Chemical Analysis Report

SO-DIST-2024-05-24-01

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

Event Description: **Algal Bloom Response - SOROC**
Request ID: **RQ-2024-04-22-59**
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: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 10-JUN-2024 12:33

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: Hancock Creek - Seaside Key Ct Canal **Collection Date/Time: 05/23/2024 11:40**

Field ID: HAB-SD-0192 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2489029	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P445676	
		Cylindrospermopsin	0.10	U	ug/L	P445675	
		Desmethyl microcystin LR	0.25	U	ug/L	P445675	
		Microcystin HilR	0.25	U	ug/L	P445675	
		Microcystin HtyR	0.25	U	ug/L	P445675	
		Microcystin LA	0.10	U	ug/L	P445675	
		Microcystin LF	0.10	U	ug/L	P445675	
		Microcystin LR	0.25	U	ug/L	P445675	
		Microcystin LW	0.25	U	ug/L	P445675	
		Microcystin LY	0.10	U	ug/L	P445675	
		Microcystin RR	0.10	U	ug/L	P445675	
		Microcystin WR	0.50	U	ug/L	P445675	
		Neosaxitoxin	0.50	U	ug/L	P445676	
		Microcystin YR	0.25	U	ug/L	P445675	
		Saxitoxin	0.50	U	ug/L	P445676	
		Nodularin-R	0.10	U	ug/L	P445675	
2489033	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P445784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P445762	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P445881	
	EPA 365.1 Rev. 2.0	Total-P	0.77		mg P/L	P445884	

Sample Location: Caloosahatchee River - Meade Canal **Collection Date/Time: 05/23/2024 11:15**

Field ID: HAB-SD-0191 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2489028	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P445676	
		Cylindrospermopsin	0.10	U	ug/L	P445675	
		Desmethyl microcystin LR	0.25	U	ug/L	P445675	
		Microcystin HilR	0.25	U	ug/L	P445675	
		Microcystin HtyR	0.25	U	ug/L	P445675	
		Microcystin LA	0.10	U	ug/L	P445675	
		Microcystin LF	0.10	U	ug/L	P445675	
		Microcystin LR	0.25	U	ug/L	P445675	
		Microcystin LW	0.25	U	ug/L	P445675	
		Microcystin LY	0.10	U	ug/L	P445675	
		Microcystin RR	0.10	U	ug/L	P445675	
		Microcystin WR	0.50	U	ug/L	P445675	
		Neosaxitoxin	0.50	U	ug/L	P445676	
		Microcystin YR	0.25	U	ug/L	P445675	
		Saxitoxin	0.50	U	ug/L	P445676	
		Nodularin-R	0.10	U	ug/L	P445675	
2489032	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P445784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P445762	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P445881	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P445770	

Sample Location: Caloosahatchee River - Caloosahatchee Drive Canal **Collection Date/Time: 05/23/2024 09:15**

Field ID: HAB-SD-0189 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2489026	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P445676	
		Cylindrospermopsin	0.10	U	ug/L	P445675	
		Desmethyl microcystin LR	0.25	U	ug/L	P445675	
		Microcystin HilR	0.25	U	ug/L	P445675	
		Microcystin HtyR	0.25	U	ug/L	P445675	
		Microcystin LA	0.10	U	ug/L	P445675	
		Microcystin LF	0.10	U	ug/L	P445675	
		Microcystin LR	0.32	I	ug/L	P445675	
		Microcystin LW	0.25	U	ug/L	P445675	
		Microcystin LY	0.10	U	ug/L	P445675	
		Microcystin RR	0.10	U	ug/L	P445675	
		Microcystin WR	0.50	U	ug/L	P445675	
		Neosaxitoxin	0.50	U	ug/L	P445676	
		Microcystin YR	0.25	U	ug/L	P445675	
		Saxitoxin	0.50	U	ug/L	P445676	
		Nodularin-R	0.10	U	ug/L	P445675	
2489030	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P445784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P445760	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P445976	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P445770	

Sample Location: Caloosahatchee River - Little Canal **Collection Date/Time: 05/23/2024 11:00**

