

Chemical Analysis Report

CEN-DIST-2023-07-06-01

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

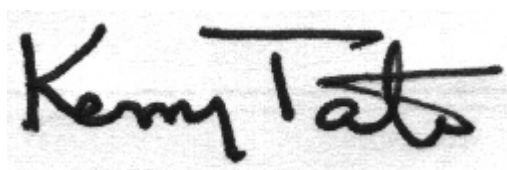
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-06-19-35**
Customer: **CEN-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Jessie Atchison

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 20-JUL-2023 08:58

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

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: Louise Lake - NW Lobe

Collection Date/Time: 07/05/2023 11:21

Field ID: HABCE0183_LouiseLake

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2421392	DEP SOP: NU-094-1	Color (true)	50		PCU	P432117	
2421395	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P432184	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P432143	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P432237	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P432189	
2421398	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P432155	
2421411	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432025	
		Cylindrospermopsin	0.10	U	ug/L	P432024	
		Desmethyl microcystin LR	0.25	U	ug/L	P432024	
		Microcystin HiLR	0.25	U	ug/L	P432024	
		Microcystin HtyR	0.25	U	ug/L	P432024	
		Microcystin LA	0.13	I	ug/L	P432024	
		Microcystin LF	0.10	U	ug/L	P432024	
		Microcystin LR	0.25	U	ug/L	P432024	
		Microcystin LW	0.25	U	ug/L	P432024	
		Microcystin LY	0.10	U	ug/L	P432024	
		Microcystin RR	0.10	U	ug/L	P432024	
		Microcystin WR	0.50	U	ug/L	P432024	
		Neosaxitoxin	0.50	U	ug/L	P432025	
		Microcystin YR	0.25	U	ug/L	P432024	
		Saxitoxin	0.50	U	ug/L	P432025	
		Nodularin-R	0.10	U	ug/L	P432024	

Sample Location: Bonita Lake - S Shore

Collection Date/Time: 07/05/2023 12:15

Field ID: HABCE0189_BonitaLake

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2421393	DEP SOP: NU-094-1	Color (true)	40		PCU	P432117	
2421396	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P432183	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P432143	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P432237	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P432189	
2421399	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P432152	
2421412	EPA 8321B	Anatoxin-a	0.26	I	ug/L	P432025	
		Cylindrospermopsin	0.10	U	ug/L	P432024	
		Desmethyl microcystin LR	0.25	U	ug/L	P432024	
		Microcystin HilR	0.25	U	ug/L	P432024	
		Microcystin HtyR	0.25	U	ug/L	P432024	
		Microcystin LA	0.10	U	ug/L	P432024	
		Microcystin LF	0.10	U	ug/L	P432024	
		Microcystin LR	0.25	U	ug/L	P432024	
		Microcystin LW	0.25	U	ug/L	P432024	
		Microcystin LY	0.10	U	ug/L	P432024	
		Microcystin RR	0.10	U	ug/L	P432024	
		Microcystin WR	0.50	U	ug/L	P432024	
		Neosaxitoxin	0.50	U	ug/L	P432025	
		Microcystin YR	0.25	U	ug/L	P432024	
		Saxitoxin	0.50	U	ug/L	P432025	
		Nodularin-R	0.10	U	ug/L	P432024	

