Chemical Analysis Report

WQAP-2022-07-08-05

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

Event Description: **Algal Bloom Response- NEROC**
Request ID: **RQ-2022-07-04-53**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256
Attn: Jeremy Parrish

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: Colin Wright, Program Administrator

Date Certified: 27-JUL-2022 16:42

NON-CONFORMANCE REPORT INCLUDED

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: Doctor's Lake @ Mill Cove **Collection Date/Time: 07/07/2022 11:15**

Field ID: NEHAB0057 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2340105	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416330	
		Cylindrospermopsin	0.10	U	ug/L	P416327	
		Desmethyl microcystin LR	0.25	U	ug/L	P416327	
		Microcystin HilR	0.25	U	ug/L	P416327	
		Microcystin HtyR	0.25	U	ug/L	P416327	
		Microcystin LA	0.10	U	ug/L	P416327	
		Microcystin LF	0.10	U	ug/L	P416327	
		Microcystin LR	2.0		ug/L	P416327	
		Microcystin LW	0.25	U	ug/L	P416327	
		Microcystin LY	0.10	U	ug/L	P416327	
		Microcystin RR	0.10	U	ug/L	P416327	
		Microcystin WR	0.50	U	ug/L	P416327	
		Microcystin YR	0.25	U	ug/L	P416327	
		Nodularin-R	0.10	U	ug/L	P416327	
2340111	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P416783	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P416463	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416856	
	EPA 365.1 Rev. 2.0	Total-P	0.083		mg P/L	P416599	
2340117	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P416361	

Sample Location: Dr's Lake at end of Lawrence Rd **Collection Date/Time: 07/07/2022 10:15**

Field ID: NEHAB0073 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2340106	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416330	
		Cylindrospermopsin	0.10	U	ug/L	P416327	
		Desmethyl microcystin LR	0.25	U	ug/L	P416327	
		Microcystin HilR	0.25	U	ug/L	P416327	
		Microcystin HtyR	0.25	U	ug/L	P416327	
		Microcystin LA	0.10	U	ug/L	P416327	
		Microcystin LF	0.10	U	ug/L	P416327	
		Microcystin LR	5.4		ug/L	P416327	
		Microcystin LW	0.25	U	ug/L	P416327	
		Microcystin LY	0.10	U	ug/L	P416327	
		Microcystin RR	0.10	U	ug/L	P416327	
		Microcystin WR	0.50	U	ug/L	P416327	
		Microcystin YR	0.25	U	ug/L	P416327	
		Nodularin-R	0.10	U	ug/L	P416327	
2340112	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P416783	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P416463	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P416856	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P416599	
2340118	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P416361	

Sample Location: Swimming Pen Cr @ Whitey's Fish Camp **Collection Date/Time: 07/07/2022 09:50**

Field ID: NEHAB0074 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2340107	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416330	
		Cylindrospermopsin	0.10	U	ug/L	P416327	
		Desmethyl microcystin LR	0.50	I	ug/L	P416327	
		Microcystin HilR	0.25	U	ug/L	P416327	
		Microcystin HtyR	0.25	U	ug/L	P416327	
		Microcystin LA	0.10	U	ug/L	P416327	
		Microcystin LF	0.10	U	ug/L	P416327	
		Microcystin LR	18		ug/L	P416327	
		Microcystin LW	0.25	U	ug/L	P416327	
		Microcystin LY	0.10	U	ug/L	P416327	
		Microcystin RR	0.10	U	ug/L	P416327	
		Microcystin WR	0.50	U	ug/L	P416327	
		Microcystin YR	0.25	U	ug/L	P416327	
		Nodularin-R	0.10	U	ug/L	P416327	
2340113	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P416783	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P416390	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416856	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P416599	
2340119	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.019		mg P/L	P416361	

Sample Location: LSJR @ 2930 SR 13 **Collection Date/Time: 07/07/2022 13:10**

Field ID: NEHAB0077 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2340108	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416330	
		Cylindrospermopsin	0.10	U	ug/L	P416327	
		Desmethyl microcystin LR	0.25	U	ug/L	P416327	
		Microcystin HilR	0.25	U	ug/L	P416327	
		Microcystin HtyR	0.25	U	ug/L	P416327	
		Microcystin LA	0.10	U	ug/L	P416327	
		Microcystin LF	0.10	U	ug/L	P416327	
		Microcystin LR	0.25	U	ug/L	P416327	
		Microcystin LW	0.25	U	ug/L	P416327	
		Microcystin LY	0.10	U	ug/L	P416327	
		Microcystin RR	0.10	U	ug/L	P416327	
		Microcystin WR	0.50	U	ug/L	P416327	
		Microcystin YR	0.25	U	ug/L	P416327	
		Nodularin-R	0.10	U	ug/L	P416327	
2340114	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P416670	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P416623	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P416856	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P416599	
2340120	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.036		mg P/L	P416361	

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.

