



Water Use in Association with Oil and Gas Activities

Source: <http://www.rrc.state.tx.us/about-us/resource-center/faqs/oil-gas-faqs/faq-water-use-in-association-with-oil-and-gas-activities/>

Which oil and gas activities require the largest volumes of fresh water?

The largest volume of water is used in enhanced recovery. This water is primarily saline or brackish water. Enhanced recovery refers to techniques that make it possible to recover more oil than can be obtained by natural pressure, such as the injection of fluid or gases into an oilfield to force more oil to the surface.

The next largest volume of water is used during the drilling and completion of oil and gas wells. Water is used during drilling for drilling fluid preparation and make-up water for completion fluids, including cementing, in well stimulation, as rig wash water, as coolant for internal combustion engines, and for workers' on-site sanitary purposes.

Fresh water is used in oil and gas well stimulation. Stimulation methods include acidizing and/or hydraulic fracturing. In order to be able to produce oil and gas at volumes and rates that are economical, reservoirs with low permeability must be treated. One method of treatment to increase permeability is hydraulic fracturing treatment or "fracking."

Hydraulic fracturing consists of pumping into a formation large volumes of fresh water that generally has been treated with a friction reducer, surfactant and clay stabilizer to create a gel that is used to transport sand into the formation. The gelled fluid is pumped under pressure to create and propagate a fracture or crack into the formation. The sand, known as proppant, is carried in the gel and is deposited into the fracture to "prop" or hold it open. The fracture treatments are designed to increase fracture length and minimize fracture height. The fractures result in increased surface area within the reservoir, which expands the productive area of the formation, and results in increases in the desorption of the oil and gas from the shale and increases in the mobility of the oil and gas. The result is lower completion costs and faster recovery of a larger volume of gas-in-place. The volumes injected during hydraulic fracturing treatment can range from 70,000 barrels in a vertical well to more than 90,000 barrels in a horizontal well. Hydraulic fracturing, where necessary, generally takes place immediately after drilling and periodically during the life of a well.