

Chemical Analysis Report

WQAP-2016-08-24-02

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

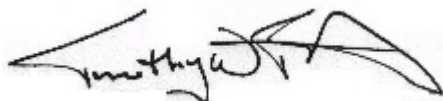
Event Description: **Lake Istokpoga**
Request ID: **RQ-2016-08-08-52**
Customer: **WQAP**
Project ID: **SPPROJECTS**

Send Reports to:
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Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 26-AUG-2016 09:30

A handwritten signature in black ink, appearing to read "Timothy W. Fitzpatrick", with a stylized flourish at the end.

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 group are included in this report: 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 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 ISTOKPOGA ALGAE SE

Collection Date/Time: 08/23/2016 09:25

Field ID: G4SD0154

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1826197	EPA 8321B	Microcystin LR**	1.0	U	ug/L	P310201	
		Microcystin LA**	1.0	U	ug/L	P310201	
		Microcystin RR**	1.0	U	ug/L	P310201	
		Microcystin YR**	1.0	U	ug/L	P310201	
		Cylindrospermopsin**	1.0	U	ug/L	P310201	

Ref. Method and Comment:

EPA 8321B: Anatoxin-a = 1.0 U ug/L. Microcystin LF = 1.0 U ug/L and microcystin LY = 1.0 U ug/L. Results for microcystins LF and LY are qualitative only and their validation is pending.

Sample Location: LAKE ISTOKPOGA ALGAE S

Collection Date/Time: 08/23/2016 08:55

Field ID: G4SD0153

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1826198	EPA 8321B	Microcystin LR**	1.0	U	ug/L	P310201	
		Microcystin LA**	1.0	U	ug/L	P310201	
		Microcystin RR**	1.0	U	ug/L	P310201	
		Microcystin YR**	1.0	U	ug/L	P310201	
		Cylindrospermopsin**	1.0	U	ug/L	P310201	

Ref. Method and Comment:

EPA 8321B: Anatoxin-a = 1.0 U ug/L. Microcystin LF = 1.0 U ug/L and microcystin LY = 1.0 U ug/L. Results for microcystins LF and LY are qualitative only and their validation is pending.

Sample Location: LAKE ISTOKPOGA ALGAE NE

Collection Date/Time: 08/23/2016 10:10

Field ID: G4SD0151

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1826199	EPA 8321B	Microcystin LR**	1.0	U	ug/L	P310201	
		Microcystin LA**	1.0	U	ug/L	P310201	
		Microcystin RR**	1.0	U	ug/L	P310201	
		Microcystin YR**	1.0	U	ug/L	P310201	
		Cylindrospermopsin**	1.0	U	ug/L	P310201	

Ref. Method and Comment:

EPA 8321B: Anatoxin-a = 1.0 U ug/L. Microcystin LF = 1.0 U ug/L and microcystin LY = 1.0 U ug/L. Results for microcystins LF and LY are qualitative only and their validation is pending.

Sample Location: LAKE ISTOKPOGA ALGAE NW

Collection Date/Time: 08/23/2016 10:35

Field ID: G4SD0152

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1826200	EPA 8321B	Microcystin LR**	1.0	U	ug/L	P310201	
		Microcystin LA**	1.0	U	ug/L	P310201	
		Microcystin RR**	1.0	U	ug/L	P310201	
		Microcystin YR**	1.0	U	ug/L	P310201	
		Cylindrospermopsin**	1.0	U	ug/L	P310201	

Ref. Method and Comment:

EPA 8321B: Anatoxin-a = 1.0 U ug/L. Microcystin LF = 1.0 U ug/L and microcystin LY = 1.0 U ug/L. Results for microcystins LF and LY are qualitative only and their validation is pending.

Sample Location: LAKE ISTOKPOGA ALGAE CEN

Collection Date/Time: 08/23/2016 09:50

Field ID: G4SD0156

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1826201	EPA 8321B	Microcystin LR**	1.0	U	ug/L	P310201	
		Microcystin LA**	1.0	U	ug/L	P310201	
		Microcystin RR**	1.0	U	ug/L	P310201	
		Microcystin YR**	1.0	U	ug/L	P310201	
		Cylindrospermopsin**	1.0	U	ug/L	P310201	

Ref. Method and Comment:

EPA 8321B: Anatoxin-a = 1.0 U ug/L. Microcystin LF = 1.0 U ug/L and microcystin LY = 1.0 U ug/L. Results for microcystins LF and LY are qualitative only and their validation is pending.

