

Chemical Analysis Report

WQAP-2020-12-01-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2020-08-24-12**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 18-DEC-2020 18:03



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: Canal on SE 26th St

Collection Date/Time: 11/30/2020 09:55

Field ID: HAB_SD_113020_01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2209624	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	
2209625	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P390725	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P390710	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P390594	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P390665	
2209626	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.075		mg P/L	P390578	MS

Ref. Method and Comment:

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: P390725

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390710

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390710

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209710	Ammonia-N	97.6	95.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209574	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209604	Total-P	105	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209596	O-Phosphate-P	89.5	89.5	F/F	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

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209710	Ammonia-N	1.75	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390710

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209694	Kjeldahl Nitrogen	7.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209574	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209604	Total-P	1.64	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209596	O-Phosphate-P	0.0	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

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

Quality Assurance Report Surrogates

Lab Sample ID: 2209624
Field Sample ID: HAB_SD_113020_01

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	90.1	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	78.4	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A102355

Included Lab Sample IDs: 2209626

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102364

Included Lab Sample IDs: 2209625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A102376

Included Lab Sample IDs: 2209624

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

Run ID: A102421

Included Lab Sample IDs: 2209625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	106	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102429

Included Lab Sample IDs: 2209625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.1	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102501

Included Lab Sample IDs: 2209625

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 SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	97.6	95.8			1.75
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101					7.62
EPA 353.2 Rev. 2.0	NO2NO3-N	101	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	104	105	108			1.64
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	89.5	89.5			0.0
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

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2209625
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2209625
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2209625
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2209625
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2209626
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2209624

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	12/01/2020			12/05/2020 15:12	Ping Hua	2209625
EPA 351.2 Rev. 2.0	12/01/2020	12/04/2020 13:24	David Boose	12/09/2020 14:53	Julia Storbeck	2209625
EPA 353.2 Rev. 2.0	12/01/2020			12/02/2020 10:01	Beverly Y. Sanders	2209625
EPA 365.1 Rev. 2.0	12/01/2020	12/03/2020 13:21	Yen Ta	12/04/2020 13:17	Benjamin T. Nordmann	2209625
EPA 365.1 Rev. 2.0 dissolved	12/01/2020			12/01/2020 16:14	Blanca Fach	2209626
EPA 8321B	12/01/2020	12/02/2020 12:00	Juyoung Kim	12/02/2020 16:15	Mohammad Ghaffari	2209624