Field ID: HAB-SD-0190 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2489027	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P445676	
		Cylindrospermopsin	0.10	U	ug/L	P445675	
		Desmethyl microcystin LR	0.25	U	ug/L	P445675	
		Microcystin HilR	0.25	U	ug/L	P445675	
		Microcystin HtyR	0.25	U	ug/L	P445675	
		Microcystin LA	0.10	U	ug/L	P445675	
		Microcystin LF	0.10	U	ug/L	P445675	
		Microcystin LR	0.25	U	ug/L	P445675	
		Microcystin LW	0.25	U	ug/L	P445675	
		Microcystin LY	0.10	U	ug/L	P445675	
		Microcystin RR	0.10	U	ug/L	P445675	
		Microcystin WR	0.50	U	ug/L	P445675	
		Neosaxitoxin	0.50	U	ug/L	P445676	
		Microcystin YR	0.25	U	ug/L	P445675	
		Saxitoxin	0.50	U	ug/L	P445676	
		Nodularin-R	0.10	U	ug/L	P445675	
2489031	EPA 350.1 Rev. 2.0	Ammonia-N	0.18		mg N/L	P445831	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P445759	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P445793	
	EPA 365.1 Rev. 2.0	Total-P	0.27		mg P/L	P445756	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P445784

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P445831

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445759

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445760

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445762

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445793

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445881

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445976

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445756

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445770

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445884

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

Reference Method: EPA 8321B
Batch ID: P445675

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: P445676

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: P445784

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P445831

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445759

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445760

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445762

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445793

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445881

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445976

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445756

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445770

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445884

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

Reference Method: EPA 8321B
Batch ID: P445675

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	88.9		P	40 - 160
Desmethyl microcystin LR	81.5		P	40 - 160
Microcystin HilR	83.5		P	40 - 160
Microcystin HtyR	80.9		P	40 - 160
Microcystin LA	93.6		P	40 - 160
Microcystin LF	93.8		P	40 - 160
Microcystin LR	80.6		P	40 - 160
Microcystin LW	87.8		P	40 - 160
Microcystin LY	85.6		P	40 - 160
Microcystin RR	89.1		P	40 - 160
Microcystin WR	87.4		P	40 - 160
Microcystin YR	80.8		P	40 - 160
Nodularin-R	85.6		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P445676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	98.2		P	40 - 150
Neosaxitoxin	72.3		P	40 - 150
Saxitoxin	81.2		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P445784

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488957	Ammonia-N	103	99.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P445831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488870	Ammonia-N	95.6	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488268	Kjeldahl Nitrogen	98.0	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445760

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488348	Kjeldahl Nitrogen	96.7	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445762

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2489032	Kjeldahl Nitrogen	94.2	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445793

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488267	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445881

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2489045	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488348	NO2NO3-N	99.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2489058	Total-P	93.4	93.8	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445770

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488959	Total-P	99.3	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2489676	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P445675

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488997	Cylindrospermopsin	92.5	90.4	P/P	40 - 160
2488997	Desmethyl microcystin LR	86.8	84.6	P/P	40 - 160
2488997	Microcystin HilR	90.0	86.9	P/P	40 - 160
2488997	Microcystin HtyR	86.3	85.1	P/P	40 - 160
2488997	Microcystin LA	96.3	93.8	P/P	40 - 160
2488997	Microcystin LF	98.1	103	P/P	40 - 160
2488997	Microcystin LR	83.3	84.1	P/P	40 - 160
2488997	Microcystin LW	87.7	93.0	P/P	40 - 160
2488997	Microcystin LY	85.6	85.0	P/P	40 - 160
2488997	Microcystin RR	89.7	91.2	P/P	40 - 160
2488997	Microcystin WR	92.6	89.5	P/P	40 - 160
2488997	Microcystin YR	85.1	85.6	P/P	40 - 160
2488997	Nodularin-R	91.2	92.2	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P445676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2488997	Anatoxin-a	97.8	97.3	P/P	40 - 150
2488997	Neosaxitoxin	64.1	64.2	P/P	40 - 150
2488997	Saxitoxin	78.1	78.6	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P445784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488957	Ammonia-N	2.93	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P445831

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488870	Ammonia-N	0.935	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488268	Kjeldahl Nitrogen	2.11	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445760

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488348	Kjeldahl Nitrogen	0.972	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P445762

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2489032	Kjeldahl Nitrogen	3.75	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488267	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445881

