Chemical Analysis Report

WQAP-2023-08-15-02

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-07-24-36**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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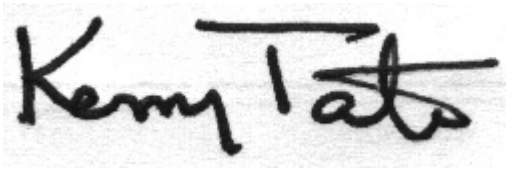
Date Certified: 05-SEP-2023 12:30



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Nutrients and Pesticides.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Okeechobee - Pahokee Marina **Collection Date/Time: 08/14/2023 11:40**

Field ID: SEHAB0017 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2430815	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433886	
		Cylindrospermopsin	0.10	U	ug/L	P433884	
		Desmethyl microcystin LR	0.25	U	ug/L	P433884	
		Microcystin HilR	0.25	U	ug/L	P433884	
		Microcystin HtyR	0.25	U	ug/L	P433884	
		Microcystin LA	0.10	U	ug/L	P433884	
		Microcystin LF	0.10	U	ug/L	P433884	
		Microcystin LR	0.25	U	ug/L	P433884	
		Microcystin LW	0.25	U	ug/L	P433884	
		Microcystin LY	0.10	U	ug/L	P433884	
		Microcystin RR	0.10	U	ug/L	P433884	
		Microcystin WR	0.50	U	ug/L	P433884	
		Neosaxitoxin	0.50	U	ug/L	P433886	
		Microcystin YR	0.25	U	ug/L	P433884	
		Saxitoxin	0.50	U	ug/L	P433886	
		Nodularin-R	0.10	U	ug/L	P433884	
2430818	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P434171	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P434137	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P434473	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P433904	
2430821	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.088		mg P/L	P433867	

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: Lake Okeechobee - S308C (lakeside) **Collection Date/Time: 08/14/2023 12:30**

Field ID: SEHAB0062 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2430816	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433886	
		Cylindrospermopsin	0.10	U	ug/L	P433884	
		Desmethyl microcystin LR	0.61	I	ug/L	P433884	
		Microcystin HilR	0.60	I	ug/L	P433884	
		Microcystin HtyR	0.25	U	ug/L	P433884	
		Microcystin LA	0.82		ug/L	P433884	
		Microcystin LF	0.10	U	ug/L	P433884	
		Microcystin LR	28		ug/L	P433884	
		Microcystin LW	0.25	U	ug/L	P433884	
		Microcystin LY	0.10	U	ug/L	P433884	
		Microcystin RR	0.10	U	ug/L	P433884	
		Microcystin WR	0.50	U	ug/L	P433884	
		Neosaxitoxin	0.50	U	ug/L	P433886	
		Microcystin YR	0.25	U	ug/L	P433884	
		Saxitoxin	0.50	U	ug/L	P433886	
		Nodularin-R	0.10	U	ug/L	P433884	
2430819	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P434171	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.1		mg N/L	P434137	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.095		mg N/L	P434473	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P433904	
2430822	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.044		mg P/L	P433867	

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: C44 Canal - S308C (canal side) **Collection Date/Time: 08/14/2023 12:40**

Field ID: SEHAB0063 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2430817	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433886	
		Cylindrospermopsin	0.10	U	ug/L	P433884	
		Desmethyl microcystin LR	0.25	U	ug/L	P433884	
		Microcystin HilR	0.25	U	ug/L	P433884	
		Microcystin HtyR	0.25	U	ug/L	P433884	
		Microcystin LA	0.10	U	ug/L	P433884	
		Microcystin LF	0.10	U	ug/L	P433884	
		Microcystin LR	1.2		ug/L	P433884	
		Microcystin LW	0.25	U	ug/L	P433884	
		Microcystin LY	0.10	U	ug/L	P433884	
		Microcystin RR	0.10	U	ug/L	P433884	
		Microcystin WR	0.50	U	ug/L	P433884	
		Neosaxitoxin	0.50	U	ug/L	P433886	
		Microcystin YR	0.25	U	ug/L	P433884	
		Saxitoxin	0.50	U	ug/L	P433886	
		Nodularin-R	0.10	U	ug/L	P433884	
2430820	EPA 350.1 Rev. 2.0	Ammonia-N	0.20		mg N/L	P434171	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P434227	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.17		mg N/L	P434473	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P433904	
2430823	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.079		mg P/L	P433869	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434171

