Chemical Analysis Report

WQAP-2023-06-28-01

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

Event Description: **Algae Bloom Response NEROC-as needed**
Request ID: **RQ-2023-05-22-64**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 14-JUL-2023 10:54

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: ICW - Vilano Point **Collection Date/Time: 06/27/2023 10:10**

Field ID: NEHAB0104 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2420080	DEP SOP: NU-094-1	Color (true)	3.5	I	PCU	P431887	
2420081	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P431993	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33	I	mg N/L	P431901	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P432111	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P431902	
2420082	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P431895	
2420085	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P431852	
		Cylindrospermopsin	0.10	U	ug/L	P431851	
		Desmethyl microcystin LR	0.25	U	ug/L	P431851	
		Microcystin HilR	0.25	U	ug/L	P431851	
		Microcystin HtyR	0.25	U	ug/L	P431851	
		Microcystin LA	0.10	U	ug/L	P431851	
		Microcystin LF	0.10	U	ug/L	P431851	
		Microcystin LR	0.25	U	ug/L	P431851	
		Microcystin LW	0.25	U	ug/L	P431851	
		Microcystin LY	0.10	U	ug/L	P431851	
		Microcystin RR	0.10	U	ug/L	P431851	
		Microcystin WR	0.50	U	ug/L	P431851	
		Neosaxitoxin	0.50	U	ug/L	P431852	
		Microcystin YR	0.25	U	ug/L	P431851	
		Saxitoxin	0.50	U	ug/L	P431852	
		Nodularin-R	0.10	U	ug/L	P431851	

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P431887

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431993

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431901

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432111

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431902

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431895

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

Reference Method: EPA 8321B
Batch ID: P431851

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
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P431852

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P431887

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431993

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431901

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432111

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431902

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431895

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

Reference Method: EPA 8321B
Batch ID: P431851

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	87.8		P	40 - 150
Desmethyl microcystin LR	79.7		P	40 - 150
Microcystin HilR	93.2		P	40 - 150
Microcystin HtyR	98.1		P	40 - 150
Microcystin LA	102		P	40 - 150
Microcystin LF	87.9		P	40 - 150
Microcystin LR	84.8		P	40 - 150
Microcystin LW	75.2		P	40 - 150
Microcystin LY	90.5		P	40 - 150
Microcystin RR	77.1		P	40 - 150
Microcystin WR	87.6		P	40 - 150
Microcystin YR	95.1		P	40 - 150
Nodularin-R	90.8		P	40 - 150

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P431852

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	102		P	40 - 150
Neosaxitoxin	83.2		P	40 - 150
Saxitoxin	90.9		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431993

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2420081	Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431901

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419987	Kjeldahl Nitrogen	96.6	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419960	NO2NO3-N	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419984	Total-P	97.3	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431895

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2420082	O-Phosphate-P	103	103	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P431851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419770	Cylindrospermopsin	104	103	P/P	40 - 150
2419770	Desmethyl microcystin LR	97.9	104	P/P	40 - 150
2419770	Microcystin HilR	96.0	100	P/P	40 - 150
2419770	Microcystin HtyR	99.0	109	P/P	40 - 150
2419770	Microcystin LA	96.8	115	P/P	40 - 150
2419770	Microcystin LF	107	115	P/P	40 - 150
2419770	Microcystin LR	97.1	104	P/P	40 - 150
2419770	Microcystin LW	71.0	85.5	P/P	40 - 150
2419770	Microcystin LY	106	121	P/P	40 - 150
2419770	Microcystin RR	83.0	82.8	P/P	40 - 150
2419770	Microcystin WR	89.0	100	P/P	40 - 150
2419770	Microcystin YR	103	105	P/P	40 - 150
2419770	Nodularin-R	100	103	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P431852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419770	Anatoxin-a	95.5	80.2	P/P	40 - 150
2419770	Neosaxitoxin	84.5	73.4	P/P	40 - 150
2419770	Saxitoxin	97.8	82.9	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P431887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2420049	Color (true)	0.00300	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431993

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2420081	Ammonia-N	1.05	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431901

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419987	Kjeldahl Nitrogen	5.59	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419960	NO2NO3-N	1.42	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419984	Total-P	0.103	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431895

