Chemical Analysis Report

WQAP-2023-09-06-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-07-24-36**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 18-SEP-2023 11:56

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: C44 Canal - Timer Powers Park **Collection Date/Time: 09/05/2023 12:15**

Field ID: SEHAB0046 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2434174	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P434594	
		Cylindrospermopsin	0.10	U	ug/L	P434595	
		Desmethyl microcystin LR	0.25	U	ug/L	P434595	
		Microcystin HilR	0.25	U	ug/L	P434595	
		Microcystin HtyR	0.25	U	ug/L	P434595	
		Microcystin LA	0.10	U	ug/L	P434595	
		Microcystin LF	0.10	U	ug/L	P434595	
		Microcystin LR	0.25	U	ug/L	P434595	
		Microcystin LW	0.25	U	ug/L	P434595	
		Microcystin LY	0.10	U	ug/L	P434595	
		Microcystin RR	0.10	U	ug/L	P434595	
		Microcystin WR	0.50	U	ug/L	P434595	
		Neosaxitoxin	0.50	U	ug/L	P434594	
		Microcystin YR	0.25	U	ug/L	P434595	
		Saxitoxin	0.50	U	ug/L	P434594	
		Nodularin-R	0.10	U	ug/L	P434595	
2434175	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P434682	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P434765	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P434871	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P434663	
2434176	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.098		mg P/L	P434622	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries and relative percent difference are unavailable because of analytical difficulties.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434682

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434765

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434871

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434663

Component	Result	Code	Units
Total-P	0.010	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P434622

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

Reference Method: EPA 8321B
Batch ID: P434594

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Reference Method: EPA 8321B
Batch ID: P434595

Component	Result	Code	Units
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: P434682

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: P434765

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434871

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: P434663

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: P434622

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.2		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P434594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	106		P	40 - 150
Neosaxitoxin	89.3		P	40 - 150
Saxitoxin	99.8		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P434595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	105		P	40 - 160
Desmethyl microcystin LR	103		P	40 - 160
Microcystin HilR	99.6		P	40 - 160
Microcystin HtyR	98.4		P	40 - 160
Microcystin LA	99.8		P	40 - 160
Microcystin LF	93.1		P	40 - 160
Microcystin LR	89.1		P	40 - 160
Microcystin LW	83.6		P	40 - 160
Microcystin LY	95.2		P	40 - 160
Microcystin RR	104		P	40 - 160
Microcystin WR	100		P	40 - 160
Microcystin YR	86.2		P	40 - 160
Nodularin-R	103		P	40 - 160

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2434027	Ammonia-N	98.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2433643	NO2NO3-N	92.1	91.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2434175	Total-P	106	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P434622

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2434513	O-Phosphate-P	99.6	99.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P434594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2434174	Anatoxin-a	105	102	P/P	40 - 150
2434174	Neosaxitoxin	57.9	57.1	P/P	40 - 150
2434174	Saxitoxin	72.2	68.6	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P434595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2434174	Cylindrospermopsin	97.7	89.2	P/P	40 - 160
2434174	Desmethyl microcystin LR	98.7	83.5	P/P	40 - 160
2434174	Microcystin HilR	90.7	78.6	P/P	40 - 160
2434174	Microcystin HtyR	94.5	79.4	P/P	40 - 160
2434174	Microcystin LA	93.9	83.4	P/P	40 - 160
2434174	Microcystin LF	98.7	83.9	P/P	40 - 160
2434174	Microcystin LR	87.1	70.6	P/P	40 - 160
2434174	Microcystin LW	83.6	78.0	P/P	40 - 160
2434174	Microcystin LY	85.8	76.7	P/P	40 - 160
2434174	Microcystin RR	92.9	81.2	P/P	40 - 160
2434174	Microcystin WR	88.8	83.9	P/P	40 - 160
2434174	Microcystin YR	88.5	76.6	P/P	40 - 160
2434174	Nodularin-R	98.1	78.1	P/P	40 - 160

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2434027	Ammonia-N	1.78	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2433643	NO2NO3-N	0.545	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2434175	Total-P	0.944	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P434622