Sample Location: Pioneer Lake - NE Shore

Collection Date/Time: 07/05/2023 11:40

Field ID: HABCE0190_PioneerLake

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2421394	DEP SOP: NU-094-1	Color (true)	18	A	PCU	P432118	
2421397	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P432183	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60	J	mg N/L	P432143	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.53		mg N/L	P432237	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P432189	
2421400	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P432155	
2421413	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P432083	
		Cylindrospermopsin	0.10	U	ug/L	P432081	
		Desmethyl microcystin LR	0.25	UJ	ug/L	P432081	MS
		Microcystin HILR	0.25	U	ug/L	P432081	
		Microcystin HtyR	0.25	U	ug/L	P432081	
		Microcystin LA	0.45		ug/L	P432081	
		Microcystin LF	0.10	U	ug/L	P432081	
		Microcystin LR	0.25	U	ug/L	P432081	
		Microcystin LW	0.25	U	ug/L	P432081	
		Microcystin LY	0.10	U	ug/L	P432081	
		Microcystin RR	0.10	U	ug/L	P432081	
		Microcystin WR	0.50	U	ug/L	P432081	
		Neosaxitoxin	0.50	U	ug/L	P432083	
		Microcystin YR	0.25	U	ug/L	P432081	
		Saxitoxin	0.50	U	ug/L	P432083	
		Nodularin-R	0.10	U	ug/L	P432081	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

EPA 8321B: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P432117

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P432118

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432183

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432184

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432143

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432237

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432189

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432152

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432155

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B

Batch ID: P432024

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

Reference Method: EPA 8321B

Batch ID: P432025

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

Reference Method: EPA 8321B

Batch ID: P432081

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

Reference Method: EPA 8321B

Batch ID: P432083

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: P432117

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Reference Method: DEP SOP: NU-094-1
Batch ID: P432118

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432183

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432184

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432143

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432237

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432189

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432152

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432155

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P432024

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	70.0		P	40 - 160
Desmethyl microcystin LR	133		P	40 - 160
Microcystin HilR	128		P	40 - 160
Microcystin HtyR	115		P	40 - 160
Microcystin LA	93.2		P	40 - 160
Microcystin LF	108		P	40 - 160
Microcystin LR	126		P	40 - 160
Microcystin LW	77.7		P	40 - 160
Microcystin LY	94.4		P	40 - 160
Microcystin RR	73.7		P	40 - 160
Microcystin WR	127		P	40 - 160
Microcystin YR	121		P	40 - 160
Nodularin-R	83.4		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432025

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	124		P	40 - 150
Neosaxitoxin	107		P	40 - 150
Saxitoxin	102		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P432081

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	78.3		P	40 - 160
Desmethyl microcystin LR	137		P	40 - 160
Microcystin HilR	130		P	40 - 160
Microcystin HtyR	118		P	40 - 160
Microcystin LA	99.7		P	40 - 160
Microcystin LF	96.8		P	40 - 160
Microcystin LR	118		P	40 - 160
Microcystin LW	72.0		P	40 - 160
Microcystin LY	82.3		P	40 - 160
Microcystin RR	77.6		P	40 - 160
Microcystin WR	126		P	40 - 160
Microcystin YR	117		P	40 - 160
Nodularin-R	80.4		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	113		P	40 - 150
Neosaxitoxin	94.2		P	40 - 150
Saxitoxin	95.5		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421396	Ammonia-N	95.6	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432184

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421317	Ammonia-N	93.8	94.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432143

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421397	Kjeldahl Nitrogen	108	111	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432237

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421319	NO2NO3-N	98.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432189

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421397	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421399	O-Phosphate-P	97.8	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421398	O-Phosphate-P	95.1	95.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P432024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421263	Cylindrospermopsin	68.4	66.0	P/P	40 - 160
2421263	Desmethyl microcystin LR	136	136	P/P	40 - 160
2421263	Microcystin HiLR	127	123	P/P	40 - 160
2421263	Microcystin HtyR	112	112	P/P	40 - 160
2421263	Microcystin LA	89.5	92.7	P/P	40 - 160
2421263	Microcystin LF	102	110	P/P	40 - 160
2421263	Microcystin LR	119	123	P/P	40 - 160
2421263	Microcystin LW	74.5	73.2	P/P	40 - 160
2421263	Microcystin LY	79.7	80.8	P/P	40 - 160
2421263	Microcystin RR	72.4	71.2	P/P	40 - 160

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P432024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421263	Microcystin WR	116	118	P/P	40 - 160
2421263	Microcystin YR	115	112	P/P	40 - 160
2421263	Nodularin-R	79.3	76.9	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432025