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434137

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434227

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434473

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433904

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433867

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433869

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

Reference Method: EPA 8321B
Batch ID: P433884

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P433884

Component	Result	Code	Units
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: P433886

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: P434171

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434137

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434227

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434473

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433904

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433867

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433869

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

Reference Method: EPA 8321B
Batch ID: P433884

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	103		P	40 - 160
Desmethyl microcystin LR	96.3		P	40 - 160
Microcystin HilR	93.5		P	40 - 160
Microcystin HtyR	90.5		P	40 - 160
Microcystin LA	92.3		P	40 - 160
Microcystin LF	106		P	40 - 160
Microcystin LR	95.3		P	40 - 160
Microcystin LW	98.7		P	40 - 160
Microcystin LY	86.3		P	40 - 160
Microcystin RR	97.2		P	40 - 160

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P433884

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Microcystin WR	76.2		P	40 - 160
Microcystin YR	86.7		P	40 - 160
Nodularin-R	104		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433886

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	102		P	40 - 150
Neosaxitoxin	89.1		P	40 - 150
Saxitoxin	83.3		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434171

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430785	Ammonia-N	99.8	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430836	Kjeldahl Nitrogen	101	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434473

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430818	NO2NO3-N	98.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433904

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430784	Total-P	103	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430763	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430904	O-Phosphate-P	101	99.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P433884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430755	Cylindrospermopsin	108	93.4	P/P	40 - 160
2430755	Desmethyl microcystin LR	106	83.6	P/P	40 - 160
2430755	Microcystin HilR	103	101	P/P	40 - 160
2430755	Microcystin HtyR	97.5	96.5	P/P	40 - 160
2430755	Microcystin LA	104	96.8	P/P	40 - 160
2430755	Microcystin LF	104	106	P/P	40 - 160
2430755	Microcystin LR	97.2	101	P/P	40 - 160
2430755	Microcystin LW	100	102	P/P	40 - 160
2430755	Microcystin LY	97.5	98.9	P/P	40 - 160
2430755	Microcystin RR	97.4	78.3	P/P	40 - 160
2430755	Microcystin WR	97.5	95.1	P/P	40 - 160
2430755	Microcystin YR	95.9	91.4	P/P	40 - 160
2430755	Nodularin-R	102	106	P/P	40 - 160

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P433886

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430755	Anatoxin-a	107	109	P/P	40 - 150
2430755	Neosaxitoxin	105	108	P/P	40 - 150
2430755	Saxitoxin	90.9	96.6	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434171

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430785	Ammonia-N	1.70	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2429369	Kjeldahl Nitrogen	0.151	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430836	Kjeldahl Nitrogen	4.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430818	NO2NO3-N	0.651	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P433904