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2489045	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P445976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488348	NO2NO3-N	1.50	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2489058	Total-P	0.382	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488959	Total-P	1.53	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P445884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2489676	Total-P	0.745	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P445675

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488997	Cylindrospermopsin	2.23	Spike	P	0 - 30
2488997	Desmethyl microcystin LR	2.54	Spike	P	0 - 30
2488997	Microcystin HilR	3.57	Spike	P	0 - 30
2488997	Microcystin HtyR	1.45	Spike	P	0 - 30
2488997	Microcystin LA	2.60	Spike	P	0 - 30
2488997	Microcystin LF	5.04	Spike	P	0 - 30
2488997	Microcystin LR	0.967	Spike	P	0 - 30
2488997	Microcystin LW	5.83	Spike	P	0 - 30
2488997	Microcystin LY	0.735	Spike	P	0 - 30
2488997	Microcystin RR	1.72	Spike	P	0 - 30
2488997	Microcystin WR	3.44	Spike	P	0 - 30
2488997	Microcystin YR	0.570	Spike	P	0 - 30
2488997	Nodularin-R	1.09	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P445676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2488997	Anatoxin-a	0.490	Spike	P	0 - 30
2488997	Neosaxitoxin	0.197	Spike	P	0 - 30
2488997	Saxitoxin	0.566	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2489026
Field Sample ID: HAB-SD-0189

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	104	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	88.1	P	30 - 160

Lab Sample ID: 2489027
Field Sample ID: HAB-SD-0190

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	85.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	94.5	P	30 - 160

Lab Sample ID: 2489028
Field Sample ID: HAB-SD-0191

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	101	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	89.7	P	30 - 160

Lab Sample ID: 2489029
Field Sample ID: HAB-SD-0192

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	95.4	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	100	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A125847
Included Lab Sample IDs: 2489026, 2489027, 2489028, 2489029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	103	99.9	P/P	50 - 160
Neosaxitoxin	86.4	83.1	P/P	50 - 160
Saxitoxin	94.9	91.5	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A125858
Included Lab Sample IDs: 2489026, 2489027, 2489028, 2489029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	92.0	89.9	P/P	60 - 160
Desmethyl microcystin LR	83.0	81.6	P/P	60 - 160
Microcystin HilR	84.6	83.8	P/P	60 - 160
Microcystin HtyR	87.1	83.1	P/P	60 - 160
Microcystin LA	93.1	94.5	P/P	50 - 160
Microcystin LF	90.6	92.1	P/P	50 - 160
Microcystin LR	86.5	81.4	P/P	60 - 160
Microcystin LW	92.9	84.9	P/P	60 - 160
Microcystin LY	85.0	87.6	P/P	60 - 160
Microcystin RR	87.7	86.8	P/P	60 - 160
Microcystin WR	85.4	83.0	P/P	60 - 160
Microcystin YR	86.7	81.4	P/P	60 - 160
Nodularin-R	90.2	87.6	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A125899
Included Lab Sample IDs: 2489030, 2489032, 2489033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A125903
Included Lab Sample IDs: 2489031

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A125912
Included Lab Sample IDs: 2489030, 2489031

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	104	P/P	90 - 110
Total-P	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A125916
Included Lab Sample IDs: 2489032

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A125917
Included Lab Sample IDs: 2489031

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A125918
Included Lab Sample IDs: 2489031

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A125932
Included Lab Sample IDs: 2489032, 2489033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A125936
Included Lab Sample IDs: 2489030, 2489032, 2489033

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	98.3	P/P	90 - 110
Kjeldahl Nitrogen	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A125950
Included Lab Sample IDs: 2489033

