

# The Project underground mine



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The Project adjoins the existing Ranger mine and utilises substantial existing plant and infrastructure.

The underground uranium ore body is east of Pit 3, with most mining activity to occur between 200 and 500 m below the surface.

Mining will remove approximately 6.8 Mt of uranium ore, at an average grade of 0.27%  $U_3O_8$ , plus 0.6 Mt of low grade ore and 0.5 Mt of waste rock before completion of operations in January 2021. This represents about 50% of the overall underground resource.

The ore will be delivered to the existing Ranger plant, where it will be processed in combination with stockpiled ore to generate additional uranium oxide product. The Project will comprise two main components:

- an underground mine, where ore is extracted from a series of small stopes (mining blocks), loaded and transported to the surface in trucks; and,
- supporting surface infrastructure, some of which is an extension of existing equipment, and some of which is specific to the new mining method.

### Underground mine

The proposed mine will utilise the existing exploration "portal" (entrance) and "decline" (tunnel) to access the underground working areas. The exploration decline, approved in 2011, was constructed to determine if underground mining was economically feasible.

The underground mine will be divided into mining districts,

from south to far north, and consist of a number of horizontal levels, each approximately 25 metres thick. Within each district and level, horizontal tunnels referred to as "lateral development" or "ore drives", provide access to the stopes.

A ventilation system comprising primary vertical air intake and exhaust shafts, toward the extremity of each district, and a secondary ducting system, will maintain a safe working environment for personnel.

The mining method is more selective compared to open pit mining, with specific mineralised areas targeted for extraction. This minimises the quantity of waste rock. As the mining progresses, the extracted stopes are backfilled to prevent subsidence and provide geotechnical stability for adjacent areas.

The mine will be progressively developed over approximately five years, with lateral development prioritised in the initial period.

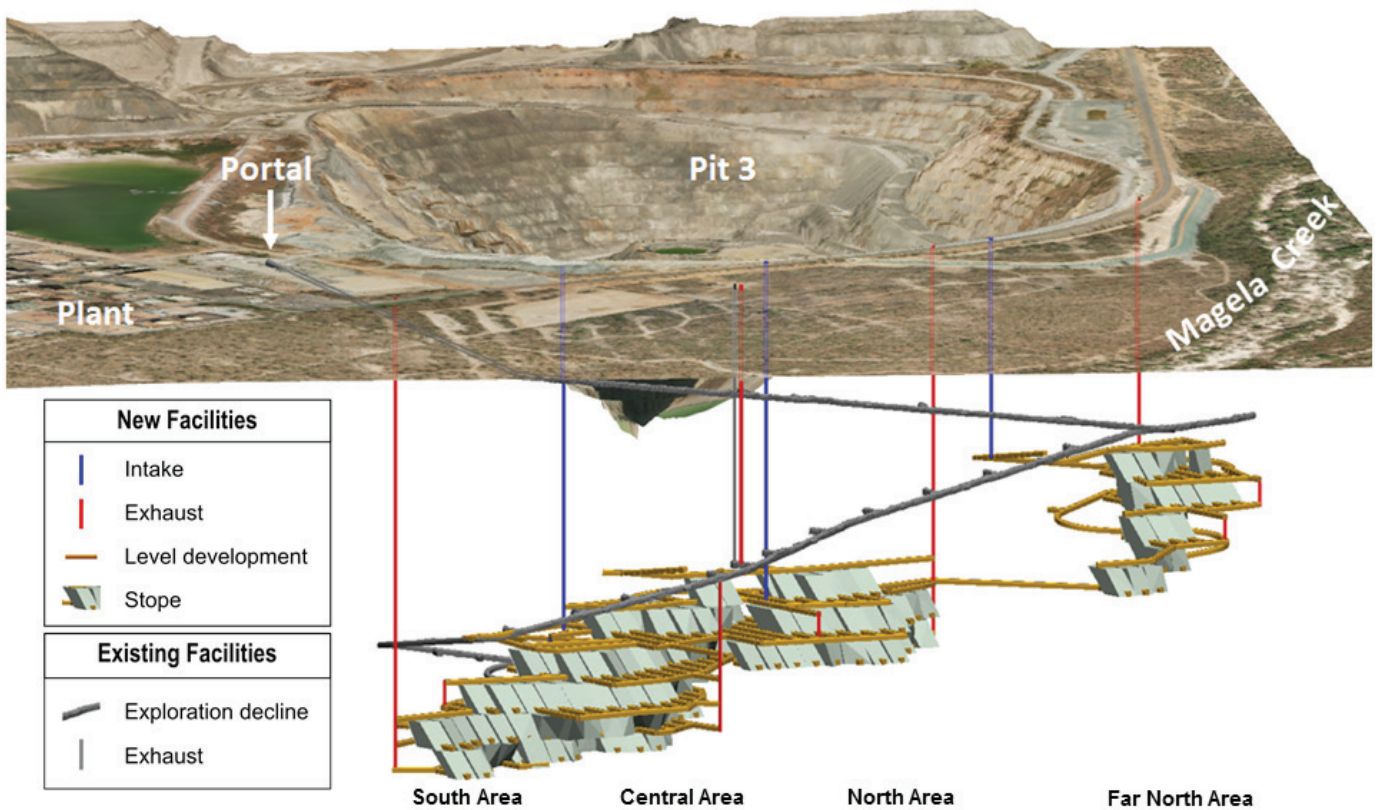
- The mining sequence will typically be "bottom-up", where the lowest stopes are mined first. Mining will retreat from the periphery of each mining district towards the centre, where the mine access and air intake shafts are located.
- This strategy ensures that mining always retreats towards the source of fresh air, which greatly reduces the exposure of personnel to air returning from active work areas, thereby minimising exposure to airborne radiation.
- Ore will be transported to the surface by truck to the existing processing facilities, where it will be refined into uranium oxide product and exported overseas for use in nuclear power plants.
- The proposed underground mine and mine districts is shown on the next page. Stopes are shown in solid shading, development in yellow, exploration decline in grey, intake ventilation in blue and exhaust ventilation in red.

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## Fast Facts

- The Project represents a different method of mining uranium bearing ore.
- The underground workings will be accessed using the existing exploration decline and portal.
- The mining sequence will typically be "bottom-up", where the lowest stopes are mined first and retreating from the periphery of each mining district towards the centre. This strategy reduces the exposure of workers to airborne radiation
- Ore will be processed through Ranger's existing processing plant.
- Stopes will be progressively backfilled as mining progresses.



View of proposed underground mine, looking south west

## Further reading:

Refer to Chapter 3 of the *ERA Ranger 3 Deeps: Draft Environmental Impact Statement*.