

Chemical Analysis Report

WQAP-2020-11-06-01

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

Event Description: **Lake O Release SD**
Request ID: **RQ-2020-10-19-58**
Customer: **WQAP**
Project ID: **LKORELEASE**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399-2400
Attn: Dave Whiting

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 16-NOV-2020 09:55

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first few letters of the first name.

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: G3SD0171 Upstream S77 Lock

Collection Date/Time: 11/05/2020 09:45

Field ID: HAB_SD110520_001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2206971	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P389959	
		Cylindrospermopsin**	0.25	U	ug/L	P389959	
		Desmethyl microcystin LR**	0.25	U	ug/L	P389959	
		Microcystin LA**	0.25	U	ug/L	P389959	
		Microcystin LF**	0.25	U	ug/L	P389959	
		Microcystin LR**	0.25	U	ug/L	P389959	
		Microcystin LW**	0.25	U	ug/L	P389959	
		Microcystin LY**	0.25	U	ug/L	P389959	
		Microcystin RR**	0.25	U	ug/L	P389959	
		Microcystin WR**	0.50	U	ug/L	P389959	
		Microcystin YR**	0.25	U	ug/L	P389959	
2206972	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P389894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P389953	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.063		mg N/L	P389917	
	EPA 365.1 Rev. 2.0	Total-P	0.075		mg P/L	P389933	
2206973	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P389888	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389894

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389953

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389917

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389933

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

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

Reference Method: EPA 8321B
Batch ID: P389959

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	0.50	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: P389894

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389953

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389917

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389933

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

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

Reference Method: EPA 8321B
Batch ID: P389959

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 150
Cylindrospermopsin	99.0		P	40 - 150
Desmethyl microcystin LR	94.5		P	40 - 150
Microcystin LA	123		P	40 - 150
Microcystin LF	105		P	40 - 150
Microcystin LR	96.0		P	40 - 150
Microcystin LW	80.9		P	40 - 150
Microcystin LY	102		P	40 - 150
Microcystin RR	86.6		P	40 - 150
Microcystin WR	95.5		P	40 - 150
Microcystin YR	86.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206642	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389917

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206701	NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389933

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2205417	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207124	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P389959

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2206971	Anatoxin-a	90.1	85.6	P/P	40 - 150
2206971	Cylindrospermopsin	84.2	86.1	P/P	40 - 150
2206971	Desmethyl microcystin LR	97.2	101	P/P	40 - 150
2206971	Microcystin LA	107	112	P/P	40 - 150
2206971	Microcystin LF	93.8	93.8	P/P	40 - 150
2206971	Microcystin LR	97.2	87.9	P/P	40 - 150
2206971	Microcystin LW	71.5	78.4	P/P	40 - 150
2206971	Microcystin LY	99.3	92.8	P/P	40 - 150
2206971	Microcystin RR	84.8	86.7	P/P	40 - 150
2206971	Microcystin WR	90.3	97.1	P/P	40 - 150
2206971	Microcystin YR	75.9	71.0	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206642	Ammonia-N	1.14	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206978	Kjeldahl Nitrogen	1.55	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389917

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206701	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2205417	Total-P	1.45	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207124	O-Phosphate-P	0.494	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P389959

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2206971	Anatoxin-a	5.10	Spike	P	0 - 30
2206971	Cylindrospermopsin	2.17	Spike	P	0 - 30
2206971	Desmethyl microcystin LR	3.46	Spike	P	0 - 30
2206971	Microcystin LA	4.87	Spike	P	0 - 30
2206971	Microcystin LF	0.0167	Spike	P	0 - 30
2206971	Microcystin LR	10.1	Spike	P	0 - 30
2206971	Microcystin LW	9.22	Spike	P	0 - 30
2206971	Microcystin LY	6.72	Spike	P	0 - 30
2206971	Microcystin RR	2.16	Spike	P	0 - 30
2206971	Microcystin WR	7.32	Spike	P	0 - 30
2206971	Microcystin YR	6.71	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2206971
Field Sample ID: HAB_SD110520_001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	86.5	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	76.9	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A102024

Included Lab Sample IDs: 2206973

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102027

Included Lab Sample IDs: 2206972

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102043

Included Lab Sample IDs: 2206972

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A102070

Included Lab Sample IDs: 2206972

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102073

Included Lab Sample IDs: 2206972

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	99.7	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A102106

Included Lab Sample IDs: 2206971

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	93.0	99.2	P/P	50 - 160
Cylindrospermopsin	98.4	98.5	P/P	60 - 160
Desmethyl microcystin LR	97.7	107	P/P	60 - 160
Microcystin LA	115	128	P/P	50 - 160
Microcystin LF	92.0	107	P/P	50 - 160
Microcystin LR	92.5	96.0	P/P	60 - 160
Microcystin LW	82.4	85.3	P/P	60 - 160
Microcystin LY	102	104	P/P	60 - 160
Microcystin RR	80.2	92.5	P/P	60 - 160
Microcystin WR	96.8	98.9	P/P	60 - 160
Microcystin YR	82.6	79.9	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 350.1 Rev. 2.0	Ammonia-N	98.9	103	104			1.14
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110					1.55
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	98.5	99.0			0.506
EPA 365.1 Rev. 2.0	Total-P	105	102	103			1.45
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	101	102			0.494
EPA 8321B	Anatoxin-a	104	90.1	85.6			5.10
	Cylindrospermopsin	99.0	84.2	86.1			2.17
	Desmethyl microcystin LR	94.5	97.2	101			3.46
	Microcystin LA	123	107	112			4.87
	Microcystin LF	105	93.8	93.8			0.0167
	Microcystin LR	96.0	97.2	87.9			10.1
	Microcystin LW	80.9	71.5	78.4			9.22
	Microcystin LY	102	99.3	92.8			6.72
	Microcystin RR	86.6	84.8	86.7			2.16
	Microcystin WR	95.5	90.3	97.1			7.32
	Microcystin YR	86.1	75.9	71.0			6.71

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2206972
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2206972
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2206972
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2206972
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2206973
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2206971

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	11/06/2020			11/07/2020 12:44	Ping Hua	2206972
EPA 351.2 Rev. 2.0	11/06/2020	11/09/2020 13:30	David Boose	11/10/2020 12:25	Elliott Rodriguez	2206972
EPA 353.2 Rev. 2.0	11/06/2020			11/09/2020 09:37	Beverly Y. Sanders	2206972
EPA 365.1 Rev. 2.0	11/06/2020	11/09/2020 12:24	Yen Ta	11/10/2020 12:45	Benjamin T. Nordmann	2206972
EPA 365.1 Rev. 2.0 dissolved	11/06/2020			11/06/2020 17:05	Ping Hua	2206973
EPA 8321B	11/06/2020	11/12/2020 08:30	Juyoung Kim	11/12/2020 10:14	Pramila Ghimire	2206971