Chemical Analysis Report

WQAP-2021-09-10-02

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-2021-09-06-61**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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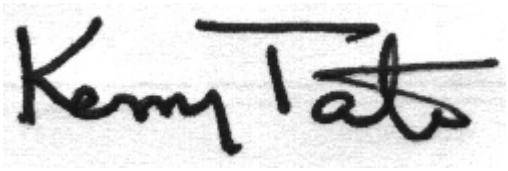
Date Certified: 04-OCT-2021 09:47



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 Anderson - Center **Collection Date/Time: 09/09/2021 09:15**

Field ID: HABOC0004_LakeAnderson Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2275233	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P403579	
		Cylindrospermopsin	0.10	U	ug/L	P403579	
		Desmethyl microcystin LR	0.25	U	ug/L	P403579	
		Microcystin HilR**	0.25	U	ug/L	P403579	
		Microcystin HtyR**	0.25	U	ug/L	P403579	
		Microcystin LA	0.10	U	ug/L	P403579	
		Microcystin LF	0.10	U	ug/L	P403579	
		Microcystin LR	0.25	U	ug/L	P403579	
		Microcystin LW	0.25	U	ug/L	P403579	
		Microcystin LY	0.10	U	ug/L	P403579	
		Microcystin RR	0.10	U	ug/L	P403579	
		Microcystin WR	0.50	U	ug/L	P403579	
		Microcystin YR	0.25	U	ug/L	P403579	
		Nodularin-R**	0.10	U	ug/L	P403579	
2275234	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P403830	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P403630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.047		mg N/L	P403666	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P403671	
2275235	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403602	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403830

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403630

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403666

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403671

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403602

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

Reference Method: EPA 8321B
Batch ID: P403579

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 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: P403830

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403666

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403671

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403602

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P403579

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	82.0		P	40 - 150
Cylindrospermopsin	102		P	40 - 150
Desmethyl microcystin LR	86.3		P	40 - 150
Microcystin HilR	97.4		P	40 - 150
Microcystin HtyR	91.7		P	40 - 150
Microcystin LA	124		P	40 - 150
Microcystin LF	132		P	40 - 150
Microcystin LR	97.0		P	40 - 150
Microcystin LW	115		P	40 - 150
Microcystin LY	124		P	40 - 150
Microcystin RR	111		P	40 - 150
Microcystin WR	88.8		P	40 - 150
Microcystin YR	92.4		P	40 - 150
Nodularin-R	110		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403830

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275009	Ammonia-N	98.0	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2274980	Kjeldahl Nitrogen	98.8	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403666

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275142	NO2NO3-N	96.5	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403671

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2274984	Total-P	107	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275268	O-Phosphate-P	103	103	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P403579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275171	Anatoxin-a	89.1	85.6	P/P	40 - 150
2275171	Cylindrospermopsin	99.8	95.1	P/P	40 - 150
2275171	Desmethyl microcystin LR	81.3	78.8	P/P	40 - 150
2275171	Microcystin HilR	94.9	87.2	P/P	40 - 150
2275171	Microcystin HtyR	94.3	88.1	P/P	40 - 150
2275171	Microcystin LA	118	115	P/P	40 - 150
2275171	Microcystin LF	132	124	P/P	40 - 150
2275171	Microcystin LR	95.1	92.5	P/P	40 - 150
2275171	Microcystin LW	110	105	P/P	40 - 150
2275171	Microcystin LY	123	118	P/P	40 - 150
2275171	Microcystin RR	111	104	P/P	40 - 150
2275171	Microcystin WR	85.9	84.8	P/P	40 - 150
2275171	Microcystin YR	85.4	83.4	P/P	40 - 150
2275171	Nodularin-R	109	104	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403830

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275009	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2274980	Kjeldahl Nitrogen	1.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403666

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275142	NO2NO3-N	0.519	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403671

