

Biological Analysis Report

SE-DIST-2018-05-17-01

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

Event Description: **SMP- Okeechobee Run**
Request ID: **RQ-2018-05-14-57**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

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Certified by: Puja Jasrotia, Environmental Manager

Date Certified: 15-JUN-2018 15:07

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 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: OTTER CREEK @ 441

Collection Date/Time: 05/16/2018 10:20

Field ID: G1SE0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993382	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	816.4	Q	MPN/100 mL	P345708	
1993394	SOP-PCR-1.0	HF183-qPCR**	350	I	GEU/100 mL	P346170	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Sample Location: OTTER CREEK @ 68

Collection Date/Time: 05/16/2018 10:30

Field ID: G1SE0003

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993383	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	816.4	Q	MPN/100 mL	P345708	
1993395	SOP-PCR-1.0	HF183-qPCR**	150	I	GEU/100 mL	P346170	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Sample Location: TAYLOR CREEK @ 441

Collection Date/Time: 05/16/2018 10:40

Field ID: G1SE0001

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993373	SM 10200 H (mod.)	Chlorophyll-a, Corrected	7.2		ug/L	P345923	
		Phaeophytin-a	3.3		ug/L	P345923	
		Chlorophyll-a, Uncorrected	9.4		ug/L	P345923	
1993384	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	307.6	Q	MPN/100 mL	P345708	
1993396	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

Sample Location: TAYLOR CREEK @ 70

Collection Date/Time: 05/16/2018 11:30

Field ID: G1SE0011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993374	SM 10200 H (mod.)	Chlorophyll-a, Corrected	22		ug/L	P345923	
		Phaeophytin-a	11		ug/L	P345923	
		Chlorophyll-a, Uncorrected	29		ug/L	P345923	
1993385	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	307.6	Q	MPN/100 mL	P345708	
1993397	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

Sample Location: POPASH @ 70

Collection Date/Time: 05/16/2018 12:25

Field ID: G1SE0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993375	SM 10200 H (mod.)	Chlorophyll-a, Corrected	8.0	A	ug/L	P345923	
		Phaeophytin-a	1.7	A	ug/L	P345923	
		Chlorophyll-a, Uncorrected	9.3	A	ug/L	P345923	
1993386	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	344.8	Q	MPN/100 mL	P345708	

Sample Location: MOSQUITO CREEK @ 70

Collection Date/Time: 05/16/2018 12:55

Field ID: G1SE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Field ID: G1SE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993387	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	2419.6	Q	MPN/100 mL	P345708	
1993398	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P346170	
	SOP-PCR-1.4	BacR-qPCR**	4.86E+05		TSC/100 mL	P346170	RPD
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				

Ref. Method and Comment:
 SOP-PCR-1.4: Precision data unavailable for Analysis Batch A84429.

Sample Location: MOSQUITO CREEK @ 710

Collection Date/Time: 05/16/2018 13:15

Field ID: G1SE0014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993388	SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray	193.5	Q	MPN/100 mL	P345708	
1993399	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				

Quality Assurance Report Method Blank Results

Reference Method: SM 10200 H (mod.)
 Batch ID: P345923

Component	Result	Code	Units
Chlorophyll-a, Corrected	0.55	U	ug/L
Chlorophyll-a, Uncorrected	0.40	U	ug/L
Phaeophytin-a	0.40	U	ug/L

Reference Method: SM 9223 Quanti-Tray
 Batch ID: P345708

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

Reference Method: SOP-PCR-1.0
 Batch ID: P346170

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

Reference Method: SOP-PCR-1.4
 Batch ID: P346170

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 10200 H (mod.)
 Batch ID: P345923

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chlorophyll-a, Corrected	94.1		P	84 - 116

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P346170

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	115	90.3	P/P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P346170

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	63.9	82.5	P/P	50 - 175
BacR-qPCR	136	92.9	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P346170

