Chemical Analysis Report

WQAP-2021-10-27-03

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-2021-05-24-38**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637
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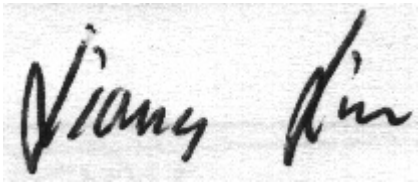
Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-NOV-2021 09:39



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 Panasoffkee East of Center **Collection Date/Time: 10/26/2021 11:00**

Field ID: HAB-SW-0044 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2286294	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P405661	
		Cylindrospermopsin	0.10	U	ug/L	P405661	
		Desmethyl microcystin LR	0.25	U	ug/L	P405661	
		Microcystin HilR**	0.25	U	ug/L	P405661	
		Microcystin HtyR**	0.25	U	ug/L	P405661	
		Microcystin LA	0.10	U	ug/L	P405661	
		Microcystin LF	0.10	U	ug/L	P405661	
		Microcystin LR	0.26	I	ug/L	P405661	
		Microcystin LW	0.25	U	ug/L	P405661	
		Microcystin LY	0.10	U	ug/L	P405661	
		Microcystin RR	0.10	U	ug/L	P405661	
		Microcystin WR	0.50	U	ug/L	P405661	
		Microcystin YR	0.25	U	ug/L	P405661	
		Nodularin-R**	0.10	U	ug/L	P405661	
2286295	EPA 350.1 Rev. 2.0	Ammonia-N	0.20		mg N/L	P406064	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P405823	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P405757	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P405864	
2286296	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P405679	

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: P406064

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405823

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405757

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405864

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405679

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

Reference Method: EPA 8321B
Batch ID: P405661

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: P406064

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405823

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: P405757

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: P405864

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405679

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P405661

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	117		P	40 - 150
Cylindrospermopsin	111		P	40 - 150
Desmethyl microcystin LR	133		P	40 - 150
Microcystin HilR	110		P	40 - 150
Microcystin HtyR	105		P	40 - 150
Microcystin LA	114		P	40 - 150
Microcystin LF	107		P	40 - 150
Microcystin LR	132		P	40 - 150
Microcystin LW	110		P	40 - 150
Microcystin LY	121		P	40 - 150
Microcystin RR	110		P	40 - 150
Microcystin WR	115		P	40 - 150
Microcystin YR	115		P	40 - 150
Nodularin-R	115		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406064

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286384	Ammonia-N	96.4	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286295	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284548	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405679

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286296	O-Phosphate-P	98.5	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P405661

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286179	Anatoxin-a	110	115	P/P	40 - 150
2286179	Cylindrospermopsin	84.5	86.3	P/P	40 - 150
2286179	Desmethyl microcystin LR	118	114	P/P	40 - 150
2286179	Microcystin HilR	93.1	98.4	P/P	40 - 150
2286179	Microcystin HtyR	84.8	91.6	P/P	40 - 150
2286179	Microcystin LA	89.0	95.5	P/P	40 - 150
2286179	Microcystin LF	87.0	91.0	P/P	40 - 150
2286179	Microcystin LR	112	116	P/P	40 - 150
2286179	Microcystin LW	86.5	85.6	P/P	40 - 150
2286179	Microcystin LY	102	107	P/P	40 - 150
2286179	Microcystin RR	95.7	104	P/P	40 - 150
2286179	Microcystin WR	86.5	94.1	P/P	40 - 150
2286179	Microcystin YR	93.1	105	P/P	40 - 150
2286179	Nodularin-R	100	108	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P406064

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286384	Ammonia-N	1.21	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286295	Kjeldahl Nitrogen	5.77	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286295	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284548	Total-P	0.950	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405679