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430784	Total-P	2.93	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430763	O-Phosphate-P	0.276	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430904	O-Phosphate-P	0.853	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P433884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430755	Cylindrospermopsin	14.5	Spike	P	0 - 30
2430755	Desmethyl microcystin LR	23.4	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P433884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430755	Microcystin HilR	1.39	Spike	P	0 - 30
2430755	Microcystin HtyR	1.03	Spike	P	0 - 30
2430755	Microcystin LA	7.54	Spike	P	0 - 30
2430755	Microcystin LF	1.57	Spike	P	0 - 30
2430755	Microcystin LR	3.35	Spike	P	0 - 30
2430755	Microcystin LW	1.52	Spike	P	0 - 30
2430755	Microcystin LY	1.40	Spike	P	0 - 30
2430755	Microcystin RR	21.3	Spike	P	0 - 30
2430755	Microcystin WR	2.44	Spike	P	0 - 30
2430755	Microcystin YR	4.87	Spike	P	0 - 30
2430755	Nodularin-R	3.86	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P433886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430755	Anatoxin-a	2.14	Spike	P	0 - 30
2430755	Neosaxitoxin	2.73	Spike	P	0 - 30
2430755	Saxitoxin	6.07	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2430815
Field Sample ID: SEHAB0017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	95.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	74.6	P	30 - 160

Lab Sample ID: 2430816
Field Sample ID: SEHAB0062

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	96.8	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	113	P	30 - 160

Lab Sample ID: 2430817
Field Sample ID: SEHAB0063

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	101	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	90.2	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A121045
Included Lab Sample IDs: 2430821, 2430822, 2430823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.3	98.2	P/P	90 - 110
O-Phosphate-P	98.4	97.1	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A121085
Included Lab Sample IDs: 2430815, 2430816, 2430817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.3	91.6	P/P	50 - 160
Anatoxin-a	91.6	85.1	P/P	50 - 160
Neosaxitoxin	83.1	84.1	P/P	50 - 160
Neosaxitoxin	84.1	81.7	P/P	50 - 160
Saxitoxin	78.7	79.4	P/P	50 - 160
Saxitoxin	79.3	78.7	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A121086
Included Lab Sample IDs: 2430815, 2430816, 2430817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	81.1	98.2	P/P	60 - 160
Cylindrospermopsin	98.2	88.9	P/P	60 - 160
Desmethyl microcystin LR	92.6	92.9	P/P	50 - 160
Desmethyl microcystin LR	92.9	87.5	P/P	50 - 160
Microcystin HilR	87.9	95.8	P/P	60 - 160
Microcystin HilR	94.1	87.9	P/P	60 - 160
Microcystin HtyR	82.8	89.0	P/P	60 - 160
Microcystin HtyR	85.0	82.8	P/P	60 - 160
Microcystin LA	92.0	99.0	P/P	50 - 160
Microcystin LA	92.7	92.0	P/P	50 - 160
Microcystin LF	93.0	93.5	P/P	60 - 160
Microcystin LF	94.5	93.0	P/P	60 - 160
Microcystin LR	85.3	80.8	P/P	60 - 160
Microcystin LR	86.9	85.3	P/P	60 - 160
Microcystin LW	89.3	92.3	P/P	60 - 160
Microcystin LW	91.0	89.3	P/P	60 - 160
Microcystin LY	85.7	88.1	P/P	60 - 160
Microcystin LY	91.2	85.7	P/P	60 - 160
Microcystin RR	77.7	83.6	P/P	60 - 160
Microcystin RR	83.9	77.7	P/P	60 - 160
Microcystin WR	87.6	79.8	P/P	60 - 160
Microcystin WR	88.2	87.6	P/P	60 - 160
Microcystin YR	81.3	81.7	P/P	60 - 160
Microcystin YR	81.7	82.9	P/P	60 - 160
Nodularin-R	89.4	77.9	P/P	60 - 160
Nodularin-R	97.9	89.4	P/P	60 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121096
Included Lab Sample IDs: 2430818, 2430819, 2430820

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A121170
Included Lab Sample IDs: 2430818, 2430819, 2430820

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.1	98.2	P/P	90 - 110
Ammonia-N	98.2	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A121202
Included Lab Sample IDs: 2430818, 2430819

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A121227
Included Lab Sample IDs: 2430820

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A121306
Included Lab Sample IDs: 2430818, 2430819, 2430820

