



Samphire Uranium Project - In Situ Recovery (ISR)



WHO IS ALLIGATOR ENERGY?

Alligator Energy Ltd is an Australian exploration company listed on the Australian Stock Exchange (ASX). The company focuses on exploring uranium and other energy-related minerals, with active projects in South Australia and the Northern Territory.

These include the Samphire and Big Lake uranium projects in South Australia, and the Alligator Rivers project in the Northern Territory.



SAMPHIRE PROJECT OVERVIEW

The Samphire Uranium Project is located around 20 kilometers south of Whyalla in regional South Australia, near the Mullaquana Road area. The project includes two historical uranium deposits, Blackbush and Plumbush.

In 2025, Alligator Energy will conduct a short-term small-scale Field Recovery Trial (FRT). The goal of this trial is to test the use of the In-Situ Recovery (ISR) mining method at Samphire.

ISR is a mining technique used in around 60% of the world's uranium production and has been safely employed at other mining operations.



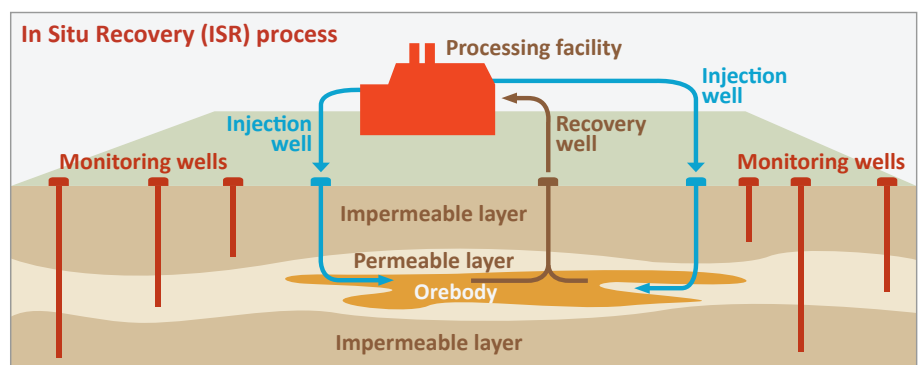
WHAT IS IN SITU RECOVERY (ISR)?

Alligator Energy acknowledges and respects that the topic of uranium is a concerning one for some people. Equally, Alligator Energy respects the importance that local communities place on groundwater, aquifers, and any natural or man-made water sources, and acknowledges the concerns stakeholders may have regarding mining activity taking place near these sites.

We will always work to better understand any concerns people have and provide information about the project and the environmental protections that must be followed as transparently and openly as possible. The ISR method involves reversing the natural process that deposited the uranium in the first place.

ISR is also known as 'invisible' mining due to its extremely low visual impact – there is no digging or moving tons of overburden material (i.e. rock or dirt) in the same way that you would see in open cut or underground mining. At the Samphire Project, the uranium occurs within compacted sand beds 60m to 80m below the surface deposited in the tertiary period 5.3 - 23 million years ago. The uranium occurs around and in between the sand grains which also houses hypersaline groundwater. This is called the Tertiary Aquifer and is where ISR is proposed to be undertaken to extract the uranium.

The Tertiary aquifer is capped both above and below by impermeable layers of clay (confining layers) meaning the groundwater can only move laterally but not up or down. The upper confining layer is 40-50m thick making it much deeper than and separated from the Spenser Gulf ~ 3.6km away. Independent external modelling confirms there is no interaction between the contained aquifer (sand beds) containing the uranium and the waters in the gulf.



To find out more about Alligator Energy's projects, you can reach us at:



Call our community line on
1800 954 140



Email:
feedback@alligatorenergy.com.au



To subscribe to digital updates visit:
alligatorenergy.com.au/projects/samphire



WHAT APPROVALS ARE REQUIRED?

Before the Field Recovery Trial (FRT) can begin, Alligator Energy needed to secure a Retention Lease (RL) from the Department of Energy and Mining, which was approved in January 2025. The FRT will be regulated by several agencies, including the Department of Energy and Mining, the Environment Protection Agency (EPA), the Department for Environment and Water, and SafeWork SA.

Once the RL is in place, Alligator Energy must also obtain approval for a Program for Environmental Protection and Rehabilitation (PEPR) from the State Government. The PEPR outlines how the environment will be protected during and after the trial, including plans for managing the site.

The trial aims to test the use of the In-Situ Recovery (ISR) method on the Blackbush deposit, with the findings from earlier scientific tests supporting its use. The trial will take place on a small area of land within the 250-hectare RL, and the area will be rehabilitated after the trial.

