

# FLOWBACK (WASTEWATER) FROM HYDRAULIC FRACTURING

*Hydraulic fracturing has been used in Ohio since the 1950s as part of the oil and gas well completion process. About 80,000 wells have been stimulated in Ohio by hydraulic fracturing.*

## WELL STIMULATION BY HYDRAULIC FRACTURING

After the drilling process is complete, a mixture of water, sand and chemical additives is pumped under pressure to fracture the reservoir, which enhances the flow of oil and gas to the wellbore.

Most of the water used in fracturing remains thousands of feet underground, however, about 15-20 percent returns to the surface through a steel-cased wellbore and is temporarily stored in steel tanks or lined pits. The wastewater which returns to the surface after hydraulic fracturing is called flowback.

- It can take 4 million gallons or more of water to complete a multi-staged hydraulic fracturing stimulation for a horizontally drilled shale well, compared to around 4 million gallons used monthly by an average golf course during the summer.
- Sand helps to prop the fractures open which enables the natural gas to migrate through the shale reservoir to the steel-cased well bore to reach the collection point.
- Chemical additives typically make up a small percentage of the fluid volume. Benefits provided by these chemicals include preventing corrosion and reducing friction. Most additives have other common uses including water treatment and household cleansers.

In Ohio, most is recycled or injected into Class II injection wells to deep zones that naturally contain water of similar chemistry below the deepest useable groundwater aquifers. Permits for these types of wells are issued by the Ohio Department of Natural Resources (ODNR) Division of Oil and Gas Resources Management (DOGRM).

## SEISMIC MONITORING

In response to concerns regarding the potential for Class II injection to cause induced seismicity, Ohio has taken proactive steps to become a national leader in this area. The DOGRM has installed 19 seismic monitors across the state and, in real time, can monitor any potential seismic activity in proximity to injection wells or oil and gas production operations. The DOGRM is committed to gathering accurate data to better understand seismic activity that occurs within the state and its various causes.



*Shale drill sites use a series of stainless steel tanks to collect flowback from hydraulic fracturing.*



*In Ohio, oil and gas operators must either recycle their wastewater or inject it into Class II injection wells.*



*Seismic monitoring stations provide real time information on potential seismic activity in proximity to both production wells and injection wells.*



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