

Biological Analysis Report

CEN-DIST-2021-04-27-01

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

Event Description: **Tributary to Econlockhatchee**
Request ID: **RQ-2021-04-12-14**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Kalina Warren

For additional information please contact
Cheryl Swanson - Administrator
Jacqueline Savage - Bench Biology & Aquatic
Toxicity
Puja Jasrotia, Ph.D. - Molecular Biology & Taxonomy
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8177

Certified by: Jacqueline Savage, Environmental Administrator

Date Certified: 25-MAY-2021 06:38

A handwritten signature in black ink that reads "Jackie Savage". The signature is written in a cursive, flowing style.

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: 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: Econ River Trib @ 170m N of Jay Blanchard Trail

Collection Date/Time: 04/26/2021 10:33

Field ID: G2CE0198

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2242746	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	72.3	Q	MPN/100 mL	P397564	
2242747	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P396963	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P396963	MS
	SOP-PCR-1.3	GFD-qPCR**	640	I	TSC/100 mL	P396963	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P396963	LCS
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P396963	LCS

Quality Assurance Report Method Blank Results

Reference Method: SM 9223 Quanti-Tray

Batch ID: P397564

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

Reference Method: SOP-PCR-1.0

Batch ID: P396963

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

Reference Method: SOP-PCR-1.2

Batch ID: P396963

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

Reference Method: SOP-PCR-1.3

Batch ID: P396963

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

Reference Method: SOP-PCR-1.4

Batch ID: P396963

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

Reference Method: SOP-PCR-1.5

Batch ID: P396963

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

Quality Assurance Report Laboratory Control Sample Accuracy

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	98.3	109	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	92.4	99.7	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	101	131	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	24.4	81.4	F/P	50 - 175
BacR-qPCR	20.7	84.4	F/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P396963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	83.6	25.2	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	HF183-qPCR	97.2	93.3	P/P	50 - 175
2241707	HF183-qPCR	85.0		P	50 - 175
2241708	HF183-qPCR	95.9		P	50 - 175
2241709	HF183-qPCR	86.0		P	50 - 175
2241710	HF183-qPCR	84.4		P	50 - 175
2242747	HF183-qPCR	72.7		P	50 - 175
2243049	HF183-qPCR	87.1		P	50 - 175
2243481	HF183-qPCR	74.3		P	50 - 175
2243991	HF183-qPCR	80.4		P	50 - 175
2243992	HF183-qPCR	78.8		P	50 - 175
2244081	HF183-qPCR	70.7		P	50 - 175
2244251	HF183-qPCR	81.1		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	GULL2-qPCR	64.6	72.3	P/P	50 - 300
2241707	GULL2-qPCR	88.5		P	50 - 300
2241709	GULL2-qPCR	87.7		P	50 - 300
2241710	GULL2-qPCR	74.6		P	50 - 300
2242747	GULL2-qPCR	72.2		P	50 - 300
2243481	GULL2-qPCR	32.7		F	50 - 300
2243991	GULL2-qPCR	88.4		P	50 - 300
2243992	GULL2-qPCR	80.2		P	50 - 300
2244251	GULL2-qPCR	77.0		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	GFD-qPCR	101	97.9	P/P	50 - 175
2241707	GFD-qPCR	98.9		P	50 - 175
2241709	GFD-qPCR	94.1		P	50 - 175
2241710	GFD-qPCR	90.0		P	50 - 175
2242747	GFD-qPCR	87.9		P	50 - 175
2243481	GFD-qPCR	82.5		P	50 - 175
2243991	GFD-qPCR	98.0		P	50 - 175
2243992	GFD-qPCR	83.4		P	50 - 175
2244081	GFD-qPCR	90.3		P	50 - 175
2244251	GFD-qPCR	90.5		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	BacR-qPCR	60.1	61.6	P/P	50 - 175
2241707	BacR-qPCR	70.2		P	50 - 175
2241708	BacR-qPCR	68.9		P	50 - 175
2241709	BacR-qPCR	67.5		P	50 - 175
2241710	BacR-qPCR	63.1		P	50 - 175
2242747	BacR-qPCR	56.9		P	50 - 175
2243049	BacR-qPCR	56.2		P	50 - 175
2243481	BacR-qPCR	76.2		P	50 - 175
2243991	BacR-qPCR	65.3		P	50 - 175
2243992	BacR-qPCR	60.8		P	50 - 175
2244081	BacR-qPCR	57.0		P	50 - 175
2244251	BacR-qPCR	63.3		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241706	DG3-qPCR	87.0	90.2	P/P	50 - 175
2241707	DG3-qPCR	84.8		P	50 - 175
2241708	DG3-qPCR	96.3		P	50 - 175
2241709	DG3-qPCR	84.6		P	50 - 175
2241710	DG3-qPCR	90.6		P	50 - 175
2242747	DG3-qPCR	77.1		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P396963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243049	DG3-qPCR	85.6		P	50 - 175
2243481	DG3-qPCR	77.5		P	50 - 175
2243991	DG3-qPCR	83.0		P	50 - 175
2243992	DG3-qPCR	105		P	50 - 175
2244251	DG3-qPCR	86.2		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 9223 Quanti-Tray
Batch ID: P397564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2242693	Escherichia Coli-Quanti-Tray	20.9	Sample	P	0 - 80
2243129	Escherichia Coli-Quanti-Tray	0.0	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	HF183-qPCR	4.14	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	GULL2-qPCR	11.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	GFD-qPCR	3.42	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	BacR-qPCR	10.3	Spike	P	0 - 25
2241706	BacR-qPCR	2.50	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: SOP-PCR-1.5
 Batch ID: P396963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241706	DG3-qPCR	3.57	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2242747
 Field Sample ID: G2CE0198

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	93.2	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	93.4	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	92.4	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	85.0	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray							20.9 0.0	
SOP-PCR-1.0	HF183-qPCR	109	98.3	97.2	93.3	85.0			4.14
				95.9					
SOP-PCR-1.2	GULL2-qPCR	99.7	92.4	64.6	72.3	88.5			11.2
				87.7					
SOP-PCR-1.3	GFD-qPCR	131	101	101	97.9	98.9			3.42
				94.1					
SOP-PCR-1.4	BacR-qPCR	24.4	84.4	81.4	60.1	61.6	70.2		2.50 10.3
		20.7			68.9				
SOP-PCR-1.5	DG3-qPCR	25.2	83.6	87.0	90.2	84.8			3.57
				96.3					

Reference Method Descriptions

Method	Description	Associated Samples
SM 9223 Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2242746
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2242747
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2242747
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2242747
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2242747
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2242747

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 9223 Quanti-Tray	04/27/2021	04/27/2021 15:07	Carina A. Tull	04/28/2021 11:27	Carina A. Tull	2242746
SOP-PCR-1.0	04/27/2021	04/27/2021 14:45	Mailin Lopez	05/05/2021 12:34	DeAsia Armster	2242747
SOP-PCR-1.2	04/27/2021	04/27/2021 14:45	Mailin Lopez	05/11/2021 14:54	Mailin Lopez	2242747
SOP-PCR-1.3	04/27/2021	04/27/2021 14:45	Mailin Lopez	05/11/2021 12:21	DeAsia Armster	2242747
SOP-PCR-1.4	04/27/2021	04/27/2021 14:45	Mailin Lopez	05/06/2021 12:09	DeAsia Armster	2242747
SOP-PCR-1.5	04/27/2021	04/27/2021 14:45	Mailin Lopez	05/07/2021 10:10	Mailin Lopez	2242747