

Biological Analysis Report

TLH-ROC-2019-02-28-01

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

Event Description: **Run 3**
Request ID: **RQ-2019-02-18-32**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
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Certified by: Jacqueline Savage, Environmental Administrator

Date Certified: 17-APR-2019 12:46

A handwritten signature in black ink that reads "Jackie Savage". The signature is written in a cursive, flowing style.

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: SWEETWATER BRANCH @ CODY CHURCH RD.

Collection Date/Time: 02/28/2019 08:50

Field ID: G1TLHR0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2066175	SM 10200 H (mod.)	Chlorophyll-a, Corrected	4.9		ug/L	P360119	
		Phaeophytin-a	3.4		ug/L	P360119	
		Chlorophyll-a, Uncorrected	7.2		ug/L	P360119	
2066179	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	727.0		MPN/100 mL	P359883	RPD
2066183	SOP-PCR-1.0	HF183-qPCR**	310	I	GEU/100 mL	P359951	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P359296	

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: MOORE BRANCH @ CODY CHURCH

Collection Date/Time: 02/28/2019 09:10

Field ID: G1TLHR0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2066176	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.0	I	ug/L	P360119	
		Phaeophytin-a	0.60	U	ug/L	P360119	
		Chlorophyll-a, Uncorrected	1.2		ug/L	P360119	
2066180	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	1986.3		MPN/100 mL	P359883	RPD
2066184	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P359951	
	SOP-PCR-1.2	GULL2-qPCR**	1.7E+04	UJ	TSC/100 mL	P359951	MS
	SOP-PCR-1.3	GFD-purified-qPCR**	170	UJ	TSC/100 mL	P360503	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	U	TSC/100 mL	P359951	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold			P359296	

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.

SOP-PCR-1.2: Quality control failure(s) observed. See QA report for details.

SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

Sample Location: WOODS CREEK @ OSTEEN RD

Collection Date/Time: 02/28/2019 10:20

Field ID: G1TLHR0067

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2066177	SM 10200 H (mod.)	Chlorophyll-a, Corrected	5.5		ug/L	P360119	
		Phaeophytin-a	2.3	I	ug/L	P360119	
		Chlorophyll-a, Uncorrected	7.1		ug/L	P360119	
2066181	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	272.3		MPN/100 mL	P359883	RPD
2066185	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold			P359296	

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: SPRING CREEK AT US98

Collection Date/Time: 02/28/2019 10:40

Field ID: G1TLHR0084

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2066178	SM 10200 H (mod.)	Chlorophyll-a, Corrected	0.61	U	ug/L	P360119	

Field ID: G1TLHR0084

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2066178	SM 10200 H (mod.)	Phaeophytin-a	0.67	U	ug/L	P360119	
		Chlorophyll-a, Uncorrected	0.44	U	ug/L	P360119	
2066182	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	186.0		MPN/100 mL	P359883	RPD

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: P360119

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.55	U	ug/L
Chlorophyll-a, Uncorrected	0.40	U	ug/L
Phaeophytin-a	0.60	U	ug/L

Reference Method: SM 9223 Quanti-Tray
Batch ID: P359883

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

Reference Method: SOP-PCR-1.0
Batch ID: P359951

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

Reference Method: SOP-PCR-1.2
Batch ID: P359951

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

Reference Method: SOP-PCR-1.3
Batch ID: P360503

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

Reference Method: SOP-PCR-1.4
Batch ID: P359951

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: P360119

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
Batch ID: P360119

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	100		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P359951

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	122	155	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P359951

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	175	246	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P360503

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	163	40.3	P/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P359951

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	91.6	89.5	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P359951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2061146	HF183-qPCR	130		P	50 - 175
2062106	HF183-qPCR	103		P	50 - 175
2066183	HF183-qPCR	120		P	50 - 175
2066184	HF183-qPCR	108		P	50 - 175
2066947	HF183-qPCR	118		P	50 - 175
2067537	HF183-qPCR	114		P	50 - 175
2067538	HF183-qPCR	118		P	50 - 175
2067629	HF183-qPCR	108	105	P/P	50 - 175
2067943	HF183-qPCR	115		P	50 - 175
2068069	HF183-qPCR	129		P	50 - 175
2068070	HF183-qPCR	127		P	50 - 175
2068941	HF183-qPCR	113		P	50 - 175
2068942	HF183-qPCR	116		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P359951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P359951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2061146	GULL2-qPCR	150		P	50 - 300
2062106	GULL2-qPCR	110		P	50 - 300
2066184	GULL2-qPCR	886		F	50 - 300
2067629	GULL2-qPCR	111	92.5	P/P	50 - 300
2067943	GULL2-qPCR	176		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P360503

