

Chemical Analysis Report

SO-DIST-2023-07-11-01

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

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2023-07-10-66**
Customer: **SO-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
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Certified by: Colin Wright, Program Administrator

Date Certified: 27-JUL-2023 11:53

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light pink rectangular background.

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: Caloosahatchee - W First St and Altamont

Collection Date/Time: 07/10/2023 12:10

Field ID: HAB-SD-071023-1210

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2422327	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432284	
		Cylindrospermopsin	0.10	U	ug/L	P432283	
		Desmethyl microcystin LR	0.33	I	ug/L	P432283	
		Microcystin HILR	0.25	U	ug/L	P432283	
		Microcystin HtyR	0.25	U	ug/L	P432283	
		Microcystin LA	0.16	I	ug/L	P432283	
		Microcystin LF	0.10	U	ug/L	P432283	
		Microcystin LR	11		ug/L	P432283	
		Microcystin LW	0.25	U	ug/L	P432283	
		Microcystin LY	0.10	U	ug/L	P432283	
		Microcystin RR	0.10	U	ug/L	P432283	
		Microcystin WR	0.50	U	ug/L	P432283	
		Neosaxitoxin	0.50	U	ug/L	P432284	
		Microcystin YR	0.25	U	ug/L	P432283	
		Saxitoxin	0.50	U	ug/L	P432284	
		Nodularin-R	0.10	U	ug/L	P432283	
2422334	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P432566	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P432754	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P432531	
	EPA 365.1 Rev. 2.0	Total-P	0.25		mg P/L	P432374	
2422341	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.18		mg P/L	P432315	

Sample Location: Caloosahatchee - End of Coon Rd

Collection Date/Time: 07/10/2023 09:55

Field ID: HAB-SD-071023-0955

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2422323	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432284	
		Cylindrospermopsin	0.10	U	ug/L	P432283	
		Desmethyl microcystin LR	0.25	U	ug/L	P432283	
		Microcystin HILR	0.25	U	ug/L	P432283	
		Microcystin HtyR	0.25	U	ug/L	P432283	
		Microcystin LA	0.10	U	ug/L	P432283	
		Microcystin LF	0.10	U	ug/L	P432283	
		Microcystin LR	0.25	U	ug/L	P432283	
		Microcystin LW	0.25	U	ug/L	P432283	
		Microcystin LY	0.10	U	ug/L	P432283	
		Microcystin RR	0.10	U	ug/L	P432283	
		Microcystin WR	0.50	U	ug/L	P432283	
		Neosaxitoxin	0.50	U	ug/L	P432284	
		Microcystin YR	0.25	U	ug/L	P432283	
		Saxitoxin	0.50	U	ug/L	P432284	
		Nodularin-R	0.10	U	ug/L	P432283	
2422330	EPA 350.1 Rev. 2.0	Ammonia-N	0.066		mg N/L	P432422	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P432707	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.27		mg N/L	P432530	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P432374	
2422337	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P432314	

Sample Location: Caloosahatchee - N of Loftons Island

Collection Date/Time: 07/10/2023 11:40

Field ID: HAB-SD-071023-1140

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2422326	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432284	
		Cylindrospermopsin	0.10	U	ug/L	P432283	
		Desmethyl microcystin LR	0.25	U	ug/L	P432283	
		Microcystin HILR	0.25	U	ug/L	P432283	
		Microcystin HtyR	0.25	U	ug/L	P432283	
		Microcystin LA	0.10	U	ug/L	P432283	
		Microcystin LF	0.10	U	ug/L	P432283	
		Microcystin LR	0.25	U	ug/L	P432283	
		Microcystin LW	0.25	U	ug/L	P432283	
		Microcystin LY	0.10	U	ug/L	P432283	
		Microcystin RR	0.10	U	ug/L	P432283	
		Microcystin WR	0.50	U	ug/L	P432283	
		Neosaxitoxin	0.50	U	ug/L	P432284	
		Microcystin YR	0.25	U	ug/L	P432283	
		Saxitoxin	0.50	U	ug/L	P432284	
		Nodularin-R	0.10	U	ug/L	P432283	
2422333	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P432566	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P432754	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P432531	
	EPA 365.1 Rev. 2.0	Total-P	0.27		mg P/L	P432397	
2422340	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P432315	

