

# **DESIGN AND TESTING OF A PROTOTYPE SOLAR SANITIZER**

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## **ABSTRACT**

According to the World Health Organization (WHO), many people die of preventable diseases like diarrhea, cholera, pneumonia, and hepatitis A each year. A lack of appropriate water treatment infrastructure, improper waste disposal and inadequate treatment of human waste are common causes of water contamination. In addition to their severe effects on local populations, similar challenges for preventing diarrheal diseases confronted the United States Army during recent deployments in Iraq and Afghanistan.

The common ways to treat human waste for the United States Army include burning, chemical disinfection or burying. Burning and chemical disinfection are harmful to the environment; moreover, both are expensive in terms of the fuel and chemicals that are used during waste treatment. Burying waste under the earth is cheaper but, it could possibly stimulate the growth and spread of bacteria in water sources around rivers and wells if done improperly.

Therefore, there is a significant need for an effective low-cost, low-technology solution that prevents the spread of the above-mentioned diseases for civilians in developing countries and the United States Army. We have developed and tested a device that meets these needs. The device, which we call the Solar Sanitizer, takes advantage of infrared sunlight to kill the bacteria in human waste. This thesis describes the motivation, design, prototype development, and preliminary testing of the Solar Sanitizer.