

Biological Analysis Report

TLH-ROC-2022-01-27-01

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

Event Description: **Run 11**
Request ID: **RQ-2022-01-10-34**
Customer: **TLH-ROC**
Project ID: **SMP**

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Certified by: Sarah Menz, Environmental Administrator

Date Certified: 15-MAR-2022 12:23

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: Sandy Creek

Collection Date/Time: 01/27/2022 10:15

Field ID: G3TLHR0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302266	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.96	U	ug/L	P409444	
		Phaeophytin-a	1.0	U	ug/L	P409444	
		Chlorophyll-a, Uncorrected	0.70	U	ug/L	P409444	
2302269	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	137.6		MPN/100 mL	P409180	

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.

Sample Location: Mule Creek @ Alvie Holmes Rd

Collection Date/Time: 01/27/2022 10:35

Field ID: G3TLHR0017

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302268	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.99	I	ug/L	P409444	
		Phaeophytin-a	0.90	U	ug/L	P409444	
		Chlorophyll-a, Uncorrected	0.86	I	ug/L	P409444	
2302274	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	121.0		MPN/100 mL	P409180	
2302275	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P408914	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P408914	
	SOP-PCR-1.3	GFD-qPCR**	1.1E+03	I	TSC/100 mL	P408914	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P408914	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P408914	LCS

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.

Sample Location: Sandy Creek Upstream Boat Ramp

Collection Date/Time: 01/27/2022 10:50

Field ID: G3TLHR0037

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302270	Enterolert/QT	Enterococci-Quanti-Tray	10.0	U	MPN/100 mL	P409180	
2302271	SM 9222 D	Fecal Coliforms-Membrane Filter	74		cfu/100 mL	P409155	

Ref. Method and Comment:

SM 9222 D: Precision data for QC sample is unavailable due to the colony count falling outside of method acceptable range.

Sample Location: Sandy Creek @ Mouth 0051

Collection Date/Time: 01/27/2022 11:20

Field ID: G3TLHR0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302267	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.1	I	ug/L	P409444	
		Phaeophytin-a	0.98	U	ug/L	P409444	
		Chlorophyll-a, Uncorrected	2.4		ug/L	P409444	
2302272	Enterolert/QT	Enterococci-Quanti-Tray	10.0		MPN/100 mL	P409180	
2302273	SM 9222 D	Fecal Coliforms-Membrane Filter	26	B	cfu/100 mL	P409155	

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.

SM 9222 D: Laboratory duplicate result is 23 B. Precision data for this duplicate is unavailable due to the colony count falling outside of method acceptable range.

Quality Assurance Report

Method Blank Results

Reference Method: Enterolert/QT
Batch ID: P409180

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

Reference Method: SM 10200 H (mod.)
Batch ID: P409444

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 9222 D
Batch ID: P409155

Component	Result	Code	Units
Fecal Coliforms-Membrane Filter	2	U	cfu/100 mL

Reference Method: SM 9223 B Quanti-Tray
Batch ID: P409180

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

Reference Method: SOP-PCR-1.0
Batch ID: P408914

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

Reference Method: SOP-PCR-1.2
Batch ID: P408914

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

Reference Method: SOP-PCR-1.3
Batch ID: P408914

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

Reference Method: SOP-PCR-1.4
Batch ID: P408914

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

Reference Method: SOP-PCR-1.5
Batch ID: P408914

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: P409444

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	91.4		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P408914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	87.0	89.0	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P408914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	87.8	83.0	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P408914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	70.1	88.6	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P408914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	86.9	61.4	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P408914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	79.3	40.7	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P408914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301273	HF183-qPCR	84.7	78.1	P/P	50 - 175
2301313	HF183-qPCR	91.7		P	50 - 175
2301314	HF183-qPCR	81.8		P	50 - 175
2301315	HF183-qPCR	85.1		P	50 - 175
2301316	HF183-qPCR	82.3		P	50 - 175
2301317	HF183-qPCR	83.4		P	50 - 175
2301686	HF183-qPCR	97.9		P	50 - 175
2301687	HF183-qPCR	84.1		P	50 - 175
2302275	HF183-qPCR	82.6		P	50 - 175
2302714	HF183-qPCR	103		P	50 - 175
2302715	HF183-qPCR	101		P	50 - 175
2302732	HF183-qPCR	83.5		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P408914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2303015	HF183-qPCR	93.0		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P408914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301273	GULL2-qPCR	92.2	90.0	P/P	50 - 300
2301316	GULL2-qPCR	85.0		P	50 - 300
2301686	GULL2-qPCR	93.1		P	50 - 300
2301687	GULL2-qPCR	90.2		P	50 - 300
2302275	GULL2-qPCR	77.1		P	50 - 300
2302714	GULL2-qPCR	61.6		P	50 - 300
2302715	GULL2-qPCR	82.9		P	50 - 300
2303015	GULL2-qPCR	68.6		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P408914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301273	GFD-qPCR	83.1	82.9	P/P	50 - 175
2301316	GFD-qPCR	93.3		P	50 - 175
2301686	GFD-qPCR	108		P	50 - 175
2301687	GFD-qPCR	103		P	50 - 175
2302275	GFD-qPCR	95.3		P	50 - 175
2302714	GFD-qPCR	119		P	50 - 175
2302715	GFD-qPCR	118		P	50 - 175
2303015	GFD-qPCR	113		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P408914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301273	BacR-qPCR	76.2	76.9	P/P	50 - 175
2301313	BacR-qPCR	63.5		P	50 - 175
2301314	BacR-qPCR	63.8		P	50 - 175
2301315	BacR-qPCR	65.7		P	50 - 175
2301316	BacR-qPCR	73.1		P	50 - 175
2301317	BacR-qPCR	76.4		P	50 - 175
2301686	BacR-qPCR	57.3		P	50 - 175
2301687	BacR-qPCR	62.3		P	50 - 175
2302275	BacR-qPCR	65.0		P	50 - 175
2302714	BacR-qPCR	64.6		P	50 - 175
2302715	BacR-qPCR	73.7		P	50 - 175
2302732	BacR-qPCR	76.2		P	50 - 175
2303015	BacR-qPCR	58.7		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P408914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301273	DG3-qPCR	74.4	69.8	P/P	50 - 175
2301313	DG3-qPCR	57.5		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
 Batch ID: P408914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301314	DG3-qPCR	64.6		P	50 - 175
2301315	DG3-qPCR	66.9		P	50 - 175
2301316	DG3-qPCR	74.1		P	50 - 175
2301317	DG3-qPCR	75.2		P	50 - 175
2301686	DG3-qPCR	61.7		P	50 - 175
2301687	DG3-qPCR	68.1		P	50 - 175
2302275	DG3-qPCR	65.1		P	50 - 175
2302714	DG3-qPCR	51.0		P	50 - 175
2302715	DG3-qPCR	65.4		P	50 - 175
2302732	DG3-qPCR	70.2		P	50 - 175
2303015	DG3-qPCR	55.2		P	50 - 175