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A125968
Included Lab Sample IDs: 2489030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	104	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	96.2	103	99.8			2.93
	Ammonia-N	94.2	95.6	96.6			0.935
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	98.0	101			2.11
	Kjeldahl Nitrogen	96.8	96.7	98.2			0.972
	Kjeldahl Nitrogen	98.1	94.2	99.4			3.75
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	100			0.499
	NO2NO3-N	103	102	102			0.489
	NO2NO3-N	100	99.5	101			1.50
EPA 365.1 Rev. 2.0	Total-P	101	93.4	93.8			0.382
	Total-P	99.5	99.3	101			1.53
	Total-P	104	106	106			0.745
EPA 8321B	Anatoxin-a	98.2	97.8	97.3			0.490
	Cylindrospermopsin	88.9	92.5	90.4			2.23
	Desmethyl microcystin LR	81.5	86.8	84.6			2.54
	Microcystin HilR	83.5	90.0	86.9			3.57
	Microcystin HtyR	80.9	86.3	85.1			1.45
	Microcystin LA	93.6	96.3	93.8			2.60
	Microcystin LF	93.8	98.1	103			5.04
	Microcystin LR	80.6	83.3	84.1			0.967
	Microcystin LW	87.8	87.7	93.0			5.83
	Microcystin LY	85.6	85.6	85.0			0.735
	Microcystin RR	89.1	89.7	91.2			1.72
	Microcystin WR	87.4	92.6	89.5			3.44
	Microcystin YR	80.8	85.1	85.6			0.570
	Neosaxitoxin	72.3	64.1	64.2			0.197
	Nodularin-R	85.6	91.2	92.2			1.09
	Saxitoxin	81.2	78.1	78.6			0.566

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2489030, 2489031, 2489032, 2489033
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2489030, 2489031, 2489032, 2489033
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2489030, 2489031, 2489032, 2489033
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2489030, 2489031, 2489032, 2489033
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2489026, 2489027, 2489028, 2489029
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2489026, 2489027, 2489028, 2489029

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	05/24/2024			05/29/2024 13:45	Khloe J Berg	2489030
	05/24/2024			05/29/2024 13:46	Khloe J Berg	2489032
	05/24/2024			05/29/2024 13:47	Khloe J Berg	2489033
	05/24/2024			05/30/2024 12:31	Khloe J Berg	2489031
EPA 351.2 Rev. 2.0	05/24/2024	05/29/2024 12:12	Robyn Blevins	05/30/2024 14:08	Robyn Blevins	2489031
	05/24/2024	05/29/2024 12:13	Robyn Blevins	05/31/2024 10:51	Robyn Blevins	2489030
	05/24/2024	05/29/2024 12:13	Robyn Blevins	05/31/2024 10:55	Robyn Blevins	2489032
	05/24/2024	05/29/2024 12:13	Robyn Blevins	05/31/2024 11:03	Robyn Blevins	2489033
EPA 353.2 Rev. 2.0	05/24/2024			05/29/2024 15:20	Fadila Guebre	2489031
	05/24/2024			05/30/2024 16:20	Fadila Guebre	2489032
	05/24/2024			05/30/2024 16:24	Fadila Guebre	2489033
	05/24/2024			06/03/2024 14:33	Fadila Guebre	2489030
EPA 365.1 Rev. 2.0	05/24/2024	05/29/2024 12:15	Josephine W Gitau	05/30/2024 11:05	Simonne.V. Calhoun	2489031
	05/24/2024	05/29/2024 12:15	Josephine W Gitau	05/30/2024 11:17	Simonne.V. Calhoun	2489030
	05/24/2024	05/29/2024 12:15	Josephine W Gitau	05/30/2024 13:05	Simonne.V. Calhoun	2489032
	05/24/2024	05/31/2024 13:18	Josephine W Gitau	06/03/2024 12:16	James L Waggerby	2489033
EPA 8321B	05/24/2024	05/24/2024 12:30	Hana Lee	05/24/2024 15:58	Hana Lee	2489026
	05/24/2024	05/24/2024 12:30	Hana Lee	05/24/2024 16:14	Hana Lee	2489027
	05/24/2024	05/24/2024 12:30	Hana Lee	05/24/2024 16:31	Hana Lee	2489028
	05/24/2024	05/24/2024 12:30	Hana Lee	05/24/2024 16:48	Hana Lee	2489029
	05/24/2024	05/24/2024 12:40	Hana Lee	05/24/2024 16:07	Hana Lee	2489026
	05/24/2024	05/24/2024 12:40	Hana Lee	05/24/2024 16:21	Hana Lee	2489027
	05/24/2024	05/24/2024 12:40	Hana Lee	05/24/2024 16:35	Hana Lee	2489028
	05/24/2024	05/24/2024 12:40	Hana Lee	05/24/2024 16:49	Hana Lee	2489029