

Biological Analysis Report

SO-DIST-2022-09-15-01

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

Overflow Analyses Performed By:
Sanders Laboratories
10090 Bavaria Road
Ft. Myers, FL 33913
DOH Accreditation E85457

Event Description: **2021 SMP: Continuous Lee**
Request ID: **RQ-2022-09-05-46**
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

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: Cheryl A. Swanson, Program Administrator

Date Certified: 31-OCT-2022 16:49



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: Spring Creek @ US41

Collection Date/Time: 09/14/2022 08:30

Field ID: G1SD0109

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2356767	SM 10200 H (mod.)	Chlorophyll-a, Corrected	3.2		ug/L	P420473	
		Phaeophytin-a	0.90	U	ug/L	P420473	
		Chlorophyll-a, Uncorrected	3.6		ug/L	P420473	
2356769	SOP-PCR-1.0	HF183-qPCR**	8.8E+03		TSC/100 mL	P419630	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P419630	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P419630	
2356771	Enterolert/QT	ENTEROCOCCI-ENTEROLERT	20.0		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-1.0: Duplicate was analyzed and result is 1.7E+03 U.

Sample Location: Imperial River @ Orr Rd

Collection Date/Time: 09/14/2022 09:10

Field ID: G1SD0105

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2356768	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.8	I	ug/L	P420473	
		Phaeophytin-a	0.90	U	ug/L	P420473	
		Chlorophyll-a, Uncorrected	2.0		ug/L	P420473	
2356770	SOP-PCR-1.0	HF183-qPCR**	830	U	TSC/100 mL	P419630	
	SOP-PCR-1.2	GULL2-qPCR**	900	U	TSC/100 mL	P419630	
	SOP-PCR-1.3	GFD-qPCR**	180	U	TSC/100 mL	P419630	
	SOP-PCR-1.4	BacR-qPCR**	760	U	TSC/100 mL	P419630	
	SOP-PCR-1.5	DG3-qPCR**	640	U	TSC/100 mL	P419630	
2356772	Colilert-18	Escherichia Coli-Quanti-Tray	60.5		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-1.2: Precision data unavailable for Gull2-qPCR component.

SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P420473

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: P419630

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

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.2
Batch ID: P419630

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

Reference Method: SOP-PCR-1.3
Batch ID: P419630

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

Reference Method: SOP-PCR-1.4
Batch ID: P419630

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

Reference Method: SOP-PCR-1.5
Batch ID: P419630

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: P420473

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	94.9		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P419630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	103	87.4	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P419630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	94.0	88.5	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P419630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	98.0	98.4	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P419630

