

Chemical Analysis Report

WQAP-2023-03-31-01

Florida DEP Laboratory
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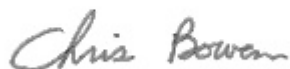
Event Description: **Algal Bloom Response - Orange Co**
Request ID: **RQ-2023-03-27-49**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Orlando, FL 32083
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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 20-APR-2023 08:40



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 Ola - NE Shore

Collection Date/Time: 03/30/2023 09:30

Field ID: HABOC0016_Lake Ola

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2397223	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P427957	
		Cylindrospermopsin	0.10	U	ug/L	P427956	
		Desmethyl microcystin LR	0.25	U	ug/L	P427956	
		Microcystin H1R	0.25	U	ug/L	P427956	
		Microcystin HtyR	0.25	U	ug/L	P427956	
		Microcystin LA	0.10	U	ug/L	P427956	
		Microcystin LF	0.10	U	ug/L	P427956	
		Microcystin LR	0.25	U	ug/L	P427956	
		Microcystin LW	0.25	U	ug/L	P427956	
		Microcystin LY	0.10	U	ug/L	P427956	
		Microcystin RR	0.10	U	ug/L	P427956	
		Microcystin WR	0.50	U	ug/L	P427956	
		Neosaxitoxin	0.50	U	ug/L	P427957	
		Microcystin YR	0.25	U	ug/L	P427956	
		Saxitoxin	0.50	U	ug/L	P427957	
		Nodularin-R	0.10	U	ug/L	P427956	
2397224	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P427999	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P428584	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P427996	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P428044	
2397225	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P427931	

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: P427999

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428584

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427996

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428044

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427931

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

Reference Method: EPA 8321B
Batch ID: P427956

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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

Reference Method: EPA 8321B
Batch ID: P427957

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: EPA 350.1 Rev. 2.0
Batch ID: P427999

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P428584

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427996

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: P428044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427931

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

Reference Method: EPA 8321B
Batch ID: P427956

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	97.8		P	40 - 150
Desmethyl microcystin LR	94.7		P	40 - 150
Microcystin H1R	108		P	40 - 150
Microcystin HtyR	107		P	40 - 150
Microcystin LA	105		P	40 - 150
Microcystin LF	88.7		P	40 - 150
Microcystin LR	95.6		P	40 - 150
Microcystin LW	106		P	40 - 150
Microcystin LY	106		P	40 - 150
Microcystin RR	102		P	40 - 150
Microcystin WR	106		P	40 - 150
Microcystin YR	104		P	40 - 150
Nodularin-R	108		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	73.4		P	40 - 150
Neosaxitoxin	99.2		P	40 - 150
Saxitoxin	77.7		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427999

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2397224	Ammonia-N	98.4	97.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427996

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2397224	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P428044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396766	Total-P	98.9	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2397322	O-Phosphate-P	98.0	98.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P427956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2397200	Cylindrospermopsin	97.6	100	P/P	40 - 150
2397200	Desmethyl microcystin LR	113	111	P/P	40 - 150
2397200	Microcystin HilR	115	117	P/P	40 - 150
2397200	Microcystin HtyR	113	121	P/P	40 - 150
2397200	Microcystin LA	97.2	109	P/P	40 - 150
2397200	Microcystin LF	90.9	104	P/P	40 - 150
2397200	Microcystin LR	114	112	P/P	40 - 150
2397200	Microcystin LW	91.7	105	P/P	40 - 150
2397200	Microcystin LY	90.5	88.7	P/P	40 - 150
2397200	Microcystin RR	97.6	98.7	P/P	40 - 150
2397200	Microcystin WR	117	115	P/P	40 - 150
2397200	Microcystin YR	117	119	P/P	40 - 150
2397200	Nodularin-R	110	104	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427957

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2397200	Anatoxin-a	69.9	74.5	P/P	40 - 150
2397200	Neosaxitoxin	69.4	74.5	P/P	40 - 150
2397200	Saxitoxin	62.5	64.6	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P427999

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2397224	Ammonia-N	0.768	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P428584

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2397775	Kjeldahl Nitrogen	0.0563	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P427996

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2397224	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P428044

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396766	Total-P	2.44	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P427931

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2397322	O-Phosphate-P	0.347	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P427956

