Chemical Analysis Report

WQAP-2020-02-14-01

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-2020-01-20-11**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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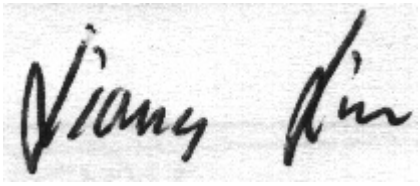
Date Certified: 06-MAR-2020 16:56



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 Grace @ SE Corner **Collection Date/Time: 02/13/2020 10:10**

Field ID: HABCE0002_Lake Grace Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2157670	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P378956	
		Cylindrospermopsin**	0.25	U	ug/L	P378956	
		Desmethyl microcystin LR**	0.25	U	ug/L	P378956	
		Microcystin LA**	0.25	U	ug/L	P378956	
		Microcystin LF**	0.25	U	ug/L	P378956	
		Microcystin LR**	0.25	U	ug/L	P378956	
		Microcystin LW**	0.25	U	ug/L	P378956	
		Microcystin LY**	0.25	U	ug/L	P378956	
		Microcystin RR**	0.25	U	ug/L	P378956	
		Microcystin WR**	0.50	U	ug/L	P378956	
		Microcystin YR**	0.25	U	ug/L	P378956	
2157672	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P379456	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P379262	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P379548	
	EPA 365.1 Rev. 2.0	Total-P	0.042		mg P/L	P379088	
2157673	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P378972	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379456

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379262

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379548

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379088

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378972

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

Reference Method: EPA 8321B
Batch ID: P378956

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: P379456

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379548

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: P379088

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: P378972

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.3		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P378956

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	105		P	40 - 140
Cylindrospermopsin	92.8		P	40 - 140
Desmethyl microcystin LR	90.8		P	40 - 140
Microcystin LA	87.2		P	40 - 140
Microcystin LF	80.0		P	40 - 140
Microcystin LR	95.1		P	40 - 140
Microcystin LW	80.3		P	40 - 140
Microcystin LY	108		P	40 - 140
Microcystin RR	89.0		P	40 - 140
Microcystin WR	90.1		P	40 - 140
Microcystin YR	88.7		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379456

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157672	Ammonia-N	95.0	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157672	Kjeldahl Nitrogen	101	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157573	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2155663	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378972

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157673	O-Phosphate-P	97.5	91.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P378956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157658	Anatoxin-a	126	114	P/P	40 - 140
2157658	Cylindrospermopsin	93.2	80.9	P/P	40 - 140
2157658	Desmethyl microcystin LR	106	105	P/P	40 - 140
2157658	Microcystin LA	95.0	86.0	P/P	40 - 140
2157658	Microcystin LF	95.1	88.2	P/P	40 - 140
2157658	Microcystin LR	95.8	95.8	P/P	40 - 140
2157658	Microcystin LW	79.6	75.1	P/P	40 - 140
2157658	Microcystin LY	91.8	102	P/P	40 - 140
2157658	Microcystin RR	101	97.4	P/P	40 - 140
2157658	Microcystin WR	98.9	84.9	P/P	40 - 140
2157658	Microcystin YR	108	88.7	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157672	Ammonia-N	1.48	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157672	Kjeldahl Nitrogen	3.60	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157573	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2155663	Total-P	0.807	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378972

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157673	O-Phosphate-P	5.86	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P378956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157658	Anatoxin-a	10.1	Spike	P	0 - 30
2157658	Cylindrospermopsin	14.1	Spike	P	0 - 30
2157658	Desmethyl microcystin LR	1.31	Spike	P	0 - 30
2157658	Microcystin LA	9.94	Spike	P	0 - 30
2157658	Microcystin LF	7.47	Spike	P	0 - 30
2157658	Microcystin LR	0.0360	Spike	P	0 - 30
2157658	Microcystin LW	5.79	Spike	P	0 - 30
2157658	Microcystin LY	10.3	Spike	P	0 - 30
2157658	Microcystin RR	3.24	Spike	P	0 - 30
2157658	Microcystin WR	15.2	Spike	P	0 - 30
2157658	Microcystin YR	19.8	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2157670
Field Sample ID: HABCE0002_Lake Grace

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	102	P	30 - 165
EPA 8321B	Microcystin LR-d7	118	P	40 - 150

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A97554
Included Lab Sample IDs: 2157673

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.2	97.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A97643
Included Lab Sample IDs: 2157672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	106	103	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A97669
Included Lab Sample IDs: 2157670

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	103	99.0	P/P	50 - 160
Cylindrospermopsin	85.7	97.4	P/P	60 - 160
Desmethyl microcystin LR	100	117	P/P	60 - 160
Microcystin LA	115	93.3	P/P	50 - 160
Microcystin LF	105	92.9	P/P	60 - 160
Microcystin LR	102	110	P/P	60 - 160
Microcystin LW	93.3	87.5	P/P	60 - 160
Microcystin LY	88.0	97.9	P/P	60 - 160
Microcystin RR	103	104	P/P	60 - 160
Microcystin WR	104	103	P/P	60 - 160
Microcystin YR	103	106	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A97709
Included Lab Sample IDs: 2157672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.4	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A97754
Included Lab Sample IDs: 2157672

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A97758
Included Lab Sample IDs: 2157672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	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	99.5	95.0	96.6			1.48
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.8	101	107			3.60
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.0	99.0			0.0
EPA 365.1 Rev. 2.0	Total-P	105	106	105			0.807
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.3	97.5	91.7			5.86
EPA 8321B	Anatoxin-a	105	126	114			10.1
	Cylindrospermopsin	92.8	93.2	80.9			14.1
	Desmethyl microcystin LR	90.8	106	105			1.31
	Microcystin LA	87.2	95.0	86.0			9.94
	Microcystin LF	80.0	95.1	88.2			7.47
	Microcystin LR	95.1	95.8	95.8			0.0360
	Microcystin LW	80.3	79.6	75.1			5.79
	Microcystin LY	108	91.8	102			10.3
	Microcystin RR	89.0	101	97.4			3.24
	Microcystin WR	90.1	98.9	84.9			15.2
	Microcystin YR	88.7	108	88.7			19.8

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2157672
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2157672
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2157672
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2157672
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2157673
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2157670

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	02/14/2020			02/21/2020 09:33	Ping Hua	2157672
EPA 351.2 Rev. 2.0	02/14/2020	02/20/2020 13:30	Sima Feizi	02/21/2020 07:50	Jhamieka S. Greenwood	2157672
EPA 353.2 Rev. 2.0	02/14/2020			02/24/2020 11:38	Beverly Y. Sanders	2157672
EPA 365.1 Rev. 2.0	02/14/2020	02/17/2020 17:00	Yen Ta	02/18/2020 17:51	Benjamin T. Nordmann	2157672
EPA 365.1 Rev. 2.0 dissolved	02/14/2020			02/14/2020 15:05	Carlos Miranda	2157673
EPA 8321B	02/14/2020	02/19/2020 08:45	Juyoung Kim	02/20/2020 00:16	Juyoung Kim	2157670