

Biological Analysis Report

SO-DIST-2023-10-18-02

Florida DEP 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: **2023 SMP : Shell Creek**

Request ID: **RQ-2023-10-16-39**

Customer: **SO-DIST**

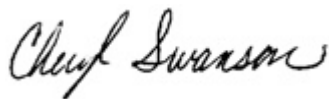
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: Nicole Reistad

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: 30-NOV-2023 15:19



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: SHELL CR AT HATHAWAY PARK

Collection Date/Time: 10/17/2023 09:15

Field ID: G3SD0120

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2445881	SOP-PCR-1.0	HF183-qPCR**	1.1E+03	U	TSC/100 mL	P436617	
	SOP-PCR-1.2	GULL2-qPCR**	1.2E+03	U	TSC/100 mL	P436617	
	SOP-PCR-1.3	GFD-qPCR**	240	U	TSC/100 mL	P436617	
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P436617	
	SOP-PCR-1.5	DG3-qPCR**	860	U	TSC/100 mL	P436617	
2445882	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	10	U	MPN/100 mL		

Sample Location: SHELLCREEKRESERVOIR MID

Collection Date/Time: 10/17/2023 09:50

Field ID: G3SD0204

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2445880	SM 10150 B	Chlorophyll-a, Corrected	3.3		ug/L	P437095	
		Phaeophytin-a	1.0	U	ug/L	P437095	
		Chlorophyll-a, Uncorrected	3.9		ug/L	P437095	

Ref. Method and Comment:
SM 10150 B: 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.

Sample Location: MYRTLE SLOUGH AT BERMONT

Collection Date/Time: 10/17/2023 10:50

Field ID: G3SD0181

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2445883	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	10	U	MPN/100 mL		

Quality Assurance Report

Method Blank Results

Reference Method: SM 10150 B
Batch ID: P437095

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.96	U	ug/L
Chlorophyll-a, Uncorrected	0.70	U	ug/L
Phaeophytin-a	1.0	U	ug/L

Reference Method: SOP-PCR-1.0
Batch ID: P436617

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

Reference Method: SOP-PCR-1.2
Batch ID: P436617

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: P436617

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

Reference Method: SOP-PCR-1.4
Batch ID: P436617

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

Reference Method: SOP-PCR-1.5
Batch ID: P436617

Component	Result	Code	Units
DG3-qPCR	2.6E+03	U	TSC/100 mL

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 10150 B
Batch ID: P437095

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	108		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P436617

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	89.3	63.8	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P436617

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	97.0	60.0	P/P	50 - 175

Reference Method: SOP-PCR-1.3
Batch ID: P436617

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	96.2	53.5	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P436617

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	95.0	60.0	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P436617

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P436617

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	94.0	53.0	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P436617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2445193	HF183-qPCR	82.6	78.2	P/P	50 - 175
2445497	HF183-qPCR	78.0		P	50 - 175
2445616	HF183-qPCR	85.9		P	50 - 175
2445735	HF183-qPCR	96.5		P	50 - 175
2445736	HF183-qPCR	91.7		P	50 - 175
2445754	HF183-qPCR	82.5		P	50 - 175
2445792	HF183-qPCR	87.8		P	50 - 175
2445881	HF183-qPCR	94.4		P	50 - 175
2446054	HF183-qPCR	88.3		P	50 - 175
2446074	HF183-qPCR	105		P	50 - 175
2446386	HF183-qPCR	71.9		P	50 - 175
2446449	HF183-qPCR	82.1		P	50 - 175
2446715	HF183-qPCR	89.7		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P436617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2445497	GULL2-qPCR	84.9		P	50 - 175
2445735	GULL2-qPCR	61.6		P	50 - 175
2445736	GULL2-qPCR	103		P	50 - 175
2445754	GULL2-qPCR	97.0		P	50 - 175
2445881	GULL2-qPCR	57.5		P	50 - 175
2446054	GULL2-qPCR	83.5		P	50 - 175
2446074	GULL2-qPCR	87.2		P	50 - 175
2446449	GULL2-qPCR	83.9		P	50 - 175

