INHERENTLY SAFE IN-SITU URANIUM RECOVERY

TECHNOLOGY READINESS LEVEL: 5

EARLY LAB PROTOTYPES HAVE DEMONSTRATED PROOF OF CONCEPT

US PATENT PENDING

TECHNOLOGY SUMMARY

As uranium mining continues to grow in the United States, so do the concerns over its environmental impact. An approach that may alleviate some of these problems may be in situ recovery (ISR) of uranium which involves circulating reactive fluids through an underground uranium deposit. These fluids contain chemical agents that dissolve the ore so uranium can be recovered once the fluid is pumped back to the surface. New and more stringent standards of uranium traces in drinking water are making mining operations more difficult and costly.

Our technology package has four pieces that integrate a green "leaching" process that immobilizes uranium and other trace metals, a back up decontamination process, optimized well-field design that increases uranium recovery efficiency while reducing contaminated water, and finally a protocol for long-term monitoring. The process is environmentally friendly because the land surface is not degraded by mining or ore milling operations. The mobility of these pollutants can be tied to the artificial oxidizing condition imposed on the aquifer by the ISR activity. Our set of novel technologies will be used to re-impose reducing conditions on the aquifer once the mining process has been completed. This could potentially restore the aquifer to a suitable condition for regulatory bodies would be more inclined to sign off on final site closure plans.

POTENTIAL APPLICATIONS

- Nuclear power and waste
- Mining operations

TECHNOLOGICAL BENEFITS

- Increased safety of uranium removal
- Environmentally friendly process
- Restoration of aquifer to regulatory standards
- Reduced cost
- Greater efficiency

TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

ip@sandia.gov

Refer to SD # 11501, 11503, 11505, or11506

Or visit

https://ip.sandia.gov

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