

Biological Analysis Report

CEN-DIST-2023-12-05-02

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

Event Description: **Tiger Lake Inlet**
Request ID: **RQ-2023-12-04-35**
Customer: **CEN-DIST**
Project ID: **TMDL**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
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Certified by: Sarah Menz, Environmental Administrator

Date Certified: 12-JAN-2024 13:21

A handwritten signature in dark ink, appearing to be 'Sarah Menz', with a long, sweeping horizontal stroke extending to the right.

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, Microbiology and Molecular.

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: Tiger Lake Inlet at Sam Keen Rd

Collection Date/Time: 12/04/2023 12:43

Field ID: G4CE0248

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2454291	SM 10150 B	Chlorophyll-a, Corrected	16		ug/L	P438755	
		Phaeophytin-a	3.2	U	ug/L	P438755	
		Chlorophyll-a, Uncorrected	17		ug/L	P438755	
2454292	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	2419.6	Q	MPN/100 mL	P438583	
2454293	SOP-PCR-1.0	HF183-qPCR**	3.3E+03	U	TSC/100 mL	P438357	
	SOP-PCR-1.2	GULL2-qPCR**	3.6E+03	U	TSC/100 mL	P438357	
	SOP-PCR-1.3	GFD-qPCR**	3.5E+03	I	TSC/100 mL	P438357	
	SOP-PCR-1.4	BacR-qPCR**	1.01E+05		TSC/100 mL	P438357	
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P438357	

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.

SM 9223 B Quanti-Tray: Laboratory duplicate result is >2419.6 J for E. coli- all Quanti-Tray wells were positive. Precision data is unavailable due to the high amount of analyte in this QC sample.

Quality Assurance Report Method Blank Results

Reference Method: SM 10150 B

Batch ID: P438755

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: SM 9223 B Quanti-Tray

Batch ID: P438583

Component	Result	Code	Units
Escherichia Coli-Quanti-Tray	1.0	U	MPN/100 mL

Reference Method: SOP-PCR-1.0

Batch ID: P438357

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

Reference Method: SOP-PCR-1.2

Batch ID: P438357

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

Reference Method: SOP-PCR-1.3

Batch ID: P438357

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: P438357

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

Reference Method: SOP-PCR-1.5
Batch ID: P438357

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: P438755

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	88.9		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P438357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	83.0	78.2	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P438357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	92.4	66.5	P/P	50 - 175

Reference Method: SOP-PCR-1.3
Batch ID: P438357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	63.3	70.1	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P438357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	94.4	72.7	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P438357

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	101	73.4	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P438357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453535	HF183-qPCR	80.0	86.9	P/P	50 - 175
2453569	HF183-qPCR	80.3		P	50 - 175
2453785	HF183-qPCR	109		P	50 - 175
2453979	HF183-qPCR	87.3		P	50 - 175
2454293	HF183-qPCR	93.0		P	50 - 175
2454592	HF183-qPCR	77.0		P	50 - 175
2454786	HF183-qPCR	91.9		P	50 - 175
2454787	HF183-qPCR	85.6		P	50 - 175
2455145	HF183-qPCR	89.7		P	50 - 175
2455573	HF183-qPCR	79.6		P	50 - 175
2455782	HF183-qPCR	91.6		P	50 - 175
2456267	HF183-qPCR	95.9		P	50 - 175
2456268	HF183-qPCR	89.7		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P438357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453535	GULL2-qPCR	91.3	98.1	P/P	50 - 175
2453569	GULL2-qPCR	85.3		P	50 - 175
2453785	GULL2-qPCR	94.0		P	50 - 175
2453979	GULL2-qPCR	84.7		P	50 - 175
2454293	GULL2-qPCR	81.6		P	50 - 175
2454786	GULL2-qPCR	85.4		P	50 - 175
2454787	GULL2-qPCR	87.4		P	50 - 175
2455573	GULL2-qPCR	77.5		P	50 - 175
2455782	GULL2-qPCR	81.6		P	50 - 175
2456268	GULL2-qPCR	77.6		P	50 - 175