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2274984	Total-P	0.905	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275268	O-Phosphate-P	0.582	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P403579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275171	Anatoxin-a	4.00	Spike	P	0 - 30
2275171	Cylindrospermopsin	4.83	Spike	P	0 - 30
2275171	Desmethyl microcystin LR	3.04	Spike	P	0 - 30
2275171	Microcystin HilR	8.49	Spike	P	0 - 30
2275171	Microcystin HtyR	6.76	Spike	P	0 - 30
2275171	Microcystin LA	2.91	Spike	P	0 - 30
2275171	Microcystin LF	6.02	Spike	P	0 - 30
2275171	Microcystin LR	2.58	Spike	P	0 - 30
2275171	Microcystin LW	4.23	Spike	P	0 - 30
2275171	Microcystin LY	4.26	Spike	P	0 - 30
2275171	Microcystin RR	6.60	Spike	P	0 - 30
2275171	Microcystin WR	1.29	Spike	P	0 - 30
2275171	Microcystin YR	2.35	Spike	P	0 - 30
2275171	Nodularin-R	4.68	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: 2275233
Field Sample ID: HABOC0004_LakeAnderson

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	91.6	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	68.1	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A107738
Included Lab Sample IDs: 2275235

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A107763
Included Lab Sample IDs: 2275234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107775
Included Lab Sample IDs: 2275234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.0	101	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A107784
Included Lab Sample IDs: 2275233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	87.5	85.4	P/P	50 - 160
Cylindrospermopsin	107	101	P/P	50 - 160
Desmethyl microcystin LR	87.9	89.2	P/P	50 - 160
Microcystin HilR	105	101	P/P	50 - 160
Microcystin HtyR	100	100	P/P	50 - 160
Microcystin LA	139	137	P/P	50 - 160
Microcystin LF	133	128	P/P	50 - 160
Microcystin LR	103	101	P/P	50 - 160
Microcystin LW	121	115	P/P	50 - 160
Microcystin LY	132	127	P/P	50 - 160
Microcystin RR	109	108	P/P	50 - 160
Microcystin WR	87.4	93.1	P/P	50 - 160
Microcystin YR	95.1	92.9	P/P	50 - 160
Nodularin-R	115	112	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107809
Included Lab Sample IDs: 2275234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A107830
Included Lab Sample IDs: 2275234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	98.9	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		Precision		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	98.0	98.0			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.2	98.8	97.2			1.09
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	96.5	96.0			0.519
EPA 365.1 Rev. 2.0	Total-P	105	107	106			0.905
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	103	103			0.582
EPA 8321B	Anatoxin-a	82.0	89.1	85.6			4.00
	Cylindrospermopsin	102	99.8	95.1			4.83
	Desmethyl microcystin LR	86.3	81.3	78.8			3.04
	Microcystin HilR	97.4	94.9	87.2			8.49
	Microcystin HtyR	91.7	94.3	88.1			6.76
	Microcystin LA	124	118	115			2.91
	Microcystin LF	132	132	124			6.02
	Microcystin LR	97.0	95.1	92.5			2.58
	Microcystin LW	115	110	105			4.23
	Microcystin LY	124	123	118			4.26
	Microcystin RR	111	111	104			6.60
	Microcystin WR	88.8	85.9	84.8			1.29
	Microcystin YR	92.4	85.4	83.4			2.35
	Nodularin-R	110	109	104			4.68

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2275234
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2275234
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2275234
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2275234
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2275235
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2275233

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	09/10/2021			09/16/2021 12:31	Ping Hua	2275234
EPA 351.2 Rev. 2.0	09/10/2021	09/13/2021 12:00	Benjamin T. Nordmann	09/14/2021 12:40	Alexandra J Mattheus	2275234
EPA 353.2 Rev. 2.0	09/10/2021			09/14/2021 08:27	Beverly Y. Sanders	2275234
EPA 365.1 Rev. 2.0	09/10/2021	09/14/2021 14:32	Simonne.V. Calhoun	09/15/2021 14:50	Shengyu Ding	2275234
EPA 365.1 Rev. 2.0 dissolved	09/10/2021			09/10/2021 14:50	James L Waggerby	2275235
EPA 8321B	09/10/2021	09/14/2021 09:00	Juyoung Kim	09/14/2021 16:24	Manjita Shrestha	2275233