Sample Location: Dr's Lake at Camp Echockotee **Collection Date/Time: 07/07/2022 10:55**

Field ID: NEHAB0085 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2340109	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416330	
		Cylindrospermopsin	0.10	U	ug/L	P416327	
		Desmethyl microcystin LR	0.25	U	ug/L	P416327	
		Microcystin HilR	0.25	U	ug/L	P416327	
		Microcystin HtyR	0.25	U	ug/L	P416327	
		Microcystin LA	0.10	U	ug/L	P416327	
		Microcystin LF	0.10	U	ug/L	P416327	
		Microcystin LR	1.8		ug/L	P416327	
		Microcystin LW	0.25	U	ug/L	P416327	
		Microcystin LY	0.10	U	ug/L	P416327	
		Microcystin RR	0.10	U	ug/L	P416327	
		Microcystin WR	0.50	U	ug/L	P416327	
		Microcystin YR	0.25	U	ug/L	P416327	
		Nodularin-R	0.10	U	ug/L	P416327	
2340115	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P416783	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P416463	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416856	
	EPA 365.1 Rev. 2.0	Total-P	0.072		mg P/L	P416599	
2340121	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.035		mg P/L	P416361	

Sample Location: Dr's Lake Near Lucy Branch **Collection Date/Time: 07/07/2022 10:35**

Field ID: NEHAB0086 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2340110	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416330	
		Cylindrospermopsin	0.10	U	ug/L	P416327	
		Desmethyl microcystin LR	0.25	U	ug/L	P416327	
		Microcystin HilR	0.25	U	ug/L	P416327	
		Microcystin HtyR	0.25	U	ug/L	P416327	
		Microcystin LA	0.10	U	ug/L	P416327	
		Microcystin LF	0.10	U	ug/L	P416327	
		Microcystin LR	7.6		ug/L	P416327	
		Microcystin LW	0.25	U	ug/L	P416327	
		Microcystin LY	0.10	U	ug/L	P416327	
		Microcystin RR	0.10	U	ug/L	P416327	
		Microcystin WR	0.50	U	ug/L	P416327	
		Microcystin YR	0.25	U	ug/L	P416327	
		Nodularin-R	0.10	U	ug/L	P416327	
2340116	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P416783	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P416463	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416856	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P416599	
2340122	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.026		mg P/L	P416361	

Non-Conformance Report

NCR ID: 9456

Event(s)	Job(s)	Sample(s)	Test(s)
WQAP-2022-07-08-05	TLH-2022-07-08-86	2340108	

NCR Type: SHIPPING/RECEIVING **NCR Category: Sample Integrity**

Observation: Sample received with cracked cap.

Resolution: Seal on broken cap still intact upon receipt, cap replaced.

Authorized by/Date: Colin Wright 7/27/2022

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416670

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416783

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416390

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416463

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416623

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416856

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416599

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416361

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

Reference Method: EPA 8321B
Batch ID: P416327

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P416327

Component	Result	Code	Units
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: P416330

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416670

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416783

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: P416390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416463

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416623

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: P416856

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: P416599

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416361

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

Reference Method: EPA 8321B
Batch ID: P416327

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	104		P	40 - 150
Desmethyl microcystin LR	88.3		P	40 - 150
Microcystin HilR	91.4		P	40 - 150
Microcystin HtyR	100		P	40 - 150

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P416327

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Microcystin LA	111		P	40 - 150
Microcystin LF	107		P	40 - 150
Microcystin LR	81.2		P	40 - 150
Microcystin LW	115		P	40 - 150
Microcystin LY	102		P	40 - 150
Microcystin RR	91.2		P	40 - 150
Microcystin WR	98.4		P	40 - 150
Microcystin YR	104		P	40 - 150
Nodularin-R	89.7		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416330

