

Biological Analysis Report

SO-DIST-2023-01-25-01

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

Overflow Analyses Performed By:
Sanders Laboratories
10090 Bavaria Road
Ft. Myers, FL 33913
DOH Accreditation E85457

Event Description: **2023 SMP: Glades Slough**
Request ID: **RQ-2023-01-23-17**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: William Mullen

For additional information please contact
Cheryl Swanson - Administrator
Sarah Menz, Ph.D. - Bench Biology & Aquatic
Toxicity
Puja Jasrotia, Ph.D. - Molecular Biology & Taxonomy
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8177

Certified by: Sarah Menz, Environmental Administrator

Date Certified: 09-MAR-2023 10:29

A handwritten signature in dark ink, appearing to be 'Sarah Menz', written in a cursive 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, Molecular and Overflow.

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: Gopher Gully At US27

Collection Date/Time: 01/24/2023 10:00

Field ID: G4SD0216

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383055	SM 10200 H (mod.)	Chlorophyll-a, Corrected	15		ug/L	P425078	
		Phaeophytin-a	7.2		ug/L	P425078	
		Chlorophyll-a, Uncorrected	20		ug/L	P425078	
2383060	Colilert-18	Escherichia Coli-Quanti-Tray	2420	J	MPN/100 mL		

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.

Colilert-18: All Quanti-Tray wells were positive. Result may be higher than reported.

Sample Location: Gator Slough At US27

Collection Date/Time: 01/24/2023 10:15

Field ID: G4SD0214

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383056	SM 10200 H (mod.)	Chlorophyll-a, Corrected	3.1		ug/L	P425078	
		Phaeophytin-a	4.5		ug/L	P425078	
		Chlorophyll-a, Uncorrected	6.0		ug/L	P425078	
2383061	Colilert-18	Escherichia Coli-Quanti-Tray	25.0		MPN/100 mL		

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: Rainey Slough@ Farabee Road

Collection Date/Time: 01/24/2023 11:00

Field ID: G4SD0111

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383063	Colilert-18	Escherichia Coli-Quanti-Tray	250		MPN/100 mL		

Sample Location: JohnHenrySlough AtCR7321

Collection Date/Time: 01/24/2023 11:20

Field ID: G4SD0215

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383058	SM 10200 H (mod.)	Chlorophyll-a, Corrected	1.6	I	ug/L	P425406	
		Phaeophytin-a	0.98	U	ug/L	P425406	
		Chlorophyll-a, Uncorrected	1.8	IV	ug/L	P425406	
2383059	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P424966	
	SOP-PCR-1.2	GULL2-qPCR**	1.8E+03	U	TSC/100 mL	P424966	
	SOP-PCR-1.3	GFD-qPCR**	1.1E+03	I	TSC/100 mL	P424966	
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P424966	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P424966	
2383064	Colilert-18	Escherichia Coli-Quanti-Tray	1300		MPN/100 mL		

Ref. Method and Comment:

SOP-PCR-1.3: Duplicate was analyzed and result is 910 I.

Sample Location: BootheelCreekEastBranch

Collection Date/Time: 01/24/2023 11:50

Field ID: G4SD0105

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383057	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.3	I	ug/L	P425078	

Field ID: G4SD0105

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383057	SM 10200 H (mod.)	Phaeophytin-a	2.3	I	ug/L	P425078	
		Chlorophyll-a, Uncorrected	3.7		ug/L	P425078	
2383062	Colilert-18	Escherichia Coli-Quanti-Tray	2420		MPN/100 mL		

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: P425078

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.89	U	ug/L
Chlorophyll-a, Uncorrected	0.65	U	ug/L
Phaeophytin-a	0.98	U	ug/L

Reference Method: SM 10200 H (mod.)
Batch ID: P425406

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.82	U	ug/L
Chlorophyll-a, Uncorrected	0.65	I	ug/L
Phaeophytin-a	0.90	U	ug/L