Sample Location: Caloosahatchee River-Fort Myers Shores

Collection Date/Time: 07/10/2023 09:05

Field ID: HAB-SD-071023-0905

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2422322	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432284	
		Cylindrospermopsin	0.10	U	ug/L	P432283	
		Desmethyl microcystin LR	0.25	U	ug/L	P432283	
		Microcystin HILR	0.25	U	ug/L	P432283	
		Microcystin HtyR	0.25	U	ug/L	P432283	
		Microcystin LA	0.10	U	ug/L	P432283	
		Microcystin LF	0.10	U	ug/L	P432283	
		Microcystin LR	0.25	U	ug/L	P432283	
		Microcystin LW	0.25	U	ug/L	P432283	
		Microcystin LY	0.10	U	ug/L	P432283	
		Microcystin RR	0.10	U	ug/L	P432283	
		Microcystin WR	0.50	U	ug/L	P432283	
		Neosaxitoxin	0.50	U	ug/L	P432284	
		Microcystin YR	0.25	U	ug/L	P432283	
		Saxitoxin	0.50	U	ug/L	P432284	
		Nodularin-R	0.10	U	ug/L	P432283	
2422329	EPA 350.1 Rev. 2.0	Ammonia-N	0.066		mg N/L	P432422	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P432707	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P432530	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P432374	
2422336	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P432314	

Sample Location: Hancock Creek - Moody Ramp

Collection Date/Time: 07/10/2023 10:55

Field ID: HAB-SD-071023-1055

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2422325	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432284	
		Cylindrospermopsin	0.10	U	ug/L	P432283	
		Desmethyl microcystin LR	0.25	U	ug/L	P432283	
		Microcystin HILR	0.25	U	ug/L	P432283	
		Microcystin HtyR	0.25	U	ug/L	P432283	
		Microcystin LA	0.10	U	ug/L	P432283	
		Microcystin LF	0.10	U	ug/L	P432283	
		Microcystin LR	0.25	U	ug/L	P432283	
		Microcystin LW	0.25	U	ug/L	P432283	
		Microcystin LY	0.10	U	ug/L	P432283	
		Microcystin RR	0.10	U	ug/L	P432283	
		Microcystin WR	0.50	U	ug/L	P432283	
		Neosaxitoxin	0.50	U	ug/L	P432284	
		Microcystin YR	0.25	U	ug/L	P432283	
		Saxitoxin	0.50	U	ug/L	P432284	
		Nodularin-R	0.10	U	ug/L	P432283	
2422332	EPA 350.1 Rev. 2.0	Ammonia-N	0.060		mg N/L	P432566	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P432707	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P432531	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P432374	
2422339	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P432315	

Sample Location: Able Canal-Connie Ave N

Collection Date/Time: 07/10/2023 08:25

Field ID: HAB-SD-071023-0825

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2422321	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432284	
		Cylindrospermopsin	0.14	I	ug/L	P432283	
		Desmethyl microcystin LR	0.25	U	ug/L	P432283	
		Microcystin HILR	0.25	U	ug/L	P432283	
		Microcystin HtyR	0.25	U	ug/L	P432283	
		Microcystin LA	0.10	U	ug/L	P432283	
		Microcystin LF	0.10	U	ug/L	P432283	
		Microcystin LR	0.25	U	ug/L	P432283	
		Microcystin LW	0.25	U	ug/L	P432283	
		Microcystin LY	0.10	U	ug/L	P432283	
		Microcystin RR	0.10	U	ug/L	P432283	
		Microcystin WR	0.50	U	ug/L	P432283	
		Neosaxitoxin	0.50	U	ug/L	P432284	
		Microcystin YR	0.25	U	ug/L	P432283	
		Saxitoxin	0.50	U	ug/L	P432284	
		Nodularin-R	0.10	U	ug/L	P432283	
2422328	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P432422	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P432707	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.045		mg N/L	P432530	
	EPA 365.1 Rev. 2.0	Total-P	0.094		mg P/L	P432374	
2422335	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.047		mg P/L	P432314	

