Chemical Analysis Report

SW-DIST-2019-05-24-01

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-2019-05-20-17**
Customer: **SW-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Matthew Bearden

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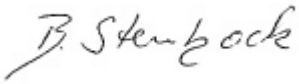
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 06-JUN-2019 18:44



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: Tierra Verde Bloom Response **Collection Date/Time: 05/23/2019 10:30**

Field ID: TIERRA VERDE Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2088981	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P364421	
		Cylindrospermopsin**	0.25	U	ug/L	P364421	
		Microcystin LA**	0.25	U	ug/L	P364421	
		Microcystin LF**	0.25	U	ug/L	P364421	RPD
		Microcystin LR**	0.25	U	ug/L	P364421	
		Microcystin LY**	0.25	U	ug/L	P364421	
		Microcystin RR**	0.25	U	ug/L	P364421	
		Microcystin YR**	0.25	U	ug/L	P364421	
		Saxitoxin**	0.25	UJ	ug/L	P364421	MS

Ref. Method and Comment:
EPA 8321B: Method validation for saxitoxin is still in progress. Second source was not analyzed. Precision for saxitoxin is not available due to no recoveries in the duplicate matrix spikes.

Sample Location: Tierra Verde Bloom Response **Collection Date/Time: 05/23/2019 10:30**

Field ID: TIERRA VERDE Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2088982	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P364811	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P364897	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364569	
	EPA 365.1 Rev. 2.0	Total-P	0.039		mg P/L	P364903	
2088983	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P364532	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364811

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364897

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364569

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364903

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364532

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

Reference Method: EPA 8321B
Batch ID: P364421

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: P364811

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.5		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364897

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364569

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364903

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364532

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P364421

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	103		P	40 - 140
Cylindrospermopsin	105		P	40 - 140
Microcystin LA	102		P	40 - 140
Microcystin LF	102		P	40 - 140
Microcystin LR	99.7		P	40 - 140
Microcystin LY	101		P	40 - 140
Microcystin RR	97.0		P	40 - 140
Microcystin YR	110		P	40 - 140
Saxitoxin	98.9		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364811

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088462	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364897

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088982	Kjeldahl Nitrogen	107	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088143	NO2NO3-N	95.4	94.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364903

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088466	Total-P	93.2	91.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364532

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088983	O-Phosphate-P	93.2	94.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P364421

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2088348	Anatoxin-a	98.7	97.8	P/P	40 - 140
2088348	Cylindrospermopsin	95.9	92.0	P/P	40 - 140
2088348	Microcystin LA	95.5	95.9	P/P	40 - 140
2088348	Microcystin LF	100	72.4	P/P	40 - 140
2088348	Microcystin LR	92.9	88.4	P/P	40 - 140
2088348	Microcystin LY	91.0	93.4	P/P	40 - 140
2088348	Microcystin RR	95.6	92.9	P/P	40 - 140
2088348	Microcystin YR	100	99.5	P/P	40 - 140
2088348	Saxitoxin	0.863	0.0	F/F	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364811

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088462	Ammonia-N	0.232	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364897

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088982	Kjeldahl Nitrogen	3.18	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088143	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364903

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088466	Total-P	2.14	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088983	O-Phosphate-P	1.53	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P364421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2088348	Anatoxin-a	0.970	Spike	P	0 - 30
2088348	Cylindrospermopsin	4.16	Spike	P	0 - 30
2088348	Microcystin LA	0.373	Spike	P	0 - 30
2088348	Microcystin LF	32.2	Spike	F	0 - 30
2088348	Microcystin LR	4.69	Spike	P	0 - 30
2088348	Microcystin LY	2.63	Spike	P	0 - 30
2088348	Microcystin RR	2.82	Spike	P	0 - 30
2088348	Microcystin YR	0.588	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: 2088981
Field Sample ID: TIERRA VERDE

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	105	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A91658
Included Lab Sample IDs: 2088981

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	103	93.2	P/P	50 - 160
Cylindrospermopsin	111	108	P/P	60 - 160
Microcystin LA	104	100	P/P	50 - 160
Microcystin LF	91.0	99.9	P/P	60 - 160
Microcystin LR	97.1	102	P/P	60 - 160
Microcystin LY	101	93.9	P/P	60 - 160
Microcystin RR	96.7	97.0	P/P	60 - 160
Microcystin YR	108	108	P/P	60 - 160
Saxitoxin	88.4	86.0	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A91670
Included Lab Sample IDs: 2088983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A91682
Included Lab Sample IDs: 2088982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A91783
Included Lab Sample IDs: 2088982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A91830
Included Lab Sample IDs: 2088982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	108	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91839
Included Lab Sample IDs: 2088982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	99.2	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		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	97.5	104	104			0.232
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	107	103			3.18
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	95.4	94.9			0.506
EPA 365.1 Rev. 2.0	Total-P	99.0	93.2	91.2			2.14
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	93.2	94.7			1.53
EPA 8321B	Anatoxin-a	103	98.7	97.8			0.970
	Cylindrospermopsin	105	95.9	92.0			4.16
	Microcystin LA	102	95.5	95.9			0.373
	Microcystin LF	102	100	72.4			32.2
	Microcystin LR	99.7	92.9	88.4			4.69
	Microcystin LY	101	91.0	93.4			2.63
	Microcystin RR	97.0	95.6	92.9			2.82
	Microcystin YR	110	100	99.5			0.588
	Saxitoxin	98.9	0.863	0.0			

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2088982
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2088982
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2088982
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2088982
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2088983
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2088981

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	05/24/2019			05/30/2019 10:54	Ping Hua	2088982
EPA 351.2 Rev. 2.0	05/24/2019	06/03/2019 13:00	Adrian Shelby	06/03/2019 23:20	Virginia P. Brown	2088982
EPA 353.2 Rev. 2.0	05/24/2019			05/28/2019 11:09	Beverly Y. Sanders	2088982
EPA 365.1 Rev. 2.0	05/24/2019	06/03/2019 11:05	Sima Feizi	06/04/2019 12:58	Rosalyn Ballman	2088982
EPA 365.1 Rev. 2.0 dissolved	05/24/2019			05/24/2019 15:51	Jhamieka S. Greenwood	2088983
EPA 8321B	05/24/2019	05/24/2019 11:30	Juyoung Kim	05/24/2019 12:32	Juyoung Kim	2088981