Reference Method: SOP-PCR-1.0
Batch ID: P424966

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

Reference Method: SOP-PCR-1.2
Batch ID: P424966

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

Reference Method: SOP-PCR-1.3
Batch ID: P424966

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

Reference Method: SOP-PCR-1.4
Batch ID: P424966

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

Reference Method: SOP-PCR-1.5
Batch ID: P424966

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: P425078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	90.4		P	84 - 116

Reference Method: SM 10200 H (mod.)
Batch ID: P425406

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	99.6		P	84 - 116

Reference Method: SOP-PCR-1.0
Batch ID: P424966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	91.1	100	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P424966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	103	88.1	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P424966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	94.2	93.0	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P424966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	59.7	109	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P424966

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	103	105	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P424966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2382696	HF183-qPCR	86.3		P	50 - 175
2382697	HF183-qPCR	92.7		P	50 - 175
2383059	HF183-qPCR	90.0	91.4	P/P	50 - 175
2383469	HF183-qPCR	96.7		P	50 - 175
2383606	HF183-qPCR	90.9		P	50 - 175
2383607	HF183-qPCR	69.2		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P424966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383608	HF183-qPCR	86.9		P	50 - 175
2383609	HF183-qPCR	76.4		P	50 - 175
2383899	HF183-qPCR	92.5		P	50 - 175
2384007	HF183-qPCR	87.9		P	50 - 175
2384449	HF183-qPCR	83.0		P	50 - 175
2384969	HF183-qPCR	97.6		P	50 - 175
2385037	HF183-qPCR	89.6		P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P424966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383059	GULL2-qPCR	84.1	79.9	P/P	50 - 300
2383469	GULL2-qPCR	72.5		P	50 - 300
2383608	GULL2-qPCR	70.9		P	50 - 300
2383609	GULL2-qPCR	75.3		P	50 - 300
2383899	GULL2-qPCR	78.7		P	50 - 300
2384007	GULL2-qPCR	87.9		P	50 - 300
2384449	GULL2-qPCR	80.6		P	50 - 300
2384969	GULL2-qPCR	84.9		P	50 - 300
2385037	GULL2-qPCR	84.5		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P424966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2382696	GFD-qPCR	89.2		P	50 - 175
2382697	GFD-qPCR	97.5		P	50 - 175
2383059	GFD-qPCR	93.6	95.0	P/P	50 - 175
2383469	GFD-qPCR	91.9		P	50 - 175
2383608	GFD-qPCR	96.2		P	50 - 175
2383609	GFD-qPCR	88.5		P	50 - 175
2383899	GFD-qPCR	94.6		P	50 - 175
2384007	GFD-qPCR	73.8		P	50 - 175
2384449	GFD-qPCR	95.2		P	50 - 175
2384969	GFD-qPCR	87.8		P	50 - 175
2385037	GFD-qPCR	82.6		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P424966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2382696	BacR-qPCR	90.7		P	50 - 175
2382697	BacR-qPCR	99.7		P	50 - 175
2383059	BacR-qPCR	95.3	96.8	P/P	50 - 175
2383469	BacR-qPCR	88.9		P	50 - 175
2383606	BacR-qPCR	73.8		P	50 - 175
2383607	BacR-qPCR	90.5		P	50 - 175
2383608	BacR-qPCR	88.7		P	50 - 175
2383609	BacR-qPCR	84.8		P	50 - 175
2383899	BacR-qPCR	83.2		P	50 - 175
2384007	BacR-qPCR	88.0		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P424966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384449	BacR-qPCR	92.8		P	50 - 175
2384969	BacR-qPCR	97.9		P	50 - 175
2385037	BacR-qPCR	97.0		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P424966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383059	DG3-qPCR	98.3	99.7	P/P	50 - 175
2383469	DG3-qPCR	105		P	50 - 175
2383606	DG3-qPCR	91.3		P	50 - 175
2383607	DG3-qPCR	97.3		P	50 - 175
2383608	DG3-qPCR	86.8		P	50 - 175
2383609	DG3-qPCR	86.7		P	50 - 175
2383899	DG3-qPCR	92.0		P	50 - 175
2384007	DG3-qPCR	91.9		P	50 - 175
2384449	DG3-qPCR	91.7		P	50 - 175
2384969	DG3-qPCR	93.2		P	50 - 175
2385037	DG3-qPCR	92.6		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P425078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2382764	Chlorophyll-a, Uncorrected	6.85	Sample	P	0 - 25

