



# VILLAGE WATER OZONATION SYSTEM

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## Problem Statement

According to the World Health Organization, over 600 million people do not have access to clean water. Without clean water, people can contract waterborne illnesses, which can adversely affect the quality of life in a community.

## Our Mission

At VWOS, we provide communities with a basic necessity by designing and installing affordable water treatment systems.

## Village Water Ozonation System

Past project deliverables include installing ozonation systems in Nicaragua and, more recently, at Trigo y Miel in Oaxaca, Mexico in May 2016.



## How Ozonation Works:

- Ozone is highly reactive
- Ozone contacts bacteria in water
- Bacteria gets oxidized and destroyed
- Water is disinfected

## Advantages:

- Ozone residual continues disinfection
- No chemical odor or taste!

## Disadvantages:

- Costs ~\$3500, which is out of many community's financial capability

## Current Need

### ➤ *Los Prietos, Honduras*

Our purpose this year was to develop an economic water treatment option and a sustainable business plan for a school of 120 children and neighboring community. Less expensive water treatment options were considered as alternatives to ozonation. We estimated the school will need 900 gallons per day.



## Current Designs

### Ultraviolet (UV) Purification System:

- Water treatment achieved by deactivation of bacteria with high energy UV radiation

### Advantages:

- Achieves similar results to the VWOS at less than half the cost (~\$1500 for components and build materials)
- Similar to ozone treatment, UV leaves no chemical odor or taste

### Disadvantages:

- Frequent maintenance needed and costly replacement
- Does not provide disinfection residual, limiting the shelf life of the treated water
- Treatment only works on clear water, achieved by pre-filtration



UV Testing Setup

### Biosand Filtration System:

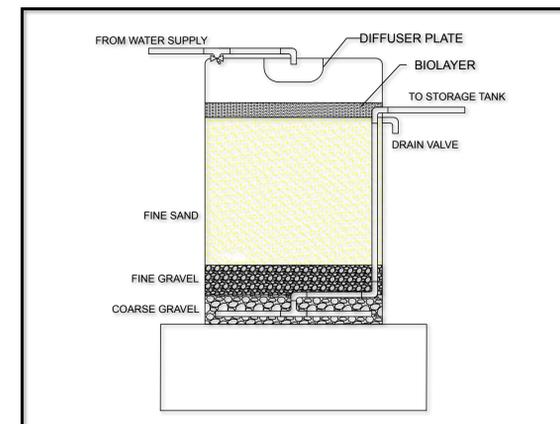
- Pathogens are trapped and consumed by the biolayer, reducing biological contaminants
- The fine sand layers provides mechanical filtration
- Designed to produce 60 gallons a day for students

### Advantages:

- One-time installation with locally sourced materials (~\$300 for components and build materials)
- Negligible operation costs with minimal maintenance requirements
- Proper care may extend operational life to 25 years

### Disadvantages:

- Does not provide disinfection residual, limiting the shelf life of the treated water



Conceptual Design

## Conclusions

The development of the UV system is in its final stages and installation attempts have been successful. The biosand filtration system is in the process of being assembled based on the conceptual design. We plan to implement the two separate systems at the school because they are capable of meeting the needs of the school and the community. The sturdy design of the biosand filter allows it to be installed near the school's sports field while the greater capacity of the UV light allows for the sale of bottled water at a lower cost than it is currently.

## Future Goals

- Complete construction of biosand filter
- Complete testing of UV system effectiveness against bacteria and viruses
- Finalize both system designs for implementation in May 2018

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## Want to know more?

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