

Chemical Analysis Report

WQAP-2020-12-02-01

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

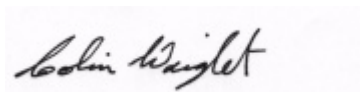
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2020-10-19-42**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 14-DEC-2020 09:39

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light-colored rectangular background.

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: IRL @ Cocoa Village Marina

Collection Date/Time: 12/01/2020 11:41

Field ID: HABCE0051_IRLFishKill1

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2209823	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P390597	
		Cylindrospermopsin**	0.25	U	ug/L	P390597	
		Desmethyl microcystin LR**	0.25	U	ug/L	P390597	
		Microcystin LA**	0.25	U	ug/L	P390597	
		Microcystin LF**	0.25	U	ug/L	P390597	
		Microcystin LR**	0.25	U	ug/L	P390597	
		Microcystin LW**	0.25	U	ug/L	P390597	
		Microcystin LY**	0.25	U	ug/L	P390597	
		Microcystin RR**	0.25	U	ug/L	P390597	
		Microcystin WR**	0.50	U	ug/L	P390597	
		Microcystin YR**	0.25	U	ug/L	P390597	
2209827	EPA 350.1 Rev. 2.0	Saxitoxin**	5.0	U	ug/L	P390598	
		Ammonia-N	1.1		mg N/L	P390726	
		Kjeldahl Nitrogen	3.1		mg N/L	P390707	
		NO2NO3-N	0.004	U	mg N/L	P390761	
2209831	EPA 351.2 Rev. 2.0	Total-P	0.20		mg P/L	P390664	
		O-Phosphate-P	0.093		mg P/L	P390636	

Ref. Method and Comment:

EPA 8321B: MDL elevated due to required dilution of sample matrix.

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390726

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390707

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390761

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390664

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390636

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

Reference Method: EPA 8321B
Batch ID: P390597

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

Reference Method: EPA 8321B
Batch ID: P390598

Component	Result	Code	Units
Saxitoxin	0.50	U	ug/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390726

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390707

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390761

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390664

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: P390636

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

Reference Method: EPA 8321B
Batch ID: P390597

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	109		P	40 - 140
Cylindrospermopsin	91.8		P	40 - 140
Desmethyl microcystin LR	119		P	40 - 140
Microcystin LA	102		P	40 - 140
Microcystin LF	79.0		P	40 - 140
Microcystin LR	108		P	40 - 140
Microcystin LW	84.4		P	40 - 140
Microcystin LY	99.4		P	40 - 140
Microcystin RR	84.8		P	40 - 140
Microcystin WR	103		P	40 - 140
Microcystin YR	107		P	40 - 140

Reference Method: EPA 8321B
Batch ID: P390598

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Saxitoxin	156		P	40 - 160

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390761

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209449	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209373	Total-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209879	O-Phosphate-P	108	109	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P390597

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209823	Anatoxin-a	109	105	P/P	40 - 140
2209823	Cylindrospermopsin	97.6	97.3	P/P	40 - 140
2209823	Desmethyl microcystin LR	85.5	81.9	P/P	40 - 140
2209823	Microcystin LA	85.0	86.2	P/P	40 - 140
2209823	Microcystin LF	54.9	53.8	P/P	40 - 140
2209823	Microcystin LR	67.0	66.4	P/P	40 - 140
2209823	Microcystin LW	63.7	56.5	P/P	40 - 140
2209823	Microcystin LY	80.6	75.6	P/P	40 - 140
2209823	Microcystin RR	81.8	76.1	P/P	40 - 140
2209823	Microcystin WR	76.6	85.9	P/P	40 - 140
2209823	Microcystin YR	80.8	84.1	P/P	40 - 140

Reference Method: EPA 8321B
Batch ID: P390598

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209823	Saxitoxin	67.6	61.9	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209607	Ammonia-N	0.131	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209859	Kjeldahl Nitrogen	3.59	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390761

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209449	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209373	Total-P	0.214	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209879	O-Phosphate-P	0.618	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P390597

