

Biological Analysis Report

WQAP-2022-11-01-02

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Hurricane Ian Post Storm Monitoring - SE ROC**
Request ID: **RQ-2022-10-31-27**
Customer: **WQAP**
Project ID: **HURR-IAN**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Rd.
Fort Pierce, FL 34945
Attn: Jordan Skaggs

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Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 10-NOV-2022 12:49

A handwritten signature in black ink, appearing to be 'Puja Jasrotia', with a horizontal line underneath it.

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: Chlorophyll/Grain Size/BOD, Microbiology and Molecular.

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: S-65 Downstream

Collection Date/Time: 10/31/2022 11:00

Field ID: 59629

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2366209	SM 10200 H (mod.)	Chlorophyll-a, Corrected	22		ug/L	P421799	
		Phaeophytin-a	10		ug/L	P421799	
		Chlorophyll-a, Uncorrected	29		ug/L	P421799	
2366210	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	10.9	Q	MPN/100 mL	P421831	
2366211	SOP-PCR-1.0	HF183-qPCR**	3.3E+03	U	TSC/100 mL	P421373	
	SOP-PCR-1.2	GULL2-qPCR**	3.6E+03	U	TSC/100 mL	P421373	
	SOP-PCR-1.3	GFD-qPCR**	720	U	TSC/100 mL	P421373	
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	U	TSC/100 mL	P421373	
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P421373	

Ref. Method and Comment:

SM 10200 H (mod.): Precision data is not available for at least one component due to the small amount of analyte in the QC sample. Refer to QA report for available precision data.

SM 9223 B Quanti-Tray: Precision data is unavailable for E. coli due to the small amount of analyte in the QC sample for the batch.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P421799

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.82	U	ug/L
Chlorophyll-a, Uncorrected	0.60	U	ug/L
Phaeophytin-a	0.90	U	ug/L