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421263	Anatoxin-a	102	98.3	P/P	40 - 150
2421263	Neosaxitoxin	60.7	58.6	P/P	40 - 150
2421263	Saxitoxin	70.3	65.1	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P432081

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421413	Cylindrospermopsin	86.4	78.5	P/P	40 - 160
2421413	Desmethyl microcystin LR	165	152	F/P	40 - 160
2421413	Microcystin HiLR	141	136	P/P	40 - 160
2421413	Microcystin HtyR	132	123	P/P	40 - 160
2421413	Microcystin LA	101	95.6	P/P	40 - 160
2421413	Microcystin LF	116	106	P/P	40 - 160
2421413	Microcystin LR	141	138	P/P	40 - 160
2421413	Microcystin LW	89.3	81.7	P/P	40 - 160
2421413	Microcystin LY	89.9	91.4	P/P	40 - 160
2421413	Microcystin RR	83.6	81.4	P/P	40 - 160
2421413	Microcystin WR	142	134	P/P	40 - 160
2421413	Microcystin YR	125	123	P/P	40 - 160
2421413	Nodularin-R	90.8	86.3	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P432083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2421413	Anatoxin-a	103	106	P/P	40 - 150
2421413	Neosaxitoxin	115	112	P/P	40 - 150
2421413	Saxitoxin	66.1	70.1	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P432117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421313	Color (true)	0.810	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P432118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421394	Color (true)	6.27	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421396	Ammonia-N	1.29	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P432184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421317	Ammonia-N	0.368	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P432143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421397	Kjeldahl Nitrogen	1.97	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432237

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421319	NO2NO3-N	0.567	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P432189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421397	Total-P	1.29	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421399	O-Phosphate-P	0.102	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P432155

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421398	O-Phosphate-P	0.315	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P432024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421263	Cylindrospermopsin	3.68	Spike	P	0 - 30
2421263	Desmethyl microcystin LR	0.286	Spike	P	0 - 30
2421263	Microcystin HiLR	3.07	Spike	P	0 - 30
2421263	Microcystin HtyR	0.542	Spike	P	0 - 30
2421263	Microcystin LA	3.41	Spike	P	0 - 30
2421263	Microcystin LF	7.21	Spike	P	0 - 30
2421263	Microcystin LR	2.89	Spike	P	0 - 30
2421263	Microcystin LW	1.70	Spike	P	0 - 30
2421263	Microcystin LY	1.38	Spike	P	0 - 30
2421263	Microcystin RR	1.67	Spike	P	0 - 30
2421263	Microcystin WR	2.11	Spike	P	0 - 30
2421263	Microcystin YR	2.32	Spike	P	0 - 30
2421263	Nodularin-R	3.06	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P432025

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421263	Anatoxin-a	3.51	Spike	P	0 - 30
2421263	Neosaxitoxin	3.49	Spike	P	0 - 30
2421263	Saxitoxin	7.66	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P432081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421413	Cylindrospermopsin	9.62	Spike	P	0 - 30
2421413	Desmethyl microcystin LR	8.28	Spike	P	0 - 30
2421413	Microcystin HiLR	3.47	Spike	P	0 - 30
2421413	Microcystin HtyR	6.94	Spike	P	0 - 30
2421413	Microcystin LA	5.12	Spike	P	0 - 30
2421413	Microcystin LF	8.47	Spike	P	0 - 30
2421413	Microcystin LR	2.21	Spike	P	0 - 30
2421413	Microcystin LW	8.87	Spike	P	0 - 30
2421413	Microcystin LY	1.71	Spike	P	0 - 30
2421413	Microcystin RR	2.61	Spike	P	0 - 30
2421413	Microcystin WR	5.51	Spike	P	0 - 30
2421413	Microcystin YR	1.76	Spike	P	0 - 30
2421413	Nodularin-R	5.08	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P432083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2421413	Anatoxin-a	2.42	Spike	P	0 - 30
2421413	Neosaxitoxin	2.93	Spike	P	0 - 30
2421413	Saxitoxin	5.91	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2421411