Reference Method: SM 10200 H (mod.)
Batch ID: P425406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384077	Chlorophyll-a, Corrected	4.16	Sample	P	0 - 25
2384077	Chlorophyll-a, Uncorrected	2.53	Sample	P	0 - 25
2384077	Phaeophytin-a	4.95	Sample	P	0 - 25

Reference Method: SOP-PCR-1.0
Batch ID: P424966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383059	HF183-qPCR	1.62	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P424966

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: P424966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383059	GULL2-qPCR	5.10	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P424966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383059	GFD-qPCR	1.57	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P424966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383059	BacR-qPCR	1.55	Spike	P	0 - 25

Reference Method: SOP-PCR-1.5
Batch ID: P424966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383059	DG3-qPCR	1.37	Spike	P	0 - 25

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

Quality Assurance Report Surrogates

Lab Sample ID: 2383059
Field Sample ID: G4SD0215

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	91.7	P	50 - 300
SOP-PCR-1.0	SKETA-qPCR	94.8	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	103	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	105	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	97.8	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	111	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	88.5	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	92.7	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	94.5	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	90.4		

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery			MS % Recovery			LCS	Precision	MS
									SMP	
SM 10200 H (mod.)	Chlorophyll-a, Corrected	99.6							4.16	
	Chlorophyll-a, Uncorrected								6.85	
	Chlorophyll-a, Uncorrected								2.53	
	Phaeophytin-a								4.95	
SOP-PCR-1.0	HF183-qPCR	100	91.1		86.3	92.7	90.0			1.62
SOP-PCR-1.2	GULL2-qPCR	88.1	103		84.1	79.9	72.5			5.10
SOP-PCR-1.3	GFD-qPCR	93.0	94.2		89.2	97.5	93.6			1.57
SOP-PCR-1.4	BacR-qPCR	109	59.7		90.7	99.7	95.3			1.55
SOP-PCR-1.5	DG3-qPCR	105	103		98.3	99.7	105			1.37
					91.3					

Reference Method Descriptions

Method	Description	Associated Samples
Colilert-18	E. coli by Colilert-18/QT by Sanders in Fort Myers	2383060, 2383061, 2383062, 2383063, 2383064
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2383055, 2383056, 2383057, 2383058
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2383059
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2383059
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2383059
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2383059
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2383059

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
Colilert-18	01/24/2023	01/24/2023 17:15		01/25/2023 11:25	Sanders-Fort Myers	2383060, 2383061, 2383062, 2383063, 2383064
SM 10200 H (mod.)	01/25/2023	01/25/2023 14:46	Callie Williams	01/26/2023 10:27	Aidan Cronin	2383055, 2383056, 2383057
	01/25/2023	01/25/2023 14:46	Callie Williams	02/02/2023 08:40	Aidan Cronin	2383058
SOP-PCR-1.0	01/25/2023	01/25/2023 12:50	Claudia Castro	02/09/2023 09:12	Roberta Tatti	2383059
SOP-PCR-1.2	01/25/2023	01/25/2023 12:50	Claudia Castro	02/17/2023 15:35	Jennifer Mihalic	2383059
SOP-PCR-1.3	01/25/2023	01/25/2023 12:50	Claudia Castro	02/17/2023 11:54	Jennifer Mihalic	2383059
SOP-PCR-1.4	01/25/2023	01/25/2023 12:50	Claudia Castro	02/16/2023 10:05	Roberta Tatti	2383059
SOP-PCR-1.5	01/25/2023	01/25/2023 12:50	Claudia Castro	02/10/2023 08:32	Roberta Tatti	2383059