Biological Analysis Report

SO-DIST-2022-02-15-01

Florida Department of Environmental Protection
Central 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: **2022 SMP : Arbuckle**
Request ID: **RQ-2022-02-14-24**
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

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: 04-APR-2022 14:42

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, 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: Arbuckle Cr @ end of E Horse Hammock Rd **Collection Date/Time: 02/14/2022 11:05**

Field ID: G4SD0110 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2305546	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	109		MPN/100 mL		

Sample Location: ArbuckleCreekbyRamp **Collection Date/Time: 02/14/2022 11:50**

Field ID: G4SD0117 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2305547	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	144		MPN/100 mL		

Sample Location: Arbuckle Branch **Collection Date/Time: 02/14/2022 12:50**

Field ID: G4SD0172 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2305544	SM 10200 H (mod.)	Chlorophyll-a, Corrected	20		ug/L	P410190	
		Phaeophytin-a	3.4	I	ug/L	P410190	
		Chlorophyll-a, Uncorrected	23		ug/L	P410190	
2305545	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P409684	
	SOP-PCR-1.2	GULL2-qPCR**	3.6E+03	U	TSC/100 mL	P409684	
	SOP-PCR-1.3	GFD-qPCR**	1.3E+03	I	TSC/100 mL	P409684	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	UJ	TSC/100 mL	P409684	MS
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P409684	
2305548	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	1198		MPN/100 mL		

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-1.4: 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: P410190

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: SOP-PCR-1.0
Batch ID: P409684

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

Reference Method: SOP-PCR-1.2
Batch ID: P409684

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

Quality Assurance Report
Method Blank Results

Reference Method: SOP-PCR-1.3
Batch ID: P409684

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

Reference Method: SOP-PCR-1.4
Batch ID: P409684

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

Reference Method: SOP-PCR-1.5
Batch ID: P409684

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: P410190

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	91.3		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P409684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	87.6	84.5	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P409684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	95.4	83.9	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P409684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	88.1	83.8	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P409684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	80.8	71.0	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P409684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P409684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	65.8	88.7	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P409684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304988	HF183-qPCR	102	98.5	P/P	50 - 175
2305073	HF183-qPCR	93.8		P	50 - 175
2305074	HF183-qPCR	91.3		P	50 - 175
2305122	HF183-qPCR	90.7		P	50 - 175
2305123	HF183-qPCR	86.4		P	50 - 175
2305175	HF183-qPCR	108		P	50 - 175
2305176	HF183-qPCR	110		P	50 - 175
2305484	HF183-qPCR	102		P	50 - 175
2305485	HF183-qPCR	85.6		P	50 - 175
2305486	HF183-qPCR	98.3		P	50 - 175
2305487	HF183-qPCR	103		P	50 - 175
2305545	HF183-qPCR	79.7		P	50 - 175
2305696	HF183-qPCR	101		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P409684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304988	GULL2-qPCR	83.0	83.0	P/P	50 - 300
2305074	GULL2-qPCR	70.0		P	50 - 300
2305175	GULL2-qPCR	85.0		P	50 - 300
2305176	GULL2-qPCR	81.9		P	50 - 300
2305484	GULL2-qPCR	84.8		P	50 - 300
2305485	GULL2-qPCR	70.8		P	50 - 300
2305486	GULL2-qPCR	81.3		P	50 - 300
2305487	GULL2-qPCR	80.2		P	50 - 300
2305545	GULL2-qPCR	67.1		P	50 - 300
2305696	GULL2-qPCR	81.3		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P409684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304988	GFD-qPCR	122	106	P/P	50 - 175
2305074	GFD-qPCR	105		P	50 - 175
2305175	GFD-qPCR	123		P	50 - 175
2305176	GFD-qPCR	125		P	50 - 175
2305484	GFD-qPCR	95.7		P	50 - 175
2305485	GFD-qPCR	94.8		P	50 - 175
2305486	GFD-qPCR	101		P	50 - 175
2305487	GFD-qPCR	104		P	50 - 175
2305545	GFD-qPCR	83.1		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.3
Batch ID: P409684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305696	GFD-qPCR	113		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P409684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304988	BacR-qPCR	69.0	66.3	P/P	50 - 175
2305073	BacR-qPCR	64.9		P	50 - 175
2305074	BacR-qPCR	62.5		P	50 - 175
2305122	BacR-qPCR	69.0		P	50 - 175
2305123	BacR-qPCR	63.9		P	50 - 175
2305175	BacR-qPCR	68.9		P	50 - 175
2305176	BacR-qPCR	67.5		P	50 - 175
2305484	BacR-qPCR	92.5		P	50 - 175
2305485	BacR-qPCR	64.2		P	50 - 175
2305486	BacR-qPCR	72.8		P	50 - 175
2305487	BacR-qPCR	65.7		P	50 - 175
2305545	BacR-qPCR	48.4		F	50 - 175
2305696	BacR-qPCR	68.9		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P409684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304988	DG3-qPCR	68.2	69.5	P/P	50 - 175
2305073	DG3-qPCR	71.8		P	50 - 175
2305074	DG3-qPCR	70.8		P	50 - 175
2305122	DG3-qPCR	72.7		P	50 - 175
2305123	DG3-qPCR	73.5		P	50 - 175
2305175	DG3-qPCR	67.9		P	50 - 175
2305176	DG3-qPCR	69.0		P	50 - 175
2305484	DG3-qPCR	76.6		P	50 - 175
2305485	DG3-qPCR	72.0		P	50 - 175
2305486	DG3-qPCR	69.5		P	50 - 175
2305487	DG3-qPCR	72.1		P	50 - 175
2305545	DG3-qPCR	71.8		P	50 - 175
2305696	DG3-qPCR	70.9		P	50 - 175