Field Sample ID: HABCE0183_LouiseLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	130	P	30 - 160
EPA 8321B	Saxitoxin-15N7	98.2	P	30 - 160

Lab Sample ID: 2421412

Field Sample ID: HABCE0189_BonitaLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	134	P	30 - 160
EPA 8321B	Saxitoxin-15N7	91.8	P	30 - 160

Lab Sample ID: 2421413

Field Sample ID: HABCE0190_PioneerLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	118	P	30 - 160
EPA 8321B	Saxitoxin-15N7	51.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A120193

Included Lab Sample IDs: 2421392, 2421393, 2421394

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 110
Color (true)	102	103	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A120204

Included Lab Sample IDs: 2421411, 2421412, 2421413

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	107	104	P/P	50 - 160
Neosaxitoxin	89.9	92.7	P/P	50 - 160
Saxitoxin	90.8	91.6	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A120205

Included Lab Sample IDs: 2421411, 2421412, 2421413

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	75.4	73.2	P/P	60 - 160
Desmethyl microcystin LR	130	135	P/P	50 - 160
Microcystin HIR	121	123	P/P	60 - 160
Microcystin HtyR	115	113	P/P	60 - 160
Microcystin LA	92.2	93.3	P/P	50 - 160
Microcystin LF	90.3	94.8	P/P	60 - 160
Microcystin LR	113	115	P/P	60 - 160
Microcystin LW	74.9	73.5	P/P	60 - 160
Microcystin LY	78.2	83.9	P/P	60 - 160
Microcystin RR	74.3	73.4	P/P	60 - 160
Microcystin WR	130	129	P/P	60 - 160
Microcystin YR	106	111	P/P	60 - 160
Nodularin-R	81.2	79.5	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A120214

Included Lab Sample IDs: 2421398, 2421399, 2421400

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.1	P/P	90 - 110
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120229

Included Lab Sample IDs: 2421395, 2421396, 2421397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	99.7	P/P	90 - 110
Ammonia-N	99.7	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120254

Included Lab Sample IDs: 2421395, 2421396, 2421397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120259

Included Lab Sample IDs: 2421395, 2421396, 2421397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120266

Included Lab Sample IDs: 2421396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120270

Included Lab Sample IDs: 2421395, 2421397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	100	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	
DEP SOP: NU-094-1	Color (true)	101				0.810	
	Color (true)	102				6.27	
EPA 350.1 Rev. 2.0	Ammonia-N	94.8	95.6	97.2			1.29
	Ammonia-N	94.6	93.8	94.2			0.368
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	108	111			1.97
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.5	99.5			0.567
EPA 365.1 Rev. 2.0	Total-P	99.7	102	101			1.29
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.8	97.9			0.102
	O-Phosphate-P	101	95.1	95.4			0.315
EPA 8321B	Anatoxin-a	124	102	98.3			3.51
	Anatoxin-a	113	103	106			2.42
	Cylindrospermopsin	70.0	68.4	66.0			3.68
	Cylindrospermopsin	78.3	86.4	78.5			9.62
	Desmethyl microcystin LR	133	136	136			0.286
	Desmethyl microcystin LR	137	165	152			8.28
	Microcystin HiLR	128	127	123			3.07
	Microcystin HiLR	130	141	136			3.47
	Microcystin HtyR	115	112	112			0.542
	Microcystin HtyR	118	132	123			6.94
	Microcystin LA	93.2	89.5	92.7			3.41
	Microcystin LA	99.7	101	95.6			5.12
	Microcystin LF	108	102	110			7.21
	Microcystin LF	96.8	116	106			8.47
	Microcystin LR	126	119	123			2.89
	Microcystin LR	118	141	138			2.21
	Microcystin LW	77.7	74.5	73.2			1.70
	Microcystin LW	72.0	89.3	81.7			8.87
	Microcystin LY	94.4	79.7	80.8			1.38
	Microcystin LY	82.3	89.9	91.4			1.71
	Microcystin RR	73.7	72.4	71.2			1.67
	Microcystin RR	77.6	83.6	81.4			2.61
	Microcystin WR	127	116	118			2.11
	Microcystin WR	126	142	134			5.51
	Microcystin YR	121	115	112			2.32
	Microcystin YR	117	125	123			1.76
	Neosaxitoxin	107	60.7	58.6			3.49
	Neosaxitoxin	94.2	115	112			2.93
	Nodularin-R	83.4	79.3	76.9			3.06
	Nodularin-R	80.4	90.8	86.3			5.08
	Saxitoxin	102	70.3	65.1			7.66
	Saxitoxin	95.5	66.1	70.1			5.91