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2434513	O-Phosphate-P	0.301	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P434594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2434174	Anatoxin-a	2.75	Spike	P	0 - 30
2434174	Neosaxitoxin	1.33	Spike	P	0 - 30
2434174	Saxitoxin	5.11	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P434595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2434174	Cylindrospermopsin	9.12	Spike	P	0 - 30
2434174	Desmethyl microcystin LR	16.6	Spike	P	0 - 30
2434174	Microcystin HilR	14.4	Spike	P	0 - 30
2434174	Microcystin HtyR	17.4	Spike	P	0 - 30
2434174	Microcystin LA	11.9	Spike	P	0 - 30
2434174	Microcystin LF	16.2	Spike	P	0 - 30
2434174	Microcystin LR	21.0	Spike	P	0 - 30
2434174	Microcystin LW	6.94	Spike	P	0 - 30
2434174	Microcystin LY	11.2	Spike	P	0 - 30
2434174	Microcystin RR	13.4	Spike	P	0 - 30
2434174	Microcystin WR	5.71	Spike	P	0 - 30
2434174	Microcystin YR	14.5	Spike	P	0 - 30
2434174	Nodularin-R	22.7	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: 2434174
Field Sample ID: SEHAB0046

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	100	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	82.2	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A121378
Included Lab Sample IDs: 2434176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	98.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A121396
Included Lab Sample IDs: 2434174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.0	87.9	P/P	50 - 160
Neosaxitoxin	81.4	85.6	P/P	50 - 160
Saxitoxin	96.1	95.9	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A121398
Included Lab Sample IDs: 2434174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	97.8	101	P/P	60 - 160
Desmethyl microcystin LR	100	92.1	P/P	50 - 160
Microcystin HilR	94.7	91.0	P/P	60 - 160
Microcystin HtyR	89.7	89.6	P/P	60 - 160
Microcystin LA	96.9	89.9	P/P	50 - 160
Microcystin LF	97.3	90.1	P/P	60 - 160
Microcystin LR	84.8	80.5	P/P	60 - 160
Microcystin LW	80.4	79.2	P/P	60 - 160
Microcystin LY	85.0	80.3	P/P	60 - 160
Microcystin RR	95.6	94.3	P/P	60 - 160
Microcystin WR	96.3	90.7	P/P	60 - 160
Microcystin YR	85.2	76.8	P/P	60 - 160
Nodularin-R	96.9	93.2	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A121407
Included Lab Sample IDs: 2434175

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121423
Included Lab Sample IDs: 2434175

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A121481
Included Lab Sample IDs: 2434175

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.5	97.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A121510
Included Lab Sample IDs: 2434175

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	98.1	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		Precision		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	98.4	101			1.78
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.6					
EPA 353.2 Rev. 2.0	NO2NO3-N	101	92.1	91.6			0.545
EPA 365.1 Rev. 2.0	Total-P	104	106	108			0.944
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	99.6	99.9			0.301
EPA 8321B	Anatoxin-a	106	105	102			2.75
	Cylindrospermopsin	105	97.7	89.2			9.12
	Desmethyl microcystin LR	103	98.7	83.5			16.6
	Microcystin HilR	99.6	90.7	78.6			14.4
	Microcystin HtyR	98.4	94.5	79.4			17.4
	Microcystin LA	99.8	93.9	83.4			11.9
	Microcystin LF	93.1	98.7	83.9			16.2
	Microcystin LR	89.1	87.1	70.6			21.0
	Microcystin LW	83.6	83.6	78.0			6.94
	Microcystin LY	95.2	85.8	76.7			11.2
	Microcystin RR	104	92.9	81.2			13.4
	Microcystin WR	100	88.8	83.9			5.71
	Microcystin YR	86.2	88.5	76.6			14.5
	Neosaxitoxin	89.3	57.9	57.1			1.33
	Nodularin-R	103	98.1	78.1			22.7
	Saxitoxin	99.8	72.2	68.6			5.11

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2434175
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2434175
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2434175
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2434175
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2434176
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2434174
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2434174

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	09/06/2023			09/07/2023 12:02	Khloe J Berg	2434175
EPA 351.2 Rev. 2.0	09/06/2023	09/11/2023 14:51	Simonne.V. Calhoun	09/13/2023 14:07	Samantha L Bates	2434175
EPA 353.2 Rev. 2.0	09/06/2023			09/12/2023 12:23	Anna M. Plaviak	2434175
EPA 365.1 Rev. 2.0	09/06/2023	09/07/2023 14:07	Adam P Silver	09/08/2023 11:40	James L Waggerby	2434175
EPA 365.1 Rev. 2.0 dissolved	09/06/2023			09/06/2023 15:29	Elise M. Gillis	2434176
EPA 8321B	09/06/2023	09/06/2023 12:00	Tae K Lee	09/06/2023 15:47	Hana Lee	2434174
	09/06/2023	09/06/2023 12:00	Tae K Lee	09/06/2023 17:25	Hana Lee	2434174