Project:
Study Sponsor:
Sample(s): **BCS 140522[illegible] (filters B and C), received May 29, 2014.**
Test: **Filtration Efficacy – Personal water purifier initial performance**
Test Parameter: **3.0 µM Fluorescent Microspheres as *Cryptosporidium parvum* [illegible]; *Raoultella terrigena* (Bacteria) and MS-2 Bacteriophage (virus)**
Performed and Analyzed by: **George Lukasik, Ph.D. & Kintin Ng; June 12, 2014**

Challenge Species	Filter influent average concentration	Average concentration of the challenge sp effluent	
		Filter B	
Bacteria: *Raoultella terrigena* cfu/ml[1]	270,000	2.3	
Virus: MS-2 Bacteriophage pfu/ml[2]	300,000	< .45**	
3.0 µM Fluorescent microspheres /ml[3]	25,000	2	

[1] *Raoultella terrigena* (ATCC 33257) was obtained from ATCC and propagated on Tryptic Soy Agar (TSA, Becton Dickinson, USA). It removal efficacy. Bacteria was enumerated as colony forming units (cfu) following incubation at 36.5°C for 24 hours as per Standard
[2]Bacteriophage MS-2 (ATCC 15597-B1) was used as a model for human viruses. It is of similar shape and size to human enterovirus filter's viral capture efficacy. It was enumerated using *E. coli* C3000 (ATCC 15597) as a host using the single layer plaque assay agai
[3]Three micron green fluorescent latex microspheres (Fluoresbrite® YG Microspheres 3.00µm, PolySciences Inc. PA, USA) were usec oocysts. It is used to determine filter's parasitic removal efficacy. The microspheres were enumerated by fixing onto SingleSpot Slide fluorescence microscopy.
** No species were detected in the filter effluent for the total volume analyzed (<0.45 cfu or pfu/ml). Filter effluent samples were analy following collection.

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TEST DATA ON FILE.

Project:
Study Sponsor:
Sample(s): **BCS 1405223 (filters B and C), received May 29, 2014.**
Test: **Filtration Efficacy – Personal water purifier initial performance**
Test Parameter: **3.0 µM Fluorescent Microspheres as *Cryptosporidium parvum* (*Raoultella terrigena* (Bacteria) and MS-2 Bacteriophage (virus)**
Performed and Analyzed by: **George Lukasik, Ph.D. & Kintin Ng; June 12, 2014**

Challenge Species	Filter influent average concentration	Average percent removal*** of the chall	
		Filter B	
Bacteria: *Raoultella terrigena*	2.7×10^5 cfu /ml	99.9996%	
Virus: MS-2 Bacteriophage	3.0×10^5 pfu /ml	> 99.9999%**	
3.0 µM Fluorescent microspheres	2.5×10^4 / ml	99.992%	

** No species were detected in the filter effluent for the total volume analyzed (<0.45 cfu or pfu/ml). Filter effluent samples were analyze following collection.
*** Purifier NSF/ANSI standard microbial removal claims are 99.99% or greater for virus, 99.9999% or greater for bacteria, and 99.9% o

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Project:
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Sample(s): **BCS 1405223 (filters B and C), received May 29, 2014.**
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Performed and Analyzed by: **George Lukasik, Ph.D. & Kintin Ng; June 12, 2014**

Challenge Species	Filter influent average concentration	Log_{10} Reduction*** of the challenge	
		Filter B	
Bacteria: *Raoultella terrigena*[1]	2.7×10^5 cfu /1 ml (5.43 Log_{10})	5.07	
Virus: MS-2 Bacteriophage[2]	3.0×10^5 pfu /ml (5.48 Log_{10})	> 5.83**	
3.0 µM Fluorescent microspheres[3]	2.5×10^4 /ml (4.40 Log_{10})	4.10	

** No species were detected in the filter effluent for the total volume analyzed (<0.45 cfu or pfu/ml). Filter effluent samples were analyze following collection.
*** Purifier NSF/ANSI standard microbial removal claims are 4 Log_{10} or greater for virus, 6 Log_{10} or greater for bacteria, and 3 Log_{10} or g

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Project:
Study Sponsor:
Sample(s): **BCS 1405223 (filters B and C), received May 29, 2014.**
Test: **Filtration Efficacy – Personal water purifier performance followi gallons of City of Gainesville municipal tap water ***
Test Parameter: **3.0 µM Fluorescent Microspheres as *Cryptosporidium parvum* (*Raoultella terrigena* (Bacteria)**
Performed and Analyzed by: **George Lukasik, Ph.D. & Kintin Ng; June 19, 2014**

