Chemical Analysis Report

WQAP-2021-10-14-01

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

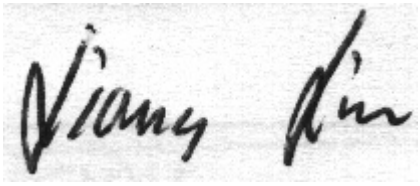
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2021-10-11-66**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-NOV-2021 14:20



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 Ida - Lakeview Park **Collection Date/Time: 10/13/2021 15:00**

Field ID: SEHAB0069 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2283379	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P405028	
		Cylindrospermopsin	0.10	U	ug/L	P405028	
		Desmethyl microcystin LR	0.25	U	ug/L	P405028	
		Microcystin HilR**	0.25	U	ug/L	P405028	
		Microcystin HtyR**	0.25	U	ug/L	P405028	
		Microcystin LA	0.10	U	ug/L	P405028	
		Microcystin LF	0.10	U	ug/L	P405028	
		Microcystin LR	0.25	U	ug/L	P405028	
		Microcystin LW	0.25	U	ug/L	P405028	
		Microcystin LY	0.10	U	ug/L	P405028	
		Microcystin RR	0.10	U	ug/L	P405028	
		Microcystin WR	0.50	U	ug/L	P405028	
		Microcystin YR	0.25	U	ug/L	P405028	
		Nodularin-R**	0.10	U	ug/L	P405028	
2283380	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P405439	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P405476	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P405581	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P405210	
2283381	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P405079	

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: P405439

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405476

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405581

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405210

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405079

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

Reference Method: EPA 8321B
Batch ID: P405028

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: P405439

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405476

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: P405581

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: P405210

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: P405079

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

Reference Method: EPA 8321B
Batch ID: P405028

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	68.6		P	40 - 150
Cylindrospermopsin	73.4		P	40 - 150
Desmethyl microcystin LR	78.0		P	40 - 150
Microcystin HilR	79.2		P	40 - 150
Microcystin HtyR	82.5		P	40 - 150
Microcystin LA	79.6		P	40 - 150
Microcystin LF	78.2		P	40 - 150
Microcystin LR	74.0		P	40 - 150
Microcystin LW	79.9		P	40 - 150
Microcystin LY	83.2		P	40 - 150
Microcystin RR	75.3		P	40 - 150
Microcystin WR	77.4		P	40 - 150
Microcystin YR	85.6		P	40 - 150
Nodularin-R	71.1		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405439

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283318	Ammonia-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405581

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283351	NO2NO3-N	95.3	94.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283396	Total-P	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283333	O-Phosphate-P	96.1	96.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P405028

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283379	Anatoxin-a	87.9	86.7	P/P	40 - 150
2283379	Cylindrospermopsin	81.4	83.2	P/P	40 - 150
2283379	Desmethyl microcystin LR	89.3	93.5	P/P	40 - 150
2283379	Microcystin HilR	96.1	97.3	P/P	40 - 150
2283379	Microcystin HtyR	99.6	102	P/P	40 - 150
2283379	Microcystin LA	89.5	90.2	P/P	40 - 150
2283379	Microcystin LF	91.9	90.3	P/P	40 - 150
2283379	Microcystin LR	91.2	90.0	P/P	40 - 150
2283379	Microcystin LW	90.1	92.4	P/P	40 - 150
2283379	Microcystin LY	97.9	96.0	P/P	40 - 150
2283379	Microcystin RR	91.7	92.0	P/P	40 - 150
2283379	Microcystin WR	91.4	94.6	P/P	40 - 150
2283379	Microcystin YR	97.2	94.2	P/P	40 - 150
2283379	Nodularin-R	87.9	90.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405439