Sample Location: LAKE ISTOKPOGA ALGAE W

Collection Date/Time: 08/23/2016 10:50

Field ID: G4SD0155

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1826202	EPA 8321B	Microcystin LR**	1.0	U	ug/L	P310201	
		Microcystin LA**	1.0	U	ug/L	P310201	
		Microcystin RR**	1.0	U	ug/L	P310201	
		Microcystin YR**	1.0	U	ug/L	P310201	
		Cylindrospermopsin**	1.0	U	ug/L	P310201	

Ref. Method and Comment:

EPA 8321B: Anatoxin-a = 1.0 U ug/L. Microcystin LF = 1.0 U ug/L and microcystin LY = 1.0 U ug/L. Results for microcystins LF and LY are qualitative only and their validation is pending.

Quality Assurance Report Method Blank Results

Reference Method: EPA 8321B

Batch ID: P310201

Component	Result	Code	Units
Cylindrospermopsin	1.0	U	ug/L
Microcystin LA	1.0	U	ug/L
Microcystin LR	1.0	U	ug/L
Microcystin RR	1.0	U	ug/L
Microcystin YR	1.0	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B

Batch ID: P310201

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	79.9		P	40 - 160
Microcystin LA	113		P	40 - 160
Microcystin LR	86.0		P	40 - 160
Microcystin RR	92.3		P	40 - 160
Microcystin YR	116		P	40 - 160

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P310201

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825568	Cylindrospermopsin	101	74.9	P/P	40 - 160
1825568	Microcystin LA	117	118	P/P	40 - 160
1825568	Microcystin LR	107	95.4	P/P	40 - 160
1825568	Microcystin RR	98.4	99.3	P/P	40 - 160
1825568	Microcystin YR	89.8	107	P/P	40 - 160

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P310201

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1825568	Cylindrospermopsin	29.7	Spike	P	0 - 30
1825568	Microcystin LA	0.851	Spike	P	0 - 30
1825568	Microcystin LR	11.5	Spike	P	0 - 30
1825568	Microcystin RR	0.928	Spike	P	0 - 30
1825568	Microcystin YR	17.5	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: 1826197
Field Sample ID: G4SD0154

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	91.0	P	40 - 160
EPA 8321B	Microcystin LF-d5	84.0	P	40 - 150

Lab Sample ID: 1826198
Field Sample ID: G4SD0153

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	102	P	40 - 160
EPA 8321B	Microcystin LF-d5	62.0	P	40 - 150

Lab Sample ID: 1826199
Field Sample ID: G4SD0151

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	97.0	P	40 - 160
EPA 8321B	Microcystin LF-d5	87.0	P	40 - 150

Lab Sample ID: 1826200
Field Sample ID: G4SD0152

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
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Quality Assurance Report Surrogates

Lab Sample ID: 1826200
 Field Sample ID: G4SD0152

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	112	P	40 - 160
EPA 8321B	Microcystin LF-d5	81.0	P	40 - 150

Lab Sample ID: 1826201
 Field Sample ID: G4SD0156

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	99.0	P	40 - 160
EPA 8321B	Microcystin LF-d5	104	P	40 - 150

Lab Sample ID: 1826202
 Field Sample ID: G4SD0155

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	94.5	P	40 - 160
EPA 8321B	Microcystin LF-d5	98.5	P	40 - 150

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
 Run ID: A71325
 Included Lab Sample IDs: 1826197, 1826198, 1826199, 1826200, 1826201, 1826202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	97.9	71.9	P/P	60 - 160
Microcystin LA	104	128	P/P	50 - 160
Microcystin LR	96.6	104	P/P	60 - 160
Microcystin RR	96.2	116	P/P	60 - 160
Microcystin YR	74.1	71.5	P/P	60 - 160

* 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	LCS	Precision SMP	MS
EPA 8321B	Cylindrospermopsin	79.9	101 74.9			29.7
	Microcystin LA	113	117 118			0.851
	Microcystin LR	86.0	107 95.4			11.5
	Microcystin RR	92.3	98.4 99.3			0.928
	Microcystin YR	116	89.8 107			17.5

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
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Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	1826197, 1826198, 1826199, 1826200, 1826201, 1826202

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	08/24/2016	08/24/2016	Juyoung Kim	08/24/2016	Juyoung Kim	1826197, 1826198, 1826199, 1826200, 1826201, 1826202