Reference Method: SOP-PCR-1.3
Batch ID: P436617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2445497	GFD-qPCR	105		P	50 - 175
2445735	GFD-qPCR	115		P	50 - 175
2445736	GFD-qPCR	114		P	50 - 175
2445754	GFD-qPCR	109		P	50 - 175
2445881	GFD-qPCR	113		P	50 - 175
2446054	GFD-qPCR	98.2		P	50 - 175
2446074	GFD-qPCR	101		P	50 - 175
2446449	GFD-qPCR	107		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P436617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2445193	BacR-qPCR	87.7	87.8	P/P	50 - 175
2445497	BacR-qPCR	62.1		P	50 - 175
2445616	BacR-qPCR	60.9		P	50 - 175
2445735	BacR-qPCR	77.8		P	50 - 175
2445736	BacR-qPCR	87.2		P	50 - 175
2445754	BacR-qPCR	72.5		P	50 - 175
2445792	BacR-qPCR	75.4		P	50 - 175
2445881	BacR-qPCR	66.9		P	50 - 175
2446054	BacR-qPCR	77.1		P	50 - 175
2446074	BacR-qPCR	87.7		P	50 - 175
2446386	BacR-qPCR	67.8		P	50 - 175
2446449	BacR-qPCR	61.7		P	50 - 175
2446715	BacR-qPCR	79.8		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P436617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2445193	DG3-qPCR	91.9	91.4	P/P	50 - 175
2445497	DG3-qPCR	78.2		P	50 - 175
2445616	DG3-qPCR	91.4		P	50 - 175
2445735	DG3-qPCR	91.4		P	50 - 175
2445736	DG3-qPCR	97.1		P	50 - 175
2445754	DG3-qPCR	87.9		P	50 - 175
2445792	DG3-qPCR	88.9		P	50 - 175
2445881	DG3-qPCR	94.1		P	50 - 175
2446054	DG3-qPCR	88.1		P	50 - 175
2446074	DG3-qPCR	102		P	50 - 175
2446386	DG3-qPCR	89.4		P	50 - 175
2446449	DG3-qPCR	89.2		P	50 - 175
2446715	DG3-qPCR	90.0		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10150 B
Batch ID: P437095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2445800	Chlorophyll-a, Corrected	2.96	Sample	P	0 - 25
2445800	Chlorophyll-a, Uncorrected	2.20	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P436617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2445193	HF183-qPCR	5.45	Spike	P	0 - 25

Quality Assurance Report
Precision

Reference Method: SOP-PCR-1.2
Batch ID: P436617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2445193	GULL2-qPCR	1.44	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P436617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2445193	GFD-qPCR	2.90	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P436617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2445193	BacR-qPCR	0.130	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P436617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2445193	DG3-qPCR	0.605	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2445881
Field Sample ID: G3SD0120

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	76.6	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	96.6	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	95.3	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	99.5	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	81.6	P	50 - 300

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10150 B	ChlorophyllI-a, Corrected	108						2.96	
	ChlorophyllI-a, Uncorrected							2.20	
SOP-PCR-1.0	HF183-qPCR	63.8	89.3	82.6	78.2	78.0			5.45
				85.9					
SOP-PCR-1.2	GULL2-qPCR	60.0	97.0	84.9	61.6	103			1.44
				97.0					

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.3	GFD-qPCR	53.5	96.2	105	115	114			2.90
SOP-PCR-1.4	BacR-qPCR	60.0	95.0	87.7	87.8	62.1			0.130
SOP-PCR-1.5	DG3-qPCR	53.0	94.0	91.9	91.4	78.2			0.605
				109					
				60.9					
				91.4					

Reference Method Descriptions

Method	Description	Associated Samples
SM 10150 B	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2445880
SM 9223 Quanti-Tray	E. coli by Colilert/QT by BEA South in North Port	2445882, 2445883
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2445881
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2445881
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2445881
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2445881
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2445881

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10150 B	10/18/2023	10/18/2023 13:55	Tynan A Branch	10/27/2023 09:42	Megan Higbee	2445880
SM 9223 Quanti-Tray	10/17/2023	10/17/2023 14:51		10/18/2023 15:04	Benchmark EnviroAnalytical in North Port	2445882, 2445883
SOP-PCR-1.0	10/18/2023	10/18/2023 14:20	Jennifer Mihalic	11/07/2023 11:39	Roberta Tatti	2445881
SOP-PCR-1.2	10/18/2023	10/18/2023 14:20	Jennifer Mihalic	11/14/2023 08:44	Roberta Tatti	2445881
SOP-PCR-1.3	10/18/2023	10/18/2023 14:20	Jennifer Mihalic	11/15/2023 08:53	Roberta Tatti	2445881
SOP-PCR-1.4	10/18/2023	10/18/2023 14:20	Jennifer Mihalic	11/08/2023 09:33	Roberta Tatti	2445881
SOP-PCR-1.5	10/18/2023	10/18/2023 14:20	Jennifer Mihalic	11/09/2023 09:56	Roberta Tatti	2445881