Sample Location: Caloosahatchee-Overiver Dr

Collection Date/Time: 07/10/2023 10:30

Field ID: HAB-SD-071023-1030

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2422324	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432284	
		Cylindrospermopsin	0.10	U	ug/L	P432283	
		Desmethyl microcystin LR	0.25	U	ug/L	P432283	
		Microcystin HILR	0.25	U	ug/L	P432283	
		Microcystin HtyR	0.25	U	ug/L	P432283	
		Microcystin LA	0.10	U	ug/L	P432283	
		Microcystin LF	0.10	U	ug/L	P432283	
		Microcystin LR	0.55	I	ug/L	P432283	
		Microcystin LW	0.25	U	ug/L	P432283	
		Microcystin LY	0.10	U	ug/L	P432283	
		Microcystin RR	0.10	U	ug/L	P432283	
		Microcystin WR	0.50	U	ug/L	P432283	
		Neosaxitoxin	0.50	U	ug/L	P432284	
		Microcystin YR	0.25	U	ug/L	P432283	
		Saxitoxin	0.50	U	ug/L	P432284	
		Nodularin-R	0.10	U	ug/L	P432283	
2422331	EPA 350.1 Rev. 2.0	Ammonia-N	0.064		mg N/L	P432566	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P432707	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P432530	
	EPA 365.1 Rev. 2.0	Total-P	0.23		mg P/L	P432374	
2422338	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.16		mg P/L	P432314	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432422

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432566

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432707

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432754

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432530

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432531

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432374

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432397

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432314

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432315

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

Reference Method: EPA 8321B
Batch ID: P432283

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: P432284

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: P432422

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432566

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432707

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432754

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432530

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432531

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: P432374

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432397

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432314

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432315

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

Reference Method: EPA 8321B
Batch ID: P432283

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	108		P	40 - 160
Desmethyl microcystin LR	107		P	40 - 160
Microcystin HIR	105		P	40 - 160
Microcystin HtyR	96.5		P	40 - 160
Microcystin LA	109		P	40 - 160
Microcystin LF	100		P	40 - 160
Microcystin LR	109		P	40 - 160
Microcystin LW	91.2		P	40 - 160
Microcystin LY	112		P	40 - 160
Microcystin RR	101		P	40 - 160
Microcystin WR	102		P	40 - 160
Microcystin YR	90.5		P	40 - 160
Nodularin-R	99.5		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432284

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	115		P	40 - 150
Neosaxitoxin	91.9		P	40 - 150
Saxitoxin	94.4		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432422

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422223	Ammonia-N	95.6	96.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422352	Ammonia-N	94.8	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422328	Kjeldahl Nitrogen	100	92.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432754

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422350	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422238	NO2NO3-N	97.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432531

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422332	NO2NO3-N	102	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432374

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422352	Total-P	99.6	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432397

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421629	Total-P	98.5	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432314

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422224	O-Phosphate-P	97.6	97.9	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422407	O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P432283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422297	Cylindrospermopsin	92.7	99.4	P/P	40 - 160
2422297	Desmethyl microcystin LR	111	118	P/P	40 - 160
2422297	Microcystin HiLR	103	108	P/P	40 - 160
2422297	Microcystin HtyR	92.3	97.1	P/P	40 - 160
2422297	Microcystin LA	102	113	P/P	40 - 160
2422297	Microcystin LF	107	110	P/P	40 - 160
2422297	Microcystin LR	115	114	P/P	40 - 160
2422297	Microcystin LW	91.9	100	P/P	40 - 160
2422297	Microcystin LY	96.5	104	P/P	40 - 160
2422297	Microcystin RR	99.0	102	P/P	40 - 160
2422297	Microcystin WR	94.1	98.3	P/P	40 - 160
2422297	Microcystin YR	90.8	89.0	P/P	40 - 160
2422297	Nodularin-R	97.2	101	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432284

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2422297	Anatoxin-a	120	105	P/P	40 - 150
2422297	Neosaxitoxin	70.6	60.9	P/P	40 - 150
2422297	Saxitoxin	75.7	66.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422223	Ammonia-N	1.16	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422352	Ammonia-N	1.02	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422328	Kjeldahl Nitrogen	5.61	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422350	Kjeldahl Nitrogen	1.13	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422238	NO2NO3-N	0.386	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422332	NO2NO3-N	1.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422352	Total-P	1.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421629	Total-P	0.608	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422224	O-Phosphate-P	0.237	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422407	O-Phosphate-P	0.900	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P432283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422297	Cylindrospermopsin	6.93	Spike	P	0 - 30
2422297	Desmethyl microcystin LR	5.71	Spike	P	0 - 30
2422297	Microcystin HilR	4.26	Spike	P	0 - 30
2422297	Microcystin HtyR	5.09	Spike	P	0 - 30
2422297	Microcystin LA	10.6	Spike	P	0 - 30
2422297	Microcystin LF	2.54	Spike	P	0 - 30
2422297	Microcystin LR	1.60	Spike	P	0 - 30
2422297	Microcystin LW	8.90	Spike	P	0 - 30
2422297	Microcystin LY	7.07	Spike	P	0 - 30
2422297	Microcystin RR	3.21	Spike	P	0 - 30
2422297	Microcystin WR	4.40	Spike	P	0 - 30
2422297	Microcystin YR	1.96	Spike	P	0 - 30
2422297	Nodularin-R	3.65	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P432284

