	120			3.79
	Microcystin RR	111	110	116			5.23
	Microcystin WR	115	134	145			7.98
	Microcystin YR	115	128	135			5.09
	Nodularin-R	120	123	134			8.27

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2368777
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2368777
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2368777
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2368777
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2368778
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2368772
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2368772

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	11/09/2022			11/10/2022 11:57	Ping Hua	2368777
EPA 351.2 Rev. 2.0	11/09/2022	11/17/2022 10:34	Samantha L Bates	11/28/2022 13:58	Judith K. Clark	2368777
EPA 353.2 Rev. 2.0	11/09/2022			11/10/2022 12:42	Beverly Y. Sanders	2368777
EPA 365.1 Rev. 2.0	11/09/2022	11/16/2022 13:00	Simonne.V. Calhoun	11/18/2022 13:03	Simonne.V. Calhoun	2368777
EPA 365.1 Rev. 2.0 dissolved	11/09/2022			11/09/2022 15:23	Elise M. Gillis	2368778
EPA 8321B	11/09/2022	11/10/2022 09:00	Umesh Chiluwal	11/10/2022 12:07	Umesh Chiluwal	2368772
	11/09/2022	11/10/2022 13:00	Umesh Chiluwal	11/10/2022 17:15	Umesh Chiluwal	2368772