

Summary of Pure Sip/ViroBac Testing & Research

University of Illinois at Chicago

Test: The Pure Sip personal purifier was examined for its ability to effectively decrease the amount of viable **Escherichia coli** in artificially contaminated water.

Results: When the contaminated water was passed through the Pure Sip purifiers at flow rates of 75 ml/min and 200 ml/min the viable colony forming *Escherichia coli* present in the influent water was effectively eliminated from the effluent water.

Loyola University of Chicago, Foster G McGaw Hospital

Test: Unused Pure Sip purifiers that had been manufactured four years ahead of the testing date were examined for their ability to effectively decrease the amount of *Escherichia coli*, ATCC #25922 in artificially contaminated water.

Results: In all tests, the reduction of the bacteria in the effluent water was significant at greater than 99.99%.

Loyola University of Chicago, Foster G McGaw Hospital

Test: Testing was developed to determine the viricidal capacity of the Pure Sip personal purifier. **The viruses used in the evaluation were; Coxsackievirus type B-2, Echovirus type 6, and Poliovirus type 2.**

Results: The results of three experiments performed with each of the three viruses showed the purifier was repeatedly effective in reducing the infectious virus titer greater than 99.9% in all three viruses.

Loyola University of Chicago, Foster G McGaw Hospital

Test: The experiments were designed to determine the bactericidal capacity of the Pure Sip purifier. In these experiments, 10 liters of water infected with *E. coli* was drawn through 2 separate Pure Sip purifiers on alternate days to test the reuseability of the purifiers.

Results: The results showed a reduction in the bacterial counts in all tests was significant, at greater than 99.99%.

University of Health Sciences, Kansas City, MO

Test: The tests were designed to measure the effectiveness of the Pure Sip purifier in the removal of cysts of **Giardia muris** from water.

Results: In a total of 12 experiments, a 6 log reduction (99.9999% clearance) of *Giardia* cysts was observed in all but two aliquots, and none of the experiments resulted in log reduction less than 4 (99.99% clearance).

Brigham Young University, Department of Zoology

Test: The test was designed to determine the ability of the Pure Sip purifier to remove and/or kill cysts and trophozoites of *Giardia lamblia*. This organism is the main cause of diarrhea in individuals who drink water in mountainous streams.

Results: The Pure Sip purifier was found to be highly efficacious (>99%) against this particular disease agent.

Hazleton Raltech, Inc. (Hazleton Laboratories America, Inc.)

Test: The research was designed to test the efficacy of the Pure Sip purifier in removing pathogenic bacteria from deionized water and river water using the cultures E. coli #11229 and Vibrio cholerae in repeat and continuous conditions.

Results: The testing demonstrated that the Pure Sip purifier will filter sterilize water infected with up to 100,000 bacteria/ml over a period of 20 successive 120 ml passages. The results also demonstrated that the Pure Sip purifier will filter sterilize a continuous flow of up to 2 gallons of water infected with up to 100,000 bacteria/ml.

Department of Air Force (USA), Fairchild AFB

Field Tests (Cold Lake, Canada & Camp Dawson, West Virginia): The test was designed to acquire pertinent information to conclude the value of the Pure Sip for inclusion in survival kits.

Results: Overall conclusions:

- Pure Sip can effectively aid a survivor/evader in all environments where there are standing/running fresh water sources.
- Provides the user with a portable water purifier capable of treating bacteriological contaminated water.
- Pure Sip can be highly advantageous to an evader. It allows secure procurement of water without risking the evader's detection by the enemy.
- Pure Sip is lightweight and easily concealed.
- The construction of Pure Sip allows for safe use.

Department of Air Force (USA), Fairchild AFB

Test: The research was designed to determine:

- The effectiveness of Pure Sip when challenged with of a large concentration of bacteria in the test water (Enterobacter cloacae)
- The ability of non-viable cells to pass through the device

Results: Summarized Findings:

- No viable bacteria were detected in the effluent water
- Microscopic examinations did not indicate the presence of bacterial cells in the effluent water
- PH did not change appreciably
- Testing data indicates the use of Pure Sip results in sterile water and Pure Sip produces a safe and potable product.
- In the studies a total of 38.5×10^9 viable bacteria (colony forming units) was exposed to the Pure Sip device and none appeared in the effluent, presumably rendered non-viable. No significant clogging was observed.
- **It was concluded that Pure Sip should be recommended for inclusion in survival kits and that the device is highly effective and fulfills its design function in all respects.**

Controls For Environmental Pollution, Inc., Santa Fe, New Mexico

Test: The study was designed to test the effectiveness of the Pure Sip purifier for reducing radioactivity in water. Based upon reports from the Chernobyl nuclear accident, it was decided to use Cesium-137 and Iodine-131 as the contaminants.

Results: The testing indicated that the Pure Sip purifiers do effectively reduce the levels of radioactivity in water. Iodine-131 was reduced to non-detectable levels while Cesium-137, despite the initial high concentration, was reduced with a mean efficiency of 82% bringing the reduction of activity within the limits prescribed by the National Interim Primary Drinking Water Standards.

Applied Chemistry Division, Defense Laboratory, Jodhpur, India

Test: The study was designed to test the effectiveness of Pure Sip purifiers to remove E. coli bacteria in water known for high concentrations of E. coli (10^5 MPN/100 ml).

Results: Pure Sip was effective in killing the E. coli used as a contaminant with resulting effluent water found free of the presence of the bacteria.

Consulting Chemists of Florida, Inc.

Test: Pure Sip was tested to establish the comparative purity of lake water and wastewater effluent after passing through the purifiers.

Results: Water from each type of water source was vacuum drawn through the purifier and collected using sterile conditions.

Before passing through Pure Sip (E coli count per 100 ml)

Wastewater Effluent: 3010 Lake Water: 220

After passing through the Pure Sip the E. coli count per 100 ml

Wastewater Effluent: <1 Lake Water: <1

Analytical Services (WA) PTY LTD. Western Australia

Test: Pure Sip was tested for effectiveness in removing E. coli bacteria from the contaminated source water of the Canning River using the Most Probable Number (MPN) method in accordance with the International Standards for Drinking Water as published by the World Health Organization.

Results: The raw/untreated Canning River water had an E. coli concentration (per 100 ml) of 161. After being passed through the Pure Sip purifier the E. coli concentration (per 100 ml) was less than 1. The accepted standard for E. coli in drinking water is a maximum of 2 per 100 ml. **The results show that highly contaminated, non-potable water was converted into microbiologically safe, potable water by the Pure Sip purifier.**

NOTES RELATED TO TESTING

- The Pure Sip pocket purifier used in the testing contained 8 cc's of ViroBac
- Current Pure 2 go Straw purifier contains 20 cc's of ViroBac, two and half times the amount in the Pure Sip tested.
- Point of use 2000 purifier contains 100 cc's of ViroBac, more than twelve times the amount in the Pure Sip tested.
- Point of use 3000 purifier contains 150 cc's of ViroBac, more than eighteen times the amount in the Pure Sip tested.
- Mobile Purification Wagons contain 800 cc's of ViroBac, 100 times the amount contained in the Pure Sip as tested
- Mobile Purification Trailers for surface and brackish water contain 19812 cc's of ViroBac, more than 2400 times the amount contained in the Pure Sip as tested