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2422297	Anatoxin-a	13.0	Spike	P	0 - 30
2422297	Neosaxitoxin	14.8	Spike	P	0 - 30
2422297	Saxitoxin	13.0	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2422321

Field Sample ID: HAB-SD-071023-0825

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	106	P	30 - 160
EPA 8321B	Saxitoxin-15N7	81.0	P	30 - 160

Lab Sample ID: 2422322

Field Sample ID: HAB-SD-071023-0905

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	98.0	P	30 - 160
EPA 8321B	Saxitoxin-15N7	76.5	P	30 - 160

Lab Sample ID: 2422323

Field Sample ID: HAB-SD-071023-0955

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	97.3	P	30 - 160
EPA 8321B	Saxitoxin-15N7	69.0	P	30 - 160

Lab Sample ID: 2422324

Field Sample ID: HAB-SD-071023-1030

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	110	P	30 - 160
EPA 8321B	Saxitoxin-15N7	80.9	P	30 - 160

Lab Sample ID: 2422325

Field Sample ID: HAB-SD-071023-1055

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	74.1	P	30 - 160
EPA 8321B	Saxitoxin-15N7	70.2	P	30 - 160

Lab Sample ID: 2422326

Field Sample ID: HAB-SD-071023-1140

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	70.6	P	30 - 160
EPA 8321B	Saxitoxin-15N7	72.6	P	30 - 160

Lab Sample ID: 2422327

Field Sample ID: HAB-SD-071023-1210

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	102	P	30 - 160
EPA 8321B	Saxitoxin-15N7	68.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120297

Included Lab Sample IDs: 2422335, 2422336, 2422337, 2422338, 2422339, 2422340, 2422341

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	101	99.4	P/P	90 - 110
O-Phosphate-P	99.4	101	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120335

Included Lab Sample IDs: 2422321, 2422322, 2422323, 2422324, 2422325, 2422326, 2422327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	120	119	P/P	50 - 160
Anatoxin-a	121	111	P/P	50 - 160
Neosaxitoxin	100	95.6	P/P	50 - 160
Neosaxitoxin	103	91.5	P/P	50 - 160
Saxitoxin	103	94.5	P/P	50 - 160
Saxitoxin	99.4	99.3	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A120337

Included Lab Sample IDs: 2422321, 2422322, 2422323, 2422324, 2422325, 2422326, 2422327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	101	108	P/P	60 - 160
Cylindrospermopsin	108	108	P/P	60 - 160
Desmethyl microcystin LR	100	99.8	P/P	50 - 160
Desmethyl microcystin LR	103	100	P/P	50 - 160
Microcystin HILR	100	99.5	P/P	60 - 160
Microcystin HILR	103	100	P/P	60 - 160
Microcystin HtyR	97.1	99.0	P/P	60 - 160
Microcystin HtyR	99.0	96.0	P/P	60 - 160
Microcystin LA	111	110	P/P	50 - 160
Microcystin LA	111	111	P/P	50 - 160
Microcystin LF	77.8	78.0	P/P	60 - 160
Microcystin LF	78.0	76.3	P/P	60 - 160
Microcystin LR	103	103	P/P	60 - 160
Microcystin LR	109	103	P/P	60 - 160
Microcystin LW	79.7	79.1	P/P	60 - 160
Microcystin LW	80.8	79.7	P/P	60 - 160
Microcystin LY	104	102	P/P	60 - 160
Microcystin LY	105	104	P/P	60 - 160
Microcystin RR	100	98.8	P/P	60 - 160
Microcystin RR	103	100	P/P	60 - 160
Microcystin WR	94.1	93.1	P/P	60 - 160
Microcystin WR	94.4	94.1	P/P	60 - 160
Microcystin YR	92.2	89.1	P/P	60 - 160
Microcystin YR	93.5	92.2	P/P	60 - 160
Nodularin-R	98.6	96.7	P/P	60 - 160
Nodularin-R	99.9	98.6	P/P	60 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120349

