Dirty waters

EurekAlert

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When a hurricane, earthquake or wildfire strikes, a variety of supplies and equipment is needed to respond and aid victims. But, clean water is a common denominator; its demand is chronic and ubiquitous. In fact, dirty water is one of Mother Nature's overlooked assassins. More than one million people perish each year after imbibing it, and according to the World Health Organization, more than one billion people lack access to its clean counterpart.

Purging water of parasites, viruses, bacteria and other grunge is nothing new. But unlike the fuel-guzzling, generator-driven systems of yesteryear, Homeland Security's Science and Technology Directorate (S&T) is seeking a portable and self-sustaining purifier, one that would lend itself to ready usage on a stand-alone basis.

Several companies responded when S&T issued an operational requirements document (ORD) for a self-contained, self-powered water purification system.

The ORD was released in April 2009 through an S&T public-private partnership known as SECURE (System Efficacy through Commercialization, Utilization, Relevance and Evaluation). The document attracted the attention of several small businesses: WorldWater, Aqua Sciences, RescueWater, Wellspring Trailer Group, First Water, Spectra Watermakers, PureSafe Water Systems and Alten Energy Solutions.

Today, these firms are actively honing their systems to the ORD's specifications. When testing is complete, each firm will deliver its data to S&T. If a technology passes muster, S&T will certify it and the firms can start marketing their wares using the SECURE insignia.

The SECURE seal of approval will help guide emergency managers who must purchase water purification systems.

A peek at some of the proposed solutions shows the SECURE program in action—tapping the free market's ingenuity for the public's benefit.

Consider the Spectra-Pearson Pump from Spectra Watermakers. As it happens, the Spectra pump provides the desalination technology behind the MaxPure. Unlike conventional systems, which consume 35-50 watts of electricity per gallon, the Spectra demands only 8-9 watts per gallon. (For 10 gallons of brackish water pumped, you get roughly one gallon of potable water.) While such levels of efficiency are common at industrial-size reverse-osmosis plants, the Spectra-Pearson can fit into a suitcase. And whereas high-pressure pumps and energy recovery systems typically are two separate entities, the Spectra-Pearson integrates

them into one lean, mean machine.

Another SECURE aspirant, RescueWater from Water of Life, prides itself on going anywhere there is freshwater—water mains, lakes, rivers, wells, and so on. Powered by propane, this submersible pump needs no priming, and its 220 pounds can be deployed to a depth of up to 50 feet in less than three minutes. The pump can disinfect pathogens with ruthless efficiency and deliver up to 17,000 gallons of pristine water per day.

Finally, there's WorldWater and Solar Technology's MaxPure. Whatever the state of the local infrastructure, this lightweight and portable water purifier can be flown in by helicopter or towed in by pick-up truck. Its seven cubic feet and 6,200 pounds arrive on its own trailer, which can be parked alongside any water source, as long as it gets sunlight. Put the system's pump in the water, flip a switch, and within 20 minutes you'll have a flow of thirst-quenching, life-saving water.

At full capacity, MaxPure can generate up to 30,000 gallons a day. For daily operation, the MaxPure needs five hours of sun exposure. Its six-foot by three-foot grid of solar panels can pocket the leftover exposure into a 31 kWh battery bank for cloudy conditions. The panels generate electricity, powering the pump to draw the water through a series of hoses and filters before storing it in a 2,500-gallon tank.

The end result: potable H_20. The net cost: a penny a gallon. The beneficiaries of this S&T project no doubt will drink to that.

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