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283318	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283431	Kjeldahl Nitrogen	0.163	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283351	NO2NO3-N	0.390	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283396	Total-P	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283333	O-Phosphate-P	0.0996	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P405028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283379	Anatoxin-a	1.36	Spike	P	0 - 30
2283379	Cylindrospermopsin	2.17	Spike	P	0 - 30
2283379	Desmethyl microcystin LR	4.58	Spike	P	0 - 30
2283379	Microcystin HilR	1.22	Spike	P	0 - 30
2283379	Microcystin HtyR	2.37	Spike	P	0 - 30
2283379	Microcystin LA	0.751	Spike	P	0 - 30
2283379	Microcystin LF	1.83	Spike	P	0 - 30
2283379	Microcystin LR	1.26	Spike	P	0 - 30
2283379	Microcystin LW	2.50	Spike	P	0 - 30
2283379	Microcystin LY	1.98	Spike	P	0 - 30
2283379	Microcystin RR	0.303	Spike	P	0 - 30
2283379	Microcystin WR	3.49	Spike	P	0 - 30
2283379	Microcystin YR	3.17	Spike	P	0 - 30
2283379	Nodularin-R	3.24	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: 2283379
Field Sample ID: SEHAB0069

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	107	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	96.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A108340
Included Lab Sample IDs: 2283379

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	97.0	96.5	P/P	50 - 160
Cylindrospermopsin	94.9	97.1	P/P	50 - 160
Desmethyl microcystin LR	101	104	P/P	50 - 160
Microcystin HilR	111	117	P/P	50 - 160
Microcystin HtyR	111	116	P/P	50 - 160
Microcystin LA	103	107	P/P	50 - 160
Microcystin LF	103	102	P/P	50 - 160
Microcystin LR	103	108	P/P	50 - 160
Microcystin LW	103	105	P/P	50 - 160
Microcystin LY	105	110	P/P	50 - 160
Microcystin RR	95.0	105	P/P	50 - 160
Microcystin WR	102	113	P/P	50 - 160
Microcystin YR	104	107	P/P	50 - 160
Nodularin-R	94.1	97.6	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A108345
Included Lab Sample IDs: 2283381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A108435
Included Lab Sample IDs: 2283380

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A108476
Included Lab Sample IDs: 2283380

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A108513
Included Lab Sample IDs: 2283380

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A108532
Included Lab Sample IDs: 2283380

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	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	97.0	99.0	99.0			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101					0.163
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	95.3	94.8			0.390
EPA 365.1 Rev. 2.0	Total-P	104	105	104			1.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	96.1	96.2			0.0996
EPA 8321B	Anatoxin-a	68.6	87.9	86.7			1.36
	Cylindrospermopsin	73.4	81.4	83.2			2.17
	Desmethyl microcystin LR	78.0	89.3	93.5			4.58
	Microcystin HilR	79.2	96.1	97.3			1.22
	Microcystin HtyR	82.5	99.6	102			2.37
	Microcystin LA	79.6	89.5	90.2			0.751
	Microcystin LF	78.2	91.9	90.3			1.83
	Microcystin LR	74.0	91.2	90.0			1.26
	Microcystin LW	79.9	90.1	92.4			2.50
	Microcystin LY	83.2	97.9	96.0			1.98
	Microcystin RR	75.3	91.7	92.0			0.303
	Microcystin WR	77.4	91.4	94.6			3.49
	Microcystin YR	85.6	97.2	94.2			3.17
	Nodularin-R	71.1	87.9	90.8			3.24

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2283380
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2283380
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2283380
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2283380
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2283381
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2283379

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	10/14/2021			10/21/2021 13:10	Ping Hua	2283380
EPA 351.2 Rev. 2.0	10/14/2021	10/22/2021 12:45	Benjamin T. Nordmann	10/25/2021 11:52	Alexandra J Mattheus	2283380
EPA 353.2 Rev. 2.0	10/14/2021			10/26/2021 10:24	Virginia P. Brown	2283380
EPA 365.1 Rev. 2.0	10/14/2021	10/19/2021 16:46	Simonne.V. Calhoun	10/20/2021 12:12	Lipi Saha	2283380
EPA 365.1 Rev. 2.0 dissolved	10/14/2021			10/14/2021 14:42	Blanca Fach	2283381
EPA 8321B	10/14/2021	10/14/2021 12:00	Manjita Shrestha	10/14/2021 14:51	Manjita Shrestha	2283379