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2061146	GFD-purified-qPCR	420		F	50 - 175
2062106	GFD-purified-qPCR	399		F	50 - 175
2063932	GFD-purified-qPCR	368		F	50 - 175
2063933	GFD-purified-qPCR	417		F	50 - 175
2064412	GFD-purified-qPCR	364		F	50 - 175
2066184	GFD-purified-qPCR	404		F	50 - 175
2070612	GFD-purified-qPCR	418		F	50 - 175
2070613	GFD-purified-qPCR	463	395	F/F	50 - 175
2070614	GFD-purified-qPCR	406		F	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P359951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2061146	BacR-qPCR	84.2		P	50 - 175
2062106	BacR-qPCR	69.1		P	50 - 175
2066184	BacR-qPCR	70.7		P	50 - 175
2067629	BacR-qPCR	71.9	72.7	P/P	50 - 175
2067943	BacR-qPCR	71.4		P	50 - 175
2068995	BacR-qPCR	77.4		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)

Batch ID: P360119

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2066107	Chlorophyll-a, Corrected	0.210	Sample	P	0 - 25
2066107	Chlorophyll-a, Uncorrected	1.37	Sample	P	0 - 25

Reference Method: SM 9223 Quanti-Tray

Batch ID: P359883

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2065929	Escherichia Coli-Quanti-Tray	102	Sample	F	0 - 80

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
 Batch ID: P359951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2067629	HF183-qPCR	2.50	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
 Batch ID: P359951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2067629	GULL2-qPCR	23.7	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
 Batch ID: P360503

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2070613	GFD-purified-qPCR	15.7	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
 Batch ID: P359951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2067629	BacR-qPCR	1.12	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: 2066183
 Field Sample ID: G1TLHR0040

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	211	P	50 - 300

Lab Sample ID: 2066184
 Field Sample ID: G1TLHR0041

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	192	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	75.5	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	152	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	100			0.210	
	Chlorophyll-a, Uncorrected				1.37	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray							102	
SOP-PCR-1.0	HF183-qPCR	155	122	103	118	114			2.50
				118					
SOP-PCR-1.2	GULL2-qPCR	246	175	110	111	92.5			23.7
				176					
SOP-PCR-1.3	GFD-purified-qPCR	40.3	163	418	463	395			15.7
				406					
SOP-PCR-1.4	BacR-qPCR	89.5	91.6	69.1	71.9	72.7			1.12
				71.4					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2066175, 2066176, 2066177, 2066178
SM 9223 Quanti-Tray / E31780	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2066179, 2066180, 2066181, 2066182
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2066183, 2066184
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2066184
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2066184
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2066184
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	2066183, 2066184, 2066185

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	02/28/2019	02/28/2019 14:10	Jennifer Mihalic	03/07/2019 10:55	Peterson Janvier	2066175, 2066176, 2066177, 2066178
SM 9223 Quanti-Tray	02/28/2019	02/28/2019 15:10	Peterson Janvier	03/01/2019 11:30	Peterson Janvier	2066179, 2066180, 2066181, 2066182
SOP-PCR-1.0	02/28/2019	02/28/2019 16:00	Sarah Menz	03/13/2019 12:04	Mailin Lopez	2066183, 2066184
SOP-PCR-1.2	02/28/2019	02/28/2019 16:00	Sarah Menz	03/20/2019 09:02	Mailin Lopez	2066184
SOP-PCR-1.3	02/28/2019	02/28/2019 16:00	Angela Smith	03/21/2019 08:49	Sarah Menz	2066184
SOP-PCR-1.4	02/28/2019	02/28/2019 16:00	Sarah Menz	03/14/2019 09:09	Mailin Lopez	2066184
SOP-PCR-4.0	02/28/2019	02/28/2019 16:00	Angela Smith	03/13/2019 09:22	Sarah Menz	2066183, 2066184, 2066185