Biological Analysis Report

SO-DIST-2020-12-18-01

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

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

Event Description: **2020 SMP : Big Slough, Popash, Carrell Canal**
Request ID: **RQ-2020-12-14-49**
Customer: **SO-DIST**
Project ID: **SMP**

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Date Certified: 15-JAN-2021 09:38

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: Carrell Canal **Collection Date/Time: 12/17/2020 14:55**

Field ID: G3SD0167 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2214540	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P391429	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P391429	MS
	SOP-PCR-1.3	GFD-qPCR**	470	I	TSC/100 mL	P391429	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P391429	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	UJ	TSC/100 mL	P391429	MS
2214545	Colilert-18	Escherichia Coli-Quanti-Tray	365		MPN/100 mL		

Ref. Method and Comment:
SOP-PCR-1.3: Duplicate was analyzed and result is 360 U.
SOP-PCR-1.5: Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: Big Slough Upstream of Butler Park **Collection Date/Time: 12/17/2020 10:25**

Field ID: G3SD0174 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2214539	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.0	I	ug/L	P391614	
		Phaeophytin-a	1.2	I	ug/L	P391614	
		Chlorophyll-a, Uncorrected	2.8		ug/L	P391614	
2214546	Colilert-18	Escherichia Coli-Quanti-Tray	152		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: P391614

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: P391429

Component	Result	Code	Units
HF183-qPCR	280	U	GEU/100 mL

Reference Method: SOP-PCR-1.2
Batch ID: P391429

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

Reference Method: SOP-PCR-1.3
Batch ID: P391429

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: P391429

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

Reference Method: SOP-PCR-1.5
Batch ID: P391429

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: P391614

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	104		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P391429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	82.5	94.6	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P391429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	89.8	84.5	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P391429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	74.5	88.1	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P391429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	109	98.3	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P391429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	57.1	151	P/P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P391429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214540	HF183-qPCR	69.2	74.2	P/P	50 - 175
2215510	HF183-qPCR	91.6		P	50 - 175
2215988	HF183-qPCR	75.9		P	50 - 175
2216227	HF183-qPCR	72.1		P	50 - 175
2216228	HF183-qPCR	68.5		P	50 - 175
2216229	HF183-qPCR	75.4		P	50 - 175
2216911	HF183-qPCR	64.6		P	50 - 175
2216912	HF183-qPCR	65.7		P	50 - 175
2216913	HF183-qPCR	61.4		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P391429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214540	GULL2-qPCR	56.8	66.5	P/P	50 - 300
2215988	GULL2-qPCR	61.7		P	50 - 300
2216227	GULL2-qPCR	43.1		F	50 - 300
2216228	GULL2-qPCR	54.1		P	50 - 300
2216229	GULL2-qPCR	57.7		P	50 - 300
2216911	GULL2-qPCR	27.1		F	50 - 300
2216912	GULL2-qPCR	29.2		F	50 - 300
2216913	GULL2-qPCR	24.4		F	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P391429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214540	GFD-qPCR	74.5	78.8	P/P	50 - 175
2215988	GFD-qPCR	75.2		P	50 - 175
2216227	GFD-qPCR	92.1		P	50 - 175
2216228	GFD-qPCR	87.2		P	50 - 175
2216229	GFD-qPCR	90.6		P	50 - 175
2216912	GFD-qPCR	85.5		P	50 - 175
2216913	GFD-qPCR	89.0		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P391429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214540	BacR-qPCR	74.4	77.2	P/P	50 - 175
2215510	BacR-qPCR	91.2		P	50 - 175
2215988	BacR-qPCR	75.3		P	50 - 175
2216227	BacR-qPCR	66.2		P	50 - 175
2216228	BacR-qPCR	62.9		P	50 - 175
2216229	BacR-qPCR	61.8		P	50 - 175
2216911	BacR-qPCR	59.7		P	50 - 175
2216912	BacR-qPCR	67.0		P	50 - 175
2216913	BacR-qPCR	66.6		P	50 - 175

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P391429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2214540	DG3-qPCR	52.5	45.7	P/F	50 - 175
2215510	DG3-qPCR	31.1		F	50 - 175
2215988	DG3-qPCR	78.6		P	50 - 175
2216227	DG3-qPCR	48.8		F	50 - 175
2216228	DG3-qPCR	44.2		F	50 - 175
2216229	DG3-qPCR	42.3		F	50 - 175
2216911	DG3-qPCR	42.2		F	50 - 175
2216912	DG3-qPCR	36.4		F	50 - 175
2216913	DG3-qPCR	35.5		F	50 - 175

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.0
Batch ID: P391429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214540	HF183-qPCR	6.99	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P391429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214540	GULL2-qPCR	15.7	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P391429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214540	GFD-qPCR	5.63	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P391429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214540	BacR-qPCR	3.71	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P391429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2214540	DG3-qPCR	13.9	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2214540
Field Sample ID: G3SD0167

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	85.8	P	50 - 300
SOP-PCR-1.0	SKETA-qPCR	83.6	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	67.8	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	87.6	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	69.1	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	87.5	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	76.9	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	87.2	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	74.5	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	80.5	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	104				
SOP-PCR-1.0	HF183-qPCR	94.6 82.5	69.2 74.2 91.6 75.9			6.99
SOP-PCR-1.2	GULL2-qPCR	84.5 89.8	56.8 66.5 61.7 43.1			15.7
SOP-PCR-1.3	GFD-qPCR	88.1 74.5	74.5 78.8 75.2 92.1			5.63
SOP-PCR-1.4	BacR-qPCR	98.3 109	74.4 77.2 91.2 75.3			3.71
SOP-PCR-1.5	DG3-qPCR	151 57.1	52.5 45.7 31.1 78.6			13.9

Reference Method Descriptions

Method	Description	Associated Samples
Colilert-18	E. coli by Colilert-18/QT by Sanders in Fort Myers	2214545, 2214546
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2214539
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2214540
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2214540
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2214540
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2214540
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2214540

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Colilert-18	12/17/2020	12/17/2020 16:35		12/18/2020 11:06	Sanders-Fort Myers	2214545, 2214546
SM 10200 H (mod.)	12/18/2020	12/18/2020 13:43	Yuliya Danyuk	12/22/2020 08:35	Jessica Sherman	2214539
SOP-PCR-1.0	12/18/2020	12/18/2020 13:30	Mailin Lopez	01/08/2021 08:33	Mailin Lopez	2214540
SOP-PCR-1.2	12/18/2020	12/18/2020 13:30	Mailin Lopez	01/11/2021 08:50	Mailin Lopez	2214540
SOP-PCR-1.3	12/18/2020	12/18/2020 13:30	Mailin Lopez	01/11/2021 10:47	Mailin Lopez	2214540
SOP-PCR-1.4	12/18/2020	12/18/2020 13:30	Mailin Lopez	01/08/2021 09:34	Mailin Lopez	2214540
SOP-PCR-1.5	12/18/2020	12/18/2020 13:30	Mailin Lopez	01/08/2021 14:32	Lauren Campbell	2214540