



Water Box Volunteers Uses Aquagenx CBT EC+TC Kit in Uganda While Field Testing UV Disinfection Product

DayZero International

Water Box Volunteers is part of DayZero International. They are field testing a UV light disinfection product for drinking water in Uganda. <https://dayzerointernational.org/>

Problem

Water Box Volunteers designed a household treatment product for use in developing world cities to replace the common practice of boiling water to make it safe to drink. In most cities of the world, the microbiological safety of drinking water is periodically compromised between the central water treatment plant and the customers. Water Box's product uses UV light for disinfection, which offers an affordable and convenient alternative to boiling water.

They recently conducted field trials in Kampala, Uganda, to collect customer feedback on the product. Rigorous lab challenge tests had been conducted beforehand to ensure the UV product provides a high level of treatment in line with World Health Organization guidelines. However, Water Box Volunteers decided it would also be valuable to test each unit in the field prior to deployment against highly contaminated water for *E. coli* and total coliform removal. The same tests were conducted on each study participant's untreated tap water and then treated water from the Water Box product.

The project is in the general Kampala area where there are microbiology labs. However, lab access is limited and sample delivery to labs while keeping samples cold in transit complicated Water Box's testing procedures and logistics. They needed a simple and reliable way to test water quality in the field without lab access.

Solution

To overcome these challenges, Water Box Volunteers used the Aquagenx [CBT EC+TC MPN Kit](#) to help characterize Kampala city water before and after point-of-use treatment, as part of field trials for their prototype household treatment product.

Water Box partnered with Engineering Ministries International (R&D Center, Kampala), and Uganda Christian University.

Pre-deployment sampling with the CBT EC+TC Kit was used to confirm treatment effectiveness of the UV-H2O-Box household treatment units before deployment, along with other measures such as lab challenge tests. A highly contaminated source water was used for these tests, with *E. Coli* levels typically in the 100 to 1000 colonies per 100 mL range and total coliform levels typically in the 1000 to >10,000 colonies per 100 mL range.



Additionally, the CBT EC+TC MPN Kit was used to determine water quality at participating households for the field trials, including measurement of untreated municipal water, water treated by the prototype UV product, and water treated using the household treatment method currently employed by the household.

Conclusion

Paul Berg, a registered professional engineer who is a Water Box volunteer, says "The CBT EC+TC Kit provides a more straight-forward interpretation of *E. coli* and Total Coliforms density results compared to media plate systems. My primary reason for using the Aquagenx CBT Kit is it provides easily readable results compared to the field use of petri dishes, which often yield ambiguous results."

Berg concludes, "Using the Aquagenx CBT EC+TC Kit gave us more flexibility on when samples could be collected and analyzed, and how many samples we did on any given day."

