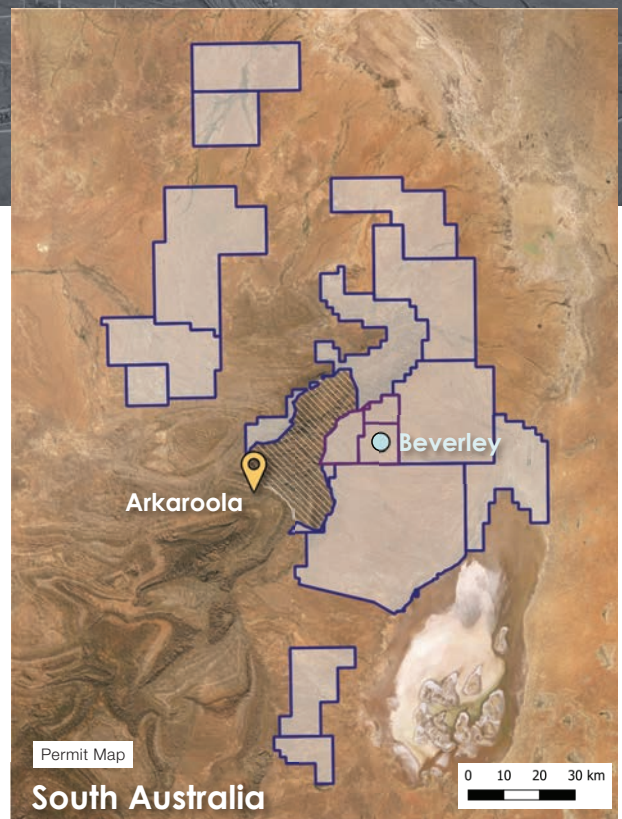


# Four Mile Mine and Beverley Processing Plant

## Visitor Information

Heathgate Resources Pty Ltd (Heathgate), is based in Adelaide and was formed in 1990. It established Australia's first In-Situ Recovery (ISR) uranium mine at Beverley, in the Frome Basin 550 km north of Adelaide. Heathgate is a subsidiary of the diversified technologies company General Atomics Technologies Corporation.

Mining at Beverley commenced in late 2000 and the Beverley North Mine began production in 2011. The Beverley Processing Plant is now solely used to process the ore from the Four Mile Uranium Mine. Heathgate operates that mine on behalf of sister company Quasar Resources Pty Ltd.



## Acknowledgement of Country

Our South Australian mine site is on the traditional land of the Adnyamathanha people. Heathgate acknowledges the Adnyamathanha people's connection to country. We respect their elders past and present.

Heathgate has forged a strong relationship with Adnyamathanha people through native title agreement making, ongoing employment, training, cultural awareness, and heritage surveys. Adnyamathanha participation in multiple facets of the mine life cycle is critical to our business success.

## Mining Process

The ISR process uses conditioned groundwater to recover uranium from the ore zone without digging and moving tonnes of earth in the same way that you would at an open cut or underground

mine. Instead, the process involves circulating the conditioned groundwater through the host rock to dissolve the uranium and recover it.



Four Mile West Wellfield

### Key advantages of ISR are:

Low surface disturbance: unlike the open pit mining process, ISR does not require the removal or crushing of ore-bearing rocks. Highly flexible: wellfields or pipelines can be quickly constructed, reused and rehabilitated. Lower capital costs compared to conventional open pit or underground mining. Small footprint compared to other types of mining processes, and very low radiation exposure to workers.

The conditioned groundwater is a mix of water and chemicals (oxidants) added to promote the recovery process. It is pumped (via extraction wells) to the surface, then to the processing plant to remove uranium for packaging and export as uranium oxide ( $U_3O_8$ ). The remaining solution is retreated and circulated back through the rock to repeat the process.

