Chemical Analysis Report

WQAP-2019-12-11-03

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-2019-12-09-62**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637
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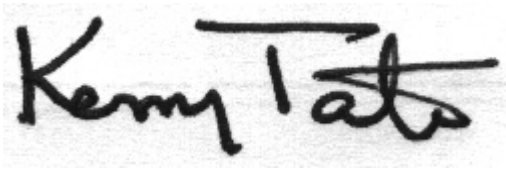
Date Certified: 20-DEC-2019 14:42



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: Tiger Lake - NW Lobe **Collection Date/Time: 12/10/2019 10:40**

Field ID: HAB-SW-0005 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2142295	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P375585	
		Cylindrospermopsin**	0.25	U	ug/L	P375585	
		Desmethyl microcystin LR**	0.25	UJ	ug/L	P375585	LCS
		Microcystin LA**	0.25	U	ug/L	P375585	
		Microcystin LF**	0.25	U	ug/L	P375585	
		Microcystin LR**	0.67	I	ug/L	P375585	
		Microcystin LW**	0.25	U	ug/L	P375585	
		Microcystin LY**	0.25	U	ug/L	P375585	
		Microcystin RR**	0.25	U	ug/L	P375585	
		Microcystin WR**	0.25	U	ug/L	P375585	
		Microcystin YR**	0.25	U	ug/L	P375585	
2142296	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P375970	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.9		mg N/L	P375959	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P375687	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P375704	
2142297	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P375641	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375970

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375959

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375687

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375704

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375641

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

Reference Method: EPA 8321B
Batch ID: P375585

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.25	U	ug/L
Microcystin YR	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375970

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375959

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375687

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: P375704

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375641

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

Reference Method: EPA 8321B
Batch ID: P375585

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	112		P	40 - 140
Cylindrospermopsin	106		P	40 - 140
Desmethyl microcystin LR	141		F	40 - 140
Microcystin LA	130		P	40 - 140
Microcystin LF	133		P	40 - 140
Microcystin LR	134		P	40 - 140
Microcystin LW	123		P	40 - 140
Microcystin LY	128		P	40 - 140
Microcystin RR	121		P	40 - 140
Microcystin WR	122		P	40 - 140
Microcystin YR	122		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142107	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375959

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142322	Kjeldahl Nitrogen	97.8	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142296	NO2NO3-N	98.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142236	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375641

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142297	O-Phosphate-P	95.8	96.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P375585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141682	Anatoxin-a	93.1	98.4	P/P	40 - 140
2141682	Cylindrospermopsin	72.2	75.4	P/P	40 - 140
2141682	Desmethyl microcystin LR	138	134	P/P	40 - 140
2141682	Microcystin LA	111	119	P/P	40 - 140
2141682	Microcystin LF	104	118	P/P	40 - 140
2141682	Microcystin LR	131	131	P/P	40 - 140
2141682	Microcystin LW	98.6	102	P/P	40 - 140
2141682	Microcystin LY	107	112	P/P	40 - 140
2141682	Microcystin RR	108	112	P/P	40 - 140
2141682	Microcystin WR	113	115	P/P	40 - 140
2141682	Microcystin YR	109	111	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142107	Ammonia-N	0.698	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375959

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142322	Kjeldahl Nitrogen	0.192	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P375687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142296	NO2NO3-N	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142236	Total-P	0.0236	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375641

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142297	O-Phosphate-P	0.573	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P375585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141682	Anatoxin-a	5.49	Spike	P	0 - 30
2141682	Cylindrospermopsin	4.30	Spike	P	0 - 30
2141682	Desmethyl microcystin LR	3.39	Spike	P	0 - 30
2141682	Microcystin LA	6.45	Spike	P	0 - 30
2141682	Microcystin LF	12.1	Spike	P	0 - 30
2141682	Microcystin LR	0.445	Spike	P	0 - 30
2141682	Microcystin LW	3.63	Spike	P	0 - 30
2141682	Microcystin LY	4.58	Spike	P	0 - 30
2141682	Microcystin RR	3.50	Spike	P	0 - 30
2141682	Microcystin WR	1.55	Spike	P	0 - 30
2141682	Microcystin YR	1.29	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2142295
Field Sample ID: HAB-SW-0005

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	118	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A96266
Included Lab Sample IDs: 2142297

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	95.8	96.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A96284
Included Lab Sample IDs: 2142296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A96289
Included Lab Sample IDs: 2142295

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	87.0	87.7	P/P	50 - 160
Cylindrospermopsin	97.4	94.4	P/P	60 - 160
Desmethyl microcystin LR	129	126	P/P	50 - 160
Microcystin LA	119	118	P/P	50 - 160
Microcystin LF	121	115	P/P	60 - 160
Microcystin LR	123	114	P/P	60 - 160
Microcystin LW	115	103	P/P	50 - 160
Microcystin LY	111	111	P/P	60 - 160
Microcystin RR	112	106	P/P	60 - 160
Microcystin WR	110	117	P/P	60 - 160
Microcystin YR	101	98.2	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A96319
Included Lab Sample IDs: 2142296

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A96389
Included Lab Sample IDs: 2142296

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A96455
Included Lab Sample IDs: 2142296

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	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	103	101	101			0.698
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.6	97.8	98.1			0.192
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	98.5	97.5			1.02
EPA 365.1 Rev. 2.0	Total-P	107	101	101			0.0236
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	95.8	96.4			0.573
EPA 8321B	Anatoxin-a	112	93.1	98.4			5.49
	Cylindrospermopsin	106	72.2	75.4			4.30
	Desmethyl microcystin LR	141	138	134			3.39
	Microcystin LA	130	111	119			6.45
	Microcystin LF	133	104	118			12.1
	Microcystin LR	134	131	131			0.445
	Microcystin LW	123	98.6	102			3.63
	Microcystin LY	128	107	112			4.58
	Microcystin RR	121	108	112			3.50
	Microcystin WR	122	113	115			1.55
	Microcystin YR	122	109	111			1.29

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2142296
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2142296
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2142296
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2142296
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2142297
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2142295

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	12/11/2019			12/16/2019 12:18	Ping Hua	2142296
EPA 351.2 Rev. 2.0	12/11/2019	12/17/2019 12:25	Sima Feizi	12/18/2019 16:47	Jhamieka S. Greenwood	2142296
EPA 353.2 Rev. 2.0	12/11/2019			12/12/2019 11:21	Beverly Y. Sanders	2142296
EPA 365.1 Rev. 2.0	12/11/2019	12/12/2019 10:19	Yen Ta	12/13/2019 13:48	Benjamin T. Nordmann	2142296
EPA 365.1 Rev. 2.0 dissolved	12/11/2019			12/11/2019 14:18	Samantha Davila	2142297
EPA 8321B	12/11/2019	12/12/2019 09:00	Juyoung Kim	12/12/2019 13:00	Juyoung Kim	2142295