



*Last updated: Jan. 3, 2012*

## General background on injection wells

- Injection wells have been used to dispose of wastes deep underground since the days of Constantine. According to EPA: “The use of injection wells was documented as early as A.D. 300. ... large-scale commercial use of injection wells in the U.S. began in the 1930s.” (EPA, [History of UIC Program](#))
- The use of injection wells is regulated under the Underground Injection Control program of the federal Safe Drinking Water Act, passed by Congress in 1974. EPA administers the UIC program, and delegates regulatory authority over SDWA to the state of Ohio.
- The state of Ohio (via Ohio DNR) issues UIC permits for Class II wells, but the standards in place for construction, maintenance, and continuous monitoring of those wells are set by the federal EPA. A complete rundown of those standards can be found [in this document](#), starting on page 76. Ohio EPA issues permits for Class I wells, which store industrial waste.
- Roughly 144,000 Class II injection wells are in operation in the United States today. On average, those wells accept more than 2 billion gallons **a day** of wastewater associated with oil and natural gas development. ([EPA website](#), “What Is a Class II well?”)
- In contrast, the state of Ohio is home to only 181 Class II injection wells – or 0.12 percent of the nation’s total. In 2011, Ohio accepted an estimated 1.03 million gallons of wastewater for disposal per day – or **less than 0.05 percent** (five hundredths of one percent) of the total nationwide volume. (ABJ, [Oct. 2, 2011](#))
- The use of injection wells as a safe disposal means for produced water in Ohio was mandated in April 1985 with the passage of House Bill 501, a bipartisan bill that was signed into law by a Democratic governor (Celeste).
- The oil and gas industry isn’t the only industry that has used injection wells as a safe and well-regulated disposal means. Other sectors that rely on injection wells include: chemicals, manufacturing, food and agriculture, plastics and metal/steel. According to EPA: “Injection [is] a **safe and inexpensive option** for the disposal of unwanted ... industrial byproducts.” ([EPA UIC website](#))
- Ohio is home to 10 so-called Class I wells (industrial wastes) and 58 Class III disposal wells. Class III wells inject fluids to dissolve and extract minerals such as uranium, salt, copper, and sulfur. There are approximately 18,500 Class III wells in operation across the nation. (EPA’s [Class III](#) page)

## Seismic events in no way connected with hydraulic fracturing

- Dr. William Leith, seismologist with the U.S. Geological Survey: “The fracking itself probably does not put enough energy into the ground to trigger an earthquake. ... **They’re not a safety hazard.** ... They’re really not something that we should be concerned about.” (NPR, Diane Rehm Show, Dec. 19, 2011; 28:50 of [this audio](#))

- USGS has produced more than a dozen reports on the connection between seismicity and deep-well injection since 1956. In a report issued in 1992, the USGS research team suggested “the phenomena of earthquakes triggered by deep well activities are certainly not new or unusual.” (paper abstract available [here](#))
- Youngstown Vindicator: “Many Mahoning Valley residents have taken to Twitter, Facebook and have called local politicians calling for a statewide ban on fracking, **mistakenly believing** that the process has caused 11 Valley earthquakes this year. ... The brine injections is a separate practice from fracking.” (Vindicator, [Jan. 2, 2011](#))
- Associated Press: “Hydraulic fracturing involves injecting millions of gallons of water, sand and chemicals deep underground to break up rock. While that may sound like it could cause an earthquake, experts say the process **doesn't pack nearly the punch** of even a moderate earthquake. ...The typical energy released in tremors triggered by fracking, ‘is the equivalent to a gallon of milk falling off the kitchen counter,’ said Stanford University geophysicist Mark Zoback.” (Associated Press, [Nov. 7, 2011](#))
- Ohio Dept. of Natural Resources: “The seismic events are not a direct result of fracking.” (ODNR director Jim Zehringer, as quoted in Wall Street Journal, [Jan. 2, 2012](#))
- Wastewater is produced in an oil and gas context whether or not a well is fractured; whether or not a well is vertical or horizontal; and whether or not the target formation happens to be a shale, sandstone or limestone. Conversations about injection wells have nothing to do with the current debate over shale, fracturing and/or horizontal drilling.