

Biological Analysis Report

SO-DIST-2021-06-16-02

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

Event Description: **2021 SMP: Lee County Sampling**
Request ID: **RQ-2021-06-14-49**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: William Mullen

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Certified by: Jacqueline Savage, Environmental Administrator

Date Certified: 13-JUL-2021 13:00

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 group are included in this report: 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: IOMIGRIO

Collection Date/Time: 06/15/2021 09:13

Field ID: IOMIGRIO

Matrix: W-BRACKISH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2255168	SOP-PCR-1.0	HF183-qPCR**	830	U	TSC/100 mL	P399434	
	SOP-PCR-1.2	GULL2-qPCR**	900	U	TSC/100 mL	P399434	LCS
	SOP-PCR-1.3	GFD-qPCR**	3.92E+03		TSC/100 mL	P399434	LCS
	SOP-PCR-1.4	BacR-qPCR**	760	U	TSC/100 mL	P399434	
	SOP-PCR-1.5	DG3-qPCR**	640	U	TSC/100 mL	P399434	RPD

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
 Batch ID: P399434

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

Reference Method: SOP-PCR-1.2
 Batch ID: P399434

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

Reference Method: SOP-PCR-1.3
 Batch ID: P399434

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

Reference Method: SOP-PCR-1.4
 Batch ID: P399434

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

Reference Method: SOP-PCR-1.5
 Batch ID: P399434

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
 Batch ID: P399434

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	64.7	163	P/P	50 - 175

Reference Method: SOP-PCR-1.2
 Batch ID: P399434

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

Reference Method: SOP-PCR-1.2
Batch ID: P399434

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	90.6	332	P/F	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P399434

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	97.5	208	P/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P399434

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	82.5	77.5	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P399434

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	91.5	116	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P399434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253866	HF183-qPCR	63.2	65.7	P/P	50 - 175
2253867	HF183-qPCR	60.0		P	50 - 175
2253869	HF183-qPCR	64.1		P	50 - 175
2254322	HF183-qPCR	65.8		P	50 - 175
2254323	HF183-qPCR	56.7		P	50 - 175
2254369	HF183-qPCR	56.2		P	50 - 175
2254984	HF183-qPCR	41.7		F	50 - 175
2255119	HF183-qPCR	57.8		P	50 - 175
2255120	HF183-qPCR	58.3		P	50 - 175
2255168	HF183-qPCR	64.5		P	50 - 175
2255397	HF183-qPCR	63.7		P	50 - 175
2255628	HF183-qPCR	57.9		P	50 - 175
2256151	HF183-qPCR	63.4		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P399434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253866	GULL2-qPCR	74.0	65.2	P/P	50 - 300
2253869	GULL2-qPCR	83.0		P	50 - 300
2254322	GULL2-qPCR	80.5		P	50 - 300
2254323	GULL2-qPCR	63.6		P	50 - 300
2254369	GULL2-qPCR	65.7		P	50 - 300
2254984	GULL2-qPCR	43.5		F	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P399434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2255168	GULL2-qPCR	69.4		P	50 - 300
2255397	GULL2-qPCR	71.7		P	50 - 300
2255628	GULL2-qPCR	71.5		P	50 - 300
2256151	GULL2-qPCR	55.3		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P399434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253866	GFD-qPCR	103	101	P/P	50 - 175
2253867	GFD-qPCR	94.1		P	50 - 175
2253869	GFD-qPCR	94.9		P	50 - 175
2254322	GFD-qPCR	95.9		P	50 - 175
2254323	GFD-qPCR	86.8		P	50 - 175
2254369	GFD-qPCR	103		P	50 - 175
2254984	GFD-qPCR	81.9		P	50 - 175
2255168	GFD-qPCR	106		P	50 - 175
2255397	GFD-qPCR	94.7		P	50 - 175
2255628	GFD-qPCR	94.7		P	50 - 175
2256151	GFD-qPCR	111		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P399434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253866	BacR-qPCR	75.7	63.0	P/P	50 - 175
2253867	BacR-qPCR	68.1		P	50 - 175
2253869	BacR-qPCR	78.4		P	50 - 175
2254322	BacR-qPCR	82.0		P	50 - 175
2254323	BacR-qPCR	65.3		P	50 - 175
2254369	BacR-qPCR	74.1		P	50 - 175
2254984	BacR-qPCR	59.4		P	50 - 175
2255119	BacR-qPCR	73.1		P	50 - 175
2255120	BacR-qPCR	54.6		P	50 - 175
2255168	BacR-qPCR	80.0		P	50 - 175
2255397	BacR-qPCR	72.9		P	50 - 175
2255628	BacR-qPCR	79.1		P	50 - 175
2256151	BacR-qPCR	66.9		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P399434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253866	DG3-qPCR	111	82.7	P/P	50 - 175
2253867	DG3-qPCR	83.4		P	50 - 175
2253869	DG3-qPCR	81.1		P	50 - 175
2254322	DG3-qPCR	76.4		P	50 - 175
2254323	DG3-qPCR	73.6		P	50 - 175
2254369	DG3-qPCR	79.1		P	50 - 175
2254984	DG3-qPCR	58.3		P	50 - 175
2255168	DG3-qPCR	81.1		P	50 - 175
2255397	DG3-qPCR	71.2		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
 Batch ID: P399434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2255628	DG3-qPCR	73.2		P	50 - 175
2256151	DG3-qPCR	90.5		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P399434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253866	HF183-qPCR	3.01	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P399434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253866	GULL2-qPCR	13.4	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P399434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253866	GFD-qPCR	3.03	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P399434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253866	BacR-qPCR	19.1	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
 Batch ID: P399434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253866	DG3-qPCR	30.2	Spike	F	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2255168
 Field Sample ID: IOMIGRIO

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
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Quality Assurance Report Surrogates

Lab Sample ID: 2255168
Field Sample ID: IOMIGRIO

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	106	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	108	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	100	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	96.1	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	163	64.7	57.9	63.4	63.2			3.01
SOP-PCR-1.2	GULL2-qPCR	332	90.6	74.0	65.2	83.0			13.4
SOP-PCR-1.3	GFD-qPCR	208	97.5	103	101	94.1			3.03
SOP-PCR-1.4	BacR-qPCR	77.5	82.5	75.7	63.0	68.1			19.1
SOP-PCR-1.5	DG3-qPCR	116	91.5	111	82.7	83.4			30.2

Reference Method Descriptions

Method	Description	Associated Samples
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2255168
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2255168
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2255168
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2255168
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2255168

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SOP-PCR-1.0	06/16/2021	06/16/2021 14:20	Amy M Gordon	06/29/2021 09:30	DeAsia Armster	2255168
SOP-PCR-1.2	06/16/2021	06/16/2021 14:20	Amy M Gordon	07/01/2021 12:06	DeAsia Armster	2255168
SOP-PCR-1.3	06/16/2021	06/16/2021 14:20	Amy M Gordon	07/01/2021 13:54	Mailin Lopez	2255168
SOP-PCR-1.4	06/16/2021	06/16/2021 14:20	Amy M Gordon	06/29/2021 14:54	DeAsia Armster	2255168
SOP-PCR-1.5	06/16/2021	06/16/2021 14:20	Amy M Gordon	06/30/2021 13:42	DeAsia Armster	2255168