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990878	HF183-qPCR	98.1		P	50 - 175
1990879	HF183-qPCR	96.8		P	50 - 175
1991821	HF183-qPCR	103		P	50 - 175
1992313	HF183-qPCR	97.4		P	50 - 175
1992498	HF183-qPCR	94.8	82.7	P/P	50 - 175
1993394	HF183-qPCR	81.9		P	50 - 175
1993395	HF183-qPCR	68.2		P	50 - 175
1993398	HF183-qPCR	72.0		P	50 - 175
1993440	HF183-qPCR	93.2		P	50 - 175
1993454	HF183-qPCR	89.8		P	50 - 175
1993537	HF183-qPCR	89.3		P	50 - 175
1993794	HF183-qPCR	85.4		P	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P346170

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990878	BacR-qPCR	68.6		P	50 - 175
1990879	BacR-qPCR	63.2		P	50 - 175
1992313	BacR-qPCR	78.9		P	50 - 175
1992498	BacR-qPCR	92.6	71.1	P/P	50 - 175
1993398	BacR-qPCR	68.4		P	50 - 175
1993440	BacR-qPCR	80.4		P	50 - 175
1993454	BacR-qPCR	64.5		P	50 - 175
1993537	BacR-qPCR	60.2		P	50 - 175

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P345923

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993375	Chlorophyll-a, Corrected	0.108	Sample	P	0 - 25

Quality Assurance Report Precision

Reference Method: SM 10200 H (mod.)
Batch ID: P345923

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993375	Chlorophyll-a, Uncorrected	1.90	Sample	P	0 - 25
1993375	Phaeophytin-a	17.5	Sample	P	0 - 25

Reference Method: SM 9223 Quanti-Tray
Batch ID: P345708

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993369	Escherichia Coli-Quanti-Tray	42.3	Sample	P	0 - 80
1993793	Escherichia Coli-Quanti-Tray	5.84	Sample	P	0 - 80

Reference Method: SOP-PCR-1.0
Batch ID: P346170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992498	HF183-qPCR	13.7	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P346170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992498	BacR-qPCR	26.3	Spike	F	0 - 25

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Surrogates

Lab Sample ID: 1993394
Field Sample ID: G1SE0007

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	84.0	P	50 - 300

Lab Sample ID: 1993395
Field Sample ID: G1SE0003

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	69.2	P	50 - 300

Lab Sample ID: 1993398
Field Sample ID: G1SE0006

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	74.9	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	92.7	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery			MS % Recovery			LCS	Precision		MS
									SMP		
SM 10200 H (mod.)	Chlorophyll-a, Corrected	94.1							0.108		
	Chlorophyll-a, Uncorrected								1.90		
	Phaeophytin-a								17.5		
SM 9223 Quanti-Tray	Escherichia Coli-Quanti-Tray								42.3	5.84	
SOP-PCR-1.0	HF183-qPCR	90.3	115		98.1	96.8	103				13.7
SOP-PCR-1.4	BacR-qPCR				97.4						
		63.9	92.9	136	68.4	60.2	68.6				26.3
		82.5			63.2						

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 10200 H (mod.) / E31780	Phytoplankton chlorophyll-a corrected, uncorrected, and phaeophytin by spectrophotometry	1993373, 1993374, 1993375
SM 9223 Quanti-Tray / E31780	Escherichia coli by Colilert 18 Quanti-Tray method - non-chlorinated water systems	1993382, 1993383, 1993384, 1993385, 1993386, 1993387, 1993388
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1993394, 1993395, 1993398
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	1993398
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	1993394, 1993395, 1993396, 1993397, 1993398, 1993399

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 10200 H (mod.)	05/17/2018	05/17/2018 15:45	Jennifer Mihalic	05/24/2018 09:55	Carina A. Tull	1993373, 1993374, 1993375
SM 9223 Quanti-Tray	05/17/2018	05/17/2018 15:10	Peterson Janvier	05/18/2018 12:30	Peterson Janvier	1993382, 1993383, 1993384, 1993385, 1993386, 1993387, 1993388
SOP-PCR-1.0	05/17/2018	05/17/2018 13:00	Puja Jasrotia	06/05/2018 16:20	Mailin Lopez	1993394, 1993395, 1993398
SOP-PCR-1.4	05/17/2018	05/17/2018 13:00	Puja Jasrotia	06/07/2018 12:27	Sarah Menz	1993398
SOP-PCR-4.0	05/17/2018	05/17/2018 13:00	Angela Smith	06/04/2018 14:30	Puja Jasrotia	1993394, 1993395, 1993396, 1993397, 1993398, 1993399