

Chemical Analysis Report

WQAP-2019-07-20-01

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-2019-06-24-31**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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3319 Maguire Blvd
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Attn: Mike Linger

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-AUG-2019 13:55

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: LAKE WASHINGTON BREVARD COUNTY

Collection Date/Time: 07/19/2019 12:10

Field ID: LAKE WASHINGTON BREVARD COUNTY

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2104950	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P367653	
		Cylindrospermopsin**	0.25	U	ug/L	P367653	
		Microcystin LA**	0.25	U	ug/L	P367653	
		Microcystin LF**	0.25	U	ug/L	P367653	
		Microcystin LR**	0.25	U	ug/L	P367653	
		Microcystin LY**	0.25	U	ug/L	P367653	
		Microcystin RR**	0.25	U	ug/L	P367653	
		Microcystin YR**	0.25	U	ug/L	P367653	

Sample Location: LAKE WASHINGTON BREVARD COUNTY

Collection Date/Time: 07/19/2019 12:10

Field ID: LAKE WASHINGTON BREVARD COUNTY

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2104951	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P368306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.6		mg N/L	P367897	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P367799	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P367809	
2104952	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P367659	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368306

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367897

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367799

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367809

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367659

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

Reference Method: EPA 8321B
Batch ID: P367653

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: P368306

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P367897

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P367799

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: P367809

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P367659

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.8		P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P367653

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	80.4		P	40 - 140
Cylindrospermopsin	87.5		P	40 - 140
Microcystin LA	84.1		P	40 - 140
Microcystin LF	96.9		P	40 - 140
Microcystin LR	93.2		P	40 - 140
Microcystin LY	92.9		P	40 - 140
Microcystin RR	96.4		P	40 - 140
Microcystin YR	102		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104790	Ammonia-N	103	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367897

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104962	Kjeldahl Nitrogen	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2103447	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367809

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104932	Total-P	100	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367659

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104952	O-Phosphate-P	90.5	90.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P367653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2104950	Anatoxin-a	88.3	84.6	P/P	40 - 140
2104950	Cylindrospermopsin	89.2	74.7	P/P	40 - 140
2104950	Microcystin LA	106	83.9	P/P	40 - 140
2104950	Microcystin LF	121	99.5	P/P	40 - 140
2104950	Microcystin LR	127	99.9	P/P	40 - 140
2104950	Microcystin LY	112	95.5	P/P	40 - 140
2104950	Microcystin RR	102	92.0	P/P	40 - 140
2104950	Microcystin YR	122	103	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104790	Ammonia-N	1.60	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P367897

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104962	Kjeldahl Nitrogen	1.38	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P367799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2103447	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P367809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104932	Total-P	4.57	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P367659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104952	O-Phosphate-P	0.315	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P367653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2104950	Anatoxin-a	4.33	Spike	P	0 - 30
2104950	Cylindrospermopsin	17.6	Spike	P	0 - 30
2104950	Microcystin LA	23.3	Spike	P	0 - 30
2104950	Microcystin LF	19.3	Spike	P	0 - 30
2104950	Microcystin LR	23.6	Spike	P	0 - 30
2104950	Microcystin LY	15.7	Spike	P	0 - 30
2104950	Microcystin RR	9.91	Spike	P	0 - 30
2104950	Microcystin YR	16.5	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: 2104950

Field Sample ID: LAKE WASHINGTON BREVARD COUNTY

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	84.0	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
 Run ID: A92912
 Included Lab Sample IDs: 2104950

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	69.2	73.9	P/P	50 - 160
Cylindrospermopsin	85.0	86.5	P/P	60 - 160
Microcystin LA	80.4	82.4	P/P	50 - 160
Microcystin LF	99.0	91.0	P/P	60 - 160
Microcystin LR	98.6	87.5	P/P	60 - 160
Microcystin LY	90.1	81.4	P/P	60 - 160
Microcystin RR	89.7	90.6	P/P	60 - 160
Microcystin YR	97.7	94.3	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Run ID: A92914
 Included Lab Sample IDs: 2104952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.9	97.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Run ID: A92975
 Included Lab Sample IDs: 2104951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A93009
 Included Lab Sample IDs: 2104951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A93073
 Included Lab Sample IDs: 2104951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	96.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A93196
 Included Lab Sample IDs: 2104951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	100	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	104	103	102			1.60
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	104	106			1.38
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.5	99.0	99.0			0.0
EPA 365.1 Rev. 2.0	Total-P	97.0	100	105			4.57
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.8	90.2	90.5			0.315
EPA 8321B	Anatoxin-a	80.4	84.6	88.3			4.33
	Cylindrospermopsin	87.5	74.7	89.2			17.6
	Microcystin LA	84.1	106	83.9			23.3
	Microcystin LF	96.9	121	99.5			19.3
	Microcystin LR	93.2	99.9	127			23.6
	Microcystin LY	92.9	112	95.5			15.7
	Microcystin RR	96.4	92.0	102			9.91
	Microcystin YR	102	103	122			16.5

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2104951
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2104951
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2104951
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2104951
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2104952
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2104950

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	07/20/2019			07/31/2019 14:32	Virginia P. Brown	2104951
EPA 351.2 Rev. 2.0	07/20/2019	07/25/2019 12:00	Adrian Shelby	07/26/2019 14:44	Joseph Suarez	2104951
EPA 353.2 Rev. 2.0	07/20/2019			07/24/2019 08:58	Beverly Y. Sanders	2104951
EPA 365.1 Rev. 2.0	07/20/2019	07/24/2019 11:15	Vijayalakshmi Reddy	07/25/2019 09:25	Lipi Saha	2104951
EPA 365.1 Rev. 2.0 dissolved	07/20/2019			07/20/2019 15:24	Julia Storbeck	2104952
EPA 8321B	07/20/2019	07/20/2019 10:30	Mohammad Ghaffari	07/20/2019 11:50	Mohammad Ghaffari	2104950