Factsheet 06-1

Emissions impacts and management

Independent and internal studies were undertaken to assess potential impacts to human health, the environment and cultural heritage.

The Ranger 3 Deeps underground mine (the Project) will involve a number of activities during construction and operation that will generate dust, gases, noise and other activities will produce ground vibration. Independent and internal studies were undertaken to assess potential impacts to human health, the environment and cultural heritage.

Air quality

Substances that are generated by existing and Project sources as a result of material movement, fuel combustion and ore processing were considered in the ambient air quality assessment. These included:

- Particulate matter (dust particles of an inhalable size);
- Total suspended particulate (associated more with visual amenity);
- Sulfur dioxide (SO_2);
- Nitrogen dioxide (NO_2); and,
- Radon (a radioactive gaseous element).

The air quality study used established meteorological and air dispersion modelling to predict concentration and deposition at residential, cultural and ecological locations (receptors). When compared with applicable guidelines, the modelling predicts that Project air emissions will not exceed air quality criteria.

The Project incorporates a number of measures to mitigate emissions and improve dispersion characteristics, including the integration of emission control technology on power generators, routing of exhaust gases to a common stack, and routine dust suppression on haulage routes and during material handling activities.

Greenhouse gas and energy

In the absence of the Project over the proposed Project years (2016 – 2020), greenhouse gas emissions are forecast to increase to 126 kt CO_2-e and energy demand to 1.7 PJ, driven by an increase in process water treatment through the recently commissioned brine concentrator.

When combined with the Project, greenhouse gas emissions and energy demand will increase to 176 kt CO_2-e and 2.3 PJ respectively. The increase in Project greenhouse gas emissions and energy demand is attributed to power generation, mobile and ancillary mining equipment.

The Project has considered a number of measures to minimise greenhouse gas emissions, such as, the integration of the Project power infrastructure with existing power generation for enhanced energy efficiency.

Noise

The noise generation during Project construction and operation has been assessed. Construction noise, is mostly expected to derive from ventilation shaft construction, whereas during the operational phase, the primary noise sources will include the operation of ventilation fans, refrigeration units, backfill plant, crushing and screening plant, power generation and material movement.

The Project has included noise reduction technology in the design of specific infrastructure and equipment. These include select ventilation fans, refrigeration plant and air compressors.

Cumulative noise will not exceed criteria at residential and commercial receptors such as Ranger mine village or the airport. Predicted noise at ecological receptors is not at a level that is anticipated to result in a significant impact to fauna.

Emissions impacts and management

ERA

Vibration

Project vibration levels will be well below the threshold of human detection and levels that would result in a detrimental impact to sites of cultural significance or surface structures such as buildings and plant. These low levels of vibration are attributable to the small scale of surface construction required and the depth at which underground activity occurs.

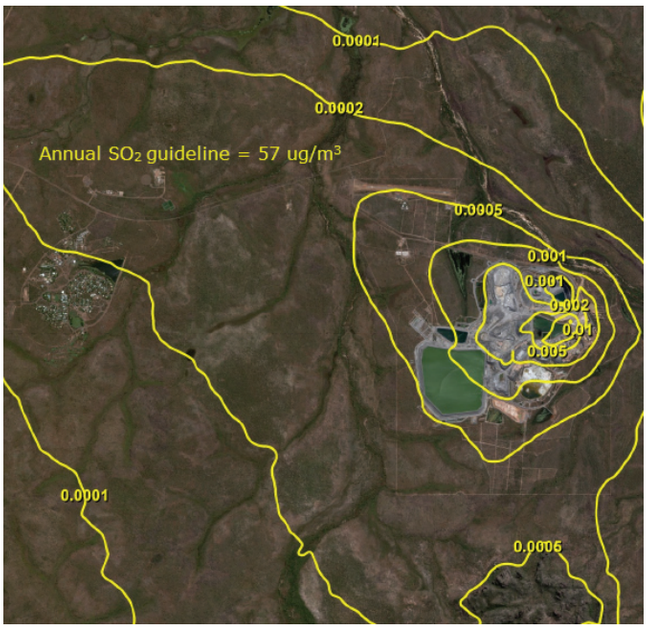
Surface vibration has been monitored during the development of the exploration decline and over this time has been below levels that historically occurred during open pit operations.

Monitoring

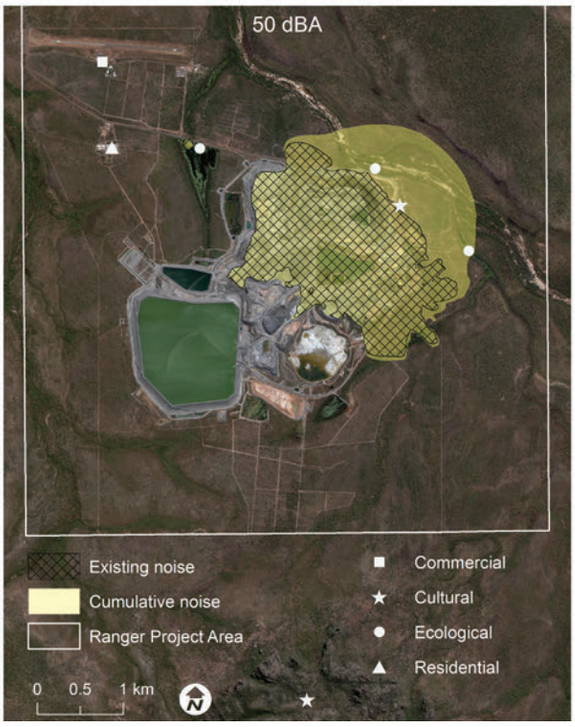
Although modelling predicts low potential for air, noise and vibration impacts, ERA has installed a temporary air monitoring station to validate predictions and continues to monitor dust and vibration in the near vicinity of culturally sensitive sites.

Fast Facts

- Project air emissions are not predicted to exceed air quality criteria at receptor locations.
- The Project will increase greenhouse gas and energy demand by around 50 kt CO_2-e and 0.5 PJ respectively.
- Noise emissions are not predicted to exceed noise criteria at residential locations.
- Noise emissions will not result in a significant impact to wildlife.
- Vibration modelling indicates that both surface and underground activities will not have a physical impact on cultural sites or buildings.



Air model contour plot (annual SO_2)



Noise and Project increase (50dBA)

Further reading:

Refer to Chapter 6 of the *ERA Ranger 3 Deeps Draft Environmental Impact Statement*.