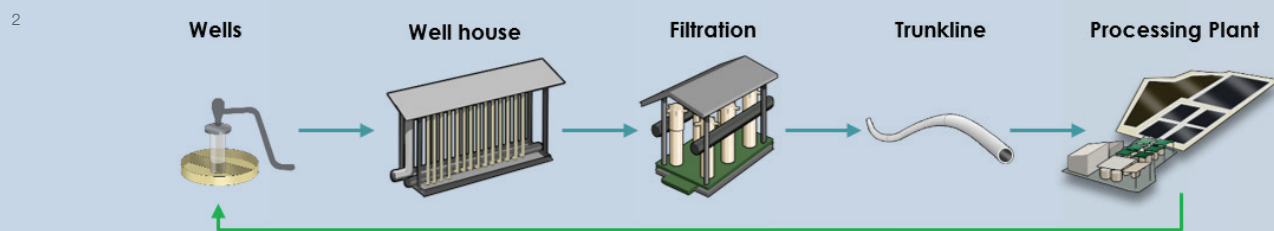
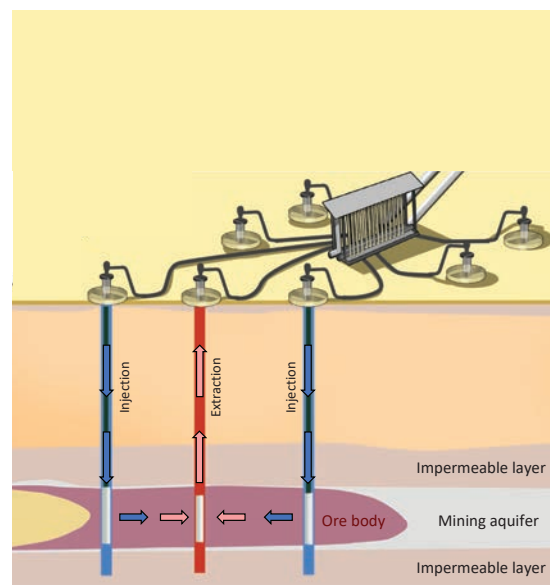
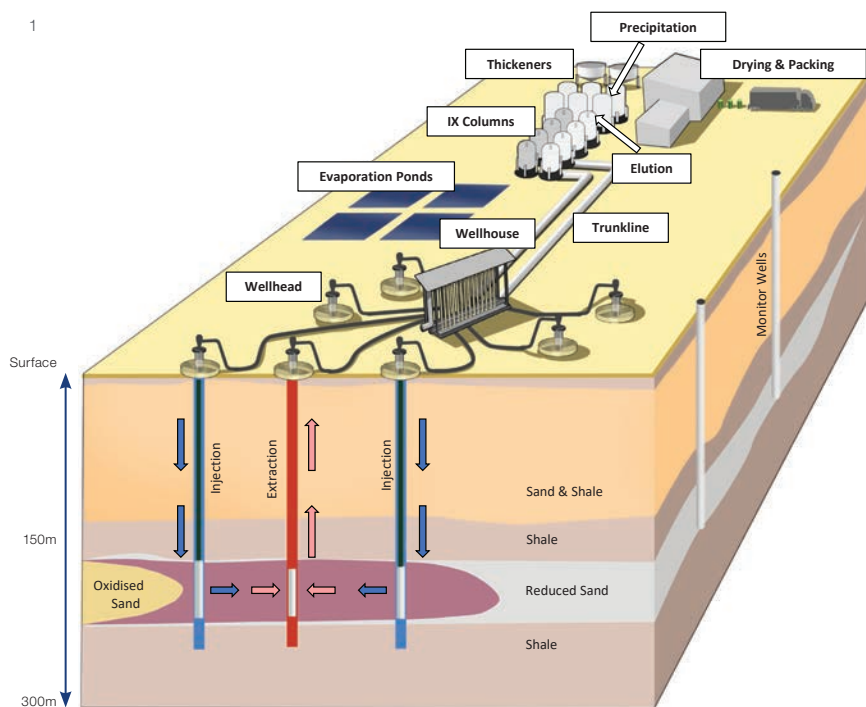


### How much uranium is produced?

Heathgate produces enough uranium oxide a year to power ten large power reactors (1000MW) for a year. This varies according to the grade of uranium being mined, the price of uranium and the rate of water circulation to the mine.

### Where does the uranium come from?

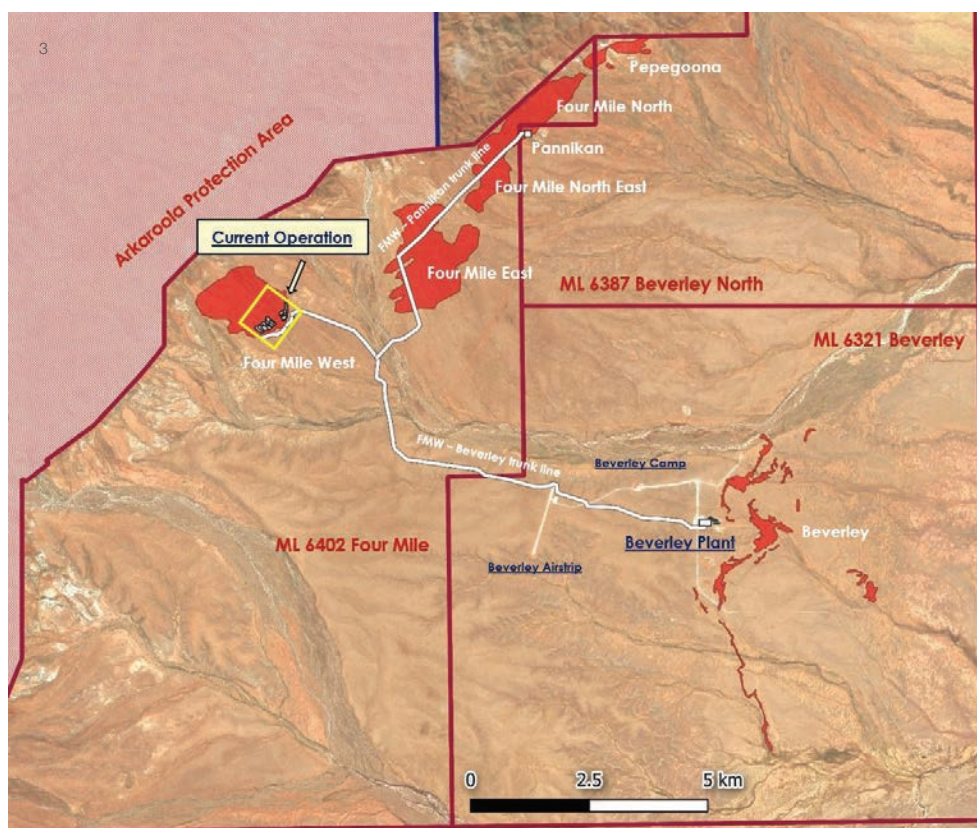
The adjacent Flinders Ranges contain uranium at well-above average concentrations, although not of health concern. The ore Heathgate mines washed off the Ranges millions of years ago, becoming concentrated in some sandy aquifers between the hills and Lake Frome. The uranium ore Heathgate mines occurs at depths between 100 – 300m below the ground surface.



