

Biological Analysis Report

SE-DIST-2022-02-22-01

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

Event Description: **Port Mayaca 2022**

Request ID: **RQ-2022-02-21-52**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

FL Dept. of Environmental Protection

FL Dept. of Environmental Protection

2199 South Rock Road

Fort Pierce, FL 34945

Attn: Jordan Skaggs

For additional information please contact

Cheryl Swanson - Administrator

Sarah Menz, Ph.D. - Bench Biology & Aquatic
Toxicity

Puja Jasrotia, Ph.D. - Molecular Biology & Taxonomy

Thekkekalathil Chandrasekhar, Ph.D, QA Officer

Phone (850) 245-8177

Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 06-APR-2022 14:20



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: Mosquito Creek @ 70

Collection Date/Time: 02/21/2022 08:45

Field ID: G1SE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306973	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	579.4	Q	MPN/100 mL	P410309	RPD

Sample Location: Nubbin Slough 1.4 miles upstream of 710

Collection Date/Time: 02/21/2022 09:15

Field ID: G1SE0031

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306971	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	1203.3	Q	MPN/100 mL	P410309	RPD
2306989	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P409862	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P409862	
	SOP-PCR-1.3	GFD-qPCR**	720	U	TSC/100 mL	P409862	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P409862	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P409862	

Sample Location: Nubbin Slough upstream of STA

Collection Date/Time: 02/21/2022 09:40

Field ID: G1SE0004

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306970	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	116.2	Q	MPN/100 mL	P410309	RPD

Sample Location: L-65 upstream of S-153

Collection Date/Time: 02/21/2022 10:40

Field ID: G1SE0050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306964	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.9		ug/L	P410380	
		Phaeophytin-a	0.90	U	ug/L	P410380	
		Chlorophyll-a, Uncorrected	3.2		ug/L	P410380	
2306968	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	1.0	UQ	MPN/100 mL	P410309	RPD

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.

Sample Location: S-153 Unnamed creek @ 710

Collection Date/Time: 02/21/2022 11:30

Field ID: G4SE0137

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306965	SM 10200 H (mod.)	Chlorophyll-a, Corrected	4.7		ug/L	P410380	
		Phaeophytin-a	4.0		ug/L	P410380	
		Chlorophyll-a, Uncorrected	7.4		ug/L	P410380	
2306969	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	36.0	AQ	MPN/100 mL	P410309	RPD

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: Laboratory duplicate precision is within criteria limits.

Sample Location: Lettuce Creek @ 710

Collection Date/Time: 02/21/2022 10:00

Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
-----------	-------------	-----------	--------	------	-------	----------	----------

Field ID: G1SE0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2306966	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.9	I	ug/L	P410380	
		Phaeophytin-a	1.5	U	ug/L	P410380	
		Chlorophyll-a, Uncorrected	2.7	I	ug/L	P410380	
2306972	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	70.6	Q	MPN/100 mL	P410309	RPD
2306990	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P409862	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	UJ	TSC/100 mL	P409862	MS
	SOP-PCR-1.3	GFD-qPCR**	790	I	TSC/100 mL	P409862	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P409862	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P409862	

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.
SOP-PCR-1.2: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report

Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P410380

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: P410309

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

Reference Method: SOP-PCR-1.0
Batch ID: P409862

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

Reference Method: SOP-PCR-1.2
Batch ID: P409862

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

Reference Method: SOP-PCR-1.3
Batch ID: P409862

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

Reference Method: SOP-PCR-1.4
Batch ID: P409862

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

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.5
Batch ID: P409862

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: P410380

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	102		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P409862

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	94.6	76.2	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P409862

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	98.5	73.4	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P409862

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	92.7	71.5	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P409862

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	87.3	68.9	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P409862

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	77.8	58.2	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P409862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305697	HF183-qPCR	75.5	66.8	P/P	50 - 175
2305698	HF183-qPCR	104		P	50 - 175
2306167	HF183-qPCR	110		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P409862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306402	HF183-qPCR	87.7		P	50 - 175
2306403	HF183-qPCR	114		P	50 - 175
2306404	HF183-qPCR	107		P	50 - 175
2306712	HF183-qPCR	102		P	50 - 175
2306989	HF183-qPCR	84.4		P	50 - 175
2306990	HF183-qPCR	98.8		P	50 - 175
2307295	HF183-qPCR	87.5		P	50 - 175
2307697	HF183-qPCR	78.2		P	50 - 175
2307698	HF183-qPCR	91.0		P	50 - 175
2307699	HF183-qPCR	82.0		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P409862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305697	GULL2-qPCR	65.7	61.2	P/P	50 - 300
2305698	GULL2-qPCR	71.5		P	50 - 300
2306167	GULL2-qPCR	59.7		P	50 - 300
2306402	GULL2-qPCR	75.9		P	50 - 300
2306403	GULL2-qPCR	51.0		P	50 - 300
2306712	GULL2-qPCR	67.1		P	50 - 300
2306989	GULL2-qPCR	57.4		P	50 - 300
2306990	GULL2-qPCR	40.1		F	50 - 300
2307295	GULL2-qPCR	73.0		P	50 - 300
2307697	GULL2-qPCR	81.7		P	50 - 300
2307698	GULL2-qPCR	88.1		P	50 - 300
2307699	GULL2-qPCR	82.5		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P409862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305697	GFD-qPCR	71.7	82.2	P/P	50 - 175
2305698	GFD-qPCR	110		P	50 - 175
2306167	GFD-qPCR	121		P	50 - 175
2306402	GFD-qPCR	106		P	50 - 175
2306403	GFD-qPCR	132		P	50 - 175
2306404	GFD-qPCR	126		P	50 - 175
2306712	GFD-qPCR	123		P	50 - 175
2306989	GFD-qPCR	109		P	50 - 175
2306990	GFD-qPCR	120		P	50 - 175
2307295	GFD-qPCR	114		P	50 - 175
2307697	GFD-qPCR	92.5		P	50 - 175
2307698	GFD-qPCR	97.6		P	50 - 175
2307699	GFD-qPCR	93.3		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P409862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305697	BacR-qPCR	60.3	61.0	P/P	50 - 175
2305698	BacR-qPCR	63.2		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4