Included Lab Sample IDs: 2422328, 2422329, 2422330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120381

Included Lab Sample IDs: 2422328, 2422329, 2422330, 2422331, 2422332, 2422333, 2422334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	104	P/P	90 - 110
Total-P	101	101	P/P	90 - 110
Total-P	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120406

Included Lab Sample IDs: 2422328, 2422329, 2422330, 2422331, 2422332, 2422333, 2422334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110
NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120426

Included Lab Sample IDs: 2422331, 2422332, 2422333, 2422334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120578

Included Lab Sample IDs: 2422328, 2422329, 2422330, 2422331, 2422332, 2422333, 2422334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	107	P/P	90 - 110
Kjeldahl Nitrogen	107	98.7	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	98.2	95.6	96.8			1.16
	Ammonia-N	97.2	94.8	96.0			1.02
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	100	92.0			5.61
	Kjeldahl Nitrogen	99.6	103	104			1.13
EPA 353.2 Rev. 2.0	NO2NO3-N	106	97.8				0.386
	NO2NO3-N	104	102	105			1.54
EPA 365.1 Rev. 2.0	Total-P	99.8	99.6	101			1.31
	Total-P	95.8	98.5	97.8			0.608
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.6	97.9			0.237
	O-Phosphate-P	100	99.5	100			0.900
EPA 8321B	Anatoxin-a	115	120	105			13.0
	Cylindrospermopsin	108	92.7	99.4			6.93
	Desmethyl microcystin LR	107	111	118			5.71
	Microcystin HiIR	105	103	108			4.26
	Microcystin HtyR	96.5	92.3	97.1			5.09
	Microcystin LA	109	102	113			10.6
	Microcystin LF	100	107	110			2.54
	Microcystin LR	109	115	114			1.60
	Microcystin LW	91.2	91.9	100			8.90
	Microcystin LY	112	96.5	104			7.07
	Microcystin RR	101	99.0	102			3.21
	Microcystin WR	102	94.1	98.3			4.40
	Microcystin YR	90.5	90.8	89.0			1.96
	Neosaxitoxin	91.9	70.6	60.9			14.8
	Nodularin-R	99.5	97.2	101			3.65
	Saxitoxin	94.4	75.7	66.5			13.0

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2422328, 2422329, 2422330, 2422331, 2422332, 2422333, 2422334
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2422328, 2422329, 2422330, 2422331, 2422332, 2422333, 2422334
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2422328, 2422329, 2422330, 2422331, 2422332, 2422333, 2422334
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2422328, 2422329, 2422330, 2422331, 2422332, 2422333, 2422334
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2422335, 2422336, 2422337, 2422338, 2422339, 2422340, 2422341
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2422321, 2422322, 2422323, 2422324, 2422325, 2422326, 2422327
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2422321, 2422322, 2422323, 2422324, 2422325, 2422326, 2422327