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	97.0		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416670

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340213	Ammonia-N	98.0	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416783

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340363	Ammonia-N	98.8	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2339638	Kjeldahl Nitrogen	98.4	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340111	Kjeldahl Nitrogen	108	95.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416856

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2339662	NO2NO3-N	103	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416599

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340115	Total-P	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416361

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340118	O-Phosphate-P	99.0	99.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P416327

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2339962	Cylindrospermopsin	93.3	97.7	P/P	40 - 150
2339962	Desmethyl microcystin LR	90.5	90.7	P/P	40 - 150
2339962	Microcystin HilR	91.8	91.0	P/P	40 - 150
2339962	Microcystin HtyR	95.5	94.2	P/P	40 - 150
2339962	Microcystin LA	100	105	P/P	40 - 150
2339962	Microcystin LF	96.6	99.9	P/P	40 - 150
2339962	Microcystin LR	82.6	79.8	P/P	40 - 150
2339962	Microcystin LW	104	103	P/P	40 - 150
2339962	Microcystin LY	92.4	98.1	P/P	40 - 150
2339962	Microcystin RR	83.1	83.6	P/P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P416327

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2339962	Microcystin WR	92.7	88.4	P/P	40 - 150
2339962	Microcystin YR	102	106	P/P	40 - 150
2339962	Nodularin-R	86.5	87.7	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2339962	Anatoxin-a	96.4	99.2	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340213	Ammonia-N	0.555	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340363	Ammonia-N	2.66	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2339638	Kjeldahl Nitrogen	1.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340111	Kjeldahl Nitrogen	7.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2339887	Kjeldahl Nitrogen	12.4	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2339662	NO2NO3-N	2.80	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416599

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340115	Total-P	1.78	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416361

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340118	O-Phosphate-P	0.251	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P416327

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2339962	Cylindrospermopsin	4.59	Spike	P	0 - 30
2339962	Desmethyl microcystin LR	0.218	Spike	P	0 - 30
2339962	Microcystin HilR	0.820	Spike	P	0 - 30
2339962	Microcystin HtyR	1.39	Spike	P	0 - 30
2339962	Microcystin LA	4.72	Spike	P	0 - 30
2339962	Microcystin LF	3.25	Spike	P	0 - 30
2339962	Microcystin LR	2.55	Spike	P	0 - 30
2339962	Microcystin LW	0.533	Spike	P	0 - 30
2339962	Microcystin LY	5.32	Spike	P	0 - 30
2339962	Microcystin RR	0.629	Spike	P	0 - 30
2339962	Microcystin WR	4.79	Spike	P	0 - 30
2339962	Microcystin YR	3.36	Spike	P	0 - 30
2339962	Nodularin-R	1.34	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P416330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2339962	Anatoxin-a	2.90	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2340105
Field Sample ID: NEHAB0057

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	101	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	50.8	P	30 - 160

Lab Sample ID: 2340106
Field Sample ID: NEHAB0073

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	116	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	64.1	P	30 - 160

Lab Sample ID: 2340107
Field Sample ID: NEHAB0074

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	110	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	50.5	P	30 - 160

Lab Sample ID: 2340108
Field Sample ID: NEHAB0077

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	97.6	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	70.2	P	30 - 160

Lab Sample ID: 2340109
Field Sample ID: NEHAB0085

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	99.2	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	65.6	P	30 - 160

Lab Sample ID: 2340110
Field Sample ID: NEHAB0086

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	109	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	57.4	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A113386
Included Lab Sample IDs: 2340117, 2340118, 2340119, 2340120, 2340121, 2340122

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A113391
Included Lab Sample IDs: 2340105, 2340106, 2340107, 2340108, 2340109, 2340110

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	87.2	87.3	P/P	50 - 160
Anatoxin-a	87.3	84.7	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A113392
Included Lab Sample IDs: 2340105, 2340106, 2340107, 2340108, 2340109, 2340110

