Chemical Analysis Report

WQAP-2021-06-04-09

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

Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2021-05-24-38**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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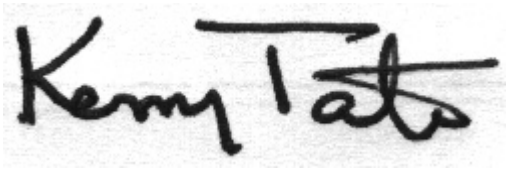
Date Certified: 30-JUN-2021 12:43



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: Peace River @ Zolfo Springs **Collection Date/Time: 06/03/2021 09:20**

Field ID: FLO 41 770 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2252347	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P399221	
		Cylindrospermopsin	0.10	U	ug/L	P399221	
		Desmethyl microcystin LR	0.25	U	ug/L	P399221	
		Microcystin HilR**	0.25	U	ug/L	P399221	
		Microcystin HtyR**	0.25	U	ug/L	P399221	
		Microcystin LA	0.10	U	ug/L	P399221	
		Microcystin LF	0.10	U	ug/L	P399221	
		Microcystin LR	0.25	I	ug/L	P399221	
		Microcystin LW	0.25	U	ug/L	P399221	
		Microcystin LY	0.10	U	ug/L	P399221	
		Microcystin RR	0.10	U	ug/L	P399221	
		Microcystin WR	0.50	U	ug/L	P399221	
		Microcystin YR	0.25	U	ug/L	P399221	
		Nodularin-R**	0.10	U	ug/L	P399221	
2252354	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P399577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P400220	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P399292	
	EPA 365.1 Rev. 2.0	Total-P	1.0		mg P/L	P399697	
2252355	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.50		mg P/L	P399269	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399577

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400220

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399292

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399697

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399269

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

Reference Method: EPA 8321B
Batch ID: P399221

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399577

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400220

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399292

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399697

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399269

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

Reference Method: EPA 8321B
Batch ID: P399221

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	102		P	40 - 150
Cylindrospermopsin	110		P	40 - 150
Desmethyl microcystin LR	105		P	40 - 150
Microcystin HilR	116		P	40 - 150
Microcystin HtyR	113		P	40 - 150
Microcystin LA	127		P	40 - 150
Microcystin LF	127		P	40 - 150
Microcystin LR	114		P	40 - 150
Microcystin LW	119		P	40 - 150
Microcystin LY	127		P	40 - 150
Microcystin RR	118		P	40 - 150
Microcystin WR	116		P	40 - 150
Microcystin YR	128		P	40 - 150
Nodularin-R	122		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2252357	Ammonia-N	99.0	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400220

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256239	Kjeldahl Nitrogen	99.5	115	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399292

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2252325	NO2NO3-N	100	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2252254	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399269

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2252290	O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P399221

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2252262	Anatoxin-a	99.0	88.3	P/P	40 - 150
2252262	Cylindrospermopsin	83.9	81.1	P/P	40 - 150
2252262	Desmethyl microcystin LR	82.7	80.2	P/P	40 - 150
2252262	Microcystin HilR	88.1	88.5	P/P	40 - 150
2252262	Microcystin HtyR	89.5	89.0	P/P	40 - 150
2252262	Microcystin LA	97.7	95.5	P/P	40 - 150
2252262	Microcystin LF	71.6	72.1	P/P	40 - 150
2252262	Microcystin LR	91.7	83.7	P/P	40 - 150
2252262	Microcystin LW	68.5	65.7	P/P	40 - 150
2252262	Microcystin LY	90.6	92.5	P/P	40 - 150
2252262	Microcystin RR	96.2	94.3	P/P	40 - 150
2252262	Microcystin WR	81.4	81.1	P/P	40 - 150
2252262	Microcystin YR	97.8	94.3	P/P	40 - 150
2252262	Nodularin-R	97.3	95.9	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252357	Ammonia-N	2.40	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256239	Kjeldahl Nitrogen	7.91	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399292

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252325	NO2NO3-N	0.440	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252254	Total-P	0.723	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399269

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252290	O-Phosphate-P	0.801	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P399221

