

Chemical Analysis Report

SW-DIST-2019-02-19-01

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

Event Description: **Algal Bloom Response - Harbor Isle**
Request ID: **RQ-2019-02-18-65**
Customer: **SW-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
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Temple Terrace, FL 33637-0926
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 15-MAR-2019 15:53



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: Harbor Isle Follow-Up Algal Bloom Response **Collection Date/Time: 02/18/2019 11:05**

Field ID: HARBOR ISLE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2063339	EPA 8321B	Microcystin LR**	110		ug/L	P359133	
		Microcystin LA**	24		ug/L	P359133	
		Microcystin RR**	4.0		ug/L	P359133	
		Microcystin YR**	0.25	U	ug/L	P359133	
		Anatoxin-a**	0.25	U	ug/L	P359133	
		Cylindrospermopsin**	0.25	U	ug/L	P359133	
		Microcystin LF**	0.37	I	ug/L	P359133	
		Microcystin LY**	0.25	U	ug/L	P359133	

Sample Location: Harbor Isle Follow-Up Algal Bloom Response **Collection Date/Time: 02/18/2019 11:05**

Field ID: HARBOR ISLE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2063340	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P359347	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	10		mg N/L	P359521	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P359515	
	EPA 365.1 Rev. 2.0	Total-P	0.94		mg P/L	P359993	
2063341	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P359178	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359347

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359521

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359515

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359993

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

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

Reference Method: EPA 8321B
Batch ID: P359133

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: P359347

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359521

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359515

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359993

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

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

Reference Method: EPA 8321B
Batch ID: P359133

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	90.0		P	40 - 140
Cylindrospermopsin	105		P	40 - 140
Microcystin LA	91.0		P	40 - 140
Microcystin LF	98.6		P	40 - 140
Microcystin LR	91.4		P	40 - 140
Microcystin LY	87.3		P	40 - 140
Microcystin RR	104		P	40 - 140
Microcystin YR	90.7		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063359	Ammonia-N	99.4	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063975	Kjeldahl Nitrogen	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359515

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2062737	NO2NO3-N	99.8	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359993

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2067038	Total-P	98.5	93.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063479	O-Phosphate-P	95.5	97.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P359133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063815	Anatoxin-a	96.8	103	P/P	40 - 140
2063815	Cylindrospermopsin	107	118	P/P	40 - 140
2063815	Microcystin LA	89.9	92.8	P/P	40 - 140
2063815	Microcystin LF	92.1	89.6	P/P	40 - 140
2063815	Microcystin LR	103	113	P/P	40 - 140
2063815	Microcystin LY	94.8	91.0	P/P	40 - 140
2063815	Microcystin RR	107	110	P/P	40 - 140
2063815	Microcystin YR	111	110	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063359	Ammonia-N	1.30	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063975	Kjeldahl Nitrogen	0.0747	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2062737	NO2NO3-N	0.971	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359993

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2067038	Total-P	4.68	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063479	O-Phosphate-P	1.48	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P359133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063815	Anatoxin-a	6.51	Spike	P	0 - 30
2063815	Cylindrospermopsin	10.2	Spike	P	0 - 30
2063815	Microcystin LA	3.23	Spike	P	0 - 30
2063815	Microcystin LF	2.68	Spike	P	0 - 30
2063815	Microcystin LR	9.41	Spike	P	0 - 30
2063815	Microcystin LY	4.13	Spike	P	0 - 30
2063815	Microcystin RR	2.28	Spike	P	0 - 30
2063815	Microcystin YR	0.347	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: 2063339
Field Sample ID: HARBOR ISLE

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	101	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A89509

Included Lab Sample IDs: 2063341

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A89577

Included Lab Sample IDs: 2063340

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

Reference Method: EPA 8321B

Run ID: A89582

Included Lab Sample IDs: 2063339

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.7	114	P/P	50 - 160
Cylindrospermopsin	107	135	P/P	60 - 160
Microcystin LA	90.6	105	P/P	50 - 160
Microcystin LF	90.0	105	P/P	60 - 160
Microcystin LR	99.9	113	P/P	60 - 160
Microcystin LY	88.3	116	P/P	60 - 160
Microcystin RR	85.8	106	P/P	60 - 160
Microcystin YR	96.6	106	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A89651

Included Lab Sample IDs: 2063340

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A89719

Included Lab Sample IDs: 2063340

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A89968

Included Lab Sample IDs: 2063340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	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	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	98.7	99.4	97.8			1.30
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	101	101			0.0747
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	99.8	98.8			0.971
EPA 365.1 Rev. 2.0	Total-P	103	98.5	93.9			4.68
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.5	95.5	97.1			1.48
EPA 8321B	Anatoxin-a	90.0	96.8	103			6.51
	Cylindrospermopsin	105	107	118			10.2
	Microcystin LA	91.0	89.9	92.8			3.23
	Microcystin LF	98.6	92.1	89.6			2.68
	Microcystin LR	91.4	103	113			9.41
	Microcystin LY	87.3	94.8	91.0			4.13
	Microcystin RR	104	107	110			2.28
	Microcystin YR	90.7	111	110			0.347

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2063340
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2063340
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2063340
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2063340
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2063341
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2063339

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	02/19/2019			02/21/2019 13:21	Ping Hua	2063340
EPA 351.2 Rev. 2.0	02/19/2019	02/26/2019 11:30	Adrian Shelby	02/28/2019 09:18	Joseph Suarez	2063340
EPA 353.2 Rev. 2.0	02/19/2019			02/26/2019 09:28	Beverly Y. Sanders	2063340
EPA 365.1 Rev. 2.0	02/19/2019	03/06/2019 14:00	Sima Feizi	03/12/2019 11:43	Rosalyn Ballman	2063340
EPA 365.1 Rev. 2.0 dissolved	02/19/2019			02/19/2019 15:32	Jhamieka S. Greenwood	2063341
EPA 8321B	02/19/2019	02/22/2019 09:30	Juyoung Kim	02/22/2019 10:28	Juyoung Kim	2063339
	02/19/2019	02/22/2019 09:30	Juyoung Kim	02/22/2019 11:18	Juyoung Kim	2063339