

Biological Analysis Report

SO-DIST-2023-01-11-01

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

Overflow Analyses Performed By:
Benchmark EnviroAnalytical, Inc. - North Port
1001 Corporate Avenue, Suite 102
North Port, FL 34289
DOH Accreditation E85086

Event Description: **2023 SMP: Later Gator**
Request ID: **RQ-2023-01-09-44**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: William Mullen

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Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 08-FEB-2023 14:37



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: Molecular and Overflow.

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: Telegraph Swamp South Site

Collection Date/Time: 01/10/2023 10:25

Field ID: G3SD0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2379862	SOP-PCR-1.0	HF183-qPCR**	3.3E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.4	BacR-qPCR**	5.7E+03	I	TSC/100 mL	P423971	
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P423971	
2379865	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	359		MPN/100 mL		

Sample Location: Myrtle Slough @ SR 31

Collection Date/Time: 01/10/2023 11:10

Field ID: G3SD0097

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2379864	SOP-PCR-1.0	HF183-qPCR**	2.2E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.4	BacR-qPCR**	1.00E+05		TSC/100 mL	P423971	
	SOP-PCR-1.5	DG3-qPCR**	1.7E+03	U	TSC/100 mL	P423971	
2379867	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	131		MPN/100 mL		

Sample Location: Alligator North @ Jones Loop Rd.

Collection Date/Time: 01/10/2023 12:10

Field ID: G2SD0032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2379863	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.3	GFD-qPCR**	4.5E+03		TSC/100 mL	P423971	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P423971	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P423971	
2379866	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	73		MPN/100 mL		

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0
Batch ID: P423971

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

Reference Method: SOP-PCR-1.2
Batch ID: P423971

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

Reference Method: SOP-PCR-1.3
Batch ID: P423971

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: P423971

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

Reference Method: SOP-PCR-1.5
Batch ID: P423971

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: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	90.2	92.7	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	114	86.5	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	104	100	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	93.3	102	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P423971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	97.7	108	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377548	HF183-qPCR	75.5	74.3	P/P	50 - 175
2378129	HF183-qPCR	81.8		P	50 - 175
2378288	HF183-qPCR	97.5		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378289	HF183-qPCR	90.6		P	50 - 175
2378943	HF183-qPCR	87.5		P	50 - 175
2378944	HF183-qPCR	75.2		P	50 - 175
2379128	HF183-qPCR	112		P	50 - 175
2379845	HF183-qPCR	85.3		P	50 - 175
2379846	HF183-qPCR	87.8		P	50 - 175
2379847	HF183-qPCR	91.9		P	50 - 175
2379862	HF183-qPCR	94.9		P	50 - 175
2379863	HF183-qPCR	91.4		P	50 - 175
2379864	HF183-qPCR	101		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378129	GULL2-qPCR	77.4		P	50 - 300
2378288	GULL2-qPCR	76.8		P	50 - 300
2378289	GULL2-qPCR	86.5		P	50 - 300
2378943	GULL2-qPCR	77.5		P	50 - 300
2379845	GULL2-qPCR	82.9		P	50 - 300
2379846	GULL2-qPCR	80.4		P	50 - 300
2379847	GULL2-qPCR	91.3		P	50 - 300
2379863	GULL2-qPCR	96.0		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2378129	GFD-qPCR	108		P	50 - 175
2378288	GFD-qPCR	106		P	50 - 175
2378289	GFD-qPCR	98.4		P	50 - 175
2378943	GFD-qPCR	112		P	50 - 175
2379845	GFD-qPCR	110		P	50 - 175
2379846	GFD-qPCR	100		P	50 - 175
2379847	GFD-qPCR	95.1		P	50 - 175
2379863	GFD-qPCR	95.8		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377548	BacR-qPCR	69.1	71.2	P/P	50 - 175
2378129	BacR-qPCR	73.6		P	50 - 175
2378288	BacR-qPCR	79.4		P	50 - 175
2378289	BacR-qPCR	83.5		P	50 - 175
2378943	BacR-qPCR	63.4		P	50 - 175
2378944	BacR-qPCR	73.9		P	50 - 175
2379128	BacR-qPCR	82.3		P	50 - 175
2379845	BacR-qPCR	78.1		P	50 - 175
2379846	BacR-qPCR	75.6		P	50 - 175
2379847	BacR-qPCR	80.2		P	50 - 175
2379862	BacR-qPCR	59.6		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2379863	BacR-qPCR	89.3		P	50 - 175
2379864	BacR-qPCR	84.5		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P423971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2377548	DG3-qPCR	88.2	83.8	P/P	50 - 175
2378129	DG3-qPCR	83.0		P	50 - 175
2378288	DG3-qPCR	92.2		P	50 - 175
2378289	DG3-qPCR	92.6		P	50 - 175
2378943	DG3-qPCR	83.4		P	50 - 175
2378944	DG3-qPCR	88.5		P	50 - 175
2379128	DG3-qPCR	99.6		P	50 - 175
2379845	DG3-qPCR	102		P	50 - 175
2379846	DG3-qPCR	99.5		P	50 - 175
2379847	DG3-qPCR	92.8		P	50 - 175
2379862	DG3-qPCR	89.2		P	50 - 175
2379863	DG3-qPCR	110		P	50 - 175
2379864	DG3-qPCR	106		P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	HF183-qPCR	1.59	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	GULL2-qPCR	1.26	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	GFD-qPCR	9.76	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	BacR-qPCR	3.05	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.5
Batch ID: P423971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2377548	DG3-qPCR	5.15	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2379862
Field Sample ID: G3SD0100

