

Biological Analysis Report

TLH-ROC-2019-10-10-01

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

Event Description: **Run 7**
Request ID: **RQ-2019-09-30-09**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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: Puja Jasrotia, Environmental Manager

Date Certified: 15-NOV-2019 13:53

A handwritten signature in black ink, appearing to be 'Puja Jasrotia', with a horizontal line underneath it.

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: BLUE HOLE SPRING @ CAVERN

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

Field ID: G2TLHR0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2127152	SM 10200 H (mod.)	Chlorophyll-a, Corrected	5.9		ug/L	P373583	
		Phaeophytin-a	0.90	U	ug/L	P373583	
		Chlorophyll-a, Uncorrected	6.5		ug/L	P373583	

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: Chipola River @ Magnolia Rd

Collection Date/Time: 10/10/2019 11:00

Field ID: G2TLHR0016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2127153	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.1	I	ug/L	P373583	
		Phaeophytin-a	0.98	U	ug/L	P373583	
		Chlorophyll-a, Uncorrected	1.5	I	ug/L	P373583	
2127157	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	10.9		MPN/100 mL	P372416	

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: TENMILE CREEK @ CR274

Collection Date/Time: 10/10/2019 11:30

Field ID: G2TLHR0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2127155	SM 10200 H (mod.)	Chlorophyll-a, Corrected	7.6		ug/L	P373583	
		Phaeophytin-a	3.3	I	ug/L	P373583	
		Chlorophyll-a, Uncorrected	9.9		ug/L	P373583	
2127159	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	224.7		MPN/100 mL	P372416	
2127162	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P371831	
	SOP-PCR-1.2	GULL2-qPCR**	1.7E+04	U	TSC/100 mL	P371831	
	SOP-PCR-1.3	GFD-purified-qPCR**	170	UJ	TSC/100 mL	P372558	MS
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	UJ	TSC/100 mL	P371831	LCS, MS
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P371831	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.

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

SOP-PCR-1.4: Quality control failure(s) observed. See QA report for details.

SOP-PCR-1.5: Precision data unavailable for Analysis Batch A95308.

Sample Location: Tenmile Creek @ NW Turkey Pin Pond Rd

Collection Date/Time: 10/10/2019 12:00

Field ID: G2TLHR0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2127161	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	365.4		MPN/100 mL	P372416	
2127163	SOP-PCR-1.0	HF183-qPCR**	760		GEU/100 mL	P371831	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P371831	LCS, MS
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P371831	LCS

Ref. Method and Comment:

SOP-PCR-1.5: Precision data unavailable for Analysis Batch A95308.

Sample Location: CHIPOLA RIVER

Collection Date/Time: 10/10/2019 12:25

Field ID: G2TLHR0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2127154	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.2	I	ug/L	P373583	
		Phaeophytin-a	0.92	I	ug/L	P373583	
		Chlorophyll-a, Uncorrected	1.8		ug/L	P373583	
2127158	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	13.5		MPN/100 mL	P372416	

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: Apalachicola River @ Bristol Landing

Collection Date/Time: 10/10/2019 13:15

Field ID: G2TLHR0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2127156	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.9	I	ug/L	P373583	
		Phaeophytin-a	1.3	I	ug/L	P373583	
		Chlorophyll-a, Uncorrected	2.8		ug/L	P373583	
2127160	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	7.3		MPN/100 mL	P372416	

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: P373583

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 Quanti-Tray
Batch ID: P372416

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

Reference Method: SOP-PCR-1.0
Batch ID: P371831

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

Reference Method: SOP-PCR-1.2
Batch ID: P371831

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

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.3
Batch ID: P372558

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

Reference Method: SOP-PCR-1.4
Batch ID: P371831

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

Reference Method: SOP-PCR-1.5
Batch ID: P371831

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: P373583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	96.6		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P371831

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	108	148	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P371831

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	87.8	181	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P372558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	163	137	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P371831

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	124	179	P/F	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P371831

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

Reference Method: SOP-PCR-1.5
 Batch ID: P371831

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	127	200	P/F	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
 Batch ID: P371831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124679	HF183-qPCR	119		P	50 - 175
2124716	HF183-qPCR	72.4	76.8	P/P	50 - 175
2125171	HF183-qPCR	120		P	50 - 175
2125205	HF183-qPCR	109		P	50 - 175
2125206	HF183-qPCR	79.0		P	50 - 175
2126456	HF183-qPCR	97.6		P	50 - 175
2126981	HF183-qPCR	107		P	50 - 175
2126982	HF183-qPCR	80.8		P	50 - 175
2127162	HF183-qPCR	108		P	50 - 175
2127163	HF183-qPCR	119		P	50 - 175
2127304	HF183-qPCR	117		P	50 - 175
2127750	HF183-qPCR	115		P	50 - 175

Reference Method: SOP-PCR-1.2
 Batch ID: P371831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126456	GULL2-qPCR	51.6		P	50 - 300
2127162	GULL2-qPCR	58.4		P	50 - 300
2127750	GULL2-qPCR	85.2		P	50 - 300

