

Chemical Analysis Report

WQAP-2019-05-30-02

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-2019-05-27-52**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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13051 N. Telecom Parkway
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Date Certified: 12-JUN-2019 11:24



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: TREASURE ISLAND BLOOM RESPONSE

Collection Date/Time: 05/29/2019 11:35

Field ID: TREASURE ISLAND

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089984	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P364733	
		Cylindrospermopsin**	0.25	U	ug/L	P364733	
		Microcystin LA**	0.25	U	ug/L	P364733	
		Microcystin LF**	0.25	U	ug/L	P364733	
		Microcystin LR**	0.25	U	ug/L	P364733	
		Microcystin LY**	0.25	U	ug/L	P364733	
		Microcystin RR**	0.25	U	ug/L	P364733	
		Microcystin YR**	0.25	U	ug/L	P364733	
		Saxitoxin**	2.5	UJ	ug/L	P364733	

Ref. Method and Comment:

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

Sample Location: TREASURE ISLAND BLOOM RESPONSE

Collection Date/Time: 05/29/2019 11:35

Field ID: TREASURE ISLAND

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089986	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P365207	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40		mg N/L	P365075	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364988	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P364977	
2089988	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P364768	

Sample Location: SAFETY HARBOR BLOOM RESPONSE

Collection Date/Time: 05/29/2019 13:25

Field ID: SAFETY HARBOR

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089985	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P364733	
		Cylindrospermopsin**	0.25	U	ug/L	P364733	
		Microcystin LA**	0.25	U	ug/L	P364733	
		Microcystin LF**	0.25	U	ug/L	P364733	
		Microcystin LR**	0.25	U	ug/L	P364733	
		Microcystin LY**	0.25	U	ug/L	P364733	
		Microcystin RR**	0.25	U	ug/L	P364733	
		Microcystin YR**	0.25	U	ug/L	P364733	
		Saxitoxin**	2.5	UJ	ug/L	P364733	

Ref. Method and Comment:

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

Sample Location: SAFETY HARBOR BLOOM RESPONSE

Collection Date/Time: 05/29/2019 13:25

Field ID: SAFETY HARBOR

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2089987	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P365207	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P365075	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P364988	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P364977	
2089989	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P364768	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365207

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365075

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364988

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364977

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364768

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

Reference Method: EPA 8321B
Batch ID: P364733

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: P365207

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365075

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.7		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364988

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364977

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364768

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

Reference Method: EPA 8321B
Batch ID: P364733

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	109		P	40 - 140
Cylindrospermopsin	98.7		P	40 - 140
Microcystin LA	92.0		P	40 - 140
Microcystin LF	107		P	40 - 140
Microcystin LR	93.4		P	40 - 140
Microcystin LY	93.3		P	40 - 140
Microcystin RR	92.8		P	40 - 140
Microcystin YR	88.4		P	40 - 140
Saxitoxin	92.9		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P365207

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089986	Ammonia-N	102	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P365075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089884	Kjeldahl Nitrogen	98.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364988

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089986	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364977

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089986	Total-P	94.6	95.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089823	O-Phosphate-P	95.2	97.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P364733

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2089788	Anatoxin-a	107	101	P/P	40 - 140
2089788	Cylindrospermopsin	94.7	93.1	P/P	40 - 140
2089788	Microcystin LA	88.6	83.8	P/P	40 - 140
2089788	Microcystin LF	114	122	P/P	40 - 140
2089788	Microcystin LR	114	118	P/P	40 - 140
2089788	Microcystin LY	82.7	88.4	P/P	40 - 140
2089788	Microcystin RR	101	100	P/P	40 - 140
2089788	Microcystin YR	102	101	P/P	40 - 140
2089788	Saxitoxin	67.8	68.7	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P365207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089986	Ammonia-N	2.72	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P365075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089884	Kjeldahl Nitrogen	1.13	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P364988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089986	NO2NO3-N	1.49	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P364977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089986	Total-P	0.361	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P364768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089823	O-Phosphate-P	2.39	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P364733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2089788	Anatoxin-a	5.36	Spike	P	0 - 30
2089788	Cylindrospermopsin	1.74	Spike	P	0 - 30
2089788	Microcystin LA	5.51	Spike	P	0 - 30
2089788	Microcystin LF	7.21	Spike	P	0 - 30
2089788	Microcystin LR	3.63	Spike	P	0 - 30
2089788	Microcystin LY	6.68	Spike	P	0 - 30
2089788	Microcystin RR	0.312	Spike	P	0 - 30
2089788	Microcystin YR	1.58	Spike	P	0 - 30
2089788	Saxitoxin	1.38	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: 2089984
Field Sample ID: TREASURE ISLAND