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	69.6	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	84.5	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	61.8	P	50 - 300

Lab Sample ID: 2379863
Field Sample ID: G2SD0032

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	106	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	91.0	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	103	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	93.6	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	89.1	P	50 - 300

Lab Sample ID: 2379864
Field Sample ID: G3SD0097

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	94.6	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	91.9	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	77.3	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	92.7	90.2	75.5	74.3	81.8		1.59
SOP-PCR-1.2	GULL2-qPCR	86.5	114	77.4	76.8	86.5		1.26
SOP-PCR-1.3	GFD-qPCR	100	104	108	106	98.4		9.76
SOP-PCR-1.4	BacR-qPCR	102	93.3	69.1	71.2	73.6		3.05
SOP-PCR-1.5	DG3-qPCR	108	97.7	88.2	83.8	83.0		5.15

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 9223 Quanti-Tray	E. coli by Colilert/QT by BEA South in North Port	2379865, 2379866, 2379867
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2379862, 2379863, 2379864
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2379863
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2379863
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2379862, 2379863, 2379864
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2379862, 2379863, 2379864

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 9223 Quanti-Tray	01/10/2023	01/10/2023 13:47		01/11/2023 14:55	Benchmark EnviroAnalytical in North Port	2379865, 2379866, 2379867
SOP-PCR-1.0	01/11/2023	01/11/2023 12:50	DeAsia Armster	01/17/2023 10:07	Roberta Tatti	2379862, 2379863, 2379864
SOP-PCR-1.2	01/11/2023	01/11/2023 12:50	DeAsia Armster	01/19/2023 14:25	DeAsia Armster	2379863
SOP-PCR-1.3	01/11/2023	01/11/2023 12:50	DeAsia Armster	01/20/2023 08:21	Roberta Tatti	2379863
SOP-PCR-1.4	01/11/2023	01/11/2023 12:50	DeAsia Armster	01/18/2023 09:21	DeAsia Armster	2379862, 2379863, 2379864
SOP-PCR-1.5	01/11/2023	01/11/2023 12:50	DeAsia Armster	01/19/2023 09:49	Roberta Tatti	2379862, 2379863, 2379864