

End Water Worries



Managing Wastewater In The Marcellus And Utica Shales





Introduction

A decade ago, extracting natural gas from the Marcellus Shale was commercially unfeasible. Technology has fueled opportunity for unconventional gas production that has brought new challenges for managing water and wastewater concerns associated with natural gas drilling and production.

Brief History

In Pennsylvania, where the booming natural gas industry is a relatively new phenomenon, strategic planning of infrastructure has included a focus not only on water use, but on reuse and alternative methods for recycling and disposal.

The critical importance of water in the region is also a focus of the U.S. Environmental Protection Agency, which is conducting a study of fracking’s impact on fresh water and drinking water, specifically with regard to hydro-fracturing of shale formations.

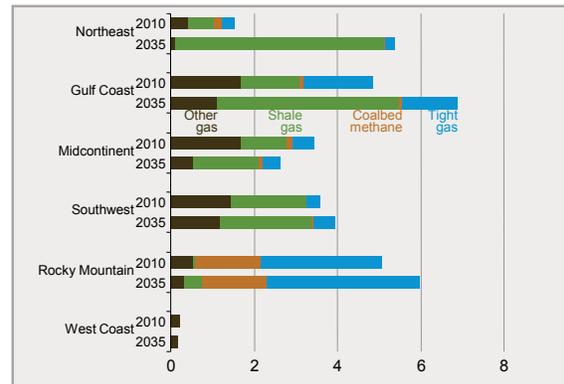
For companies operating in the Marcellus Shale region, sensitivity to water concerns and environmentally responsible stewardship of those resources is a primary focus, fueled both by regional concerns and lessons learned from other parts of the country.

In Texas, for example, water has always been a valuable commodity, and getting water to where operations are has presented major challenges and expense. A 2012 study by the Bureau of Economic Geology at the University of Texas reported that only five percent of water used in fracking was recycled or reused in the Barnett Shale. Also in Texas, studies show stresses on the freshwater supply of as much as 20 percent of total water used in areas surrounding major production sites.

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Water resource strategies have been forefront in Pennsylvania prior to unconventional well drilling, and they remain a focus for good reasons as production continues to increase.

Lower 48 onshore natural gas production by region, 2010 and 2035 (trillion cubic feet)



U.S. Energy Information Administration | Annual Energy Outlook 2012

The Department of Energy Annual Energy Outlook 2012 projected that natural gas production in the Marcellus Shale will increase by 5.2 percent per year for at least two decades. That’s an increase of trillions of cubic feet per year of natural gas.

As field development increases, water use and wastewater generation does too. Already since 2004, total wastewater generated in the Marcellus Shale region has increased by 570 percent.

Since shale wells continually generate wastewater throughout the entire production period, additional efforts are being focused on technologies that can manage these long-term needs. The combined technologies offer various levels of treatment alternatives for shale development and produced wastewaters. There is a focus on maximizing recycling where it is economical and providing a disposal option when required. As areas of the play become developed, the need for disposal options will increase.

Pressures in Pennsylvania include additional disposal concerns around movements in Ohio to shift transportation strategies, limit or possibly ban deep well injection in that state.



Wastewater Management Options

In Pennsylvania, Publicly Owned Treatment Works, POTWs, are no longer accepting untreated Marcellus Shale development or produced waters. High levels of total dissolved solids and the increased volume of wastewater has led to regulations that are co-evolving along with industry's adoption of new technologies and services.

Current wastewater management options for Marcellus and Utica Shale wastewaters include:

- 1) Partial treatment at a WMGR123 permitted private industrial wastewater facility and indirect discharge to a POTW for further treatment, followed by discharge to a local waterway;
- 2) Treatment at a WMGR123 permitted private industrial wastewater facility, followed by reuse of the treated water or discharge to a local waterway;
- 3) Transporting the wastewater to where underground injection capacity exists (typically in Ohio);
- 4) Partial treatment at a WMGR123 permitted private industrial wastewater treatment facility and recycling of wastewater for continued reuse in hydraulic fracturing.

The treatment and recycling of wastewater for reuse comes with many advantages. Freshwater costs are dramatically reduced as are transportation costs. For companies in the Marcellus Shale, conveniently located wastewater treatment facilities make it possible to efficiently deliver their wastewater for pretreatment, and then accept delivery of treated water for re-use. The reduction in need for freshwater, and the reduced transportation and disposal costs are significant.

Achieving Wastewater Management Success

Industry research indicates that in 2011, 50 percent of wastewater generated in Marcellus Shale operations was recycled for additional well development. In 2012, of the approximately 29 million barrels of

development and produced wastewater generated in the region, approximately 4 million barrels required treatment and disposal, the rest was recycled and reused.

Eureka Resources, LLC, of Williamsport, PA, has been treating wastewater in the Marcellus Shale Play since 2008 in accordance with Pennsylvania Department of Environmental Protection and other regulatory requirements. The company's wastewater treatment facilities serve dozens of drilling companies operating in the region. The company's strategy has been to strategically site centralized treatment facilities for treating developed and produced wastewaters with the required focus on reuse by E&P companies as well as a disposal option when necessary. Plants in Williamsport and near Towanda are designed to treat tens of thousands of barrels of wastewater per day.

The flexibility of the Eureka Resources wastewater treatment technologies and services allows the company to accept, treat and manage both development water and produced wastewaters. Since the physical and chemical properties of development and produced wastewaters vary considerably depending on the geographic location in the field, the host formation, and the type of hydrocarbon product being produced, processes are customized to ensure that all constituents of interest (suspended solids, salt content, and naturally occurring organics) are managed, along with drilling muds and fracking additives.

John Tintera, the president of the Texas Water Recycling Association, says the practice of water recycling in oil and gas production in Texas, while not a focus for decades, is also growing there. He predicts that in ten years the practice of wastewater recycling will have "saved the day" for drilling operations across the country.

In Pennsylvania, wastewater management strategies, including responsible recycling and disposal, are proving to be economic benefits to E&P companies, as well as the communities that are both benefitting from and are impacted by Pennsylvania's natural gas boom.

Eureka Resources

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For More Information

The resource management experts at Eureka Resources, LLC, can assist in determining the best strategy for wastewater pretreatment, discharge, reuse, recycling, and disposal for companies operating in the Marcellus and Utica Shales. The company's current expansion efforts in the region, along with the implementation of advanced technologies, will ensure additional capacity to meet continued growth in demand. For more information, visit www.eureka-resources.com.

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