Biological Analysis Report

SO-DIST-2022-06-28-03

Florida Department of Environmental Protection
Central 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-2022-06-13-34**
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: Puja Jasrotia, Environmental Administrator

Date Certified: 11-AUG-2022 10:50

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: 06/27/2022 09:05**

Field ID: G1SD0109 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2337647	SM 10200 H (mod.)	Chlorophyll-a, Corrected	4.4		ug/L	P416301	
		Phaeophytin-a	1.5	U	ug/L	P416301	
		Chlorophyll-a, Uncorrected	4.7		ug/L	P416301	
2337649	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P415559	
	SOP-PCR-1.2	GULL2-qPCR**	2.4E+03	U	TSC/100 mL	P415559	
	SOP-PCR-1.3	GFD-qPCR**	480	U	TSC/100 mL	P415559	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P415559	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P415559	
2337650	Enterolert/QT	ENTEROCOCCI-ENTEROLERT	270		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.

Quality Assurance Report
Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P416301

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: P415559

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

Reference Method: SOP-PCR-1.2
Batch ID: P415559

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

Reference Method: SOP-PCR-1.3
Batch ID: P415559

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

Reference Method: SOP-PCR-1.4
Batch ID: P415559

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

Reference Method: SOP-PCR-1.5
Batch ID: P415559

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: SOP-PCR-1.5
Batch ID: P415559

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: P416301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	89.6		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P415559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	105	75.9	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P415559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	79.7	77.5	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P415559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	63.2	67.4	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P415559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	106	83.9	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P415559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	94.4	75.9	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P415559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2336411	HF183-qPCR	91.3	92.6	P/P	50 - 175
2336412	HF183-qPCR	87.2		P	50 - 175
2336878	HF183-qPCR	93.9		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P415559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2336879	HF183-qPCR	90.7		P	50 - 175
2337579	HF183-qPCR	96.7		P	50 - 175
2337628	HF183-qPCR	96.5		P	50 - 175
2337649	HF183-qPCR	104		P	50 - 175
2337666	HF183-qPCR	89.0		P	50 - 175
2337667	HF183-qPCR	87.2		P	50 - 175
2337896	HF183-qPCR	83.8		P	50 - 175
2338283	HF183-qPCR	85.8		P	50 - 175
2338285	HF183-qPCR	85.8		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P415559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2336411	GULL2-qPCR	88.7	91.7	P/P	50 - 300
2336412	GULL2-qPCR	77.3		P	50 - 300
2337579	GULL2-qPCR	65.6		P	50 - 300
2337628	GULL2-qPCR	71.4		P	50 - 300
2337649	GULL2-qPCR	87.0		P	50 - 300
2337666	GULL2-qPCR	51.7		P	50 - 300
2337667	GULL2-qPCR	73.1		P	50 - 300
2337896	GULL2-qPCR	93.7		P	50 - 300
2338283	GULL2-qPCR	66.5		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P415559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2336411	GFD-qPCR	91.4	92.0	P/P	50 - 175
2336412	GFD-qPCR	92.7		P	50 - 175
2337579	GFD-qPCR	93.1		P	50 - 175
2337628	GFD-qPCR	91.0		P	50 - 175
2337649	GFD-qPCR	95.3		P	50 - 175
2337666	GFD-qPCR	88.2		P	50 - 175
2337667	GFD-qPCR	86.0		P	50 - 175
2337896	GFD-qPCR	84.5		P	50 - 175
2338283	GFD-qPCR	83.1		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P415559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2336411	BacR-qPCR	78.4	78.1	P/P	50 - 175
2336412	BacR-qPCR	66.5		P	50 - 175
2336878	BacR-qPCR	65.6		P	50 - 175
2336879	BacR-qPCR	56.8		P	50 - 175
2337628	BacR-qPCR	66.4		P	50 - 175
2337649	BacR-qPCR	76.2		P	50 - 175
2337667	BacR-qPCR	55.1		P	50 - 175
2337896	BacR-qPCR	82.9		P	50 - 175
2338283	BacR-qPCR	76.3		P	50 - 175
2338285	BacR-qPCR	81.3		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P415559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2336411	DG3-qPCR	85.6	84.1	P/P	50 - 175
2336412	DG3-qPCR	98.7		P	50 - 175
2336878	DG3-qPCR	81.8		P	50 - 175
2336879	DG3-qPCR	83.3		P	50 - 175
2337579	DG3-qPCR	68.2		P	50 - 175
2337628	DG3-qPCR	83.8		P	50 - 175
2337649	DG3-qPCR	87.1		P	50 - 175
2337666	DG3-qPCR	79.1		P	50 - 175
2337667	DG3-qPCR	77.9		P	50 - 175
2337896	DG3-qPCR	80.6		P	50 - 175
2338283	DG3-qPCR	75.2		P	50 - 175
2338285	DG3-qPCR	84.8		P	50 - 175

Quality Assurance Report
Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P416301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337763	Chlorophyll-a, Corrected	2.58	Sample	P	0 - 25
2337763	Chlorophyll-a, Uncorrected	0.329	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P415559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2336411	HF183-qPCR	1.39	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P415559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2336411	GULL2-qPCR	3.23	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P415559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2336411	GFD-qPCR	0.615	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P415559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2336411	BacR-qPCR	0.355	Spike	P	0 - 25

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.5
Batch ID: P415559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2336411	DG3-qPCR	1.78	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2337649
Field Sample ID: G1SD0109

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	96.7	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	111	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	101	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	98.7	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	89.6			2.58	
	Chlorophyll-a, Uncorrected				0.329	
SOP-PCR-1.0	HF183-qPCR	75.9 105	91.3 92.6 87.2 93.9			1.39
SOP-PCR-1.2	GULL2-qPCR	77.5 79.7	88.7 91.7 77.3 65.6			3.23
SOP-PCR-1.3	GFD-qPCR	67.4 63.2	91.4 92.0 92.7 93.1			0.615
SOP-PCR-1.4	BacR-qPCR	83.9 106	78.4 78.1 66.5 65.6			0.355
SOP-PCR-1.5	DG3-qPCR	75.9 94.4	85.6 84.1 98.7 81.8			1.78

Reference Method Descriptions

Method	Description	Associated Samples
Enterolert/QT	Enterococci by Enterolert/QT by Sanders in Fort Myers	2337650
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2337647
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2337649
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2337649
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2337649
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2337649

Reference Method Descriptions

Method	Description	Associated Samples
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2337649

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	06/27/2022	06/27/2022 14:25		06/28/2022 15:55	Sanders-Fort Myers	2337650
SM 10200 H (mod.)	06/28/2022	06/28/2022 15:45	Carina A. Tull	07/05/2022 13:58	Jillian G Hanley	2337647
SOP-PCR-1.0	06/28/2022	06/28/2022 13:20	Claudia Castro	07/26/2022 09:08	DeAsia Armster	2337649
SOP-PCR-1.2	06/28/2022	06/28/2022 13:20	Claudia Castro	07/28/2022 09:24	DeAsia Armster	2337649
SOP-PCR-1.3	06/28/2022	06/28/2022 13:20	Claudia Castro	07/28/2022 13:58	DeAsia Armster	2337649
SOP-PCR-1.4	06/28/2022	06/28/2022 13:20	Claudia Castro	07/27/2022 10:43	DeAsia Armster	2337649
SOP-PCR-1.5	06/28/2022	06/28/2022 13:20	Claudia Castro	07/27/2022 15:05	Roberta Tatti	2337649