



Culligan® UF-P2 CONVOY OF HOPE CASE STUDY

The Culligan UF-P2 Water Filtration System: Smart Well Technology for Disaster Response and Beyond

A Longstanding Commitment to Innovation & Philanthropy

As a global leader in water treatment, Culligan has developed innovative industrial and commercial water treatment systems for over 80 years. The company's worldwide network, strong service capability and revolutionary technology offers customers one source for end-to-end water treatment solutions tailored to help meet their distinct needs. To that end, Culligan is continuously working on innovations to its Culligan commercial and industrial product line and developed a new prototype, the UF-P2 industrial water purification system.

Similar to the company's ongoing commitment to product and solution innovation, Culligan has a longstanding partnership with international relief organization, Convoy of Hope. Through this partnership, Culligan had the opportunity to put the UF-P2 prototype to the test sooner than expected. The systems were pressed into service to provide long-term support to Haitian recovery efforts in the wake of two devastating earthquakes in January 2010. As a result, Culligan realized the ability to use the UF-P2 in disaster response situations; making it no exception to the Culligan product line that can be readily custom-engineered to fit unique applications and environments.



END TO END SOLUTIONS.

The Challenge

Refreshing Contaminated Water in Rural Environments

Polluted and contaminated water is an ever-increasing, global challenge that is swelling to dire proportions. In fact, it now kills more people worldwide than all forms of violence, including wars.¹ As urban populations increase – from a current 3.4 billion to a projected six billion over the next 40 years – providing clean, safe water will only become more complex as most cities currently lack adequate wastewater management due to aging, absent or inadequate sewage infrastructure.¹

Clean, safe water is a scarce resource in rural or developing countries – where 90 percent of the wastewater that is discharged daily is untreated¹. Often this is because it's not possible to connect existing wells to a central filtration device. Culligan saw an opportunity to supply residents in these environments with a water filtration system that could affix to old, existing or new wells, cisterns, tanker trucks or almost any source of fresh water.

Kerry Quinn, Vice President Engineering Culligan noted, “By creating a new smart well technology, we could retrofit existing distribution infrastructure to provide high quality water, which is essential for basic activities like drinking, bathing, cooking and washing, to even the most remote of communities.”



The Solution

A Smart Well for Developing Countries & Disaster Response

Culligan's UF-P2 industrial water purification system was designed to withstand a harsh rugged outdoor environment, be assembled and installed quickly and deliver large quantities of water on short order. Because of the remote location of each “smart well,” seamless operation with little-to-no onsite operator maintenance was essential; as was the system's ability to serve as a long-term solution to help small communities. The UF-P2 is available in two sizes, 2,000 lph (9 gpm) or 4,000 lph (18 gpm), depending upon the available water supply.

A Continuous Supply of Quality Water

The UF-P2 meets the challenge of providing treated drinking safe water in situations where incoming water quality is poor. A built-in pump can draw in water from any local source, including a lake, river or shallow well, using a combination of ultrafiltration membranes and carbon filtration to treat the water and improve its taste. The system also utilizes readily available chlorine to inhibit bacteria and microbiological contamination at the filtration site. Plus, its automatic chlorination capability provides some residual disinfectant for cases where the treated water may be exposed to dirty or contaminated storage containers before use.

Because each unit is capable of processing approximately 12,000 to 24,000 gallons of water a day and includes a water storage tank that holds and dispenses 250 gallons of water, it is ideal for situations or communities that require a readily available sustainable water supply. The system also can operate on gasoline or diesel-powered generators, where a reliable power supply is not readily available. Water quality and system performance can be monitored via a cellular phone connection, where a skilled operator may not be present on site.

Water Purification in Water-Starved and Emergency Conditions

Although initially created to provide treated water to small communities in remote locations or developing nations, the UF-P2's attributes also make it well suited for disaster relief efforts where water supplies are limited. Its ultrafiltration membranes are ideal for emergency situations, because they need only brief periods of backwashing, wasting very little of the available water supply.

“We realized that the systems could have a significant impact in emergency response efforts with a few minor modifications,” said Kerry Quinn of Culligan. “Planned improvements such as a smaller, lighter, two-part design for easy transport, including jugs or containers to transport water, and the ability to run the system using solar power will make it even easier to transport and operate the UF-P2.”

¹Sick Water? The Central Role of Wastewater Management in Sustainable Development. United Nations Environment Programme Report. March 2010. http://www.grida.no/_res/site/file/publications/sickwater/SickWater_screen.pdf

The Results

Delivering Hope through Treated Water

Haiti and its people are no strangers to natural disasters. In 2008 alone, four separate hurricanes or tropical storms swept through the country. But on January 12, 2010, Haiti suffered its most severe tragedy when a 7.0 magnitude earthquake hit just 10 miles west of Port-au-Prince. The quake sent 33 aftershocks ranging in magnitude from 4.2 to 5.9 throughout the country and left millions in need of emergency aid in its wake. Through their existing partnership, Convoy of Hope, and Culligan were able to come together to quickly map out a strategy to provide much needed support to those in need.