Challenge Species	Filter influent average concentration	Average concentration of the challenge sp effluent	
		Filter B	
Bacteria: *Raoultella terrigena* cfu/ml[1]	220,000	26	
3.0 µM Fluorescent microspheres /ml[2]	26,000	4	

[1] *Raoultella terrigena* (ATCC 33257) was obtained from ATCC and propagated on Tryptic Soy Agar (TSA, Becton Dickinson, USA). It removal efficacy. Bacteria was enumerated as colony forming units (cfu) following incubation at 36.5°C for 24 hours as per Standard
[2]Three micron green fluorescent latex microspheres (Fluoresbrite® YG Microspheres 3.00µm, PolySciences Inc. PA, USA) were used oocysts. It is used to determine filter's parasitic removal efficacy. The microspheres were enumerated by fixing onto SingleSpot Slide fluorescence microscopy.
** No species were detected in the filter effluent for the total volume analyzed (<0.45 cfu or pfu/ml). Filter effluent samples were analy following collection.

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Project:
Study Sponsor:
Sample(s): **BCS 1405223 (filters B and C), received May 29, 2014.**
Test: **Filtration Efficacy – Personal water purifier performance followi gallons of City of Gainesville municipal tap water ***
Test Parameter: **3.0 µM Fluorescent Microspheres as *Cryptosporidium parvum* (*Raoultella terrigena* (Bacteria).**
Performed and Analyzed by: **George Lukasik, Ph.D. & Kintin Ng; June 19, 2014**

Challenge Species	Filter influent average concentration	Average percent removal*** of the chall	
		Filter B	
Bacteria: *Raoultella terrigena*	2.2×10^5 cfu /ml	99.99%	
3.0 µM Fluorescent microspheres	2.6×10^4 / ml	99.98%	

** No species were detected in the filter effluent for the total volume analyzed (<0.45 cfu or pfu/ml). Filter effluent samples were analyze following collection.
*** Purifier NSF/ANSI standard microbial removal claims are 99.99% or greater for virus, 99.9999% or greater for bacteria, and 99.9% o

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Project:
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Test: **Filtration Efficacy – Personal water purifier performance followi gallons of City of Gainesville municipal tap water ***
Test Parameter: **3.0 µM Fluorescent Microspheres as *Cryptosporidium parvum* (*Raoultella terrigena* (Bacteria)**
Performed and Analyzed by: **George Lukasik, Ph.D. & Kintin Ng; June 19, 2014**

Challenge Species	Filter influent average concentration	Log_{10} Reduction*** of the challenge	
		Filter B	
Bacteria: *Raoultella terrigena*[1]	2.2×10^5 cfu /1 ml (5.34 Log_{10})	3.93	
3.0 µM Fluorescent microspheres[3]	2.6×10^4 /ml (4.41 Log_{10})	3.81	

** No species were detected in the filter effluent for the total volume analyzed (<0.45 cfu or pfu/ml). Filter effluent samples were analyze following collection.
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Test Parameter:	**3.0 µM Fluorescent Microspheres as *Cryptosporidium parvum* (*Raoultella terrigena* (Bacteria) and MS-2 Bacteriophage (virus)**
Performed and Analyzed by:	**George Lukasik, Ph.D. & Kintin Ng; June 12, 2014, June 19, 201**

* Biological filtration challenge study description: Initially, fifteen liter of laboratory grade reagent water each of the provided filters using 58-60 PSI of pressure. The indicated microbial species were added l water (pH 7.5±0.5) and the solution was passed through using pressure filtration. Five liters of the cha passed through the filter. The filter effluent was collected in a sterile container. The flow rate was valic traceable timer. The flow rate was measured to be two gallons/min. The effluent was assayed for the per Standard Methods (APHA 2012) and Lab Standard Operating Procedures (SOP F-1). A sample of removed prior to the beginning of the challenge study and at the end of the study. All analysis was cor the least. The number of microorganisms was determined in each sample. The respective percent anc determined based on the concentration obtained in the filter influent and effluent. The tables report t the filters tested.

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Study data are summarized in the provided table(s). The results presented pertain only to the study cc articles/samples provided by the client (or client representative). The study was authorized and comm The results presented pertain only to the samples analyzed and identifier number(s) indicated. The da representative of the study conducted using the material/samples/articles provided by the client (or clie and its (their) condition at the time of test. The study and data are obtained under laboratory condition representative or indicative of a real-life process and/or application. Positive, negative, and neutralizat performed as outlined in the method and as per Good Laboratory Practices. All analyses were perform with laboratory practices and procedures set-forth by our NELAP/TNI accreditation standards (ISO 17(noted. BCS makes no claims with regards to the express or implied warranty regarding the ownership safety or fitness for a particular purpose of any such property or product.

George Lukasik

June 2

Signature of Laboratory Director/Authorized Rep. _____ Date: _____

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