Quality Assurance Report Precision

Reference Method: Enterolert/QT
 Batch ID: P409180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302202	Enterococci-Quanti-Tray	26.9	Sample	P	0 - 80

Reference Method: SM 10200 H (mod.)
 Batch ID: P409444

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302137	Chlorophyll-a, Corrected	4.58	Sample	P	0 - 25
2302137	Chlorophyll-a, Uncorrected	3.41	Sample	P	0 - 25

Reference Method: SM 9223 B Quanti-Tray
 Batch ID: P409180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302064	Escherichia Coli-Quanti-Tray	19.4	Sample	P	0 - 80
2302204	Escherichia Coli-Quanti-Tray	25.4	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0
 Batch ID: P408914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301273	HF183-qPCR	8.14	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P408914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301273	GULL2-qPCR	2.42	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.3
Batch ID: P408914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301273	GFD-qPCR	0.252	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P408914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301273	BacR-qPCR	0.948	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P408914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301273	DG3-qPCR	6.50	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2302275
Field Sample ID: G3TLHR0017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	87.8	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	82.1	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	82.0	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	79.6	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	85.7	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
Enterolert/QT	Enterococci-Quanti-Tray							26.9	
SM 10200 H (mod.)	Chlorophyll-a, Corrected	91.4						4.58	
	Chlorophyll-a, Uncorrected							3.41	
SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray							19.4	25.4
SOP-PCR-1.0	HF183-qPCR	89.0	87.0	101	83.5	93.0			8.14
				84.7					
SOP-PCR-1.2	GULL2-qPCR	83.0	87.8	77.1	61.6	82.9			2.42
				68.6					
SOP-PCR-1.3	GFD-qPCR	88.6	70.1	83.1	82.9	93.3			0.252
				108					
SOP-PCR-1.4	BacR-qPCR	86.9	61.4	76.2	76.9	63.5			0.948
				63.8					
SOP-PCR-1.5	DG3-qPCR	40.7	79.3	74.4	69.8	57.5			6.50
				64.6					

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
Enterolert/QT	Enterococci by Enterolert Quanti-Tray method - non-chlorinated water systems	2302270, 2302272
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2302266, 2302267, 2302268
SM 9222 D	Fecal coliforms by membrane filter method - non-chlorinated water systems	2302271, 2302273
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2302269, 2302274
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2302275
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2302275
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2302275
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2302275
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2302275

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Enterolert/QT	01/27/2022	01/27/2022 14:52	Caitlyn Owens	01/28/2022 15:07	Tynan A Branch	2302270, 2302272
SM 10200 H (mod.)	01/27/2022	01/28/2022 14:26	Jillian G Hanley	02/03/2022 09:39	Jillian G Hanley	2302266, 2302267, 2302268
SM 9222 D	01/27/2022	01/27/2022 15:35	Amber S. Eells	01/28/2022 14:43	Carina A. Tull	2302271, 2302273
SM 9223 B Quanti-Tray	01/27/2022	01/27/2022 16:29	Caitlyn Owens	01/28/2022 11:47	Tynan A Branch	2302269, 2302274
SOP-PCR-1.0	01/27/2022	01/28/2022 15:00	Luke Hudson	02/23/2022 14:18	DeAsia Armster	2302275
SOP-PCR-1.2	01/27/2022	01/28/2022 15:00	Luke Hudson	03/04/2022 12:05	DeAsia Armster	2302275
SOP-PCR-1.3	01/27/2022	01/28/2022 15:00	Luke Hudson	03/07/2022 10:16	DeAsia Armster	2302275
SOP-PCR-1.4	01/27/2022	01/28/2022 15:00	Luke Hudson	03/01/2022 15:10	DeAsia Armster	2302275
SOP-PCR-1.5	01/27/2022	01/28/2022 15:00	Luke Hudson	03/03/2022 09:56	DeAsia Armster	2302275