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2421392, 2421393, 2421394
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2421395, 2421396, 2421397
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2421395, 2421396, 2421397
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2421395, 2421396, 2421397
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2421395, 2421396, 2421397
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2421398, 2421399, 2421400
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2421411, 2421412, 2421413

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2421411, 2421412, 2421413

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	07/06/2023			07/06/2023 13:54	Samantha L Bates	2421392
	07/06/2023			07/06/2023 13:55	Samantha L Bates	2421393
	07/06/2023			07/06/2023 14:00	Samantha L Bates	2421394
EPA 350.1 Rev. 2.0	07/06/2023			07/07/2023 12:42	Ping Hua	2421396
	07/06/2023			07/07/2023 12:52	Ping Hua	2421397
	07/06/2023			07/07/2023 13:24	Ping Hua	2421395
EPA 351.2 Rev. 2.0	07/06/2023	07/07/2023 11:48	Simonne.V. Calhoun	07/10/2023 09:42	Samantha L Bates	2421395
	07/06/2023	07/07/2023 11:48	Simonne.V. Calhoun	07/10/2023 09:43	Samantha L Bates	2421396
	07/06/2023	07/07/2023 11:48	Simonne.V. Calhoun	07/10/2023 09:45	Samantha L Bates	2421397
EPA 353.2 Rev. 2.0	07/06/2023			07/10/2023 11:18	Beverly Y. Sanders	2421395
	07/06/2023			07/10/2023 11:19	Beverly Y. Sanders	2421396
	07/06/2023			07/10/2023 11:20	Beverly Y. Sanders	2421397
EPA 365.1 Rev. 2.0	07/06/2023	07/07/2023 16:02	Adam P Silver	07/10/2023 13:05	Chandler E Cox	2421396
	07/06/2023	07/07/2023 16:02	Adam P Silver	07/10/2023 14:13	Chandler E Cox	2421397
	07/06/2023	07/07/2023 16:02	Adam P Silver	07/10/2023 14:14	Chandler E Cox	2421395
EPA 365.1 Rev. 2.0 dissolved	07/06/2023			07/07/2023 09:37	James L Waggeberby	2421399
	07/06/2023			07/07/2023 10:15	James L Waggeberby	2421398
	07/06/2023			07/07/2023 10:18	James L Waggeberby	2421400
EPA 8321B	07/06/2023	07/06/2023 11:00	Tae K Lee	07/06/2023 21:34	Hana Lee	2421411
	07/06/2023	07/06/2023 11:00	Tae K Lee	07/06/2023 21:47	Hana Lee	2421412
	07/06/2023	07/06/2023 11:00	Tae K Lee	07/06/2023 22:57	Hana Lee	2421413
	07/06/2023	07/06/2023 11:00	Tae K Lee	07/06/2023 23:12	Juyoung Kim	2421411
	07/06/2023	07/06/2023 11:00	Tae K Lee	07/06/2023 23:29	Juyoung Kim	2421412
	07/06/2023	07/06/2023 11:00	Tae K Lee	07/07/2023 00:54	Juyoung Kim	2421413