

Chemical Analysis Report

WQAP-2020-02-20-03

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

Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2020-02-10-30**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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13051 N. Telecom Parkway
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Attn: Matthew Bearden

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

Date Certified: 12-MAR-2020 18:30



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 Deer - Center

Collection Date/Time: 02/19/2020 10:30

Field ID: HAB-SW-0003

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2159416	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P379241	
		Cylindrospermopsin**	0.25	U	ug/L	P379241	
		Desmethyl microcystin LR**	0.25	U	ug/L	P379241	
		Microcystin LA**	1.1		ug/L	P379241	
		Microcystin LF**	0.25	U	ug/L	P379241	
		Microcystin LR**	0.25	U	ug/L	P379241	
		Microcystin LW**	0.25	U	ug/L	P379241	
		Microcystin LY**	0.25	U	ug/L	P379241	
		Microcystin RR**	0.25	U	ug/L	P379241	
		Microcystin WR**	0.50	U	ug/L	P379241	
		Microcystin YR**	0.25	U	ug/L	P379241	
2159417	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P379728	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P379586	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P380021	
	EPA 365.1 Rev. 2.0	Total-P	0.058		mg P/L	P379894	
2159418	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P379319	

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: P379728

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379586

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380021

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379894

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P379319

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

Reference Method: EPA 8321B
Batch ID: P379241

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: P379728

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.3		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P379586

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P380021

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P379894

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P379319

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

Reference Method: EPA 8321B
 Batch ID: P379241

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	127		P	40 - 140
Cylindrospermopsin	111		P	40 - 140
Desmethyl microcystin LR	102		P	40 - 140
Microcystin LA	114		P	40 - 140
Microcystin LF	93.1		P	40 - 140
Microcystin LR	105		P	40 - 140
Microcystin LW	96.9		P	40 - 140
Microcystin LY	108		P	40 - 140
Microcystin RR	110		P	40 - 140
Microcystin WR	109		P	40 - 140
Microcystin YR	110		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P379728

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2159373	Ammonia-N	99.7	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P380021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2158916	NO2NO3-N	96.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P379894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2159417	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P379319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2159418	O-Phosphate-P	98.8	100	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P379241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2159416	Anatoxin-a	132	126	P/P	40 - 140
2159416	Cylindrospermopsin	96.5	97.6	P/P	40 - 140
2159416	Desmethyl microcystin LR	95.6	98.6	P/P	40 - 140
2159416	Microcystin LA	86.8	91.9	P/P	40 - 140
2159416	Microcystin LF	84.2	81.1	P/P	40 - 140
2159416	Microcystin LR	92.1	106	P/P	40 - 140
2159416	Microcystin LW	89.1	80.4	P/P	40 - 140
2159416	Microcystin LY	91.9	94.2	P/P	40 - 140
2159416	Microcystin RR	91.7	97.5	P/P	40 - 140
2159416	Microcystin WR	99.0	84.7	P/P	40 - 140
2159416	Microcystin YR	95.2	115	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379728

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2159373	Ammonia-N	1.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2159581	Kjeldahl Nitrogen	3.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158916	NO2NO3-N	0.513	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2159417	Total-P	0.546	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P379319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2159418	O-Phosphate-P	1.31	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P379241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2159416	Anatoxin-a	4.33	Spike	P	0 - 30
2159416	Cylindrospermopsin	1.16	Spike	P	0 - 30
2159416	Desmethyl microcystin LR	3.08	Spike	P	0 - 30
2159416	Microcystin LA	5.11	Spike	P	0 - 30
2159416	Microcystin LF	3.81	Spike	P	0 - 30
2159416	Microcystin LR	14.4	Spike	P	0 - 30
2159416	Microcystin LW	10.3	Spike	P	0 - 30
2159416	Microcystin LY	2.43	Spike	P	0 - 30
2159416	Microcystin RR	6.11	Spike	P	0 - 30
2159416	Microcystin WR	15.6	Spike	P	0 - 30
2159416	Microcystin YR	19.0	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2159416
Field Sample ID: HAB-SW-0003

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	111	P	30 - 165
EPA 8321B	Microcystin LR-d7	129	P	40 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A97669
Included Lab Sample IDs: 2159416

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.9	101	P/P	50 - 160
Cylindrospermopsin	100	101	P/P	60 - 160
Desmethyl microcystin LR	84.4	89.8	P/P	60 - 160
Microcystin LA	93.9	82.2	P/P	50 - 160
Microcystin LF	84.0	88.1	P/P	60 - 160
Microcystin LR	95.9	100	P/P	60 - 160
Microcystin LW	73.9	77.1	P/P	60 - 160
Microcystin LY	95.8	80.9	P/P	60 - 160
Microcystin RR	95.2	61.1	P/P	60 - 160
Microcystin WR	90.5	91.9	P/P	60 - 160
Microcystin YR	93.6	104	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A97691
Included Lab Sample IDs: 2159418

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	97.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A97843
Included Lab Sample IDs: 2159417

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A97849
Included Lab Sample IDs: 2159417

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A97974
Included Lab Sample IDs: 2159417

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98036
Included Lab Sample IDs: 2159417

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	98.6	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	99.3	99.7	101			1.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103					3.33
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	96.5	97.5			0.513
EPA 365.1 Rev. 2.0	Total-P	103	104	105			0.546
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	98.8	100			1.31
EPA 8321B	Anatoxin-a	127	132	126			4.33
	Cylindrospermopsin	111	96.5	97.6			1.16
	Desmethyl microcystin LR	102	95.6	98.6			3.08
	Microcystin LA	114	86.8	91.9			5.11
	Microcystin LF	93.1	84.2	81.1			3.81
	Microcystin LR	105	92.1	106			14.4
	Microcystin LW	96.9	89.1	80.4			10.3
	Microcystin LY	108	91.9	94.2			2.43
	Microcystin RR	110	91.7	97.5			6.11
	Microcystin WR	109	99.0	84.7			15.6
	Microcystin YR	110	95.2	115			19.0

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2159417
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2159417
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2159417
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2159417
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2159418
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2159416

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	02/20/2020			02/26/2020 10:24	Ping Hua	2159417
EPA 351.2 Rev. 2.0	02/20/2020	02/25/2020 15:00	Sima Feizi	02/26/2020 17:53	Jhamieka S. Greenwood	2159417
EPA 353.2 Rev. 2.0	02/20/2020			03/03/2020 10:46	Beverly Y. Sanders	2159417
EPA 365.1 Rev. 2.0	02/20/2020	03/02/2020 16:52	Yen Ta	03/03/2020 14:58	Benjamin T. Nordmann	2159417
EPA 365.1 Rev. 2.0 dissolved	02/20/2020			02/20/2020 17:08	Samantha Davila	2159418
EPA 8321B	02/20/2020	02/20/2020 11:00	Juyoung Kim	02/20/2020 13:55	Juyoung Kim	2159416