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2420082	O-Phosphate-P	0.728	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P431851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419770	Cylindrospermopsin	0.695	Spike	P	0 - 30
2419770	Desmethyl microcystin LR	6.01	Spike	P	0 - 30
2419770	Microcystin HilR	4.61	Spike	P	0 - 30
2419770	Microcystin HtyR	9.23	Spike	P	0 - 30
2419770	Microcystin LA	17.1	Spike	P	0 - 30
2419770	Microcystin LF	7.60	Spike	P	0 - 30
2419770	Microcystin LR	7.10	Spike	P	0 - 30
2419770	Microcystin LW	18.5	Spike	P	0 - 30
2419770	Microcystin LY	13.1	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P431851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419770	Microcystin RR	0.238	Spike	P	0 - 30
2419770	Microcystin WR	11.7	Spike	P	0 - 30
2419770	Microcystin YR	1.07	Spike	P	0 - 30
2419770	Nodularin-R	3.15	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P431852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419770	Anatoxin-a	17.3	Spike	P	0 - 30
2419770	Neosaxitoxin	14.1	Spike	P	0 - 30
2419770	Saxitoxin	16.5	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2420085
Field Sample ID: NEHAB0104

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	37.8	P	30 - 160
EPA 8321B	Saxitoxin-15N7	31.0	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: DEP SOP: NU-094-1
Run ID: A120075
Included Lab Sample IDs: 2420080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A120079
Included Lab Sample IDs: 2420082

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	100	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A120080
Included Lab Sample IDs: 2420085

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	102	96.8	P/P	50 - 160
Neosaxitoxin	84.4	82.1	P/P	50 - 160
Saxitoxin	88.7	86.7	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A120090
Included Lab Sample IDs: 2420085

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	99.8	96.2	P/P	50 - 160
Desmethyl microcystin LR	100	81.0	P/P	50 - 160
Microcystin HilR	96.6	84.9	P/P	50 - 160
Microcystin HtyR	109	95.0	P/P	50 - 160
Microcystin LA	118	82.4	P/P	50 - 160
Microcystin LF	69.7	61.5	P/P	50 - 160
Microcystin LR	102	91.0	P/P	50 - 160
Microcystin LW	76.0	62.8	P/P	50 - 160
Microcystin LY	120	107	P/P	50 - 160
Microcystin RR	88.4	88.2	P/P	50 - 160
Microcystin WR	97.3	88.1	P/P	50 - 160
Microcystin YR	105	96.5	P/P	50 - 160
Nodularin-R	109	99.1	P/P	50 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A120125
Included Lab Sample IDs: 2420081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A120133
Included Lab Sample IDs: 2420081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.4	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A120158
Included Lab Sample IDs: 2420081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A120192
Included Lab Sample IDs: 2420081

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	103	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
DEP SOP: NU-094-1	Color (true)	98.5				0.0030	
EPA 350.1 Rev. 2.0	Ammonia-N	96.8	102	103			1.05
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.4	96.6	103			5.59
EPA 353.2 Rev. 2.0	NO2NO3-N	104	105	106			1.42
EPA 365.1 Rev. 2.0	Total-P	98.1	97.3	97.4			0.103
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	103	103			0.728
EPA 8321B	Anatoxin-a	102	95.5	80.2			17.3
	Cylindrospermopsin	87.8	104	103			0.695
	Desmethyl microcystin LR	79.7	97.9	104			6.01
	Microcystin HilR	93.2	96.0	100			4.61
	Microcystin HtyR	98.1	99.0	109			9.23
	Microcystin LA	102	96.8	115			17.1
	Microcystin LF	87.9	107	115			7.60
	Microcystin LR	84.8	97.1	104			7.10
	Microcystin LW	75.2	71.0	85.5			18.5
	Microcystin LY	90.5	106	121			13.1
	Microcystin RR	77.1	83.0	82.8			0.238
	Microcystin WR	87.6	89.0	100			11.7
	Microcystin YR	95.1	103	105			1.07
	Neosaxitoxin	83.2	84.5	73.4			14.1
	Nodularin-R	90.8	100	103			3.15
	Saxitoxin	90.9	97.8	82.9			16.5

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2420080
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2420081
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2420081
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2420081
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2420081
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2420082
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2420085
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2420085

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	06/28/2023			06/28/2023 14:37	Alexis Price	2420080
EPA 350.1 Rev. 2.0	06/28/2023			06/30/2023 12:28	Khloe J Berg	2420081
EPA 351.2 Rev. 2.0	06/28/2023	06/29/2023 12:06	Simonne.V. Calhoun	06/30/2023 12:33	Samantha L Bates	2420081
EPA 353.2 Rev. 2.0	06/28/2023			07/06/2023 14:18	Judith K. Clark	2420081
EPA 365.1 Rev. 2.0	06/28/2023	06/29/2023 16:14	Adam P Silver	06/30/2023 15:23	James L Waggerby	2420081
EPA 365.1 Rev. 2.0 dissolved	06/28/2023			06/28/2023 16:44	Elise M. Gillis	2420082
EPA 8321B	06/28/2023	06/28/2023 15:30	Hana Lee	06/29/2023 09:49	Tae K Lee	2420085
	06/28/2023	06/28/2023 16:00	Hana Lee	06/29/2023 02:09	Tae K Lee	2420085