

Our operations Northparkes

May 2024



We celebrate 30 years of mining at Northparkes in August 2024. Our current Environmental Assessment allows operations until 2032 and our vision is to operate for 'A century of mining together'.

Exploration

The Northparkes deposits occur within the Ordovician Goonumbla Volcanics, part of a volcanic belt in the Central Lachlan Orogen of NSW. The ore deposits are typical copper-gold porphyry systems; the highest grades associated with the most intense stockwork veining. Sulphide species in the systems are zoned from bornite-dominant cores, through a chalcopyrite-dominant zone to minor distal pyrite.

The porphyry copper deposits at Northparkes are typically narrow but extend to great depths. The E26 and E48 deposits range from 200 to 400m in diameter (>0.5 percent copper) and extend vertically for more than 1,000m.

Underground mining

Northparkes was the first mine in Australia to use the highly efficient block cave mining method, now used in several mines throughout the country.

Block caving relies on gravity and natural rock stresses to fragment and recover the ore. This method offers several advantages over conventional mining methods including:

- Greatly reduced surface footprint by minimising waste mining.
- Minimal use of explosives to fragment the ore.
- Reduced greenhouse emissions through minimising ore re-handling.

In 2015, the E48 Lift 1 Block Cave Mine became one of the world's most automated underground mines. This meant that operators sat in the control room on the surface and helped run the loaders about 900m under the ground below them. The E48 Block Cave finished in December 2023 and the team is now working to switch the automation system over to our E26 Lift 1 North Block Cave.

Automation keeps our people safe by removing them from any dangerous or uncomfortable environments. It also consistently provides higher production rates.

Open cut mining

Northparkes first operated open cut mines in 1993 with the E22 and E27 ore bodies. We are currently operating open cut mines with E31 North and E31 South ore bodies.

Despite the most recent operations at Northparkes being underground, two new open cuts began in 2023 to extract ore closer to the surface.

Ore processing

Ore processing describes the process of taking ore (mineralised rock from the earth) and turning it into a metal. In the case of Northparkes, we are processing this ore into copper, gold and silver concentrate.

Once the ore is removed from underground or open pits it is transported by conveyor or truck to ore processing where we aim to recover as much copper and gold as possible.

Two stockpiles receive the ore, which is then processed through several stages including grinding, flotation, concentrate thickening and finally filtration.

In early 2015 Northparkes became the first mine in Australia to use a Scanning Electron Microscope (SEM) in our onsite laboratory. Today it remains the only operation in Australia to utilise this technology onsite. Northparkes now boasts a world-class mineralogy laboratory with two SEMs and an XRD.



Tailings management

Moisture from waste materials is extracted and recycled in the ore processing plant. The waste material is known as tailings, which are transferred to Tailings Storage Facilities, creating a dry surface. To reduce dust in the past, crops have been grown on the surface of the facilities. This initiative – an industry first – was recognised as a finalist for environmental excellence at the NSW Mining Health, Safety, Environment and Community Conference in 2016. Ripping and deposition are other ways in which to mitigate dust from site.

A Cyclone Tailings System is currently in use. This project is designed to deposit coarse tailings in a 70m zone around the Rosedale Tailings Storage Facility perimeter. The material drains into channels under the dam wall, and the leftover sand can be compacted to form a safe footprint for the next rise of the dam wall. The extremely fine tailings are split off from the coarse tailings using the cyclone and deposited out further into the centre of the dam. This trial is innovative because it is not commonly used in Australia. And every dam wall raise gets harder to design so this project will allow us to continue raises with less material and be more economical to construct.

Transport and logistics

Northparkes ore is processed onsite to produce a high-grade copper concentrate which is then transported by road train to the Goonumbla rail siding approximately 13km from the mine. The containers are loaded onto trains and railed to the Port of Newcastle before being shipped to international clients.

Biodiversity

The region is home to a diverse range of flora and fauna, including some protected species. Northparkes has secured 350 hectares of habitat to serve as a biodiversity offset, and regularly survey populations of flora and fauna on our mining lease to ensure protected populations thrive. The offset property, “Kokoda” is dedicated to the conservation and enhanced biodiversity of species existing in the region.

Native vegetation and fauna habitat is being created through rehabilitation. This involves assisting natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features.

In addition to the offset property, there is a focus on ensuring activities have minimal impact on protected species. For example, when tree clearing is required on the Northparkes mining lease, by following a recognised process supervised by an onsite ecologist, fauna are able to leave trees uninjured.

Felled trees from the construction of the Rosedale Tailings Storage Facility were repurposed in partnership with the NSW Department of Primary Industries – Fisheries. The trees – known as snags once they are submerged in the water – became habitat for Murray Cod, which require complex habitat such as rocks and snags to thrive. In addition to creating habitat, the snags have the added benefit of armouring the banks of the Macquarie River against further erosion.

During Northparkes’ 30 years of operations, nearly 300,000 trees have been planted on and around the mining lease.





Environmental monitoring

Environmental monitoring is critical to identify any potential impact Northparkes may have on the surrounding area.

Air quality

Air quality is regularly sampled at key locations on and adjacent to the mine site. The program is designed to determine the effectiveness of control measures and ensure compliance with consent and licence conditions.

It comprises a combination of high-volume air samplers (PM10) and depositional dust gauges. A long-term dust mitigation strategy of growing crops on the Tailings Storage Facilities (TSFs) has been a resounding success. Growing crops directly on a TSF without topsoil is an industry first.

Noise

Noise monitoring is conducted quarterly by an external specialist who monitors and analyses noise data at four of the closest neighbouring properties. Noise levels must comply with the requirements set out in our Project Approval, and associated standards and policies. Noise monitoring comprises a combination of real-time (unattended) monitoring and attended noise surveys.

Water

Majority of the water used at Northparkes comes from recycled water, which is recovered from the Tailings facilities onsite. Its main use is to process crushed ore into copper concentrate. Water use is managed through an internal infrastructure system aiming to:

- Ensure a reliable and sustainable long-term supply of water to site.
- Minimise fresh water use by recycling water from mining and processing activities.
- Monitor surface and groundwater resources to assess the impact of our operations.

Farming

For more than 20 years, Northparkes has also operated farming operations.

There are extensive cropping operations in the Parkes and Forbes Shires. Northparkes share farms with the local Wright family, while Syngenta and Australian Grain Technologies are working on grain and herbicide trials on some of the properties. These trials are testing new wheat varieties and their productivity in our soils and environment.

Throughout farming operations there has been a clear focus on trialling and adopting techniques to improve farming, that are sustainable and appropriate to both Northparkes operations and its neighbours.