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	110	P	30 - 165

Lab Sample ID: 2089985
Field Sample ID: SAFETY HARBOR

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A91763

Included Lab Sample IDs: 2089988, 2089989

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	99.6	P/P	90 - 110
O-Phosphate-P	99.6	95.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A91786

Included Lab Sample IDs: 2089984, 2089985

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	102	101	P/P	50 - 160
Cylindrospermopsin	102	105	P/P	60 - 160
Microcystin LA	91.9	95.3	P/P	50 - 160
Microcystin LF	105	118	P/P	60 - 160
Microcystin LR	102	97.9	P/P	60 - 160
Microcystin LY	84.2	86.9	P/P	60 - 160
Microcystin RR	98.5	94.0	P/P	60 - 160
Microcystin YR	92.6	88.7	P/P	60 - 160
Saxitoxin	108	108	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91846

Included Lab Sample IDs: 2089986, 2089987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91885

Included Lab Sample IDs: 2089987

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91886

Included Lab Sample IDs: 2089986

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A91905

Included Lab Sample IDs: 2089986, 2089987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.0	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91914

Included Lab Sample IDs: 2089986, 2089987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91914

Included Lab Sample IDs: 2089986, 2089987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	101	P/P	90 - 110
Ammonia-N	103	102	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	101	102	105			2.72
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.7	98.4	101			1.13
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	100	102			1.49
EPA 365.1 Rev. 2.0	Total-P	102	94.6	95.0			0.361
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.0	95.2	97.5			2.39
EPA 8321B	Anatoxin-a	109	107	101			5.36
	Cylindrospermopsin	98.7	94.7	93.1			1.74
	Microcystin LA	92.0	88.6	83.8			5.51
	Microcystin LF	107	114	122			7.21
	Microcystin LR	93.4	114	118			3.63
	Microcystin LY	93.3	82.7	88.4			6.68
	Microcystin RR	92.8	101	100			0.312
	Microcystin YR	88.4	102	101			1.58
	Saxitoxin	92.9	67.8	68.7			1.38

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2089986, 2089987
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2089986, 2089987
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2089986, 2089987
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2089986, 2089987
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2089988, 2089989
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2089984, 2089985

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	05/30/2019			06/05/2019 11:44	Ping Hua	2089986
	05/30/2019			06/05/2019 11:55	Ping Hua	2089987
EPA 351.2 Rev. 2.0	05/30/2019	06/05/2019 12:20	Adrian Shelby	06/06/2019 11:09	Joseph Suarez	2089986
	05/30/2019	06/05/2019 12:20	Adrian Shelby	06/06/2019 11:11	Joseph Suarez	2089987
EPA 353.2 Rev. 2.0	05/30/2019			06/04/2019 14:04	Beverly Y. Sanders	2089986
	05/30/2019			06/04/2019 14:09	Beverly Y. Sanders	2089987
EPA 365.1 Rev. 2.0	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 10:52	Rosalyn Ballman	2089987
	05/30/2019	06/04/2019 11:15	Sima Feizi	06/05/2019 14:36	Rosalyn Ballman	2089986
EPA 365.1 Rev. 2.0 dissolved	05/30/2019			05/30/2019 15:34	Jhamieka S. Greenwood	2089988
	05/30/2019			05/30/2019 15:39	Jhamieka S. Greenwood	2089989
EPA 8321B	05/30/2019	05/31/2019 09:00	Juyoung Kim	05/31/2019 11:09	Juyoung Kim	2089984
	05/30/2019	05/31/2019 09:00	Juyoung Kim	05/31/2019 11:25	Juyoung Kim	2089985
	05/30/2019	05/31/2019 09:00	Juyoung Kim	05/31/2019 15:35	Juyoung Kim	2089984
	05/30/2019	05/31/2019 09:00	Juyoung Kim	05/31/2019 15:52	Juyoung Kim	2089985