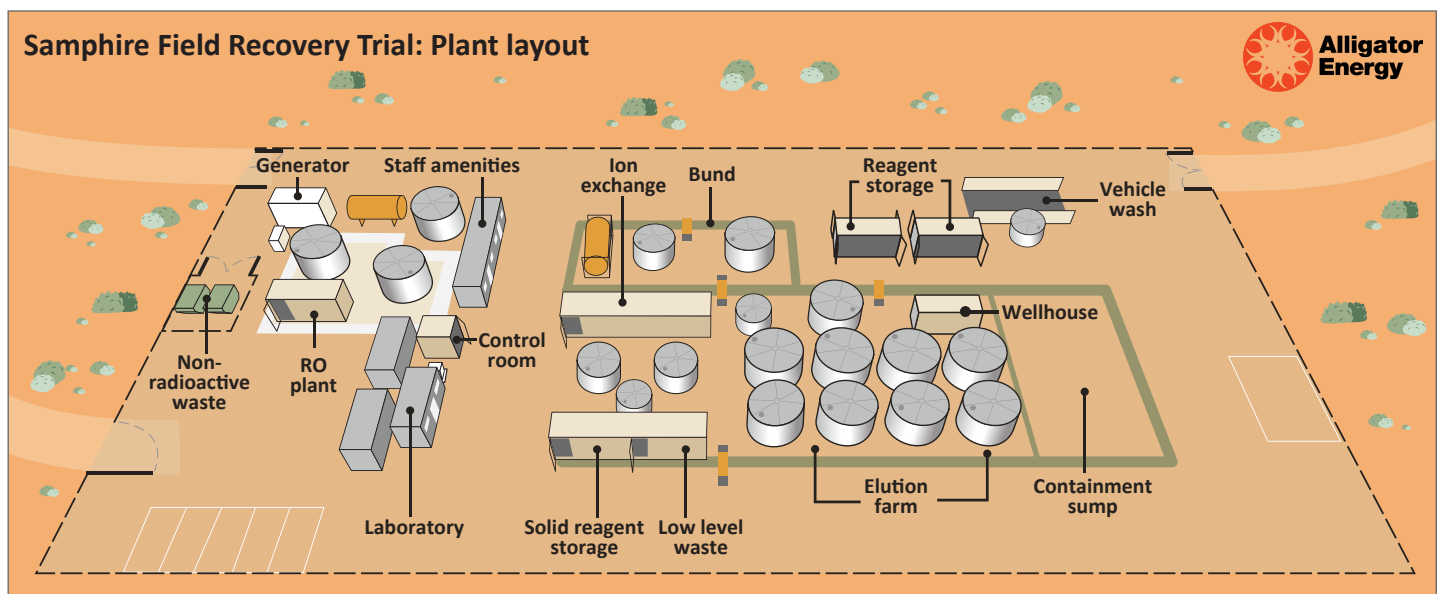
Monitoring wells will ensure there is minimal environmental impact, and any groundwater used during the trial will be safely neutralised. No uranium oxide will be produced during the trial, and any extracted uranium will be securely stored.

If the trial is successful, Alligator Energy will consider a larger-scale mining operation, but further approvals will be needed from both State and Federal Governments before any full-scale mining can occur.

The natural chemical process that deposited the uranium millions of years ago is called reduction. The extraction of uranium is achieved by reversing this chemical process (i.e. oxidation). This is done by circulating the native groundwater within the orebody through an injection and recovery well network. The network is dosed with oxidant reagents (4L of oxidant to 10,000L groundwater) to enhance uranium extraction.

The uranium, which is attached to the sand particles then dissolves into the groundwater and is pumped to the surface where the uranium is removed from the groundwater in the processing plant. The barren groundwater is then re-dosed with oxidant and recycled through the process until most of the uranium is recovered from the orebody. No water is permanently added or removed, nor is any sand brought to the surface during the ISR process.

Under strict State and Federal regulatory requirements, any ISR operation in Australia must demonstrate the groundwater used in the ISR process will neutralize within pre-determined and approved (by regulators) distances from the injection/recovery wells. For the FRT, mathematical and chemical modelling undertaken by an independent expert shows the groundwater will return to its original hypersaline state (neutralise) within a short distance of the FRT wells which will be measured to verify the modelling after the FRT is completed. This process of neutralisation has been proven to work at other ISR operations in South Australia.



COMMUNITY ENGAGEMENT

Alligator Energy is committed to building positive, collaborative relationships with stakeholders who may be impacted by or have an interest in our activities. We work closely with local communities to ensure that the land we use is left in a better state than when we began.

Our approach emphasizes environmental care, safety, and health, ensuring that our operations benefit the community while protecting the surrounding environment.

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