Chemical Analysis Report

WQAP-2021-04-30-02

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-03-22-10**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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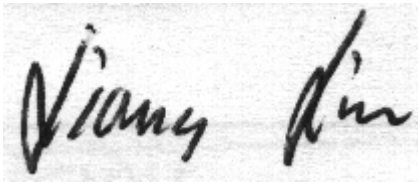
Date Certified: 19-MAY-2021 10:14



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 Otis @ Boat Ramp **Collection Date/Time: 04/29/2021 12:47**

Field ID: HABCE0043_LakeOtis Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2244414	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P397461	
		Cylindrospermopsin	0.10	U	ug/L	P397461	
		Desmethyl microcystin LR	0.25	U	ug/L	P397461	
		Microcystin HilR**	0.25	U	ug/L	P397461	
		Microcystin HtyR**	0.25	U	ug/L	P397461	
		Microcystin LA	0.80		ug/L	P397461	
		Microcystin LF	0.10	U	ug/L	P397461	
		Microcystin LR	0.30	I	ug/L	P397461	
		Microcystin LW	0.25	U	ug/L	P397461	
		Microcystin LY	0.10	U	ug/L	P397461	
		Microcystin RR	0.11	I	ug/L	P397461	
		Microcystin WR	0.50	U	ug/L	P397461	
		Microcystin YR	0.25	U	ug/L	P397461	
		Nodularin-R**	0.10	U	ug/L	P397461	
2244415	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P398153	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P397851	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P397655	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P397970	
2244416	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P397487	

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: P398153

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397851

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397655

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397970

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397487

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

Reference Method: EPA 8321B
Batch ID: P397461

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HilR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398153

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397851

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397655

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397970

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397487

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.6		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P397461

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	121		P	40 - 150
Cylindrospermopsin	107		P	40 - 150
Desmethyl microcystin LR	91.1		P	40 - 150
Microcystin HilR	96.9		P	40 - 150
Microcystin HtyR	89.5		P	40 - 150
Microcystin LA	97.7		P	40 - 150
Microcystin LF	88.4		P	40 - 150
Microcystin LR	87.3		P	40 - 150
Microcystin LW	97.9		P	40 - 150
Microcystin LY	91.4		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	97.6		P	40 - 150
Microcystin YR	96.7		P	40 - 150
Nodularin-R	91.2		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398153

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244415	Ammonia-N	95.4	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397655

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244095	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244415	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244335	O-Phosphate-P	92.4	94.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P397461

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244120	Anatoxin-a	109	109	P/P	40 - 150
2244120	Cylindrospermopsin	82.5	86.0	P/P	40 - 150
2244120	Desmethyl microcystin LR	70.2	76.2	P/P	40 - 150
2244120	Microcystin HilR	75.4	78.7	P/P	40 - 150
2244120	Microcystin HtyR	74.8	77.3	P/P	40 - 150
2244120	Microcystin LA	78.3	76.3	P/P	40 - 150
2244120	Microcystin LF	54.9	62.5	P/P	40 - 150
2244120	Microcystin LR	66.6	67.9	P/P	40 - 150
2244120	Microcystin LW	59.1	64.9	P/P	40 - 150
2244120	Microcystin LY	73.7	72.8	P/P	40 - 150
2244120	Microcystin RR	85.8	92.0	P/P	40 - 150
2244120	Microcystin WR	77.5	81.0	P/P	40 - 150
2244120	Microcystin YR	78.6	79.2	P/P	40 - 150
2244120	Nodularin-R	74.1	79.5	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244415	Ammonia-N	0.915	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244179	Kjeldahl Nitrogen	4.49	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397655

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244095	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244415	Total-P	0.897	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244335	O-Phosphate-P	2.25	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P397461

