

Biological Analysis Report

SE-DIST-2023-02-28-01

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

Event Description: **SMP - Highlands Recovery**
Request ID: **RQ-2023-02-20-40**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 10-APR-2023 18:52



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: Indian Prairie Canal upstream of SR 70

Collection Date/Time: 02/27/2023 10:10

Field ID: G4SE0152

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2390306	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	24.6	Q	MPN/100 mL	P426636	

Ref. Method and Comment:

SM 9223 B Quanti-Tray: Precision data is unavailable for E. coli due to the small amount of analyte in the QC sample for the batch.

Sample Location: Jackson Creek north of SR 66

Collection Date/Time: 02/27/2023 11:30

Field ID: G4SE0151

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2390300	SM 10200 H (mod.)	Chlorophyll-a, Corrected	37		ug/L	P426656	
		Phaeophytin-a	13		ug/L	P426656	
		Chlorophyll-a, Uncorrected	46		ug/L	P426656	
2390303	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	3.0	Q	MPN/100 mL	P426636	

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. Lab blank failure. Corr chl-a result > 10 times blank.

SM 9223 B Quanti-Tray: Precision data is unavailable for E. coli due to the small amount of analyte in the QC sample for the batch.

Sample Location: Arbuckle Creek at US Hwy 98

Collection Date/Time: 02/27/2023 12:00

Field ID: G4SE0150

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2390301	SM 10200 H (mod.)	Chlorophyll-a, Corrected	13		ug/L	P426656	
		Phaeophytin-a	3.8		ug/L	P426656	
		Chlorophyll-a, Uncorrected	16		ug/L	P426656	
2390304	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	150.0	Q	MPN/100 mL	P426636	

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. Lab blank failure. Corr chl-a result > 10 times blank.

SM 9223 B Quanti-Tray: Precision data is unavailable for E. coli due to the small amount of analyte in the QC sample for the batch.

Sample Location: Arbuckle Branch at Arbuckle Creek Rd.

Collection Date/Time: 02/27/2023 12:20

Field ID: G4SE0149

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2390302	SM 10200 H (mod.)	Chlorophyll-a, Corrected	8.0	V	ug/L	P426656	
		Phaeophytin-a	3.2		ug/L	P426656	
		Chlorophyll-a, Uncorrected	10		ug/L	P426656	
2390305	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	52.9	Q	MPN/100 mL	P426636	
2390307	SOP-PCR-1.0	HF183-qPCR**	3.3E+03	U	TSC/100 mL	P426355	
	SOP-PCR-1.2	GULL2-qPCR**	3.6E+03	U	TSC/100 mL	P426355	
	SOP-PCR-1.3	GFD-qPCR**	720	U	TSC/100 mL	P426355	
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	U	TSC/100 mL	P426355	
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P426355	

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 9223 B Quanti-Tray: Precision data is unavailable for E. coli due to the small amount of analyte in the QC sample for the batch.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P426656

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.88	I	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: P426636

