

Biological Analysis Report

SW-DIST-2018-03-08-03

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

Overflow Analyses Performed By:
Advanced Environmental Laboratories - Tampa
9610 Princess Palm Avenue
Tampa, Florida 33619
DOH Accreditation E84589

Event Description: **Rattlesnake, Braden, Cedar**
Request ID: **RQ-2018-03-05-15**
Customer: **SW-DIST**
Project ID: **SMP**

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Date Certified: 24-JUL-2018 19:26



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: 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 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: Braden R @ Linker Lodge

Collection Date/Time: 03/07/2018 09:43

Field ID: G2SW0016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973135	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1973141	EPA 1603	Escherichia coli-Membrane Filter**	68	B	cfu/100 mL		

Sample Location: Braden R @ Cypress Bend Park

Collection Date/Time: 03/07/2018 10:30

Field ID: G2SW0044

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973136	SOP-PCR-4.0	HF183 - Human Source Marker**	Below Threshold				
1973142	EPA 1603	Escherichia coli-Membrane Filter**	4	U	cfu/100 mL		

Sample Location: Rattlesnake Slough @ Linden

Collection Date/Time: 03/07/2018 12:35

Field ID: G2SW0017

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973137	SOP-PCR-1.0	HF183-qPCR**	410	I	GEU/100 mL	P342207	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1973143	EPA 1603	Escherichia coli-Membrane Filter**	8000	Z	cfu/100 mL		

Sample Location: Rattlesnake Slough @ Lockwood ridge rd

Collection Date/Time: 03/07/2018 12:20

Field ID: G2SW0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973138	SOP-PCR-1.0	HF183-qPCR**	280	U	GEU/100 mL	P342207	
	SOP-PCR-1.2	GULL2-qPCR**	1.7E+04	U	TSC/100 mL	P342207	
	SOP-PCR-1.3	GFD-purified-qPCR**	120	T	TSC/100 mL	P342626	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	3.0E+03	U	TSC/100 mL	P342207	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1973144	EPA 1603	Escherichia coli-Membrane Filter**	2500		cfu/100 mL		

Ref. Method and Comment:

SOP-PCR-1.0: No amplification of HF183 marker.

SOP-PCR-1.2: No amplification of GULL2 marker.

SOP-PCR-1.4: No amplification of BACR marker.

Sample Location: Cedar Creek @ Saddlehorn

Collection Date/Time: 03/07/2018 11:55

Field ID: G2SW0018

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973139	SOP-PCR-1.0	HF183-qPCR**	94	U	GEU/100 mL	P342207	
	SOP-PCR-1.2	GULL2-qPCR**	5.6E+03	U	TSC/100 mL	P342207	
	SOP-PCR-1.3	GFD-purified-qPCR**	480	IJ	TSC/100 mL	P342626	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.0E+03	U	TSC/100 mL	P342207	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1973145	EPA 1603	Escherichia coli-Membrane Filter**	450		cfu/100 mL		

Ref. Method and Comment:

SOP-PCR-1.0: No amplification of HF183 marker.

SOP-PCR-1.2: No amplification of GULL2 marker.

SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

SOP-PCR-1.4: No amplification of BACR marker.

Sample Location: Cedar Creek near end of WBID

Collection Date/Time: 03/07/2018 11:00

Field ID: G2SW0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973140	SOP-PCR-1.0	HF183-qPCR**	140	U	GEU/100 mL	P342207	
	SOP-PCR-1.2	GULL2-qPCR**	8.4E+03	U	TSC/100 mL	P342207	
	SOP-PCR-1.3	GFD-purified-qPCR**	990	J	TSC/100 mL	P342626	LCS, MS
	SOP-PCR-1.4	BacR-qPCR**	1.5E+03	U	TSC/100 mL	P342207	
	SOP-PCR-4.0	HF183 - Human Source Marker**	Above Threshold				
1973146	EPA 1603	Escherichia coli-Membrane Filter**	860	B	cfu/100 mL		

Ref. Method and Comment:

SOP-PCR-1.0: No amplification of HF183 marker.

SOP-PCR-1.2: No amplification of GULL2 marker.

SOP-PCR-1.3: Quality control failure(s) observed. See QA report for details.

SOP-PCR-1.4: No amplification of BACR marker.

Quality Assurance Report Method Blank Results

Reference Method: SOP-PCR-1.0

Batch ID: P342207

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

Reference Method: SOP-PCR-1.2

Batch ID: P342207

Component	Result	Code	Units
GULL2-qPCR	1.7E+04	U	TSC/100 mL

Reference Method: SOP-PCR-1.3

Batch ID: P342626

Component	Result	Code	Units
GFD-purified-qPCR	340	U	TSC/100 mL

Reference Method: SOP-PCR-1.4

Batch ID: P342207

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.0

Batch ID: P342207

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
HF183-qPCR	153	95.4	P/P	50 - 175

Reference Method: SOP-PCR-1.2

Batch ID: P342207

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GULL2-qPCR	88.7	63.0	P/P	50 - 300

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SOP-PCR-1.3
Batch ID: P342626

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
GFD-purified-qPCR	130	14.3	P/F	50 - 175

Reference Method: SOP-PCR-1.4
Batch ID: P342207

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
BacR-qPCR	101	90.5	P/P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.0
Batch ID: P342207

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972376	HF183-qPCR	104		P	50 - 175
1973137	HF183-qPCR	117		P	50 - 175
1973138	HF183-qPCR	108		P	50 - 175
1973139	HF183-qPCR	115		P	50 - 175
1973140	HF183-qPCR	104		P	50 - 175
1973481	HF183-qPCR	96.5		P	50 - 175
1978249	HF183-qPCR	114	118	P/P	50 - 175
1979261	HF183-qPCR	121		P	50 - 175
1979262	HF183-qPCR	113		P	50 - 175
1979263	HF183-qPCR	112		P	50 - 175