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2397200	Cylindrospermopsin	2.65	Spike	P	0 - 30
2397200	Desmethyl microcystin LR	1.97	Spike	P	0 - 30
2397200	Microcystin H1LR	1.70	Spike	P	0 - 30
2397200	Microcystin HtyR	7.08	Spike	P	0 - 30
2397200	Microcystin LA	11.6	Spike	P	0 - 30
2397200	Microcystin LF	13.1	Spike	P	0 - 30
2397200	Microcystin LR	1.18	Spike	P	0 - 30
2397200	Microcystin LW	13.7	Spike	P	0 - 30
2397200	Microcystin LY	1.93	Spike	P	0 - 30
2397200	Microcystin RR	1.10	Spike	P	0 - 30
2397200	Microcystin WR	2.14	Spike	P	0 - 30
2397200	Microcystin YR	1.77	Spike	P	0 - 30
2397200	Nodularin-R	5.13	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P427957

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2397200	Anatoxin-a	6.38	Spike	P	0 - 30
2397200	Neosaxitoxin	7.09	Spike	P	0 - 30
2397200	Saxitoxin	3.38	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2397223
Field Sample ID: HABOC0016_Lake Ola

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	94.7	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	75.0	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A118320

Included Lab Sample IDs: 2397225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	97.8	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A118348

Included Lab Sample IDs: 2397223

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	95.7	87.1	P/P	50 - 160
Desmethyl microcystin LR	87.7	91.1	P/P	50 - 160
Microcystin HtIR	95.7	98.0	P/P	50 - 160
Microcystin HtyR	102	103	P/P	50 - 160
Microcystin LA	95.2	105	P/P	50 - 160
Microcystin LF	98.5	76.4	P/P	50 - 160
Microcystin LR	98.5	98.7	P/P	50 - 160
Microcystin LW	104	79.7	P/P	50 - 160
Microcystin LY	73.9	84.9	P/P	50 - 160
Microcystin RR	98.1	97.6	P/P	50 - 160
Microcystin WR	100	99.4	P/P	50 - 160
Microcystin YR	101	104	P/P	50 - 160
Nodularin-R	101	97.6	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A118349

Included Lab Sample IDs: 2397223

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	63.2	65.3	P/P	50 - 160
Neosaxitoxin	84.6	89.4	P/P	50 - 160
Saxitoxin	69.3	70.5	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A118361

Included Lab Sample IDs: 2397224

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A118362

Included Lab Sample IDs: 2397224

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A118417

Included Lab Sample IDs: 2397224

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	100	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A118660

Included Lab Sample IDs: 2397224

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	98.5	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	96.6	98.4	97.6			0.768
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102					0.0563
EPA 353.2 Rev. 2.0	NO2NO3-N	104	106	106			0.0
EPA 365.1 Rev. 2.0	Total-P	97.2	98.9	95.8			2.44
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	98.0	98.4			0.347
EPA 8321B	Anatoxin-a	73.4	69.9	74.5			6.38
	Cylindrospermopsin	97.8	97.6	100			2.65
	Desmethyl microcystin LR	94.7	113	111			1.97
	Microcystin HiLR	108	115	117			1.70
	Microcystin HtyR	107	113	121			7.08
	Microcystin LA	105	97.2	109			11.6
	Microcystin LF	88.7	90.9	104			13.1
	Microcystin LR	95.6	114	112			1.18
	Microcystin LW	106	91.7	105			13.7
	Microcystin LY	106	90.5	88.7			1.93
	Microcystin RR	102	97.6	98.7			1.10
	Microcystin WR	106	117	115			2.14
	Microcystin YR	104	117	119			1.77
	Neosaxitoxin	99.2	69.4	74.5			7.09
	Nodularin-R	108	110	104			5.13
	Saxitoxin	77.7	62.5	64.6			3.38

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2397224
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2397224
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2397224
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2397224
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2397225
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2397223
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2397223

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	03/31/2023			04/04/2023 12:49	Khloe J Berg	2397224
EPA 351.2 Rev. 2.0	03/31/2023	04/18/2023 09:03	Simonne.V. Calhoun	04/19/2023 12:33	Samantha L Bates	2397224
EPA 353.2 Rev. 2.0	03/31/2023			04/04/2023 10:57	Beverly Y. Sanders	2397224
EPA 365.1 Rev. 2.0	03/31/2023	04/05/2023 14:22	Adam P Silver	04/06/2023 12:56	Simonne.V. Calhoun	2397224
EPA 365.1 Rev. 2.0 dissolved	03/31/2023			03/31/2023 15:28	Elise M. Gillis	2397225
EPA 8321B	03/31/2023	03/31/2023 16:00	Manjita Shrestha	04/03/2023 19:18	Manjita Shrestha	2397223
	03/31/2023	03/31/2023 16:00	Manjita Shrestha	04/03/2023 22:39	Manjita Shrestha	2397223