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	07/11/2023			07/13/2023 12:17	Khloe J Berg	2422328
	07/11/2023			07/13/2023 12:18	Khloe J Berg	2422329
	07/11/2023			07/13/2023 12:19	Khloe J Berg	2422330
	07/11/2023			07/17/2023 11:31	Khloe J Berg	2422331
	07/11/2023			07/17/2023 11:32	Khloe J Berg	2422332
	07/11/2023			07/17/2023 11:33	Khloe J Berg	2422333
	07/11/2023			07/17/2023 11:35	Khloe J Berg	2422334
EPA 351.2 Rev. 2.0	07/11/2023	07/20/2023 10:58	Dana G. Hughes	07/24/2023 10:28	Samantha L Bates	2422328
	07/11/2023	07/20/2023 10:58	Dana G. Hughes	07/24/2023 10:32	Samantha L Bates	2422329
	07/11/2023	07/20/2023 10:58	Dana G. Hughes	07/24/2023 10:34	Samantha L Bates	2422330
	07/11/2023	07/20/2023 10:58	Dana G. Hughes	07/24/2023 10:36	Samantha L Bates	2422331
	07/11/2023	07/20/2023 10:58	Dana G. Hughes	07/24/2023 10:40	Samantha L Bates	2422332
	07/11/2023	07/20/2023 10:58	Dana G. Hughes	07/24/2023 10:45	Samantha L Bates	2422333
EPA 353.2 Rev. 2.0	07/11/2023	07/20/2023 10:58	Dana G. Hughes	07/24/2023 10:47	Samantha L Bates	2422334
	07/11/2023			07/13/2023 13:40	Judith K. Clark	2422328
	07/11/2023			07/13/2023 13:41	Judith K. Clark	2422329
	07/11/2023			07/13/2023 13:42	Judith K. Clark	2422330
	07/11/2023			07/13/2023 13:43	Judith K. Clark	2422331
	07/11/2023			07/13/2023 13:53	Judith K. Clark	2422332
	07/11/2023			07/13/2023 13:59	Judith K. Clark	2422333
EPA 365.1 Rev. 2.0	07/11/2023			07/13/2023 14:00	Judith K. Clark	2422334
	07/11/2023	07/13/2023 16:15	Adam P Silver	07/13/2023 19:11	James L Waggeberby	2422328
	07/11/2023	07/13/2023 16:15	Adam P Silver	07/13/2023 19:12	James L Waggeberby	2422329
	07/11/2023	07/13/2023 16:15	Adam P Silver	07/13/2023 19:13	James L Waggeberby	2422330
	07/11/2023	07/13/2023 16:15	Adam P Silver	07/13/2023 19:16	James L Waggeberby	2422331
	07/11/2023	07/13/2023 16:15	Adam P Silver	07/13/2023 19:17	James L Waggeberby	2422332
	07/11/2023	07/13/2023 16:15	Adam P Silver	07/13/2023 19:18	James L Waggeberby	2422334
EPA 365.1 Rev. 2.0 dissolved	07/11/2023			07/13/2023 19:56	James L Waggeberby	2422333
	07/11/2023			07/11/2023 15:26	Elise M. Gillis	2422335
	07/11/2023			07/11/2023 15:27	Elise M. Gillis	2422338
	07/11/2023			07/11/2023 15:28	Elise M. Gillis	2422337
	07/11/2023			07/11/2023 15:29	Elise M. Gillis	2422336
	07/11/2023			07/11/2023 15:41	Elise M. Gillis	2422339
	07/11/2023			07/11/2023 15:42	Elise M. Gillis	2422341
EPA 8321B	07/11/2023			07/11/2023 15:47	Elise M. Gillis	2422340
	07/11/2023	07/12/2023 05:00	Hana Lee	07/12/2023 06:41	Juyoung Kim	2422321
	07/11/2023	07/12/2023 05:00	Hana Lee	07/12/2023 06:58	Juyoung Kim	2422322
	07/11/2023	07/12/2023 05:00	Hana Lee	07/12/2023 07:15	Juyoung Kim	2422323
	07/11/2023	07/12/2023 05:00	Hana Lee	07/12/2023 07:32	Juyoung Kim	2422324
	07/11/2023	07/12/2023 05:00	Hana Lee	07/12/2023 07:49	Juyoung Kim	2422325

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	07/11/2023	07/12/2023 05:00	Hana Lee	07/12/2023 08:23	Juyoung Kim	2422326
	07/11/2023	07/12/2023 05:00	Hana Lee	07/12/2023 08:40	Juyoung Kim	2422327
	07/11/2023	07/12/2023 10:30	Hana Lee	07/12/2023 12:08	Tae K Lee	2422321
	07/11/2023	07/12/2023 10:30	Hana Lee	07/12/2023 12:22	Tae K Lee	2422322
	07/11/2023	07/12/2023 10:30	Hana Lee	07/12/2023 12:36	Tae K Lee	2422323
	07/11/2023	07/12/2023 10:30	Hana Lee	07/12/2023 12:50	Tae K Lee	2422324
	07/11/2023	07/12/2023 10:30	Hana Lee	07/12/2023 13:04	Tae K Lee	2422325
	07/11/2023	07/12/2023 10:30	Hana Lee	07/12/2023 15:01	Tae K Lee	2422326
	07/11/2023	07/12/2023 10:30	Hana Lee	07/12/2023 15:15	Tae K Lee	2422327