ACTIVITY 25 **NAME**_____

MINERALS EDUCATION VICTORIA

Digging and Repairing

USE THE INFORMATION FROM THE CASE STUDY AT NORTHPARKES MINE TO COMPLETE THE FOLLOWING.

1. Where is the mine?

On an outline map of Australia

- Label the states of Australia
- Label the location of the Northparkes Mine on the map of Australia.

2. What's happening at Northparkes?

Complete the following questions on a sheet of lined paper or in your notebook.

2.1 The _____ company operates the Northparkes mine.
2.2 The mine produces _____, _____ and _____
2.3 The main metal produced from Northparkes is _____
2.4 It is used for _____
2.5 How is the ore mined? Underground/Open Pit/Both methods are used.
2.6 The expected life of the mine is _____ years (Hint. P3)
2.7 Describe how the land was used **before** the mine was constructed.
2.8 After the mine closes, what is likely to happen to Northparkes?

3. The impact of the mine on the environment.

Mining at Northparkes has made a significant impact on the environment.

3.1 Draw up the table below on your lined sheets or in your notebook.
3.2 For each issue (air and land), state two significant environmental impacts and what actions people at the mine are taking to minimise these impacts.

ISSUE	IMPACT	ACTIONS
AIR	**1.** **2.**	**1.** **2.**
LAND	**1.** **2.**	**1.** **2.**

3.3 WATER

- What sources are used to provide water at Northparkes?
- How is water use minimised at Northparkes?

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The following material is adapted from the case study at www.minerals.org.au/education Follow the links to Secondary Resources section and in the Envirosmart resource, other case studies, including the other sections of this case study, can be found.

At the Mine Site – Northparkes Mine

State:	**NSW**
Operation:	**Northparkes Mine**
Operator:	**Rio Tinto**
Material Produced:	**Copper, Gold, Silver**

Above: These coins contain 75% copper and 25% nickel

Introduction:

Copper is an extremely important metal. Its main use is in electrical wiring, but it is also used in coins, hot-water pipes, radiators and many other applications.
Australia is a major producer of copper, and the Northparkes Mine is one of our largest.

Northparkes is the third largest metal mine in Australia (after Mt Isa in Queensland and Cadia in NSW). It is located in central NSW, near the town of Parkes.

Although copper mining at Northparkes is important for Australia, like all human activities mining has impacts on the environment. This case study shows you just what these impacts are, and how the Northparkes operation manages them so that disturbance to the environment is minimised.

Land:

During mining operations a fairly small area of land may be significantly disturbed. In all of Australia, the area mined covers only about 0.02% of the entire continent. At Northparkes, the mining lease is 1630 hectares (ha) in area. That's about the same area as a square piece of land 4 km long by 4 km wide. There are two mines on the mining lease – one is an open cut and the other is an underground mine.
Most of the Northparkes mining lease is still covered by grass, trees and even a forest. However, about a third of the lease is disturbed by the structures and facilities necessary for mining, including the open pits, the underground mine, the dams, the ore and topsoil stockpiles, the waste-rock dumps, the processing plant and other buildings and roads.
Environmental scientists at Northparkes work hard to ensure that the disturbances to the land are as small as possible.

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Some of the effects (IMPACTS) that the mine has on the land and how they are being managed (ACTIONS) are summarised

Impact:
Topsoil is disturbed by construction of open-pits, roads, stockpiles, waste-rock heaps, buildings and other mine structures.
Action:
Topsoil is always removed and stored in piles (stockpiles) before construction of any mine structures. It is then re-used in rehabilitation of the mine site. For example, topsoil is placed on the walls of the water dams so that grasses will grow and reduce erosion and dust.

Impact:
Plants are disturbed.
Action:
Pasture and native grasses and native shrubs and trees are planted in the topsoil which covers dam walls, soundbunds and waste rock heaps. More than 100,000 trees have been planted on site since 1992.

Impact:
Animals are disturbed.
Action:
Belts of native trees have been planted around the mine site, and the Bogan River. These provide wildlife corridors for native animals. Also, local pockets of native trees in the lease have been fenced off, to provide habitats for animals.

Impact:
Processing plant and other structures and buildings may not fit into the landscape.
Action:
Gardens of native plants, and lines of trees around buildings and the mine lease help screen structures from view. This is also creates a more pleasant workplace for the people who work at Northparkes.

Air:

Mining at Northparkes can affect the air around the mine-site by producing dust and noise. However, various techniques are used to reduce as much as possible the impacts of these on the environment.

Dust:

Dust can be both annoying and a health hazard to mine workers and to people who live or work near a mine site. Dust can be produced where heavy machinery is moving around the site, particularly in windy weather. Dust is controlled using water trucks which spray water onto roads. In addition walls or "bunds" are sonstructed from soil around areas being mined. These prevent mobile airborne dust from leaving the site.

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Noise:

Too much noise in a mine is obviously very annoying both to mine workers and to people who live and work nearby. But more importantly, exposure to noise over a long time can lead to hearing loss. Noise from the mining and processing operations is reduced by:

- using insulation equipment
- constructing bunds around areas being mined
- using flashing lights instead of reversing beepers on mine machinery
- maintaining buffer zones around the plant so that the noise doesn't affect nearby residences.
-

Water:

Water is vital to the Northparkes mining and processing operations. Some water used in the mine is rainwater, collected from the roof surfaces of various buildings on the mine site. The local creeks cannot provide enough water either. Most of the mine's water comes via pipeline from a ground-water aquifer.

Great care is taken at Northparkes to recycle as much water as possible, both to save the costs of purchasing extra water, and for environmental reasons. Environmental scientists also carefully monitor the local rivers and underground supply to make sure no contaminated water re-enters the water supply.

End use of the area:

Mines do not last forever. After a number of years or even decades, the ore bodies are mined out, and mining stops. Therefore, when a mining operation is initially planned, an important factor to be considered is the use of the land after mining has finished.

It is expected that the Northparkes mine will have a life of 18 years. When mining is finished all structures and facilities relating to the mining operation will be dismantled and removed. The mine site will be rehabilitated to produce an undulating landscape with small hills and possibly three small lakes (corresponding to the open pits). The stockpiled topsoil will be spread over the area, and native trees and grasses planted. Native wildlife will move back and re-inhabit the area naturally.

Although the land use before the mine was constructed was for sheep and cattle, discussions about possible uses of the land after the mine closes are currently being held with the local community. It is likely that the mine-site may eventually become a mixed forest and grassland sanctuary or recreation area for the residents of Parkes and the surrounding district.