

Biological Analysis Report

SO-DIST-2023-03-03-01

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

Overflow Analyses Performed By:
Benchmark EnviroAnalytical, Inc. - North Port
1001 Corporate Avenue, Suite 102
North Port, FL 34289
DOH Accreditation E85086

Event Description: **2023 SMP: Stadium Arcadia**
Request ID: **RQ-2023-02-27-31**
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

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Certified by: Puja Jasrotia, Environmental Administrator

Date Certified: 12-APR-2023 11:10

A handwritten signature in black ink, appearing to be 'Puja Jasrotia', with a horizontal line 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, 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: Joshua Creek above Peace River

Collection Date/Time: 03/02/2023 10:25

Field ID: G3SD0159

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391599	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P426355	
	SOP-PCR-1.4	BacR-qPCR**	5.09E+04		TSC/100 mL	P426355	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P426355	
2391608	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	120		MPN/100 mL		

Sample Location: JoshuaCreek@AirportAve

Collection Date/Time: 03/02/2023 09:40

Field ID: G3SD0184

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391607	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	727		MPN/100 mL		

Sample Location: Hawthorne Creek @ Reynolds St.

Collection Date/Time: 03/02/2023 10:50

Field ID: G3SD0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391598	SM 10200 H (mod.)	Chlorophyll-a, Corrected	2.0	I	ug/L	P427047	
		Phaeophytin-a	1.0	U	ug/L	P427047	
		Chlorophyll-a, Uncorrected	2.3		ug/L	P427047	
2391600	SOP-PCR-1.0	HF183-qPCR**	1.7E+03	U	TSC/100 mL	P426669	
	SOP-PCR-1.4	BacR-qPCR**	3.42E+04		TSC/100 mL	P426669	
	SOP-PCR-1.5	DG3-qPCR**	1.3E+03	U	TSC/100 mL	P426669	
2391609	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	459		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.

SOP-PCR-1.4: Duplicate was analyzed and result is 3.20E4.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P427047

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.96	U	ug/L
Chlorophyll-a, Uncorrected	0.70	U	ug/L
Phaeophytin-a	1.0	U	ug/L

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-1.0

Batch ID: P426669

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

Quality Assurance Report Method Blank Results

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-1.4
Batch ID: P426669

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

Reference Method: SOP-PCR-1.5
Batch ID: P426669

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: P427047

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	89.5		P	84 - 116

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-1.0
Batch ID: P426669

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	78.4	83.6	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-1.4
Batch ID: P426669

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

Reference Method: SOP-PCR-1.4
Batch ID: P426669

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	99.0	85.3	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

Reference Method: SOP-PCR-1.5
Batch ID: P426669

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	99.8	80.7	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-1.0
Batch ID: P426669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391600	HF183-qPCR	86.1	90.5	P/P	50 - 175
2392452	HF183-qPCR	90.8		P	50 - 175
2393010	HF183-qPCR	96.5		P	50 - 175
2393144	HF183-qPCR	90.8		P	50 - 175
2393145	HF183-qPCR	92.1		P	50 - 175
2393146	HF183-qPCR	84.6		P	50 - 175
2393460	HF183-qPCR	88.6		P	50 - 175
2393667	HF183-qPCR	87.0		P	50 - 175
2393910	HF183-qPCR	92.9		P	50 - 175
2393911	HF183-qPCR	86.8		P	50 - 175
2393985	HF183-qPCR	103		P	50 - 175
2394522	HF183-qPCR	95.8		P	50 - 175
2394523	HF183-qPCR	92.5		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

