

Chemical Analysis Report

WQAP-2019-08-28-01

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

Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2019-08-19-48**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Date Certified: 11-SEP-2019 16:04



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 Bay Lake, Volusia County

Collection Date/Time: 08/27/2019 12:32

Field ID: Tiger Bay Lake, Volusia County

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2115072	EPA 8321B	Anatoxin-a**	0.25	UJ	ug/L	P369814	MS
		Cylindrospermopsin**	0.25	U	ug/L	P369814	
		Microcystin LA**	0.25	U	ug/L	P369814	
		Microcystin LF**	0.25	U	ug/L	P369814	
		Microcystin LR**	0.25	U	ug/L	P369814	
		Microcystin LY**	0.25	U	ug/L	P369814	
		Microcystin RR**	0.25	U	ug/L	P369814	
		Microcystin YR**	0.25	U	ug/L	P369814	
2115073	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P370156	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P369918	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P369997	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P370071	
2115074	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369843	

Ref. Method and Comment:

EPA 8321B: Refer to the narrative for an explanation of QC Codes.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370156

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369918

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369997

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370071

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369843

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

Reference Method: EPA 8321B
Batch ID: P369814

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	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 LY	0.25	U	ug/L
Microcystin RR	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: P370156

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369918

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369997

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370071

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369843

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P369814

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	127		P	40 - 140
Cylindrospermopsin	112		P	40 - 140
Microcystin LA	101		P	40 - 140
Microcystin LF	93.0		P	40 - 140
Microcystin LR	108		P	40 - 140
Microcystin LY	93.8		P	40 - 140
Microcystin RR	121		P	40 - 140
Microcystin YR	107		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P370156

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2114867	Ammonia-N	97.4	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P369918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115037	Kjeldahl Nitrogen	108	110	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P369997

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115073	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P370071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2114868	Total-P	94.8	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P369843

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115074	O-Phosphate-P	95.8	96.6	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P369814

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2115072	Anatoxin-a	145	134	F/P	40 - 140
2115072	Cylindrospermopsin	109	103	P/P	40 - 140
2115072	Microcystin LA	76.9	73.0	P/P	40 - 140
2115072	Microcystin LF	86.4	80.2	P/P	40 - 140
2115072	Microcystin LR	110	117	P/P	40 - 140
2115072	Microcystin LY	78.8	67.1	P/P	40 - 140
2115072	Microcystin RR	127	112	P/P	40 - 140
2115072	Microcystin YR	96.4	106	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370156

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2114867	Ammonia-N	1.11	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115037	Kjeldahl Nitrogen	1.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115073	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2114868	Total-P	2.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115074	O-Phosphate-P	0.832	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P369814

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2115072	Anatoxin-a	8.44	Spike	P	0 - 30
2115072	Cylindrospermopsin	5.82	Spike	P	0 - 30
2115072	Microcystin LA	5.14	Spike	P	0 - 30
2115072	Microcystin LF	7.48	Spike	P	0 - 30
2115072	Microcystin LR	6.58	Spike	P	0 - 30
2115072	Microcystin LY	16.1	Spike	P	0 - 30
2115072	Microcystin RR	12.3	Spike	P	0 - 30
2115072	Microcystin YR	9.16	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Surrogates

Lab Sample ID: 2115072

Field Sample ID: Tiger Bay Lake, Volusia County

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	78.3	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A93839

Included Lab Sample IDs: 2115074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A93880

Included Lab Sample IDs: 2115072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	112	115	P/P	50 - 160
Cylindrospermopsin	99.9	91.7	P/P	60 - 160
Microcystin LA	93.5	67.5	P/P	50 - 160
Microcystin LF	106	72.6	P/P	60 - 160
Microcystin LR	108	114	P/P	60 - 160
Microcystin LY	92.2	64.2	P/P	60 - 160
Microcystin RR	108	111	P/P	60 - 160
Microcystin YR	105	104	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93923

Included Lab Sample IDs: 2115073

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A93925

Included Lab Sample IDs: 2115073

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93973

Included Lab Sample IDs: 2115073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A93986

Included Lab Sample IDs: 2115073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	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 SMP	MS
					LCS	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	97.4	98.7		1.11
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	108	110		1.94
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	104	104		0.482
EPA 365.1 Rev. 2.0	Total-P	94.9	94.8	97.0		2.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	95.8	96.6		0.832
EPA 8321B	Anatoxin-a	127	145	134		8.44
	Cylindrospermopsin	112	109	103		5.82
	Microcystin LA	101	76.9	73.0		5.14
	Microcystin LF	93.0	86.4	80.2		7.48
	Microcystin LR	108	110	117		6.58
	Microcystin LY	93.8	78.8	67.1		16.1
	Microcystin RR	121	127	112		12.3
	Microcystin YR	107	96.4	106		9.16

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2115073
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2115073
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2115073
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2115073
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2115074
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2115072

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	08/28/2019			09/04/2019 13:31	Ping Hua	2115073
EPA 351.2 Rev. 2.0	08/28/2019	08/29/2019 11:55	Sima Feizi	08/30/2019 12:15	Joseph Suarez	2115073
EPA 353.2 Rev. 2.0	08/28/2019			08/30/2019 11:50	Beverly Y. Sanders	2115073
EPA 365.1 Rev. 2.0	08/28/2019	09/03/2019 13:30	Lipi Saha	09/04/2019 12:16	Lipi Saha	2115073
EPA 365.1 Rev. 2.0 dissolved	08/28/2019			08/28/2019 14:36	Jhamieka S. Greenwood	2115074
EPA 8321B	08/28/2019	08/29/2019 12:30	Juyoung Kim	08/29/2019 14:30	Juyoung Kim	2115072