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209823	Anatoxin-a	3.21	Spike	P	0 - 30
2209823	Cylindrospermopsin	0.308	Spike	P	0 - 30
2209823	Desmethyl microcystin LR	4.28	Spike	P	0 - 30
2209823	Microcystin LA	1.38	Spike	P	0 - 30
2209823	Microcystin LF	2.08	Spike	P	0 - 30
2209823	Microcystin LR	0.990	Spike	P	0 - 30
2209823	Microcystin LW	12.0	Spike	P	0 - 30
2209823	Microcystin LY	6.41	Spike	P	0 - 30
2209823	Microcystin RR	7.22	Spike	P	0 - 30
2209823	Microcystin WR	11.4	Spike	P	0 - 30
2209823	Microcystin YR	3.95	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P390598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209823	Saxitoxin	8.95	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2209823

Field Sample ID: HABCE0051_IRLFishKill1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	80.4	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	65.7	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	48.5	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A102376
Included Lab Sample IDs: 2209823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	102	118	P/P	50 - 160
Cylindrospermopsin	99.2	95.8	P/P	60 - 160
Desmethyl microcystin LR	105	95.8	P/P	60 - 160
Microcystin LA	109	105	P/P	50 - 160
Microcystin LF	88.7	76.8	P/P	50 - 160
Microcystin LR	94.7	98.4	P/P	60 - 160
Microcystin LW	94.8	85.8	P/P	60 - 160
Microcystin LY	94.7	102	P/P	60 - 160
Microcystin RR	80.3	105	P/P	60 - 160
Microcystin WR	111	102	P/P	60 - 160
Microcystin YR	94.6	99.6	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102382
Included Lab Sample IDs: 2209831

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.0	96.9	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A102390
Included Lab Sample IDs: 2209823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Saxitoxin	126	128	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A102421
Included Lab Sample IDs: 2209827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A102429
Included Lab Sample IDs: 2209827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102442
Included Lab Sample IDs: 2209827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102501

Included Lab Sample IDs: 2209827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	97.3	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	97.4					0.131
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.4					3.59
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	100	99.5			0.501
EPA 365.1 Rev. 2.0	Total-P	105	103	104			0.214
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	108	109			0.618
EPA 8321B	Anatoxin-a	109	109	105			3.21
	Cylindrospermopsin	91.8	97.6	97.3			0.308
	Desmethyl microcystin LR	119	85.5	81.9			4.28
	Microcystin LA	102	85.0	86.2			1.38
	Microcystin LF	79.0	54.9	53.8			2.08
	Microcystin LR	108	67.0	66.4			0.990
	Microcystin LW	84.4	63.7	56.5			12.0
	Microcystin LY	99.4	80.6	75.6			6.41
	Microcystin RR	84.8	81.8	76.1			7.22
	Microcystin WR	103	76.6	85.9			11.4
	Microcystin YR	107	80.8	84.1			3.95
	Saxitoxin	156	61.9	67.6			8.95

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2209827
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2209827
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2209827
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2209827
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2209831
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2209823
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2209823

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	12/02/2020			12/05/2020 16:54	Ping Hua	2209827
EPA 351.2 Rev. 2.0	12/02/2020	12/04/2020 13:24	David Boose	12/09/2020 14:39	Julia Storbeck	2209827
EPA 353.2 Rev. 2.0	12/02/2020			12/07/2020 10:54	Beverly Y. Sanders	2209827
EPA 365.1 Rev. 2.0	12/02/2020	12/03/2020 13:21	Yen Ta	12/04/2020 13:03	Benjamin T. Nordmann	2209827
EPA 365.1 Rev. 2.0 dissolved	12/02/2020			12/02/2020 16:09	Blanca Fach	2209831
EPA 8321B	12/02/2020	12/02/2020 11:40	Juyoung Kim	12/03/2020 10:47	Pramila Ghimire	2209823
	12/02/2020	12/02/2020 12:00	Juyoung Kim	12/02/2020 16:32	Mohammad Ghaffari	2209823