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	102	104	P/P	60 - 160
Cylindrospermopsin	103	102	P/P	60 - 160
Desmethyl microcystin LR	88.5	88.5	P/P	60 - 160
Desmethyl microcystin LR	92.0	88.5	P/P	60 - 160
Microcystin HilR	91.1	94.1	P/P	60 - 160
Microcystin HilR	94.1	92.5	P/P	60 - 160
Microcystin HtyR	100	103	P/P	60 - 160
Microcystin HtyR	103	100	P/P	60 - 160
Microcystin LA	112	115	P/P	50 - 160
Microcystin LA	115	117	P/P	50 - 160
Microcystin LF	100	104	P/P	60 - 160
Microcystin LF	102	100	P/P	60 - 160
Microcystin LR	80.8	88.1	P/P	60 - 160
Microcystin LR	88.1	84.8	P/P	60 - 160
Microcystin LW	107	112	P/P	60 - 160
Microcystin LW	112	109	P/P	60 - 160
Microcystin LY	104	106	P/P	60 - 160
Microcystin LY	106	112	P/P	60 - 160
Microcystin RR	89.5	89.8	P/P	60 - 160
Microcystin RR	89.8	89.0	P/P	60 - 160
Microcystin WR	94.4	96.1	P/P	60 - 160
Microcystin WR	96.1	98.3	P/P	60 - 160
Microcystin YR	105	107	P/P	60 - 160
Microcystin YR	107	113	P/P	60 - 160
Nodularin-R	87.9	88.9	P/P	60 - 160
Nodularin-R	88.9	90.1	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113493
Included Lab Sample IDs: 2340113

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	99.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A113507
Included Lab Sample IDs: 2340114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113524
Included Lab Sample IDs: 2340111, 2340112, 2340115, 2340116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113529
Included Lab Sample IDs: 2340113, 2340116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	98.7	P/P	90 - 110
Total-P	99.8	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113532
Included Lab Sample IDs: 2340111, 2340112, 2340114, 2340115

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.2	98.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A113563
Included Lab Sample IDs: 2340111, 2340112, 2340113, 2340115, 2340116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113566
Included Lab Sample IDs: 2340114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A113585
Included Lab Sample IDs: 2340111, 2340112, 2340113, 2340114, 2340115, 2340116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	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	100	98.0	98.6			0.555
	Ammonia-N	97.0	98.8	102			2.66
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.2	98.4	100			1.47
	Kjeldahl Nitrogen	98.8	108	95.9			7.47
	Kjeldahl Nitrogen	102					12.4
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	106			2.80
EPA 365.1 Rev. 2.0	Total-P	102	104	102			1.78
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.0	99.3			0.251
EPA 8321B	Anatoxin-a	97.0	96.4	99.2			2.90
	Cylindrospermopsin	104	93.3	97.7			4.59
	Desmethyl microcystin LR	88.3	90.5	90.7			0.218
	Microcystin HilR	91.4	91.8	91.0			0.820
	Microcystin HtyR	100	95.5	94.2			1.39
	Microcystin LA	111	100	105			4.72
	Microcystin LF	107	96.6	99.9			3.25
	Microcystin LR	81.2	82.6	79.8			2.55
	Microcystin LW	115	104	103			0.533
	Microcystin LY	102	92.4	98.1			5.32
	Microcystin RR	91.2	83.1	83.6			0.629
	Microcystin WR	98.4	92.7	88.4			4.79
	Microcystin YR	104	102	106			3.36
	Nodularin-R	89.7	86.5	87.7			1.34

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2340111, 2340112, 2340113, 2340114, 2340115, 2340116
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2340111, 2340112, 2340113, 2340114, 2340115, 2340116
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2340111, 2340112, 2340113, 2340114, 2340115, 2340116
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2340111, 2340112, 2340113, 2340114, 2340115, 2340116
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2340117, 2340118, 2340119, 2340120, 2340121, 2340122
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2340105, 2340106, 2340107, 2340108, 2340109, 2340110
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2340105, 2340106, 2340107, 2340108, 2340109, 2340110

