

Chemical Analysis Report

WQAP-2019-04-26-02

Florida Department of Environmental Protection
Central Laboratory
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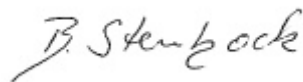
Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2019-04-15-42**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 07-MAY-2019 18:51



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 Dora

Collection Date/Time: 04/25/2019 10:40

Field ID: Lake Dora

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2081327	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P362855	
		Cylindrospermopsin**	0.25	U	ug/L	P362855	
		Microcystin LA**	0.25	U	ug/L	P362855	
		Microcystin LF**	0.25	U	ug/L	P362855	
		Microcystin LR**	0.25	U	ug/L	P362855	
		Microcystin LY**	0.25	U	ug/L	P362855	
		Microcystin RR**	0.25	U	ug/L	P362855	
		Microcystin YR**	0.25	U	ug/L	P362855	
		Saxitoxin**	0.25	UJ	ug/L	P362855	MS

Ref. Method and Comment:

EPA 8321B: Method validation for saxitoxin is still in progress. Second source was not analyzed.

Sample Location: Lake Dora

Collection Date/Time: 04/25/2019 10:40

Field ID: Lake Dora

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2081328	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P363033	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P362989	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P363077	
	EPA 365.1 Rev. 2.0	Total-P	0.079		mg P/L	P363174	
2081329	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P362932	

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: P363033

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362989

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363077

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363174

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362932

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

Reference Method: EPA 8321B
Batch ID: P362855

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
Saxitoxin	0.25	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363033

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362989

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	109		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363077

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363174

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362932

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

Reference Method: EPA 8321B
Batch ID: P362855

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	81.0		P	40 - 140
Cylindrospermopsin	107		P	40 - 140
Microcystin LA	99.4		P	40 - 140
Microcystin LF	99.7		P	40 - 140
Microcystin LR	107		P	40 - 140
Microcystin LY	111		P	40 - 140
Microcystin RR	112		P	40 - 140
Microcystin YR	107		P	40 - 140
Saxitoxin	86.7		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080237	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080131	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363174

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2081415	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P362932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2081267	O-Phosphate-P	93.7	95.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P362855

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2080934	Anatoxin-a	101	90.9	P/P	40 - 140
2080934	Cylindrospermopsin	74.1	76.6	P/P	40 - 140
2080934	Microcystin LA	90.0	92.1	P/P	40 - 140
2080934	Microcystin LF	101	88.3	P/P	40 - 140
2080934	Microcystin LR	96.5	92.6	P/P	40 - 140
2080934	Microcystin LY	97.4	86.6	P/P	40 - 140
2080934	Microcystin RR	117	112	P/P	40 - 140
2080934	Microcystin YR	103	105	P/P	40 - 140
2080934	Saxitoxin	39.7	38.5	F/F	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P363033

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080237	Ammonia-N	0.0483	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P362989

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080040	Kjeldahl Nitrogen	1.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P363077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080131	NO2NO3-N	0.404	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P363174

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2081415	Total-P	1.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P362932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2081267	O-Phosphate-P	1.60	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P362855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2080934	Anatoxin-a	10.7	Spike	P	0 - 30
2080934	Cylindrospermopsin	3.31	Spike	P	0 - 30
2080934	Microcystin LA	2.24	Spike	P	0 - 30
2080934	Microcystin LF	13.7	Spike	P	0 - 30
2080934	Microcystin LR	3.95	Spike	P	0 - 30
2080934	Microcystin LY	11.8	Spike	P	0 - 30
2080934	Microcystin RR	4.17	Spike	P	0 - 30
2080934	Microcystin YR	1.76	Spike	P	0 - 30
2080934	Saxitoxin	2.95	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: 2081327
Field Sample ID: Lake Dora

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	88.6	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A91036
Included Lab Sample IDs: 2081327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	94.2	100	P/P	50 - 160
Cylindrospermopsin	86.3	87.9	P/P	60 - 160
Microcystin LA	78.4	82.2	P/P	50 - 160
Microcystin LF	91.2	80.2	P/P	60 - 160
Microcystin LR	85.7	89.4	P/P	60 - 160
Microcystin LY	82.5	83.3	P/P	60 - 160
Microcystin RR	92.3	93.7	P/P	60 - 160
Microcystin YR	83.1	91.3	P/P	60 - 160
Saxitoxin	83.6	81.2	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A91040
Included Lab Sample IDs: 2081329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	96.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A91070
Included Lab Sample IDs: 2081328

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A91088
Included Lab Sample IDs: 2081328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A91098
Included Lab Sample IDs: 2081328

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91155
Included Lab Sample IDs: 2081328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	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		LCS	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	100	101	101			0.0483
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109					1.33
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	102			0.404
EPA 365.1 Rev. 2.0	Total-P	99.9	102	101			1.04
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.6	93.7	95.6			1.60
EPA 8321B	Anatoxin-a	81.0	101	90.9			10.7
	Cylindrospermopsin	107	74.1	76.6			3.31
	Microcystin LA	99.4	90.0	92.1			2.24
	Microcystin LF	99.7	101	88.3			13.7
	Microcystin LR	107	96.5	92.6			3.95
	Microcystin LY	111	97.4	86.6			11.8
	Microcystin RR	112	117	112			4.17
	Microcystin YR	107	103	105			1.76
	Saxitoxin	86.7	39.7	38.5			2.95

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2081328
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2081328
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2081328
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2081328
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2081329
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2081327

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	04/26/2019			04/26/2019 13:31	Ping Hua	2081328
EPA 351.2 Rev. 2.0	04/26/2019	04/29/2019 13:15	Adrian Shelby	04/30/2019 11:17	Joseph Suarez	2081328
EPA 353.2 Rev. 2.0	04/26/2019			04/30/2019 10:22	Beverly Y. Sanders	2081328
EPA 365.1 Rev. 2.0	04/26/2019	05/01/2019 14:25	Sima Feizi	05/02/2019 09:41	Rosalyn Ballman	2081328
EPA 365.1 Rev. 2.0 dissolved	04/26/2019			04/26/2019 15:23	Jhamieka S. Greenwood	2081329
EPA 8321B	04/26/2019	04/26/2019 12:00	Juyoung Kim	04/26/2019 13:56	Juyoung Kim	2081327