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	97.5	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	95.8	99.8	102			1.70
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105					0.151
	Kjeldahl Nitrogen	110	101	109			4.33
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	98.0	97.0			0.651
EPA 365.1 Rev. 2.0	Total-P	103	103	108			2.93
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	100	100			0.276
	O-Phosphate-P	101	101	99.8			0.853
EPA 8321B	Anatoxin-a	102	107	109			2.14
	Cylindrospermopsin	103	108	93.4			14.5
	Desmethyl microcystin LR	96.3	106	83.6			23.4
	Microcystin HilR	93.5	103	101			1.39
	Microcystin HtyR	90.5	97.5	96.5			1.03
	Microcystin LA	92.3	104	96.8			7.54
	Microcystin LF	106	104	106			1.57
	Microcystin LR	95.3	97.2	101			3.35
	Microcystin LW	98.7	100	102			1.52
	Microcystin LY	86.3	97.5	98.9			1.40
	Microcystin RR	97.2	97.4	78.3			21.3
	Microcystin WR	76.2	97.5	95.1			2.44
	Microcystin YR	86.7	95.9	91.4			4.87
	Neosaxitoxin	89.1	105	108			2.73
	Nodularin-R	104	102	106			3.86
	Saxitoxin	83.3	90.9	96.6			6.07

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2430818, 2430819, 2430820
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2430818, 2430819, 2430820
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2430818, 2430819, 2430820
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2430818, 2430819, 2430820
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2430821, 2430822, 2430823
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2430815, 2430816, 2430817
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2430815, 2430816, 2430817

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	08/15/2023			08/22/2023 12:20	Khloe J Berg	2430818
	08/15/2023			08/22/2023 12:21	Khloe J Berg	2430819
	08/15/2023			08/22/2023 12:48	Khloe J Berg	2430820
EPA 351.2 Rev. 2.0	08/15/2023	08/22/2023 15:30	Simonne.V. Calhoun	08/23/2023 13:45	Samantha L Bates	2430818
	08/15/2023	08/22/2023 15:30	Simonne.V. Calhoun	08/23/2023 13:50	Samantha L Bates	2430819
	08/15/2023	08/23/2023 11:43	Dana G. Hughes	08/24/2023 12:02	Samantha L Bates	2430820
EPA 353.2 Rev. 2.0	08/15/2023			08/29/2023 10:24	Beverly Y. Sanders	2430818
	08/15/2023			08/29/2023 10:33	Beverly Y. Sanders	2430819
	08/15/2023			08/29/2023 10:35	Beverly Y. Sanders	2430820
EPA 365.1 Rev. 2.0	08/15/2023	08/16/2023 16:02	Adam P Silver	08/17/2023 14:02	James L Waggerby	2430818
	08/15/2023	08/16/2023 16:02	Adam P Silver	08/17/2023 14:03	James L Waggerby	2430819
	08/15/2023	08/16/2023 16:02	Adam P Silver	08/17/2023 14:04	James L Waggerby	2430820
EPA 365.1 Rev. 2.0 dissolved	08/15/2023			08/15/2023 15:24	Adam P Silver	2430821
	08/15/2023			08/15/2023 15:25	Adam P Silver	2430822
	08/15/2023			08/15/2023 15:48	Adam P Silver	2430823
EPA 8321B	08/15/2023	08/16/2023 12:00	Tae K Lee	08/16/2023 22:44	Hana Lee	2430815
	08/15/2023	08/16/2023 12:00	Tae K Lee	08/16/2023 23:18	Hana Lee	2430816
	08/15/2023	08/16/2023 12:00	Tae K Lee	08/16/2023 23:35	Hana Lee	2430817
	08/15/2023	08/16/2023 12:00	Tae K Lee	08/16/2023 23:39	Hana Lee	2430815
	08/15/2023	08/16/2023 12:00	Tae K Lee	08/17/2023 00:07	Hana Lee	2430816
	08/15/2023	08/16/2023 12:00	Tae K Lee	08/17/2023 00:21	Hana Lee	2430817