

Village Water Ozonation Systems

Brandon Blackhurst and John Khamis

A Global Need

According to the World Health Organization, 2.1 billion people still lack access to safe drinking water.

Our Mission

To provide communities with the cleanest water they can sustainably afford by designing and installing water treatment systems to meet local drinking water needs as part of the global effort to increase access to safe and affordable drinking water for all.

An Approach to Sustainable Solutions

The team has done significant work in the 2017-2018 academic year towards accomplishing our mission with relation to our current clients:

1. Water Purification Choice

- ❖ Familiarized ourselves with current VWOS system: ozone disinfection with pre-filtration with a 300-gallon batch treatment output
- ❖ Prepared a P&ID for the VWOS system to aid in future installation
- ❖ Explored other water treatment methods, such as biosand filtration and ultraviolet disinfection
- ❖ Constructed a biosand filter and UV system and conducted experiments to determine flow rates and disinfection capabilities

2. Water, Sanitation and Hygiene (WASH) Education

- ❖ Integrated concepts from the global WASH initiative to encourage community involvement in hygiene education facets such as hand-washing, the importance of clean water, and disease control into the team's approach

Localized Impact

***Trigo y Miel* Community Center, Oaxaca, Mexico**



- ❖ *Trigo y Miel* provides children with meals, drinking water, medical care, and tutoring
- ❖ A VWOS unit was installed at *Trigo y Miel* in 2016
- ❖ Wendell Robinson (Forward Edge International) and Victor and Lety Velasco (*Trigo y Miel* Directors) have the vision to increase the number of people who have access to clean drinking water
- ❖ Read more about *Trigo y Miel* at www.forwardedge.org!

Oaxaca Site Trip Goals

- ❖ Assess current system condition; provide suggestions to maximize system operation
- ❖ Survey surrounding area for potential locations and water sources for future water treatment systems.
- ❖ Share vision for WASH engagement with interested community leaders



Summer 2018 Team: Michelle Lockwood, Daniel Ma, Brandon Blackhurst, Abigail Poh

Future Work

- ❖ Continue to explore affordable water purification options, such as biosand filtration (BSF) and ultraviolet (UV) disinfection. Test the effectiveness of BSF and UV disinfection through research and experimentation
- ❖ Gather data on viable water sources during Oaxaca Site Trip
- ❖ Potentially design new water treatment systems to continue bringing God's love and the basic human right to clean, affordable water to a world in need
- ❖ Continue to explore new and existing partnerships with target communities in Honduras and Pakistan

Conclusions

- ❖ The successful operation of the current system at *Trigo* community center may show that a similar setup is a viable solution to meet the growing scope of the project
- ❖ We can encourage the longevity of water systems by designing sustainable water systems and sources

Acknowledgements

We would like to acknowledge the hard work of our teammates Daniel Ma, Ted Sindabizera Ntwari and Abigail Poh. We greatly appreciate the immense encouragement and support of our advisors, Michelle Lockwood and Ray Knepper. We also acknowledge the efforts of the Water Testing Team in helping us design water testing experiments.