Almost immediately, Culligan and Convoy of Hope were able to ship 250,000 bottles of drinking water to earthquake survivors. But water became even more important in the aftermath of the quake as many Haitians remained outdoors, exposed to the heat and sun, for fear of structures collapsing from aftershocks. It soon became apparent that the country was in need of a longer-term solution for treated water to support rebuilding and recovery efforts.

Putting the UF-P2 to Work for Haitian Recovery Efforts

Although still in the prototype phase, Culligan realized the UF-P2 systems were ideally suited to meet the challenging environment of the Haitian earthquake zone. The systems were shipped from Culligan's commercial assembly operations in Libertyville, IL to Convoy of Hope's staging center in Springfield, MO. From there, three units were air freighted into Haiti, originally destined for the Port-au-Prince airfield. However, conditions at the airport caused the flights to be diverted to the Dominican Republic.

"Convoy of Hope has been actively working in Haiti for over three years, and our existing relationships with government officials and agencies helped expedite transportation and installation of the UF-P2 systems," said Kary Kingsland, vice president, disaster response, Convoy of Hope. "Also beneficial was Culligan's brand recognition in Haiti, due to the company's existing water purification and bottling facility located in Port-au-Prince."

The systems were transported by truck across the Dominican Republic into Haiti on unpaved, treacherous roads. Thanks to the UF-P2's rugged design, the systems were delivered to the Mission of Hope in Titayen, a volunteer village/clinic/school in Bon Repo and the Quisqueya Chapel in Port-au-Prince having sustained no damage.

"Our personnel on the ground were able to unload the systems, set them up and start filtering water on the same day," commented Kingsland. "Even though we had never seen or worked with this type of equipment before, the UF-P2 design was user-friendly and required very little training to operate."

Most importantly, water samples taken upon startup verified that the water had no detectable bacteria and contained the appropriate level of residual chlorine.

Maintaining a Measurable, Healthy Water Supply

Since their installation, the UF-P2 systems have been critical to sustaining rebuilding, medical treatment and resident water supply. At the Mission of Hope, 600-800 gallons of water are supplied every three days, medical staff at the orphanage are utilizing water to clean medical supplies, and at the Quisqueya Chapel, 250-300 people benefit from residential potable water per day.

"The water provided by each system is checked once per week for residual chlorine and microbiological contamination," said Paul Coroleuski, field director disaster response, Convoy of Hope. "But, overall, the operator maintenance required to ensure treated water is being delivered is very minimal. In fact, even on the type of water we are treating, we expect that the filters will only need to be replaced every six to 12 months."

Since the day the units were installed the quality of water delivered by the UF-P2 has been high. A detailed laboratory analysis of water produced three months after the initial installation, by Culligan, showed the system produced high quality treated water – and the system flow rate is around 94% of the rate when the units were first installed.

Convoy of Hope plans to continue delivering treated water at all three of the UF-P2 installation sites through March 2011. Specifically, the unit installed at the Quisqueya Chapel will continue to provide residential potable water, while the other two units will support daily operations at the Mission of Hope in Titayen and the volunteer site in Bon Repo.



Looking Longer Term at Global Water Needs

Although originally designed to provide smart well technology in remote environments, the UF-P2 industrial water filtration devices deliver expanded capabilities, as evidenced by their usage in the Haitian recovery efforts. Because of the system's results in Haiti, Culligan has received requests from its International Licensees in the Dominican Republic, El Salvador and Ecuador for similar smart well technology applications. Culligan also has a corporate "Culligan Cares" program that would provide the systems on loan to disaster relief organizations, like Convoy of Hope, for use in emergency response efforts. Once returned, Culligan would refurbish the units and keep them handy for future disaster relief utilization.

The UF-P2 system displays attributes and benefits that are also applicable to a wide range of commercial and industrial markets. This includes temporary drinking water needed at construction sites, drinking water for specialty applications (e.g. apartment buildings, resorts or cruise ships), customized drinking water treatment systems (e.g. mini-water treatment plants) and drinking water treatment for small municipal populations under 10,000 people where distribution already exists.

About Convoy of Hope

Founded in 1994, Convoy of Hope exists to feed millions of people in need in the United States and around the world through children's nutrition initiatives, citywide outreaches and disaster response. To learn more, or to donate, go to www.convoyofhope.org.



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