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244120	Anatoxin-a	0.0547	Spike	P	0 - 30
2244120	Cylindrospermopsin	4.19	Spike	P	0 - 30
2244120	Desmethyl microcystin LR	8.14	Spike	P	0 - 30
2244120	Microcystin HilR	4.33	Spike	P	0 - 30
2244120	Microcystin HtyR	3.32	Spike	P	0 - 30
2244120	Microcystin LA	2.60	Spike	P	0 - 30
2244120	Microcystin LF	13.0	Spike	P	0 - 30
2244120	Microcystin LR	1.95	Spike	P	0 - 30
2244120	Microcystin LW	9.31	Spike	P	0 - 30
2244120	Microcystin LY	1.22	Spike	P	0 - 30
2244120	Microcystin RR	6.95	Spike	P	0 - 30
2244120	Microcystin WR	4.48	Spike	P	0 - 30
2244120	Microcystin YR	0.812	Spike	P	0 - 30
2244120	Nodularin-R	7.06	Spike	P	0 - 30

Quality Assurance Report
Precision

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Surrogates

Lab Sample ID: 2244414
Field Sample ID: HABCE0043_LakeOtis

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	79.3	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	72.4	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105108
Included Lab Sample IDs: 2244416

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	103	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A105169
Included Lab Sample IDs: 2244414

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	118	122	P/P	50 - 160
Cylindrospermopsin	104	106	P/P	50 - 160
Desmethyl microcystin LR	86.8	86.7	P/P	50 - 160
Microcystin HilR	86.6	95.8	P/P	50 - 160
Microcystin HtyR	86.9	88.1	P/P	50 - 160
Microcystin LA	83.6	97.0	P/P	50 - 160
Microcystin LF	80.2	88.7	P/P	50 - 160
Microcystin LR	77.3	78.5	P/P	50 - 160
Microcystin LW	85.6	89.3	P/P	50 - 160
Microcystin LY	74.3	83.8	P/P	50 - 160
Microcystin RR	98.9	101	P/P	50 - 160
Microcystin WR	92.6	97.5	P/P	50 - 160
Microcystin YR	85.6	81.9	P/P	50 - 160
Nodularin-R	85.1	82.4	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105180
Included Lab Sample IDs: 2244415

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105301
Included Lab Sample IDs: 2244415

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105367
Included Lab Sample IDs: 2244415

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105414
Included Lab Sample IDs: 2244415

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	97.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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	98.0	95.4	96.4			0.915
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100					4.49
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	105	105	106			0.897
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.6	92.4	94.5			2.25
EPA 8321B	Anatoxin-a	121	109	109			0.0547
	Cylindrospermopsin	107	82.5	86.0			4.19
	Desmethyl microcystin LR	91.1	70.2	76.2			8.14
	Microcystin HilR	96.9	75.4	78.7			4.33
	Microcystin HtyR	89.5	74.8	77.3			3.32
	Microcystin LA	97.7	78.3	76.3			2.60
	Microcystin LF	88.4	54.9	62.5			13.0
	Microcystin LR	87.3	66.6	67.9			1.95
	Microcystin LW	97.9	59.1	64.9			9.31
	Microcystin LY	91.4	73.7	72.8			1.22
	Microcystin RR	105	85.8	92.0			6.95
	Microcystin WR	97.6	77.5	81.0			4.48
	Microcystin YR	96.7	78.6	79.2			0.812
	Nodularin-R	91.2	74.1	79.5			7.06

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2244415
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2244415
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2244415
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2244415
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2244416
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2244414

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	04/30/2021			05/13/2021 13:22	Ping Hua	2244415
EPA 351.2 Rev. 2.0	04/30/2021	05/07/2021 18:29	Benjamin T. Nordmann	05/10/2021 13:41	Virginia P. Brown	2244415
EPA 353.2 Rev. 2.0	04/30/2021			05/05/2021 10:12	Beverly Y. Sanders	2244415
EPA 365.1 Rev. 2.0	04/30/2021	05/11/2021 14:29	Yen Ta	05/12/2021 12:30	Shengyu Ding	2244415
EPA 365.1 Rev. 2.0 dissolved	04/30/2021			04/30/2021 14:45	Lipi Saha	2244416
EPA 8321B	04/30/2021	05/04/2021 08:00	Pramila Ghimire	05/04/2021 12:58	Pramila Ghimire	2244414