

Biological Analysis Report

SE-DIST-2021-10-15-01

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

Event Description: **SMP - Okeechobee Surface Sites**

Request ID: **RQ-2021-10-04-44**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

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FL Dept. of Environmental Protection
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Fort Pierce, FL 34945
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Date Certified: 03-MAY-2022 07:46



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: Lemkin Creek @ 78

Collection Date/Time: 10/14/2021 12:45

Field ID: G1SE0026

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2283969	SM 10200 H (mod.)	Chlorophyll-a, Corrected	19		ug/L	P405478	
		Phaeophytin-a	1.9	I	ug/L	P405478	
		Chlorophyll-a, Uncorrected	20		ug/L	P405478	
2283974	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	32.7	Q	MPN/100 mL	P405229	

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: S-153 Unnamed creek @ 710

Collection Date/Time: 10/14/2021 13:30

Field ID: G4SE0137

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2283970	SM 10200 H (mod.)	Chlorophyll-a, Corrected	5.2		ug/L	P405478	
		Phaeophytin-a	1.8	U	ug/L	P405478	
		Chlorophyll-a, Uncorrected	6.0		ug/L	P405478	
2283975	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	71.2	Q	MPN/100 mL	P405229	

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: Taylor Creek @ 70

Collection Date/Time: 10/14/2021 12:15

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2283971	SM 10200 H (mod.)	Chlorophyll-a, Corrected	7.0		ug/L	P405478	
		Phaeophytin-a	1.8	U	ug/L	P405478	
		Chlorophyll-a, Uncorrected	7.5		ug/L	P405478	
2283976	SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray	613.1	Q	MPN/100 mL	P405229	
2283977	SOP-PCR-1.0	HF183-qPCR**	3.3E+03	U	TSC/100 mL	P404981	
	SOP-PCR-1.2	GULL2-qPCR**	3.6E+03	U	TSC/100 mL	P404981	
	SOP-PCR-1.3	GFD-qPCR**	750	I	TSC/100 mL	P404981	
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	U	TSC/100 mL	P404981	
	SOP-PCR-1.5	DG3-qPCR**	2.6E+03	U	TSC/100 mL	P404981	

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-1.0: Precision data unavailable due to inhibition in QC sample.

SOP-PCR-1.2: Precision data unavailable due to inhibition in QC sample.

SOP-PCR-1.3: Precision data unavailable for GFD-qPCR component.

SOP-PCR-1.4: Precision data unavailable due to inhibition in QC sample.

SOP-PCR-1.5: Precision data unavailable due to inhibition in QC sample.

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)

Batch ID: P405478

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.82	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
Batch ID: P405478

Component	Result	Code	Units
Chlorophyll-a, Uncorrected	0.60	U	ug/L
Phaeophytin-a	0.90	U	ug/L

Reference Method: SM 9223 B Quanti-Tray
Batch ID: P405229

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

Reference Method: SOP-PCR-1.0
Batch ID: P404981

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

Reference Method: SOP-PCR-1.2
Batch ID: P404981

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

Reference Method: SOP-PCR-1.3
Batch ID: P404981

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

Reference Method: SOP-PCR-1.4
Batch ID: P404981

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

Reference Method: SOP-PCR-1.5
Batch ID: P404981

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: P405478

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	92.5		P	84 - 116

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P404981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	103	108	P/P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P404981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	98.8	117	P/P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P404981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-qPCR	94.0	106	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P404981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	103	94.7	P/P	50 - 175

Reference Method: SOP-PCR-1.5
Batch ID: P404981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
DG3-qPCR	86.2	104	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P404981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2282899	HF183-qPCR	90.6		P	50 - 175
2282902	HF183-qPCR	95.1		P	50 - 175
2282903	HF183-qPCR	77.4		P	50 - 175
2282904	HF183-qPCR	88.2		P	50 - 175
2283299	HF183-qPCR	93.8		P	50 - 175
2283300	HF183-qPCR	97.1		P	50 - 175
2283362	HF183-qPCR	93.3		P	50 - 175
2283615	HF183-qPCR	81.7		P	50 - 175
2283840	HF183-qPCR	78.2		P	50 - 175
2283977	HF183-qPCR	85.3		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P404981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2282899	GULL2-qPCR	75.6		P	50 - 300
2282902	GULL2-qPCR	82.1		P	50 - 300
2282903	GULL2-qPCR	81.9		P	50 - 300

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.2

Batch ID: P404981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2282904	GULL2-qPCR	67.1		P	50 - 300
2283299	GULL2-qPCR	51.9		P	50 - 300
2283300	GULL2-qPCR	71.6		P	50 - 300
2283362	GULL2-qPCR	51.7		P	50 - 300
2283615	GULL2-qPCR	82.3		P	50 - 300
2283840	GULL2-qPCR	75.7		P	50 - 300
2283977	GULL2-qPCR	65.2		P	50 - 300