Reference Method: SM 9223 B Quanti-Tray

Batch ID: P421831

Component	Result	Code	Units
Escherichia Coli-Quanti-Tray	1.0	U	MPN/100 mL

Reference Method: SOP-PCR-1.0

Batch ID: P421373

Component	Result	Code	Units
HF183-qPCR	3.3E+03	U	TSC/100 mL

Reference Method: SOP-PCR-1.2

Batch ID: P421373

Component	Result	Code	Units
GULL2-qPCR	3.6E+03	U	TSC/100 mL

Reference Method: SOP-PCR-1.3

Batch ID: P421373

Component	Result	Code	Units
GFD-qPCR	720	U	TSC/100 mL

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.4
Batch ID: P421373

Component	Result	Code	Units
BacR-qPCR	3.0E+03	U	TSC/100 mL

Reference Method: SOP-PCR-1.5
Batch ID: P421373

Component	Result	Code	Units
DG3-qPCR	2.6E+03	U	TSC/100 mL

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P421799

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	88.0		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P421373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	81.1	94.3	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P421373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	92.1	93.9	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P421373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	101	82.5	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P421373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	106	105	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P421373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	90.0	80.0	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P421373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364638	HF183-qPCR	81.7	93.7	P	50 - 175
2364711	HF183-qPCR	91.3		P/P	50 - 175
2364712	HF183-qPCR	97.3		P	50 - 175
2364797	HF183-qPCR	86.7		P	50 - 175
2364889	HF183-qPCR	87.1		P	50 - 175
2365252	HF183-qPCR	104		P	50 - 175
2365253	HF183-qPCR	82.6		P	50 - 175
2365254	HF183-qPCR	102		P	50 - 175
2365255	HF183-qPCR	78.5		P	50 - 175
2365256	HF183-qPCR	77.7		P	50 - 175
2365257	HF183-qPCR	98.3		P	50 - 175
2365258	HF183-qPCR	88.6		P	50 - 175
2366211	HF183-qPCR	94.7		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P421373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364638	GULL2-qPCR	77.4	93.1	P	50 - 300
2364711	GULL2-qPCR	92.7		P/P	50 - 300
2364712	GULL2-qPCR	93.9		P	50 - 300
2364797	GULL2-qPCR	85.6		P	50 - 300
2365252	GULL2-qPCR	81.2		P	50 - 300
2365253	GULL2-qPCR	54.9		P	50 - 300
2365254	GULL2-qPCR	78.5		P	50 - 300
2365256	GULL2-qPCR	76.2		P	50 - 300
2365257	GULL2-qPCR	62.1		P	50 - 300
2366211	GULL2-qPCR	109		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P421373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364638	GFD-qPCR	99.2	94.7	P	50 - 175
2364711	GFD-qPCR	102		P/P	50 - 175
2364712	GFD-qPCR	103		P	50 - 175
2364797	GFD-qPCR	77.6		P	50 - 175
2364889	GFD-qPCR	99.6		P	50 - 175
2365252	GFD-qPCR	97.3		P	50 - 175
2365253	GFD-qPCR	96.2		P	50 - 175
2365254	GFD-qPCR	98.5		P	50 - 175
2365255	GFD-qPCR	89.6		P	50 - 175
2365256	GFD-qPCR	94.5		P	50 - 175
2365257	GFD-qPCR	93.6		P	50 - 175
2365258	GFD-qPCR	79.2		P	50 - 175
2366211	GFD-qPCR	95.8		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P421373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364638	BacR-qPCR	56.6		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P421373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364711	BacR-qPCR	88.9	87.6	P/P	50 - 175
2364712	BacR-qPCR	86.8		P	50 - 175
2364797	BacR-qPCR	71.8		P	50 - 175
2364889	BacR-qPCR	80.1		P	50 - 175
2365252	BacR-qPCR	71.7		P	50 - 175
2365253	BacR-qPCR	63.9		P	50 - 175
2365254	BacR-qPCR	84.8		P	50 - 175
2365255	BacR-qPCR	57.8		P	50 - 175
2365256	BacR-qPCR	83.8		P	50 - 175
2365257	BacR-qPCR	74.4		P	50 - 175
2365258	BacR-qPCR	58.5		P	50 - 175
2366211	BacR-qPCR	81.7		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P421373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364638	DG3-qPCR	81.5		P	50 - 175
2364711	DG3-qPCR	95.5	94.8	P/P	50 - 175
2364712	DG3-qPCR	99.1		P	50 - 175
2364797	DG3-qPCR	94.3		P	50 - 175
2365252	DG3-qPCR	100		P	50 - 175
2365253	DG3-qPCR	79.0		P	50 - 175
2365254	DG3-qPCR	96.4		P	50 - 175
2365255	DG3-qPCR	72.6		P	50 - 175
2365256	DG3-qPCR	88.3		P	50 - 175
2365257	DG3-qPCR	73.9		P	50 - 175
2365258	DG3-qPCR	78.5		P	50 - 175
2366211	DG3-qPCR	93.3		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P421799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2366250	Chlorophyll-a, Corrected	3.05	Sample	P	0 - 25
2366250	Chlorophyll-a, Uncorrected	1.88	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P421373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364711	HF183-qPCR	2.51	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.2
Batch ID: P421373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364711	GULL2-qPCR	0.377	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P421373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364711	GFD-qPCR	7.24	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P421373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364711	BacR-qPCR	1.46	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P421373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364711	DG3-qPCR	0.750	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2366211
Field Sample ID: 59629

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	85.5	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	89.8	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	86.2	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	90.0	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	89.3	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	ChlorophyllI-a, Corrected	88.0						3.05	
	ChlorophyllI-a, Uncorrected							1.88	
SOP-PCR-1.0	HF183-qPCR	94.3	81.1	81.7	91.3	93.7			2.51
				97.3					
SOP-PCR-1.2	GULL2-qPCR	93.9	92.1	77.4	92.7	93.1			0.377
				93.9					

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.3	GFD-qPCR	82.5	101	99.2	102	94.7			7.24
SOP-PCR-1.4	BacR-qPCR	105	106	84.8	57.8	83.8			1.46
SOP-PCR-1.5	DG3-qPCR	80.0	90.0	81.5	95.5	94.8			0.750
				103					
				74.4					
				99.1					

Reference Method Descriptions

Method	Description	Associated Samples
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2366209
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2366210
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2366211
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2366211
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2366211
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2366211
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2366211

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	11/01/2022	11/01/2022 15:54	Megan Higbee	11/02/2022 09:07	Megan Higbee	2366209
SM 9223 B Quanti-Tray	11/01/2022	11/01/2022 15:28	Callie Williams	11/02/2022 12:54	Callie Williams	2366210
SOP-PCR-1.0	11/01/2022	11/01/2022 14:30	Claudia Castro	11/03/2022 11:01	Roberta Tatti	2366211
SOP-PCR-1.2	11/01/2022	11/01/2022 14:30	Claudia Castro	11/08/2022 09:26	Roberta Tatti	2366211
SOP-PCR-1.3	11/01/2022	11/01/2022 14:30	Claudia Castro	11/08/2022 12:04	DeAsia Armster	2366211
SOP-PCR-1.4	11/01/2022	11/01/2022 14:30	Claudia Castro	11/04/2022 08:54	Roberta Tatti	2366211
SOP-PCR-1.5	11/01/2022	11/01/2022 14:30	Claudia Castro	11/04/2022 11:15	DeAsia Armster	2366211