

Biological Analysis Report

SW-DIST-2019-06-19-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Overflow Analyses Performed By:
Benchmark Environmental, Inc.
1711 12th Street East
Palmetto, FL 34221
DOH Accreditation E84167

Event Description: **SMP: Cedar, Mocassin**
Request ID: **RQ-2019-06-10-40**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Bne Paswater

For additional information please contact
Cheryl Swanson - Administrator
Jacqueline Savage - Microbiology
Diane Power - Bench Biology
Andrew Tintle - Aquatic Toxicology
Puja Jasrotia, Ph.D. - Molecular Biology
Amelia Rankin - Taxonomy (Invertebrate & Algal)
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8177

Certified by: Cheryl A. Swanson, Program Administrator

Date Certified: 18-JUL-2019 10:59



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: MOCCASIN CREEK TIDAL

Collection Date/Time: 06/18/2019 11:00

Field ID: G1SW0051

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2096550	SM 10200 H (mod.)	Chlorophyll-a, Corrected	28		ug/L	P366709	
		Phaeophytin-a	4.4		ug/L	P366709	
		Chlorophyll-a, Uncorrected	32		ug/L	P366709	
2096551	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P366460	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P366460	
	SOP-PCR-1.3	GFD-purified-qPCR**	290	I	TSC/100 mL	P366837	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P366460	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P365679	
2096565	Enterolert/QT	Enterococci-Quanti-Tray	3448		MPN/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.2: Precision data unavailable due to inhibition in QC sample.

Sample Location: CEDAR CREEK ABOVE PATRICIA AVE

Collection Date/Time: 06/18/2019 10:10

Field ID: G5SW0147

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2096549	SM 10200 H (mod.)	Chlorophyll-a, Corrected	14		ug/L	P366709	
		Phaeophytin-a	3.9		ug/L	P366709	
		Chlorophyll-a, Uncorrected	16		ug/L	P366709	
2096564	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	733		MPN/100 mL		
2096585	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P366460	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P366460	
	SOP-PCR-1.3	GFD-purified-qPCR**	180	IJ	TSC/100 mL	P366837	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P366460	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P365679	

Ref. Method and Comment:
 SOP-PCR-1.2: Precision data unavailable due to inhibition in QC sample.
 SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Sample Location: CEDAR CREEK @ PINEHURST (PC 09-02)

Collection Date/Time: 06/18/2019 10:30

Field ID: G5SW0129

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2096552	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P366460	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P366460	
	SOP-PCR-1.3	GFD-purified-qPCR**	170	UJ	TSC/100 mL	P366837	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P366460	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P365679	
2096566	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	450		MPN/100 mL		

Ref. Method and Comment:
 SOP-PCR-1.2: Precision data unavailable due to inhibition in QC sample.
 SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Quality Assurance Report

Method Blank Results

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P366709

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: P366460

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

Reference Method: SOP-PCR-1.2
Batch ID: P366460

Component	Result	Code	Units
GULL2-qPCR	1.7E+04	U	TSC/100 mL

Reference Method: SOP-PCR-1.3
Batch ID: P366837

Component	Result	Code	Units
GFD-purified-qPCR	340	U	TSC/100 mL

Reference Method: SOP-PCR-1.4
Batch ID: P366460

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P366709

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	93.8		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P366460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	149	143	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P366460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	235	188	P/P	50 - 300

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.3
 Batch ID: P366837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	203	71.5	F/P	50 - 175

Reference Method: SOP-PCR-1.4
 Batch ID: P366460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	83.2	69.3	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
 Batch ID: P366460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095804	HF183-qPCR	99.2		P	50 - 175
2095805	HF183-qPCR	100		P	50 - 175
2096551	HF183-qPCR	119		P	50 - 175
2096552	HF183-qPCR	101		P	50 - 175
2096585	HF183-qPCR	109		P	50 - 175
2096763	HF183-qPCR	118		P	50 - 175
2096968	HF183-qPCR	108		P	50 - 175
2096969	HF183-qPCR	89.1		P	50 - 175
2097844	HF183-qPCR	104		P	50 - 175
2098562	HF183-qPCR	97.0		P	50 - 175
2099657	HF183-qPCR	95.5		P	50 - 175
2099658	HF183-qPCR	102		P	50 - 175
2100038	HF183-qPCR	71.7	65.2	P/P	50 - 175

Reference Method: SOP-PCR-1.2
 Batch ID: P366460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095804	GULL2-qPCR	143		P	50 - 300
2095805	GULL2-qPCR	149		P	50 - 300
2096551	GULL2-qPCR	142		P	50 - 300
2096552	GULL2-qPCR	143		P	50 - 300
2096585	GULL2-qPCR	146		P	50 - 300
2096763	GULL2-qPCR	164		P	50 - 300
2096968	GULL2-qPCR	158		P	50 - 300
2096969	GULL2-qPCR	65.2		P	50 - 300
2098562	GULL2-qPCR	116		P	50 - 300