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252262	Anatoxin-a	11.4	Spike	P	0 - 30
2252262	Cylindrospermopsin	3.38	Spike	P	0 - 30
2252262	Desmethyl microcystin LR	3.10	Spike	P	0 - 30
2252262	Microcystin HilR	0.459	Spike	P	0 - 30
2252262	Microcystin HtyR	0.594	Spike	P	0 - 30
2252262	Microcystin LA	2.28	Spike	P	0 - 30
2252262	Microcystin LF	0.739	Spike	P	0 - 30
2252262	Microcystin LR	9.11	Spike	P	0 - 30
2252262	Microcystin LW	4.12	Spike	P	0 - 30
2252262	Microcystin LY	2.10	Spike	P	0 - 30
2252262	Microcystin RR	1.99	Spike	P	0 - 30
2252262	Microcystin WR	0.398	Spike	P	0 - 30
2252262	Microcystin YR	3.55	Spike	P	0 - 30
2252262	Nodularin-R	1.41	Spike	P	0 - 30

Quality Assurance Report
Precision

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2252347
Field Sample ID: FLO 41 770

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	83.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	94.0	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A105880
Included Lab Sample IDs: 2252347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	86.2	90.9	P/P	50 - 160
Cylindrospermopsin	100	112	P/P	50 - 160
Desmethyl microcystin LR	89.1	88.6	P/P	50 - 160
Microcystin HilR	91.1	93.8	P/P	50 - 160
Microcystin HtyR	95.8	92.9	P/P	50 - 160
Microcystin LA	107	107	P/P	50 - 160
Microcystin LF	96.7	105	P/P	50 - 160
Microcystin LR	97.3	101	P/P	50 - 160
Microcystin LW	89.8	96.0	P/P	50 - 160
Microcystin LY	107	106	P/P	50 - 160
Microcystin RR	107	108	P/P	50 - 160
Microcystin WR	93.7	93.4	P/P	50 - 160
Microcystin YR	105	109	P/P	50 - 160
Nodularin-R	103	106	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105891
Included Lab Sample IDs: 2252355

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105912
Included Lab Sample IDs: 2252354

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106024
Included Lab Sample IDs: 2252354

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106099
Included Lab Sample IDs: 2252354

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A106324
Included Lab Sample IDs: 2252354

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.9	98.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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	97.6	99.0	96.0			2.40
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.6	99.5	115			7.91
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	99.7			0.440
EPA 365.1 Rev. 2.0	Total-P	101	102	103			0.723
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	99.5	100			0.801
EPA 8321B	Anatoxin-a	102	99.0	88.3			11.4
	Cylindrospermopsin	110	83.9	81.1			3.38
	Desmethyl microcystin LR	105	82.7	80.2			3.10
	Microcystin HilR	116	88.1	88.5			0.459
	Microcystin HtyR	113	89.5	89.0			0.594
	Microcystin LA	127	97.7	95.5			2.28
	Microcystin LF	127	71.6	72.1			0.739
	Microcystin LR	114	91.7	83.7			9.11
	Microcystin LW	119	68.5	65.7			4.12
	Microcystin LY	127	90.6	92.5			2.10
	Microcystin RR	118	96.2	94.3			1.99
	Microcystin WR	116	81.4	81.1			0.398
	Microcystin YR	128	97.8	94.3			3.55
	Nodularin-R	122	97.3	95.9			1.41

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2252354
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2252354
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2252354
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2252354
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2252355
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2252347

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	06/04/2021			06/11/2021 12:27	Roberta Tatti	2252354
EPA 351.2 Rev. 2.0	06/04/2021	06/25/2021 16:59	Benjamin T. Nordmann	06/28/2021 11:44	Letuzia M De Oliveira	2252354
EPA 353.2 Rev. 2.0	06/04/2021			06/07/2021 11:22	Beverly Y. Sanders	2252354
EPA 365.1 Rev. 2.0	06/04/2021	06/15/2021 10:37	Shengyu Ding	06/16/2021 10:09	Shengyu Ding	2252354
EPA 365.1 Rev. 2.0 dissolved	06/04/2021			06/04/2021 17:39	Ping Hua	2252355
EPA 8321B	06/04/2021	06/04/2021 14:00	Pramila Ghimire	06/04/2021 20:59	Pramila Ghimire	2252347