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

Reference Method: SOP-PCR-1.0
Batch ID: P426355

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

Reference Method: SOP-PCR-1.2
Batch ID: P426355

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

Reference Method: SOP-PCR-1.3
Batch ID: P426355

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

Reference Method: SOP-PCR-1.4
Batch ID: P426355

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

Reference Method: SOP-PCR-1.5
Batch ID: P426355

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: P426656

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	91.1		P	84 - 116

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P426355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	80.7	89.8	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P426355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	103	90.2	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P426355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	104	97.2	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P426355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	101	162	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P426355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	102	153	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P426355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389955	HF183-qPCR	90.2	90.2	P/P	50 - 175
2390307	HF183-qPCR	86.1		P	50 - 175
2390320	HF183-qPCR	85.9		P	50 - 175
2390519	HF183-qPCR	92.1		P	50 - 175
2390521	HF183-qPCR	91.8		P	50 - 175
2390522	HF183-qPCR	94.4		P	50 - 175
2390646	HF183-qPCR	94.4		P	50 - 175
2390722	HF183-qPCR	90.1		P	50 - 175
2391303	HF183-qPCR	92.3		P	50 - 175
2391304	HF183-qPCR	94.1		P	50 - 175
2391448	HF183-qPCR	94.4		P	50 - 175
2391599	HF183-qPCR	96.8		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P426355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389955	GULL2-qPCR	86.4	89.0	P/P	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P426355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2390307	GULL2-qPCR	63.5		P	50 - 300
2390320	GULL2-qPCR	81.0		P	50 - 300
2390521	GULL2-qPCR	73.9		P	50 - 300
2390646	GULL2-qPCR	68.9		P	50 - 300
2390722	GULL2-qPCR	86.3		P	50 - 300
2391303	GULL2-qPCR	96.7		P	50 - 300
2391304	GULL2-qPCR	73.0		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P426355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389955	GFD-qPCR	103	110	P/P	50 - 175
2390307	GFD-qPCR	90.6		P	50 - 175
2390320	GFD-qPCR	95.9		P	50 - 175
2390521	GFD-qPCR	94.7		P	50 - 175
2390646	GFD-qPCR	85.4		P	50 - 175
2390722	GFD-qPCR	103		P	50 - 175
2391303	GFD-qPCR	95.7		P	50 - 175
2391304	GFD-qPCR	94.2		P	50 - 175
2391448	GFD-qPCR	99.5		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P426355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389955	BacR-qPCR	92.9	88.9	P/P	50 - 175
2390307	BacR-qPCR	71.2		P	50 - 175
2390320	BacR-qPCR	78.3		P	50 - 175
2390519	BacR-qPCR	90.8		P	50 - 175
2390521	BacR-qPCR	72.2		P	50 - 175
2390522	BacR-qPCR	80.0		P	50 - 175
2390646	BacR-qPCR	78.6		P	50 - 175
2390722	BacR-qPCR	89.2		P	50 - 175
2391303	BacR-qPCR	92.1		P	50 - 175
2391304	BacR-qPCR	82.3		P	50 - 175
2391448	BacR-qPCR	85.6		P	50 - 175
2391599	BacR-qPCR	91.4		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P426355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389955	DG3-qPCR	97.8	101	P/P	50 - 175
2390307	DG3-qPCR	92.4		P	50 - 175
2390320	DG3-qPCR	97.1		P	50 - 175
2390519	DG3-qPCR	105		P	50 - 175
2390521	DG3-qPCR	103		P	50 - 175
2390522	DG3-qPCR	98.8		P	50 - 175
2390646	DG3-qPCR	97.9		P	50 - 175
2390722	DG3-qPCR	107		P	50 - 175
2391303	DG3-qPCR	106		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P426355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391304	DG3-qPCR	99.6		P	50 - 175
2391599	DG3-qPCR	103		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P426656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2390093	Chlorophyll-a, Corrected	0.512	Sample	P	0 - 25
2390093	Chlorophyll-a, Uncorrected	0.346	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P426355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389955	HF183-qPCR	0.0101	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P426355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389955	GULL2-qPCR	3.04	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P426355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389955	GFD-qPCR	6.98	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P426355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389955	BacR-qPCR	4.32	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P426355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389955	DG3-qPCR	3.35	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2390307
 Field Sample ID: G4SE0149

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	93.0	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	79.3	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	81.1	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	78.6	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	81.4	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	91.1					0.512	
	Chlorophyll-a, Uncorrected						0.346	
SOP-PCR-1.0	HF183-qPCR	89.8	80.7	90.2	90.2	86.1		0.0101
SOP-PCR-1.2	GULL2-qPCR	90.2	103	85.9	89.0	63.5		3.04
				81.0				
SOP-PCR-1.3	GFD-qPCR	97.2	104	103	110	90.6		6.98
				95.9				
SOP-PCR-1.4	BacR-qPCR	162	101	92.9	88.9	71.2		4.32
				78.3				
SOP-PCR-1.5	DG3-qPCR	153	102	97.8	101	92.4		3.35
				97.1				

Reference Method Descriptions

Method	Description	Associated Samples
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2390300, 2390301, 2390302
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2390303, 2390304, 2390305, 2390306
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2390307
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2390307
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2390307
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2390307
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2390307

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	02/28/2023	02/28/2023 13:32	Callie Williams	03/01/2023 09:45	Aidan Cronin	2390300, 2390301, 2390302
SM 9223 B Quanti-Tray	02/28/2023	02/28/2023 15:37	Megan Higbee	03/01/2023 11:48	Tynan A Branch	2390303, 2390304, 2390305, 2390306
SOP-PCR-1.0	02/28/2023	02/28/2023 14:30	Claudia Castro	03/20/2023 10:10	Roberta Tatti	2390307
SOP-PCR-1.2	02/28/2023	02/28/2023 14:30	Claudia Castro	03/28/2023 14:01	Jennifer Mihalic	2390307
SOP-PCR-1.3	02/28/2023	02/28/2023 14:30	Claudia Castro	03/27/2023 15:57	Jennifer Mihalic	2390307
SOP-PCR-1.4	02/28/2023	02/28/2023 14:30	Claudia Castro	03/21/2023 09:39	Roberta Tatti	2390307
SOP-PCR-1.5	02/28/2023	02/28/2023 14:30	Claudia Castro	03/21/2023 10:50	Roberta Tatti	2390307