June 07, 2018

Mark Zakaib
Survivor Filter
2190 Warden Avenue, Suite 203
Scarborough, Ontario, Canada M1T1V6

Client ID: Survivor Pro Filter L610 #1, Survivor Pro Filter L610 #2, Personal Water Filter L600 #1, Personal Water Filter L600 #2

BCS ID: 1805322, 1805323, 1805326, 1805327

Project Name: Purifier Initial Parasite Filtration Efficacy Testing

Dear Mark Zakaib,

We have completed the filtration efficacy study on the submitted units as outlined below. The contaminant species, study conditions, and water parameters utilized were based on client's request and adaptation of the guidance documents and protocols listed below:

Validation of Water Purifier Efficacy: Screening of initial purifier performance as per client requested protocol; BCS SOP-F1 (ISO17025 accredited)

Report Conclusion: Acceptable performance for the tested species at the indicated test points

Following, you will find our report on the results of the study conducted on the referenced samples. Should you have any questions, please do not hesitate to contact me.

Sincerely,

George Lukasik, Ph.D.
Laboratory Director

BCS LABORATORIES, INC. – GAINESVILLE
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Analysis: *3.0um Microspheres Filtration Efficacy (parasite)* Test Water: General Test Water

Test Point: Initial Filtration Efficacy of Parasites (Cryptosporidium and Giardia) **Test Point Conclusion: Pass**

Flow rate: 429-594mL/min Temp: 22.2 C pH: 7.8 NTU: 0.2NTU TOC: 0.4ppm

Influent Conc: 7.20E+04 microspheres/mL TDS: 208ppm Hardness: 157.2

Test Notes: Parasite surrogate was not detected in the filtrate; Value represents the method's detection limit for the amount of sample analyzed as per the method's standard reporting units.

BCS Sample ID 1: 1805322 Client ID 1: Survivor Pro Filter L610 #1 Pressure(psi): NA

Eff Conc 1: <6.70E-01 microspheres/mL % Reduct 1: >99.9991 Log10 Reduct 1: >5

BCS Sample ID 2: 1805323 Client ID 2: Survivor Pro Filter L610 #2 Pressure(psi): NA

Eff Conc 2: <6.70E-01 microspheres/mL % Reduct 2: >99.9991 Log10 Reduct 2: >5

BCS Sample ID 3: 1805326 Client ID 3: Personal Water Filter L600 #1 Pressure(psi): -2.98

Eff Conc 3: <6.70E-01 microspheres/mL % Reduct 3: >99.9991 Log10 Reduct 3: >5

BCS Sample ID 4: 1805327 Client ID 4: Personal Water Filter L600 #2 Pressure(psi): -2.78

Eff Conc 4: <6.70E-01 microspheres/mL % Reduct 4: >99.9991 Log10 Reduct 4: >5

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Project:	Purifier Initial Parasite Filtration Efficacy Testing				
Date Received:	May 31, 2018 12:22	Analyst: Jonathan Nunes			
Test Start Date:	June 05, 2018	Test End Date: June 06, 2018		Qualifier:	U

Report Notes:

The study was conducted as per client's request. The study determines the initial use efficacy of the tested units of Survivor Pro L610 and Personal Water Filter L600 for the filtration of 3.0um Microsphere as surrogates for Cryptosporidium parvum and Giardia lamblia from a water supply. The units were received from the client and assigned the indicated BCS Laboratories identifiers. The study was conducted by fitting two of the provided Personal Water Filter L600s into a peristaltic pump assembly. The Pro L610 filter hand pump units were assembled as instructed. The filter units were submerged in a supply of General Test Water (GTW, NSF 53). Both sets were flushed/conditioned as per manufacturer's instructions. Two (2) liters of General Test Water (GTW, NSF 53) were passed through each filter as follows: the peristaltic pump was set to 600mL/min, and pressure maintained between -2.9 +/- 0.1 PSI for the Personal Water Filter L600s, and the Pro-L610s were hand pumped at a rate of 1sec per upward motion followed by 1sec per downward motion. After conditioning, an aliquot of the challenge species was added to five (5) liters of GTW, and the water was homogenized. The filters were submerged in the challenge water, and one (1) liter was passed through each filter as previously described, and the entirety of the passed challenge water was collected. The elapsed time was measured for each filter effluent volume. Samples of the influent challenge water were removed prior to and at the end of the challenge along with duplicate samples of each collected and homogenized effluent. Analysis was conducted as per laboratory's accredited ISO17025:2005 methodology: 3.0um Microsphere cyst surrogates were analyzed as per EPA 1623.1, turbidity as per SM2130B, pH as per SM4500HB, TOC as per SM5310C, Alkalinity as per SM2320B (if needed), TDS as per SM2540, chlorine as per SM4500-Cl G, & hardness as per SM2340C. Analysis was conducted using calibrated and/or validated Instruments to traceable standards (NIST). All QC was within method acceptance limit. No general environmental conditions are specified in the standard or have been identified that could affect the test results or measurements. END OF REPORT NOTES.

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*I certify that I have examined I am familiar with the information submitted herein. The results pertain only to the sample(s) analyzed associated identifier #(s). Based on my inquiry of the individuals responsible for the analysis, I believe the data to be true, accurate, and complete. Unit descriptions and names were obtained from the submitted documents. The analysis was authorized and commissioned by the client or client's representative. The resulting data are representative of the analysis conducted on the collected samples and it's/their condition at the time of analysis. The data provided is strictly representative of the study conducted under laboratory conditions using the material/samples/articles provided by the client (or client's representative) and it's (their) condition at the time of test. The data obtained may not be representative or indicative of a real-life process and/or application. The sample(s) were analyzed in accordance with the appropriate method, however due to the inherent limitations of methods, microorganisms may avoid detection. BCS Laboratories offers no express or implied warranties concerning the quality, safety, and/or purity of any sample, batch, source, or the process they are derived from. Quality assurance controls were performed as outlined in the method and as per Good Laboratory Practices. Analyses were performed in accordance with laboratory practices and procedures set-forth by ISO 17025-2005 and NELAP/TNI accreditation standards unless otherwise noted. BCS makes no express or implied warranty regarding the ownership, merchantability, safety or fitness for a particular purpose of any such property or product.

Signature of Laboratory Director/Authorized Rep. _____ Date: June 07, 2018

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DATA QUALIFIER CODES	
SYMBOL	MEANING
D	Measurement was made in the field.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J1	The sample matrix interfered with the ability to make any accurate determination.
J2	No Quality Control criteria exist for the component.
^	analysis conducted outside the Laboratory's scope of accreditation
L	Off scale high. Actual value is known to be greater than value given.
O	Sampled, but analysis not performed.
Q	Sample held beyond the accepted holding time.
U	Indicates that the compound was analyzed for but not detected. The reported value is the method detection limit.
V	Analyte was detected in both sample and associated method blank. Data may not be accurate.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies present (TNTC); the numeric value given represents the upper end of the value that can be determined based on the volume.
?	Data are rejected and should not be used. QC data did not meet acceptance criteria.
**	Analysis of analyte submitted to an accredited sub-contract laboratory.
!	Data deviate from historically established concentration range.
#	BCS Lab specific qualifier. See laboratory analysis notes.

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