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-1.4
Batch ID: P426669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391600	BacR-qPCR	93.7	94.2	P/P	50 - 175
2392452	BacR-qPCR	79.9		P	50 - 175
2393010	BacR-qPCR	93.6		P	50 - 175
2393144	BacR-qPCR	69.3		P	50 - 175
2393145	BacR-qPCR	72.6		P	50 - 175
2393146	BacR-qPCR	64.4		P	50 - 175
2393460	BacR-qPCR	80.3		P	50 - 175
2393667	BacR-qPCR	73.6		P	50 - 175
2393910	BacR-qPCR	81.4		P	50 - 175
2393911	BacR-qPCR	78.5		P	50 - 175
2393985	BacR-qPCR	83.9		P	50 - 175
2394522	BacR-qPCR	77.3		P	50 - 175
2394523	BacR-qPCR	76.9		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
2391304	DG3-qPCR	99.6		P	50 - 175
2391599	DG3-qPCR	103		P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P426669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391600	DG3-qPCR	98.4	99.2	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.5
Batch ID: P426669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2392452	DG3-qPCR	91.5		P	50 - 175
2393010	DG3-qPCR	94.3		P	50 - 175
2393144	DG3-qPCR	78.8		P	50 - 175
2393145	DG3-qPCR	93.2		P	50 - 175
2393146	DG3-qPCR	86.5		P	50 - 175
2393460	DG3-qPCR	92.9		P	50 - 175
2393667	DG3-qPCR	85.0		P	50 - 175
2393910	DG3-qPCR	96.2		P	50 - 175
2393911	DG3-qPCR	94.9		P	50 - 175
2393985	DG3-qPCR	96.3		P	50 - 175
2394522	DG3-qPCR	99.8		P	50 - 175
2394523	DG3-qPCR	93.9		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P427047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391622	Chlorophyll-a, Corrected	5.74	Sample	P	0 - 25
2391622	Chlorophyll-a, Uncorrected	6.53	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-1.0
Batch ID: P426669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391600	HF183-qPCR	5.00	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-1.4
Batch ID: P426669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391600	BacR-qPCR	0.459	Spike	P	0 - 25

Quality Assurance Report
Precision

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

Reference Method: SOP-PCR-1.5
Batch ID: P426669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391600	DG3-qPCR	0.790	Spike	P	0 - 25

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2391599
Field Sample ID: G3SD0159

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	87.1	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	86.6	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	88.1	P	50 - 300

Lab Sample ID: 2391600
Field Sample ID: G3SD0011

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	98.1	P	50 - 300
SOP-PCR-1.0	SKETA-qPCR	97.9	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	95.2	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	97.4	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	98.0	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	95.3	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	89.5							5.74	
	Chlorophyll-a, Uncorrected								6.53	
SOP-PCR-1.0	HF183-qPCR	89.8	80.7		90.2	90.2	86.1			0.0101
					85.9					
	HF183-qPCR	83.6	78.4		86.1	90.5	90.8			5.00
					96.5					
SOP-PCR-1.4	BacR-qPCR	162	101		92.9	88.9	71.2			4.32
					78.3					
	BacR-qPCR	85.3	99.0		93.7	94.2	79.9			0.459
					93.6					
SOP-PCR-1.5	DG3-qPCR	153	102		97.8	101	92.4			3.35
					97.1					

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision SMP	MS
SOP-PCR-1.5	DG3-qPCR	80.7	99.8	98.4	99.2	91.5		0.790
				94.3				

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2391598
SM 9223 Quanti-Tray	E. coli by Colilert/QT by BEA South in North Port	2391607, 2391608, 2391609
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2391599, 2391600
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2391599, 2391600
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2391599, 2391600

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	03/03/2023	03/03/2023 14:10	Aidan Cronin	03/08/2023 08:55	Aidan Cronin	2391598
SM 9223 Quanti-Tray	03/02/2023	03/02/2023 13:29		03/03/2023 14:39	Benchmark EnviroAnalytical in North Port	2391607, 2391608, 2391609
SOP-PCR-1.0	03/03/2023	03/03/2023 14:45	Claudia Castro	03/20/2023 10:10	Roberta Tatti	2391599
	03/03/2023	03/03/2023 14:45	Claudia Castro	03/29/2023 09:41	Roberta Tatti	2391600
SOP-PCR-1.4	03/03/2023	03/03/2023 14:45	Claudia Castro	03/21/2023 09:39	Roberta Tatti	2391599
	03/03/2023	03/03/2023 14:45	Claudia Castro	03/30/2023 09:10	Roberta Tatti	2391600
SOP-PCR-1.5	03/03/2023	03/03/2023 14:45	Claudia Castro	03/21/2023 10:50	Roberta Tatti	2391599
	03/03/2023	03/03/2023 14:45	Claudia Castro	03/30/2023 14:20	Roberta Tatti	2391600