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

Reference Method: SOP-PCR-1.4
Batch ID: P419630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	103	80.2	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P419630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	120	85.8	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P419630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356757	HF183-qPCR	80.6	97.2	P	50 - 175
2356769	HF183-qPCR	91.1		P/P	50 - 175
2356770	HF183-qPCR	87.9		P	50 - 175
2357302	HF183-qPCR	90.7		P	50 - 175
2357487	HF183-qPCR	83.5		P	50 - 175
2357488	HF183-qPCR	83.6		P	50 - 175
2357754	HF183-qPCR	87.4		P	50 - 175
2357755	HF183-qPCR	87.4		P	50 - 175
2358080	HF183-qPCR	90.9		P	50 - 175
2358096	HF183-qPCR	87.7		P	50 - 175
2358298	HF183-qPCR	79.9		P	50 - 175
2358710	HF183-qPCR	89.6		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P419630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356757	GULL2-qPCR	81.2		P	50 - 300
2356770	GULL2-qPCR	80.4		P	50 - 300
2357487	GULL2-qPCR	70.3		P	50 - 300
2357488	GULL2-qPCR	61.8		P	50 - 300
2357754	GULL2-qPCR	74.1		P	50 - 300
2358080	GULL2-qPCR	75.0		P	50 - 300
2358710	GULL2-qPCR	81.5		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P419630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356757	GFD-qPCR	112		P	50 - 175
2356770	GFD-qPCR	101		P	50 - 175
2357487	GFD-qPCR	87.9		P	50 - 175
2357488	GFD-qPCR	80.0		P	50 - 175
2357754	GFD-qPCR	108		P	50 - 175
2358080	GFD-qPCR	107		P	50 - 175
2358710	GFD-qPCR	108		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P419630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356757	BacR-qPCR	83.7	88.2	P	50 - 175
2356769	BacR-qPCR	94.4		P/P	50 - 175
2356770	BacR-qPCR	93.3		P	50 - 175
2357302	BacR-qPCR	74.5		P	50 - 175
2357487	BacR-qPCR	70.5		P	50 - 175
2357488	BacR-qPCR	72.6		P	50 - 175
2357754	BacR-qPCR	71.1		P	50 - 175
2357755	BacR-qPCR	68.6		P	50 - 175
2358080	BacR-qPCR	88.4		P	50 - 175
2358096	BacR-qPCR	76.7		P	50 - 175
2358298	BacR-qPCR	64.3		P	50 - 175
2358710	BacR-qPCR	93.1		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P419630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356757	DG3-qPCR	101	101	P	50 - 175
2356769	DG3-qPCR	108		P/P	50 - 175
2356770	DG3-qPCR	101		P	50 - 175
2357302	DG3-qPCR	93.7		P	50 - 175
2357487	DG3-qPCR	105		P	50 - 175
2357488	DG3-qPCR	87.1		P	50 - 175
2357754	DG3-qPCR	102		P	50 - 175
2357755	DG3-qPCR	83.6		P	50 - 175
2358080	DG3-qPCR	97.3		P	50 - 175
2358096	DG3-qPCR	92.8		P	50 - 175
2358298	DG3-qPCR	91.3		P	50 - 175
2358710	DG3-qPCR	100		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P420473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2356782	Chlorophyll-a, Corrected	5.46	Sample	P	0 - 25
2356782	Chlorophyll-a, Uncorrected	6.78	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P419630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2356769	HF183-qPCR	5.73	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.4
Batch ID: P419630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2356769	BacR-qPCR	6.76	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P419630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2356769	DG3-qPCR	6.70	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2356769
Field Sample ID: G1SD0109

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	99.6	P	50 - 300
SOP-PCR-1.0	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	103	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	94.3	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	104	P	50 - 300

Lab Sample ID: 2356770
Field Sample ID: G1SD0105

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	88.2	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	98.9	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	106	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	106	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	96.0	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	94.9					5.46	
	Chlorophyll-a, Uncorrected						6.78	
SOP-PCR-1.0	HF183-qPCR	87.4	103	87.9	80.6	90.7		5.73
				83.5				
SOP-PCR-1.2	GULL2-qPCR	88.5	94.0	80.4	81.2	70.3		
				61.8				
SOP-PCR-1.3	GFD-qPCR	98.4	98.0	107	108	101		
				112				
SOP-PCR-1.4	BacR-qPCR	80.2	103	94.4	88.2	93.3		6.76
				83.7				

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.5	DG3-qPCR	85.8	120	108	101	101			6.70
				101					

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
Colilert-18	E. coli by Colilert-18/QT by Sanders in Fort Myers	2356772
Enterolert/QT	Enterococci by Enterolert/QT by Sanders in Fort Myers	2356771
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2356767, 2356768
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2356769, 2356770
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2356770
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2356770
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2356769, 2356770
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2356769, 2356770

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Colilert-18	09/14/2022	09/14/2022 15:25		09/15/2022 09:50	Sanders-Fort Myers	2356772
Enterolert/QT	09/14/2022	09/14/2022 12:10		09/15/2022 12:12	Sanders-Fort Myers	2356771
SM 10200 H (mod.)	09/15/2022	09/15/2022 14:31	Megan Higbee	10/03/2022 15:05	Carina A. Tull	2356767, 2356768
SOP-PCR-1.0	09/15/2022	09/15/2022 13:25	Claudia Castro	10/05/2022 09:47	DeAsia Armster	2356769, 2356770
SOP-PCR-1.2	09/15/2022	09/15/2022 13:25	Claudia Castro	10/13/2022 08:54	DeAsia Armster	2356770
SOP-PCR-1.3	09/15/2022	09/15/2022 13:25	Claudia Castro	10/13/2022 11:19	Roberta Tatti	2356770
SOP-PCR-1.4	09/15/2022	09/15/2022 13:25	Claudia Castro	10/06/2022 10:17	DeAsia Armster	2356769, 2356770
SOP-PCR-1.5	09/15/2022	09/15/2022 13:25	Claudia Castro	10/10/2022 08:39	Roberta Tatti	2356769, 2356770