Quality Assurance Report
Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P410190

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305644	Chlorophyll-a, Corrected	11.5	Sample	P	0 - 25
2305644	Chlorophyll-a, Uncorrected	14.2	Sample	P	0 - 25

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.0
Batch ID: P409684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304988	HF183-qPCR	3.90	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P409684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304988	GULL2-qPCR	0.00595	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P409684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304988	GFD-qPCR	14.3	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P409684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304988	BacR-qPCR	4.02	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P409684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304988	DG3-qPCR	1.85	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2305545
Field Sample ID: G4SD0172

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	57.3	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	70.5	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	71.0	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	56.4	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	61.2	P	50 - 300

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision		
				LCS	SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	91.3			11.5	
	Chlorophyll-a, Uncorrected				14.2	
SOP-PCR-1.0	HF183-qPCR	84.5 87.6	102 98.5 93.8 91.3			3.90
SOP-PCR-1.2	GULL2-qPCR	83.9 95.4	83.0 83.0 70.0 85.0			0.0059
SOP-PCR-1.3	GFD-qPCR	83.8 88.1	105 123 125 95.7			14.3
SOP-PCR-1.4	BacR-qPCR	71.0 80.8	64.2 72.8 65.7 48.4			4.02
SOP-PCR-1.5	DG3-qPCR	88.7 65.8	68.2 69.5 71.8 70.8			1.85

Reference Method Descriptions

Method	Description	Associated Samples
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2305544
SM 9223 Quanti-Tray	E. coli by Colilert/QT by BEA South in North Port	2305546, 2305547, 2305548
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2305545
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2305545
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2305545
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2305545
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2305545

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	02/15/2022	02/15/2022 15:21	Jillian G Hanley	02/21/2022 10:55	Ethan Wickline	2305544
SM 9223 Quanti-Tray	02/14/2022	02/14/2022 15:34		02/15/2022 16:16	Benchmark EnviroAnalytical in North Port	2305546, 2305547, 2305548
SOP-PCR-1.0	02/15/2022	02/15/2022 14:30	Luke Hudson	02/25/2022 09:40	DeAsia Armster	2305545
SOP-PCR-1.2	02/15/2022	02/15/2022 14:30	Luke Hudson	03/16/2022 10:33	DeAsia Armster	2305545
SOP-PCR-1.3	02/15/2022	02/15/2022 14:30	Luke Hudson	03/17/2022 09:30	DeAsia Armster	2305545
SOP-PCR-1.4	02/15/2022	02/15/2022 14:30	Luke Hudson	03/14/2022 14:35	DeAsia Armster	2305545
SOP-PCR-1.5	02/15/2022	02/15/2022 14:30	Luke Hudson	03/15/2022 09:10	DeAsia Armster	2305545