Uranium In-Situ Recovery at Zuuvch Ovoo

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Aerial view of the Pilot cell, Zuuvch Ovoo

Badrakh Energy LLC is conducting mining development operations at Zuuvch Ovoo, including detailed feasibility work and an in-situ recovery (ISR) pilot test.

What is In-Situ Recovery (ISR)?

- ISR is a proven method of extracting uranium from sandstone-type uranium deposits which cannot be mined using the conventional open cast or underground mining techniques.
- ISR is now the method the most frequently used to mine uranium. Approximately 48% of the world uranium production comes from ISR mines.
- ISR is also used to extract other metals, especially copper.

The pilot test results will provide information for the Zuuvch Ovoo Project feasibility study and confirm technical parameters such as uranium recovery and acid consumption.

The pilot will provide data to confirm the low environmental impact of the ISR mining method.

Another objective of the pilot test is to involve local communities in the monitoring of the test, thus contributing to the societal and environmental acceptance of the project.

The pilot test will extract uranium from the deposit using two production cells. This uranium will then be processed on site to produce approximately 20 tons of uranium concentrate, which will be exported.

How does ISR work?

- "In-situ" is a Latin word that means "in place" or "in the natural or original position". It is used in "In-Situ Recovery" because with ISR, the target metal is recovered from its deposit without excavating the host rock.
- ISR utilizes wells to inject a leach solution into the ore zone. Acidified water is the most frequent type of leach solution used in ISR. The acid solution dissolves the uranium while moving through the ore in a controlled manner to reach pumping wells (also called recovery or production wells), where it is pumped to surface for processing. Uranium is extracted from the solution to produce a saleable uranium concentrate.
- For ISR to be effective, the ore zone must be located in a permeable formation, such as sand. This formation should be naturally isolated by non-permeable rock, such as clay, located above and below the ore zone.

Advantages of ISR compared with other mining methods

ISR has become a popular method because it has economical, technical and environmental advantages over conventional open cast or underground mining:

- Lower capital costs (no mining fleet, no ore crushing, simpler processing plant)
- Lower operating costs (no blasting, no earth-moving)
- Greater flexibility in production capacity
- No waste or ore removed
- No creation of open pits, waste dumps or tailings
- No mine dewatering
- Minimal visual disturbance
- Minimal noise, dust and diesel emissions (minimal use of heavy equipment, no haul road)

Groundwater protection principles

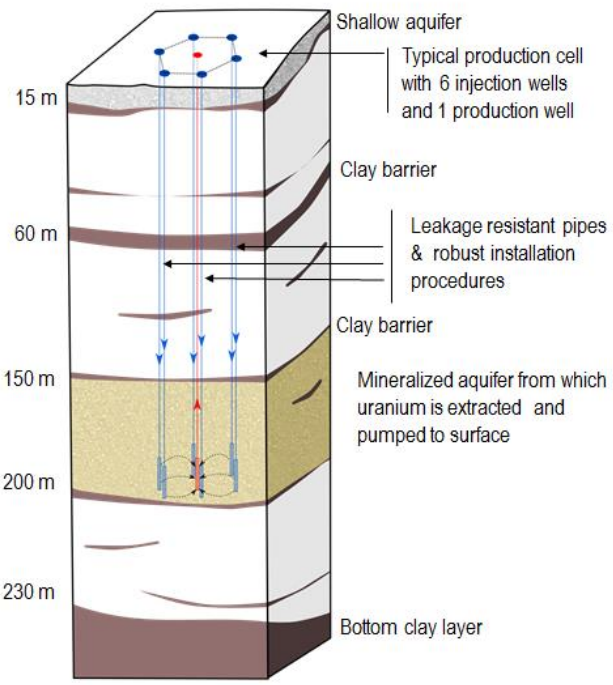
The major environmental issue associated with ISR is the protection of groundwater. The following groundwater protection principles apply:

- The local groundwater system is fully mapped prior to ISR mining
- ISR mining should not compromise a water resource usable for drinking purposes
- At no stage should ISR mining compromise groundwater use in the mineralized aquifer outside an agreed distance (not exceeding a few kilometers)
- ISR mining should not affect other aquifers present in the mining area
- Control wells are positioned within and around the extraction area to monitor groundwater flow and quality during operation
- After remediation, the post-mining groundwater quality should be returned to its pre-mining class of usage

Why is ISR the right approach for the Zuuvch Ovoo Project?

- The Zuuvch Ovoo deposit is located below the water table, at a depth ranging from 150 m to 200 m, in permeable and poorly consolidated sand. These conditions are not favorable to traditional open cast or underground mining methods.
- Furthermore, the grade of the deposit is low (i.e., only 220 g of uranium per ton of rock) making ISR the only technically and economically viable mining method for this deposit.
- Groundwater conditions in the Zuuvch Ovoo area have been studied since 2006 through a network of 200 monitoring wells. Based on this monitoring network, it is confirmed that:
  - The deep aquifer that contains the mineralization is well isolated from the shallow aquifer by numerous clay barriers. Therefore the few historical wells located in this upper aquifer are not impacted by this extraction process.
  - There is no drinkable groundwater source in the area. Groundwater is characterized by naturally high concentrations of sodium, chlorine, uranium and many other elements. As a result, groundwater chemistry is not suitable for drinking purposes according to national and international standards.

Principle of ISR at Zuuvch Ovoo



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