Reference Method: SOP-PCR-1.3
 Batch ID: P372558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123207	GFD-purified-qPCR	343		F	50 - 175
2123983	GFD-purified-qPCR	415		F	50 - 175
2123984	GFD-purified-qPCR	377		F	50 - 175
2126456	GFD-purified-qPCR	107		P	50 - 175
2127162	GFD-purified-qPCR	330		F	50 - 175
2127750	GFD-purified-qPCR	331		F	50 - 175
2129915	GFD-purified-qPCR	377		F	50 - 175
2129917	GFD-purified-qPCR	385	366	F/F	50 - 175
2132423	GFD-purified-qPCR	367		F	50 - 175
2132424	GFD-purified-qPCR	372		F	50 - 175
2132425	GFD-purified-qPCR	325		F	50 - 175

Reference Method: SOP-PCR-1.4
 Batch ID: P371831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124679	BacR-qPCR	86.9		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4

Batch ID: P371831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2124716	BacR-qPCR	65.3	73.5	P/P	50 - 175
2125171	BacR-qPCR	76.1		P	50 - 175
2125205	BacR-qPCR	75.6		P	50 - 175
2125206	BacR-qPCR	68.8		P	50 - 175
2126456	BacR-qPCR	71.5		P	50 - 175
2127162	BacR-qPCR	34.8		F	50 - 175
2127163	BacR-qPCR	53.9		P	50 - 175
2127750	BacR-qPCR	92.6		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P371831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2126456	DG3-qPCR	120		P	50 - 175
2127162	DG3-qPCR	109		P	50 - 175
2127163	DG3-qPCR	110		P	50 - 175
2127750	DG3-qPCR	116		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)

Batch ID: P373583

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2127348	Chlorophyll-a, Corrected	6.05	Sample	P	0 - 25
2127348	Chlorophyll-a, Uncorrected	4.96	Sample	P	0 - 25

Reference Method: SM 9223 Quanti-Tray

Batch ID: P372416

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2126742	Escherichia Coli-Quanti-Tray	16.7	Sample	P	0 - 80
2126906	Escherichia Coli-Quanti-Tray	29.7	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0

Batch ID: P371831

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124716	HF183-qPCR	5.85	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2

Batch ID: P371831

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123304	GULL2-qPCR	3.19	Spike	P	0 - 25

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.3
Batch ID: P372558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129917	GFD-purified-qPCR	5.25	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P371831

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2124716	BacR-qPCR	12.0	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2127162
Field Sample ID: G2TLHR0001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	96.8	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	125	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	83.1	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	87.2	P	50 - 300

Lab Sample ID: 2127163
Field Sample ID: G2TLHR0022

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	103	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	97.7	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	97.5	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision	
				LCS			SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	96.6					6.05	
	Chlorophyll-a, Uncorrected						4.96	
SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray						16.7	29.7
SOP-PCR-1.0	HF183-qPCR	148	108	119	72.4	76.8		5.85
				120				
SOP-PCR-1.2	GULL2-qPCR	181	87.8	51.6	58.4	85.2		3.19
SOP-PCR-1.3	GFD-purified-qPCR	137	163	415	377	377		5.25
				385				
SOP-PCR-1.4	BacR-qPCR	179	124	86.9	65.3	73.5		12.0
				76.1				
SOP-PCR-1.5	DG3-qPCR	200	127	120	109	110		
				116				

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2127152, 2127153, 2127154, 2127155, 2127156
SM 9223 Quanti-Tray / E31780	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2127157, 2127158, 2127159, 2127160, 2127161
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2127162, 2127163
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2127162
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2127162
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2127162, 2127163
SOP-PCR-1.5 / E31780	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2127162, 2127163

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	10/10/2019	10/10/2019 16:06	Yuliya Danyuk	10/17/2019 15:52	Carina A. Tull	2127152, 2127153, 2127154, 2127155, 2127156
SM 9223 Quanti-Tray	10/10/2019	10/10/2019 15:47	Jessica Sherman	10/11/2019 10:06	Jessica Sherman	2127157, 2127158, 2127159, 2127160, 2127161
SOP-PCR-1.0	10/10/2019	10/10/2019 16:00	Angela Smith	10/25/2019 15:14	Lauren Campbell	2127162, 2127163
SOP-PCR-1.2	10/10/2019	10/10/2019 16:00	Angela Smith	10/31/2019 08:25	Mailin Lopez	2127162
SOP-PCR-1.3	10/10/2019	10/10/2019 16:00	Lauren Campbell	11/01/2019 08:15	Mailin Lopez	2127162
SOP-PCR-1.4	10/10/2019	10/10/2019 16:00	Angela Smith	10/30/2019 08:28	Mailin Lopez	2127162, 2127163
SOP-PCR-1.5	10/10/2019	10/10/2019 16:00	Angela Smith	10/29/2019 10:44	Lauren Campbell	2127162, 2127163