Reference Method: SOP-PCR-1.2
Batch ID: P342207

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973138	GULL2-qPCR	53.5		P	50 - 300
1973139	GULL2-qPCR	70.7		P	50 - 300
1973140	GULL2-qPCR	66.6		P	50 - 300
1973481	GULL2-qPCR	60.3		P	50 - 300

Reference Method: SOP-PCR-1.3
Batch ID: P342626

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973138	GFD-purified-qPCR	124		P	50 - 175
1973139	GFD-purified-qPCR	181		F	50 - 175
1973140	GFD-purified-qPCR	181		F	50 - 175
1973481	GFD-purified-qPCR	136		P	50 - 175
1973482	GFD-purified-qPCR	98.7		P	50 - 175
1974759	GFD-purified-qPCR	66.7		P	50 - 175
1980249	GFD-purified-qPCR	215	183	F/F	50 - 175
1981851	GFD-purified-qPCR	174		P	50 - 175
1983204	GFD-purified-qPCR	243		F	50 - 175
1983223	GFD-purified-qPCR	149		P	50 - 175

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SOP-PCR-1.4
Batch ID: P342207

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973138	BacR-qPCR	59.9		P	50 - 175
1973139	BacR-qPCR	90.6		P	50 - 175
1973140	BacR-qPCR	66.2		P	50 - 175
1973481	BacR-qPCR	65.9		P	50 - 175
1978108	BacR-qPCR	65.4		P	50 - 175
1978109	BacR-qPCR	84.1	76.2	P/P	50 - 175

Quality Assurance Report Precision

Reference Method: SOP-PCR-1.0
Batch ID: P342207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978249	HF183-qPCR	2.74	Spike	P	0 - 25

Reference Method: SOP-PCR-1.2
Batch ID: P342207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1980249	GULL2-qPCR	10.2	Spike	P	0 - 25

Reference Method: SOP-PCR-1.3
Batch ID: P342626

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1980249	GFD-purified-qPCR	15.7	Spike	P	0 - 25

Reference Method: SOP-PCR-1.4
Batch ID: P342207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978109	BacR-qPCR	9.80	Spike	P	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: 1973137
Field Sample ID: G2SW0017

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	96.1	P	50 - 300

Quality Assurance Report Surrogates

Lab Sample ID: 1973138
Field Sample ID: G2SW0043

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	111	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	110	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	106	P	50 - 300

Lab Sample ID: 1973139
Field Sample ID: G2SW0018

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	113	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	119	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	106	P	50 - 300

Lab Sample ID: 1973140
Field Sample ID: G2SW0042

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
SOP-PCR-1.0	SKETA-qPCR	104	P	50 - 300
SOP-PCR-1.2	SKETA-qPCR	115	P	50 - 300
SOP-PCR-1.4	SKETA-qPCR	108	P	50 - 300

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery		MS % Recovery			LCS	Precision SMP	MS
SOP-PCR-1.0	HF183-qPCR	95.4	153	117	108	115			2.74
				104					
SOP-PCR-1.2	GULL2-qPCR	63.0	88.7	53.5	70.7	66.6			10.2
				60.3					
SOP-PCR-1.3	GFD-purified-qPCR	14.3	130	215	183	174			15.7
				124					
SOP-PCR-1.4	BacR-qPCR	90.5	101	59.9	90.6	66.2			9.80
				65.4					

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 1603 / E84589	Escherichia coli by membrane filter method using modified mTEC by Advanced Environmental Tampa Lab for SWD	1973141, 1973142, 1973143, 1973144, 1973145, 1973146
SOP-PCR-1.0 / E31780	Detection and quantification of human-specific HF183 Bacteroides genetic marker with quantitative polymerase chain reaction	1973137, 1973138, 1973139, 1973140
SOP-PCR-1.2 / E31780	Detection and quantification of coastal bird specific Catellicoccus marimammalium Gull2 genetic marker with quantitative polymerase chain reaction	1973138, 1973139, 1973140
SOP-PCR-1.3 / E31780	Detection and quantification of bird specific Helicobacter GFD genetic marker with quantitative polymerase chain reaction	1973138, 1973139, 1973140
SOP-PCR-1.4 / E31780	Detection and quantification of Ruminant specific Bacteroidetes BacR genetic marker with quantitative polymerase chain reaction	1973138, 1973139, 1973140
SOP-PCR-4.0 / E31780	Preparation of Samples by Filtration and held for qPCR Analysis	1973135, 1973136, 1973137, 1973138, 1973139, 1973140

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 1603	03/07/2018	03/07/2018 17:25		03/08/2018 17:10	AEL - Tampa	1973141, 1973142, 1973143, 1973144, 1973145, 1973146
SOP-PCR-1.0	03/08/2018	03/08/2018 15:00	Puja Jasrotia	04/05/2018 11:41	Mailin Lopez	1973137, 1973138, 1973139, 1973140
SOP-PCR-1.2	03/08/2018	03/08/2018 15:00	Puja Jasrotia	04/09/2018 12:39	Sarah Menz	1973138, 1973139, 1973140
SOP-PCR-1.3	03/08/2018	03/08/2018 15:00	Angela Smith	04/13/2018 12:53	Sarah Menz	1973138, 1973139, 1973140
SOP-PCR-1.4	03/08/2018	03/08/2018 15:00	Puja Jasrotia	04/06/2018 10:21	Sarah Menz	1973138, 1973139, 1973140
SOP-PCR-4.0	03/08/2018	03/08/2018 15:00	Angela Smith	03/26/2018 16:15	Puja Jasrotia	1973135, 1973136, 1973137, 1973138, 1973139, 1973140