

How Is Uranium Mined in Texas ?

The two uranium mining techniques that have been used in Texas are open pit mining and *in situ* mining. Shallow uranium deposits that occurred above groundwater at depths typically no deeper than 300 feet in Karnes County were mined simply by digging open pits. Most of the open pit mining for uranium occurred in Karnes County, although some occurred in Gonzales, Atascosa, Live Oak, and McMullen counties. Deeper deposits in Brooks, Kleberg, Jim Hogg, Duval, Webb, Bee, Live Oak, and Karnes counties have been mined using *in situ* mining techniques.

In situ mining involves injecting fluids into the ground to dissolve minerals, then pumping the fluids to the surface where they are processed to recover the minerals. *In situ* mining for uranium generally reverses the process by which nature formed the uranium deposits. A leaching solution is injected into the uranium-bearing zone through injection wells arranged in a pattern designed to efficiently recover the uranium. The leaching solution circulates through the uranium-bearing zone and dissolves the uranium. The uranium-bearing solution is then recovered through production wells (see Figure 1). In the past, the leaching solution was an acid solution. More recently, the leaching solution typically consists of groundwater supplemented with oxygen and bicarbonate ions, which is safer and better for the environment. At the surface, this solution is processed to remove the uranium. The water is then refortified with oxygen and bicarbonate ions and reused for additional *in situ* mining.

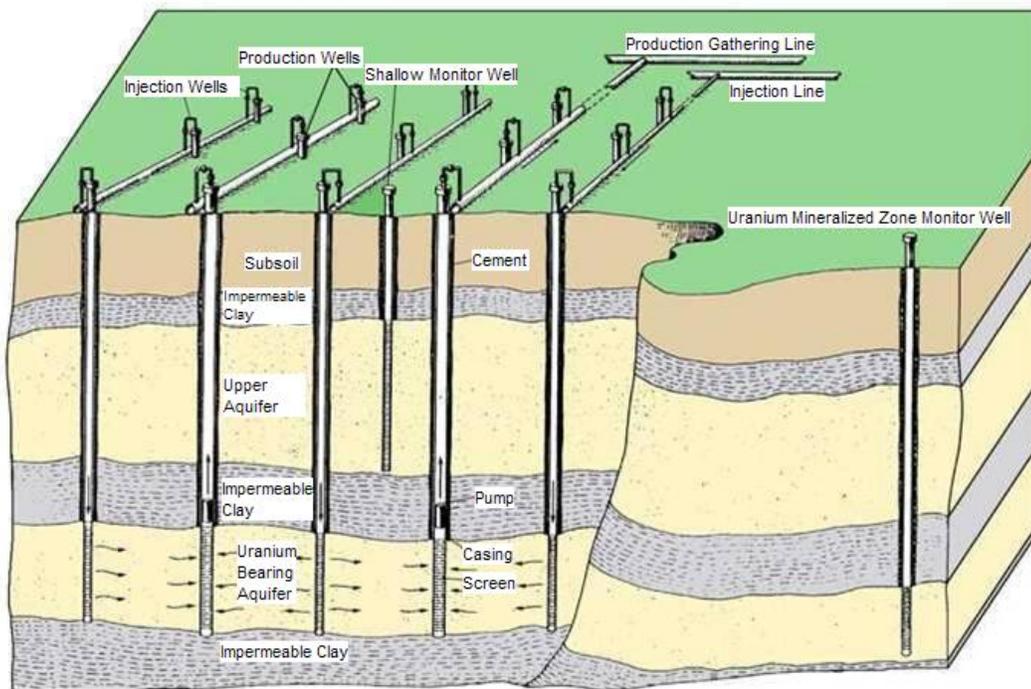


Figure 1. *In Situ* Uranium Mining Operation

Exploration drilling for uranium and open pit mining of uranium are regulated by the Railroad Commission of Texas (RRC). There are no longer any active open pit uranium mines in Texas. Most of the old open pit mines and mill sites have been reclaimed through a program managed by the RRC.

In situ mining and uranium processing plants are regulated by the Texas Commission on Environmental Quality (TCEQ). There are five active *in situ* uranium mining sites in the state – one in Brooks County, one in Kleberg County, and three in Duval County – and one inactive *in situ* processing facility in Karnes County, presently undergoing license renewal. In addition, an *in situ* uranium mining permit application for a site in Goliad County is pending.

References:

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- RRC Surface Mining and Reclamation Division (SMRD), <http://www.rrc.texas.gov/about-us/resource-center/faqs/mining-exploration-faqs/faq-surface-mining-and-reclamation-division-smrd/>
- Smith, Gary, TCEQ Underground Injection Control (UIC) Team, personal communication, June, 2009.

For additional Frequently Asked Questions (FAQs) related to groundwater quantity, groundwater quality, septic systems, water wells, administrative entities, and

publications, visit the Texas Groundwater Protection Committee's FAQ webpage at <http://tgpc.state.tx.us/frequently-asked-questions-faqs/>.