

An Innovative Solution FOR OIL & GAS WASTEWATER

A water management technology that cut its teeth on natural gas wells in the Woodford and Fayetteville shale plays can be equally effective on liquid plays such as those found here on the Bakken, says Ecosphere Technologies Inc., a water engineering, technology licensing and environmental services company based in Florida.

Current economic and environmental pressures are driving greater awareness of the urgent need for intelligent resource conservation. Through invention and application of its innovative technologies, Ecosphere is helping organizations improve their water treatment practices so they can meet both production goals and environmental requirements successfully.

Ecosphere has developed, patented and fully commercialized an advanced oxidation water treatment process, called Ozonix™, that allows operators to replace the liquid chemical biocides and scale inhibitors typically used on the front end of hydraulic fracturing operations and then re-use 100% of the flowback and produced waters on the back end. As a result, Ecosphere's Ozonix™ technology is helping operators save millions of gallons of this valuable resource, while eliminating the need to truck wastewater to deep injection wells for disposal.

Since 2008, Ecosphere has been operating this liquid chemical-free water treatment and water recycling technology for major oil and gas companies such as Newfield Exploration in the Woodford shale and Southwestern Energy in the Fayetteville shale. To date, Ecosphere and its energy subsidiary, Ecosphere Energy Services, have treated more than 1 billion gallons of water on nearly 500 oil and gas wells around the United States.

Ecosphere's latest product, the Ozonix™ EF80, is a mobile water treatment system housed in a 53-ft trailer that goes from well site to well site and processes



Ecosphere's Patented Ozonix™ Technology
Used on 500+ Oil and Gas Wells

up to 80 barrels of water per minute OR approximately 3,360 gallons per minute – the real-time flow rate of a fracturing operation. The system is currently available to U.S. onshore oil and gas operators through Ecosphere's sub-licensee, Hydrozonix LLC. Hydrozonix has most recently deployed the technology in the Permian Basin and Eagle Ford shale plays.

Ozonix™ is a patented ozone-based advanced oxidation process that treats industrial wastewaters without the use of liquid chemicals. Ozonix™ oxidizes heavy metals and eliminates highly resistant bacteria, biofilms and the food source for microorganisms. The Ozonix™ process does this by combining ozone with proprietary hydrodynamic cavitation, acoustic cavitation, and electro-oxidation technologies.

In March, the Company and its sub-licensee Hydrozonix signed a letter of commitment with the Blackfeet Nation to work with oil and gas companies to provide the Ozonix™ process to treat waters used in the production of oil and gas on the Tribe's 1.5 million acre reservation, which sits on top of the western reaches of the prolific Bakken shale.

Several major oil and gas companies have all secured mineral rights from the Blackfeet Tribe and are actively drilling vertical and horizontal wells on the reservation to pursue the Southern Alberta Basin, which includes the Bakken, Three Forks, Nisku and Lodgepole formations. The Devonian-Mississippian Bakken shale on the Blackfeet reservation is a widespread, organic-rich marine source rock that has been a known producer in the Williston Basin.

Customers are seeing the benefits of deploying Ecosphere's Ozonix™ technology first hand, which include:

- Eliminating costly biocides and scale inhibitors typically used for bacteria and corrosion control
- Oxidizing contaminants, killing bacteria and



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With a decade of focused research, development of patented technologies, and successful large-scale water projects completed, Ecosphere is focused on providing energy exploration and production companies with a cost-effective solution to recycle millions of gallons of wastewater each year, mitigating regulatory risk and improving the economics of each well, while safely developing our nation's energy reserves, and improving energy security. ■