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	07/08/2022			07/14/2022 14:12	Ping Hua	2340114
	07/08/2022			07/18/2022 11:58	Ping Hua	2340111
	07/08/2022			07/18/2022 11:59	Ping Hua	2340112
	07/08/2022			07/18/2022 12:01	Ping Hua	2340113
	07/08/2022			07/18/2022 12:02	Ping Hua	2340115
	07/08/2022			07/18/2022 12:03	Ping Hua	2340116
EPA 351.2 Rev. 2.0	07/08/2022	07/12/2022 16:32	Samantha L Bates	07/13/2022 14:49	Alexandra J Mattheus	2340113
	07/08/2022	07/13/2022 14:48	Samantha L Bates	07/14/2022 14:51	Alexandra J Mattheus	2340111
	07/08/2022	07/13/2022 14:48	Samantha L Bates	07/14/2022 14:56	Alexandra J Mattheus	2340112
	07/08/2022	07/13/2022 14:48	Samantha L Bates	07/14/2022 14:58	Alexandra J Mattheus	2340115
	07/08/2022	07/13/2022 14:48	Samantha L Bates	07/14/2022 14:59	Alexandra J Mattheus	2340116
	07/08/2022	07/15/2022 10:00	Samantha L Bates	07/18/2022 13:59	Alexandra J Mattheus	2340114
EPA 353.2 Rev. 2.0	07/08/2022			07/19/2022 14:05	Judith K. Clark	2340111
	07/08/2022			07/19/2022 14:06	Judith K. Clark	2340112
	07/08/2022			07/19/2022 14:07	Judith K. Clark	2340113
	07/08/2022			07/19/2022 14:08	Judith K. Clark	2340114
	07/08/2022			07/19/2022 14:10	Judith K. Clark	2340115
	07/08/2022			07/19/2022 14:11	Judith K. Clark	2340116
EPA 365.1 Rev. 2.0	07/08/2022	07/14/2022 13:10	Simonne.V. Calhoun	07/15/2022 11:09	James L Waggerby	2340113
	07/08/2022	07/14/2022 13:10	Simonne.V. Calhoun	07/15/2022 11:13	James L Waggerby	2340116
	07/08/2022	07/14/2022 13:10	Simonne.V. Calhoun	07/15/2022 13:41	Simonne.V. Calhoun	2340115
	07/08/2022	07/14/2022 13:10	Simonne.V. Calhoun	07/15/2022 13:42	Simonne.V. Calhoun	2340111
	07/08/2022	07/14/2022 13:10	Simonne.V. Calhoun	07/15/2022 13:43	Simonne.V. Calhoun	2340112
	07/08/2022	07/14/2022 13:10	Simonne.V. Calhoun	07/15/2022 13:44	Simonne.V. Calhoun	2340114
EPA 365.1 Rev. 2.0 dissolved	07/08/2022			07/08/2022 15:05	Chandler E Cox	2340118
	07/08/2022			07/08/2022 15:08	Chandler E Cox	2340117, 2340119
	07/08/2022			07/08/2022 15:09	Chandler E Cox	2340120
	07/08/2022			07/08/2022 15:10	Chandler E Cox	2340121
	07/08/2022			07/08/2022 15:11	Chandler E Cox	2340122
EPA 8321B	07/08/2022	07/08/2022 13:00	Manjita Shrestha	07/08/2022 23:32	Manjita Shrestha	2340105
	07/08/2022	07/08/2022 13:00	Manjita Shrestha	07/08/2022 23:45	Manjita Shrestha	2340106
	07/08/2022	07/08/2022 13:00	Manjita Shrestha	07/08/2022 23:59	Manjita Shrestha	2340107
	07/08/2022	07/08/2022 13:00	Manjita Shrestha	07/09/2022 00:13	Manjita Shrestha	2340108
	07/08/2022	07/08/2022 13:00	Manjita Shrestha	07/09/2022 00:41	Manjita Shrestha	2340109
	07/08/2022	07/08/2022 13:00	Manjita Shrestha	07/09/2022 00:55	Manjita Shrestha	2340110
	07/08/2022	07/08/2022 13:00	Umesh Chiluwal	07/08/2022 22:58	Umesh Chiluwal	2340105
	07/08/2022	07/08/2022 13:00	Umesh Chiluwal	07/08/2022 23:15	Umesh Chiluwal	2340106
	07/08/2022	07/08/2022 13:00	Umesh Chiluwal	07/08/2022 23:32	Umesh Chiluwal	2340107
	07/08/2022	07/08/2022 13:00	Umesh Chiluwal	07/08/2022 23:49	Umesh Chiluwal	2340108
	07/08/2022	07/08/2022 13:00	Umesh Chiluwal	07/09/2022 00:23	Umesh Chiluwal	2340109

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	07/08/2022	07/08/2022 13:00	Umesh Chiluwal	07/09/2022 00:40	Umesh Chiluwal	2340110