Reference Method: SOP-PCR-1.3
 Batch ID: P366837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2096551	GFD-purified-qPCR	153		P	50 - 175
2096552	GFD-purified-qPCR	272		F	50 - 175
2096585	GFD-purified-qPCR	258		F	50 - 175
2096763	GFD-purified-qPCR	252		F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.3

Batch ID: P366837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2096968	GFD-purified-qPCR	393		F	50 - 175
2096969	GFD-purified-qPCR	316		F	50 - 175
2097845	GFD-purified-qPCR	301		F	50 - 175
2098562	GFD-purified-qPCR	96.9		P	50 - 175
2100038	GFD-purified-qPCR	248	221	F/F	50 - 175
2101175	GFD-purified-qPCR	381		F	50 - 175
2101593	GFD-purified-qPCR	311		F	50 - 175
2101594	GFD-purified-qPCR	321		F	50 - 175
2101595	GFD-purified-qPCR	292		F	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P366460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2095804	BacR-qPCR	67.6		P	50 - 175
2095805	BacR-qPCR	65.5		P	50 - 175
2096551	BacR-qPCR	66.6		P	50 - 175
2096552	BacR-qPCR	64.7		P	50 - 175
2096585	BacR-qPCR	66.7		P	50 - 175
2096763	BacR-qPCR	80.8		P	50 - 175
2096968	BacR-qPCR	75.0		P	50 - 175
2096969	BacR-qPCR	65.0		P	50 - 175
2098562	BacR-qPCR	66.7		P	50 - 175
2100038	BacR-qPCR	61.6	51.4	P/P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)

Batch ID: P366709

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2096693	Chlorophyll-a, Corrected	6.86	Sample	P	0 - 25
2096693	Chlorophyll-a, Uncorrected	6.65	Sample	P	0 - 25
2096693	Phaeophytin-a	5.84	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0

Batch ID: P366460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2100038	HF183-qPCR	9.47	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3

Batch ID: P366837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2100038	GFD-purified-qPCR	11.2	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.4
 Batch ID: P366460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2100038	BacR-qPCR	18.0	Spike	P	0 - 25

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
 Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Surrogates

Lab Sample ID: 2096551
 Field Sample ID: G1SW0051

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	107	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	98.2	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	110	P	50 - 300

Lab Sample ID: 2096552
 Field Sample ID: G5SW0129

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	94.6	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	94.8	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	101	P	50 - 300

Lab Sample ID: 2096585
 Field Sample ID: G5SW0147

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	100	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	93.2	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	101	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery			MS % Recovery			LCS	Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	93.8							6.86	
	Chlorophyll-a, Uncorrected								6.65	
	Phaeophytin-a								5.84	
SOP-PCR-1.0	HF183-qPCR	143	149		108	89.1	104			9.47
					95.5					
SOP-PCR-1.2	GULL2-qPCR	188	235		143	149	142			
					143					
SOP-PCR-1.3	GFD-purified-qPCR	71.5	203		301	248	221			11.2
					153					
SOP-PCR-1.4	BacR-qPCR	69.3	83.2		66.7	67.6	65.5			18.0
					66.6					

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
Enterolert/QT / E84167	Enterococci by Enterolert/QT by BEA in Palmetto	2096565
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2096549, 2096550
SM 9223 B Quanti-Tray / E84167	E. coli by Colilert/QT by BEA in Palmetto	2096564, 2096566
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2096551, 2096552, 2096585
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2096551, 2096552, 2096585
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2096551, 2096552, 2096585
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2096551, 2096552, 2096585
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2096551, 2096552, 2096585

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	06/18/2019	06/18/2019 12:52		06/19/2019 13:15	Benchmark EnviroAnalytical - Palmetto	2096565
SM 10200 H (mod.)	06/19/2019	06/19/2019 13:35	Yuliya Danyuk	07/03/2019 09:13	Peterson Janvier	2096549, 2096550
SM 9223 B Quanti-Tray	06/18/2019	06/18/2019 12:57		06/19/2019 13:33	Benchmark EnviroAnalytical - Palmetto	2096564, 2096566
SOP-PCR-1.0	06/19/2019	06/19/2019 13:45	Sarah Menz	07/05/2019 11:45	Mailin Lopez	2096551, 2096552, 2096585
SOP-PCR-1.2	06/19/2019	06/19/2019 13:45	Sarah Menz	07/08/2019 13:47	Mailin Lopez	2096551, 2096552, 2096585
SOP-PCR-1.3	06/19/2019	06/19/2019 13:45	Mailin Lopez	07/15/2019 17:22	Mailin Lopez	2096551, 2096552, 2096585
SOP-PCR-1.4	06/19/2019	06/19/2019 13:45	Sarah Menz	07/05/2019 17:00	Mailin Lopez	2096551, 2096552, 2096585
SOP-PCR-4.0	06/19/2019	06/19/2019 13:45	Angela Smith	06/28/2019 11:34	Sarah Menz	2096551, 2096552, 2096585