1  
Model of the in-situ recovery  
mining process

2  
Mining Process Flowchart

3  
Operations Map



## What chemicals are used?

The main reagents used for mining at Beverley are hydrogen peroxide, sulphuric acid and ferric sulphate. Power generation is from natural gas from Moomba.



## Nuclear Energy

*"Australian uranium may only be exported for peaceful non-explosive purposes under Australia's network of bilateral nuclear cooperation agreements."* (DFAT, 2022)

Heathgate's uranium may only be sold to countries approved by the Australian Government such as the United States, Canada, Japan and France.

*"Nuclear power is the second-largest source of low-carbon electricity today, with 452 operating reactors providing 2700 TWh of electricity in 2018, or 10% of global electricity supply."* (IEA, 2019)

*"Nuclear power has avoided about 55 Gt of CO<sub>2</sub> emissions over the past 50 years, nearly equal to 2 years of global energy-related CO<sub>2</sub> emissions."* (IEA, 2022)



Nuclear energy makes an important positive contribution to the environment by providing reliable, base-load, carbon free power to assist with low carbon energy transitions around the world.

*Images clockwise from top right: Uranium resource packaged for shipment, Beverley Processing Plant, Uranium Oxide (U<sub>3</sub>O<sub>8</sub>) or 'yellowcake'.*



## Radiation

Workers at Beverley are monitored for radiation exposure and always record under radiation limits, as confirmed by the Radiation Protection Division of the South Australian Environmental Protection Authority.

## Environment

Miners must hold an approved program for environment protection and rehabilitation (PEPR) from the SA Government before they begin operations. They must ensure:

- no disturbance to Aboriginal artefacts or sites of significance.
- no net adverse impacts on native fauna diversity or abundance.
- no introduction of new weeds, plant pathogens or pests.
- no watercourse contamination or compromise of pastoral use of downstream surface water bodies.

## Waste

The operation does not produce any high level radioactive waste from the uranium recovery process, that requires disposal in a dedicated high-level radioactive waste facility.

The mine is highly regulated by State and Federal Government agencies such as The South Australian Environmental Protection Authority, The Department of Energy and Mining and The Australian Safety and Nuclear Organisation (ASNO).



*Beverley Wellfield Comparison 2011 – 2021*

## Rehabilitation

ISR mining is so low impact it can be hard to see where it took place when it's all finished!

Drilling is low impact with a 25m radius disturbance footprint.

There are no tailings dam or giant waste heaps from tunneling or an open cut mine.

Once a wellfield has finished production it is rehabilitated, with wells capped and wellhouses and piping removed.



## Community

Heathgate supports its local community in many ways. We sponsor events, such as the Flinders Family Fun Day and participate onsite in annual National Aboriginal and Islanders Day Observance Committee (NAIDOC) week celebrations. We are committed to promoting opportunities in the industry with mentoring programs, school visits and local career day events. Heathgate is committed to local community engagement. We provide employment opportunities, including traineeships and apprenticeships for the Adnyamathanha community. Heathgate is proud that many Adnyamathanha work across our operation as a vital part of our team.

## Cultural Heritage

Beverley operates under a Native Title Mining Agreement with the Adnyamathanha Native Title Holders. Heathgate undertakes specific Aboriginal cultural heritage surveys with a group of Adnyamathanha representatives for any new disturbance activities such as drilling. Up to four Adnyamathanha employees at Heathgate act as Aboriginal Liaison Officers (ALOs), with a primary focus on ensuring mining operations are completed in accordance with cultural heritage survey conditions.

Cultural Heritage Survey Team





## Contact Heathgate Resources

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