Reference Method: SOP-PCR-1.3

Batch ID: P438357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453535	GFD-qPCR	97.3	99.2	P/P	50 - 175
2453569	GFD-qPCR	93.6		P	50 - 175
2453785	GFD-qPCR	91.0		P	50 - 175
2453979	GFD-qPCR	85.9		P	50 - 175
2454293	GFD-qPCR	85.4		P	50 - 175
2454786	GFD-qPCR	95.9		P	50 - 175
2454787	GFD-qPCR	94.8		P	50 - 175
2455573	GFD-qPCR	92.8		P	50 - 175
2455782	GFD-qPCR	88.5		P	50 - 175
2456268	GFD-qPCR	80.9		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P438357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453535	BacR-qPCR	88.2	90.2	P/P	50 - 175
2453569	BacR-qPCR	80.8		P	50 - 175
2453785	BacR-qPCR	90.2		P	50 - 175
2453979	BacR-qPCR	85.0		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P438357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454293	BacR-qPCR	80.2		P	50 - 175
2454592	BacR-qPCR	65.6		P	50 - 175
2454786	BacR-qPCR	80.0		P	50 - 175
2454787	BacR-qPCR	74.1		P	50 - 175
2455145	BacR-qPCR	55.7		P	50 - 175
2455573	BacR-qPCR	81.9		P	50 - 175
2455782	BacR-qPCR	82.6		P	50 - 175
2456267	BacR-qPCR	82.1		P	50 - 175
2456268	BacR-qPCR	81.7		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P438357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453535	DG3-qPCR	99.7	102	P/P	50 - 175
2453569	DG3-qPCR	96.0		P	50 - 175
2453785	DG3-qPCR	114		P	50 - 175
2453979	DG3-qPCR	104		P	50 - 175
2454293	DG3-qPCR	98.1		P	50 - 175
2454592	DG3-qPCR	90.4		P	50 - 175
2454786	DG3-qPCR	107		P	50 - 175
2454787	DG3-qPCR	98.0		P	50 - 175
2455145	DG3-qPCR	93.5		P	50 - 175
2455573	DG3-qPCR	95.7		P	50 - 175
2455782	DG3-qPCR	102		P	50 - 175
2456267	DG3-qPCR	89.7		P	50 - 175
2456268	DG3-qPCR	98.1		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10150 B
Batch ID: P438755

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454328	Chlorophyll-a, Corrected	13.1	Sample	P	0 - 25
2454328	Chlorophyll-a, Uncorrected	13.7	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P438357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453535	HF183-qPCR	8.25	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P438357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: SOP-PCR-1.2
Batch ID: P438357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453535	GULL2-qPCR	7.13	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P438357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453535	GFD-qPCR	1.85	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P438357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453535	BacR-qPCR	2.20	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P438357

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453535	DG3-qPCR	2.47	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2454293
Field Sample ID: G4CE0248

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	93.9	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	102	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	102	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	104	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 10150 B	ChlorophyllI-a, Corrected	88.9						13.1	
	ChlorophyllI-a, Uncorrected							13.7	
SOP-PCR-1.0	HF183-qPCR	78.2	83.0	80.0	86.9	80.3			8.25
SOP-PCR-1.2	GULL2-qPCR	66.5	92.4	91.3	98.1	85.3			7.13
				94.0					

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision	MS
								SMP	
SOP-PCR-1.3	GFD-qPCR	70.1	63.3	97.3	99.2	93.6			1.85
SOP-PCR-1.4	BacR-qPCR	72.7	94.4	88.2	90.2	80.8			2.20
SOP-PCR-1.5	DG3-qPCR	73.4	101	99.7	102	96.0			2.47
				114					

Reference Method Descriptions

Method	Description	Associated Samples
SM 10150 B	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2454291
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2454292
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2454293
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2454293
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2454293
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2454293
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2454293

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10150 B	12/05/2023	12/05/2023 13:18	Callie Williams	12/06/2023 16:09	Tynan A Branch	2454291
SM 9223 B Quanti-Tray	12/05/2023	12/05/2023 13:59	Megan Higbee	12/06/2023 09:13	Megan Higbee	2454292
SOP-PCR-1.0	12/05/2023	12/05/2023 13:12	Madeline Gruver	12/18/2023 09:30	Roberta Tatti	2454293
SOP-PCR-1.2	12/05/2023	12/05/2023 13:12	Madeline Gruver	12/21/2023 17:54	Madeline Gruver	2454293
SOP-PCR-1.3	12/05/2023	12/05/2023 13:12	Madeline Gruver	12/20/2023 17:26	Madeline Gruver	2454293
SOP-PCR-1.4	12/05/2023	12/05/2023 13:12	Madeline Gruver	12/20/2023 08:48	Roberta Tatti	2454293
SOP-PCR-1.5	12/05/2023	12/05/2023 13:12	Madeline Gruver	12/20/2023 09:36	Roberta Tatti	2454293