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286296	O-Phosphate-P	0.713	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P405661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286179	Anatoxin-a	4.56	Spike	P	0 - 30
2286179	Cylindrospermopsin	2.08	Spike	P	0 - 30
2286179	Desmethyl microcystin LR	3.32	Spike	P	0 - 30
2286179	Microcystin HilR	5.56	Spike	P	0 - 30
2286179	Microcystin HtyR	7.72	Spike	P	0 - 30
2286179	Microcystin LA	7.01	Spike	P	0 - 30
2286179	Microcystin LF	4.53	Spike	P	0 - 30
2286179	Microcystin LR	3.87	Spike	P	0 - 30
2286179	Microcystin LW	1.05	Spike	P	0 - 30
2286179	Microcystin LY	4.69	Spike	P	0 - 30
2286179	Microcystin RR	8.04	Spike	P	0 - 30
2286179	Microcystin WR	8.41	Spike	P	0 - 30
2286179	Microcystin YR	12.0	Spike	P	0 - 30
2286179	Nodularin-R	7.35	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: 2286294
Field Sample ID: HAB-SW-0044

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	115	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	149	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A108565
Included Lab Sample IDs: 2286296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.9	98.6	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A108598
Included Lab Sample IDs: 2286294

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	98.5	97.0	P/P	50 - 160
Cylindrospermopsin	85.0	81.8	P/P	50 - 160
Desmethyl microcystin LR	96.7	107	P/P	50 - 160
Microcystin HilR	79.5	88.6	P/P	50 - 160
Microcystin HtyR	81.2	80.2	P/P	50 - 160
Microcystin LA	85.8	90.6	P/P	50 - 160
Microcystin LF	82.9	85.0	P/P	50 - 160
Microcystin LR	99.1	103	P/P	50 - 160
Microcystin LW	83.8	87.1	P/P	50 - 160
Microcystin LY	88.8	95.9	P/P	50 - 160
Microcystin RR	81.3	79.8	P/P	50 - 160
Microcystin WR	82.3	92.2	P/P	50 - 160
Microcystin YR	86.3	91.0	P/P	50 - 160
Nodularin-R	83.6	86.9	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A108614
Included Lab Sample IDs: 2286295

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A108661
Included Lab Sample IDs: 2286295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A108720
Included Lab Sample IDs: 2286295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A108743
Included Lab Sample IDs: 2286295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.0	96.8	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	98.0	96.4	97.8			1.21
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101					5.77
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	99.5			1.00
EPA 365.1 Rev. 2.0	Total-P	100	106	105			0.950
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	98.5	97.8			0.713
EPA 8321B	Anatoxin-a	117	110	115			4.56
	Cylindrospermopsin	111	84.5	86.3			2.08
	Desmethyl microcystin LR	133	118	114			3.32
	Microcystin HilR	110	93.1	98.4			5.56
	Microcystin HtyR	105	84.8	91.6			7.72
	Microcystin LA	114	89.0	95.5			7.01
	Microcystin LF	107	87.0	91.0			4.53
	Microcystin LR	132	112	116			3.87
	Microcystin LW	110	86.5	85.6			1.05
	Microcystin LY	121	102	107			4.69
	Microcystin RR	110	95.7	104			8.04
	Microcystin WR	115	86.5	94.1			8.41
	Microcystin YR	115	93.1	105			12.0
	Nodularin-R	115	100	108			7.35

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2286295
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2286295
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2286295
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2286295
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2286296
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2286294

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	10/27/2021			11/04/2021 13:20	Ping Hua	2286295
EPA 351.2 Rev. 2.0	10/27/2021	11/01/2021 13:20	Benjamin T. Nordmann	11/02/2021 13:01	Alexandra J Mattheus	2286295
EPA 353.2 Rev. 2.0	10/27/2021			10/29/2021 10:15	Beverly Y. Sanders	2286295
EPA 365.1 Rev. 2.0	10/27/2021	11/02/2021 16:18	Simonne.V. Calhoun	11/03/2021 17:00	Sarah A Nixon	2286295
EPA 365.1 Rev. 2.0 dissolved	10/27/2021			10/27/2021 14:47	James L Waggerby	2286296
EPA 8321B	10/27/2021	10/28/2021 12:00	Manjita Shrestha	10/28/2021 18:27	Manjita Shrestha	2286294