Batch ID: P409862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2306167	BacR-qPCR	62.5		P	50 - 175
2306402	BacR-qPCR	73.0		P	50 - 175
2306403	BacR-qPCR	59.6		P	50 - 175
2306404	BacR-qPCR	57.2		P	50 - 175
2306712	BacR-qPCR	51.7		P	50 - 175
2306989	BacR-qPCR	61.7		P	50 - 175
2306990	BacR-qPCR	55.7		P	50 - 175
2307295	BacR-qPCR	68.2		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P409862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305697	DG3-qPCR	70.6	68.0	P/P	50 - 175
2305698	DG3-qPCR	84.6		P	50 - 175
2306167	DG3-qPCR	110		P	50 - 175
2306402	DG3-qPCR	87.0		P	50 - 175
2306403	DG3-qPCR	111		P	50 - 175
2306404	DG3-qPCR	105		P	50 - 175
2306712	DG3-qPCR	99.1		P	50 - 175
2306989	DG3-qPCR	86.1		P	50 - 175
2306990	DG3-qPCR	103		P	50 - 175
2307295	DG3-qPCR	78.1		P	50 - 175
2307697	DG3-qPCR	82.9		P	50 - 175
2307698	DG3-qPCR	92.2		P	50 - 175
2307699	DG3-qPCR	86.4		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 9223 B Quanti-Tray

Batch ID: P410309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2306969	Escherichia Coli-Quanti-Tray	88.9	Sample	F	0 - 80
2307291	Escherichia Coli-Quanti-Tray	29.6	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0

Batch ID: P409862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305697	HF183-qPCR	12.3	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2

Batch ID: P409862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305697	GULL2-qPCR	7.00	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.3
Batch ID: P409862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305697	GFD-qPCR	13.6	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P409862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305697	BacR-qPCR	1.27	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P409862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305697	DG3-qPCR	3.72	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2306989
Field Sample ID: G1SE0031

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	84.4	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	107	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	94.2	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	75.1	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	79.6	P	50 - 300

Lab Sample ID: 2306990
Field Sample ID: G1SE0015

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	78.2	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	112	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	80.8	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	76.4	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	81.8	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	102				
SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray				88.9	29.6

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	76.2	94.6	75.5	66.8	104		12.3
SOP-PCR-1.2	GULL2-qPCR	73.4	98.5	65.7	61.2	71.5		7.00
SOP-PCR-1.3	GFD-qPCR	71.5	92.7	71.7	82.2	110		13.6
SOP-PCR-1.4	BacR-qPCR	68.9	87.3	60.3	61.0	63.2		1.27
SOP-PCR-1.5	DG3-qPCR	58.2	77.8	70.6	68.0	84.6		3.72

Reference Method Descriptions

Method	Description	Associated Samples
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2306964, 2306965, 2306966
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2306968, 2306969, 2306970, 2306971, 2306972, 2306973
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2306989, 2306990
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2306989, 2306990
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2306989, 2306990
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2306989, 2306990
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2306989, 2306990

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	02/22/2022	02/22/2022 14:35	Jillian G Hanley	02/25/2022 10:30	Joel Wharton	2306964, 2306965, 2306966
SM 9223 B Quanti-Tray	02/22/2022	02/22/2022 16:55	Caitlyn Owens	02/23/2022 11:14	Amber S. Eells	2306968, 2306969, 2306970, 2306971, 2306972, 2306973
SOP-PCR-1.0	02/22/2022	02/22/2022 14:00	Luke Hudson	03/21/2022 11:36	DeAsia Armster	2306989, 2306990
SOP-PCR-1.2	02/22/2022	02/22/2022 14:00	Luke Hudson	03/23/2022 14:21	DeAsia Armster	2306989, 2306990
SOP-PCR-1.3	02/22/2022	02/22/2022 14:00	Luke Hudson	03/24/2022 11:46	DeAsia Armster	2306989, 2306990
SOP-PCR-1.4	02/22/2022	02/22/2022 14:00	Luke Hudson	03/22/2022 12:45	DeAsia Armster	2306989, 2306990
SOP-PCR-1.5	02/22/2022	02/22/2022 14:00	Luke Hudson	03/23/2022 09:32	DeAsia Armster	2306989, 2306990