Reference Method: SOP-PCR-1.3

Batch ID: P404981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2282899	GFD-qPCR	85.0		P	50 - 175
2282902	GFD-qPCR	85.1		P	50 - 175
2282903	GFD-qPCR	81.0		P	50 - 175
2282904	GFD-qPCR	77.1		P	50 - 175
2283299	GFD-qPCR	89.0		P	50 - 175
2283300	GFD-qPCR	89.9		P	50 - 175
2283362	GFD-qPCR	96.2		P	50 - 175
2283615	GFD-qPCR	81.4		P	50 - 175
2283840	GFD-qPCR	80.6		P	50 - 175
2283977	GFD-qPCR	75.1		P	50 - 175

Reference Method: SOP-PCR-1.4

Batch ID: P404981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283299	BacR-qPCR	67.8		P	50 - 175
2283300	BacR-qPCR	62.2		P	50 - 175
2283362	BacR-qPCR	76.8		P	50 - 175
2283615	BacR-qPCR	76.1		P	50 - 175
2283840	BacR-qPCR	68.4		P	50 - 175
2283977	BacR-qPCR	68.6		P	50 - 175

Reference Method: SOP-PCR-1.5

Batch ID: P404981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2282899	DG3-qPCR	73.0		P	50 - 175
2282902	DG3-qPCR	74.8		P	50 - 175
2282903	DG3-qPCR	77.8		P	50 - 175
2282904	DG3-qPCR	76.6		P	50 - 175
2283299	DG3-qPCR	60.7		P	50 - 175
2283300	DG3-qPCR	67.9		P	50 - 175
2283362	DG3-qPCR	58.7		P	50 - 175
2283615	DG3-qPCR	71.4		P	50 - 175
2283840	DG3-qPCR	67.4		P	50 - 175
2283977	DG3-qPCR	72.9		P	50 - 175

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P405478

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283793	Chlorophyll-a, Corrected	9.96	Sample	P	0 - 25
2283793	Chlorophyll-a, Uncorrected	10.9	Sample	P	0 - 25

Reference Method: SM 9223 B Quanti-Tray
Batch ID: P405229

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284059	Escherichia Coli-Quanti-Tray	43.1	Sample	P	0 - 80
2284081	Escherichia Coli-Quanti-Tray	14.6	Sample	P	0 - 80

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

Quality Assurance Report Surrogates

Lab Sample ID: 2283977
Field Sample ID: G1SE0011

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	75.0	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	88.6	P	50 - 300
SOP-PCR-1.3	SKETA-qPCR	85.9	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	77.7	P	50 - 300
SOP-PCR-1.5	SKETA-qPCR	86.9	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			Precision	
							LCS	MS
SM 10200 H (mod.)	Chlorophyll-a, Corrected	92.5					9.96	
	Chlorophyll-a, Uncorrected						10.9	
SM 9223 B Quanti-Tray	Escherichia Coli-Quanti-Tray						43.1	14.6
SOP-PCR-1.0	HF183-qPCR	108	103	90.6	95.1	77.4		
SOP-PCR-1.2	GULL2-qPCR	117	98.8	93.8	81.9	51.9		
				82.1				
SOP-PCR-1.3	GFD-qPCR	106	94.0	71.6	85.1	81.0		
				85.0				
SOP-PCR-1.4	BacR-qPCR	103	94.7	89.0	62.2	76.8		
				67.8				
SOP-PCR-1.5	DG3-qPCR	104	86.2	76.1	74.8	77.8		
				73.0				
				60.7				

Reference Method Descriptions

Method	Description	Associated Samples
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Reference Method Descriptions

Method	Description	Associated Samples
SM 10200 H (mod.)	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	2283969, 2283970, 2283971
SM 9223 B Quanti-Tray	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	2283974, 2283975, 2283976
SOP-PCR-1.0	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	2283977
SOP-PCR-1.2	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	2283977
SOP-PCR-1.3	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	2283977
SOP-PCR-1.4	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	2283977
SOP-PCR-1.5	Detection and quantification of canine-specific DG3 Bacteroides genetic marker with quantitative polymerase chain reaction	2283977

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	10/15/2021	10/15/2021 14:57	Joel Wharton	10/21/2021 09:10	Jillian G Hanley	2283969, 2283970, 2283971
SM 9223 B Quanti-Tray	10/15/2021	10/15/2021 16:44	Amber S. Eells	10/16/2021 14:12	Jillian G Hanley	2283974, 2283975, 2283976
SOP-PCR-1.0	10/15/2021	10/15/2021 13:25	Luke Hudson	10/21/2021 09:48	DeAsia Armster	2283977
SOP-PCR-1.2	10/15/2021	10/15/2021 13:25	Luke Hudson	10/26/2021 10:36	DeAsia Armster	2283977
SOP-PCR-1.3	10/15/2021	10/15/2021 13:25	Luke Hudson	10/27/2021 11:56	DeAsia Armster	2283977
SOP-PCR-1.4	10/15/2021	10/15/2021 13:25	Luke Hudson	10/19/2021 11:10	DeAsia Armster	2283977
SOP-PCR-1.5	10/15/2021	10/15/2021 13:25	Luke Hudson	10/22/2021 10:58	DeAsia Armster	2283977