



Waste rock dumps

Version 2.1 August 2021

Waste rock dumps are usually the most visually obvious landforms left after open pit mining.

Together with tailings storage facilities, they are also the most prone to erosion. For these reasons, it is essential that careful planning before and during construction produces a safe, stable, non-polluting landform, with an agreed post-mining land use. If the dump is to be revegetated, use local native species.

Site selection

When selecting the location of any waste rock dump, the proponent should:

- take into account tenement boundaries and any natural features of the landform
- not interrupt significant drainage lines
- blend the dumps into natural hillsides if possible
- choose a location that will not be in the way of any possible future pit cut back or any other development
- make sure the toe of any waste dump is not closer to the pit than the abandonment bund for that pit
- design the pit abandonment bund according to our guidelines
- backfill earlier mined-out pits if you can.

Waste rock characterisation

Before construction of the waste dump commences, it is essential to know what types of material will go into the dump, so their location within the dump can be planned. The following materials should be appropriately encapsulated within the dump:

- those with acid rock drainage (ARD) potential
- those with high salinity
- those that are highly dispersive
- any other potentially polluting leachate.

The material that will be used for the outer surfaces, when covered with topsoil, should be suitable for revegetation.

Dump design

The dump's profile (e.g. height and slope angles) should be designed to ensure the final structure is safe, stable and not prone to significant erosion. Factors that should be considered in the design are material types, proposed vegetation cover, natural topography and climate.

In general, more dispersive material, poorer topsoil and high dumps will require flatter outer slopes. Only the best conditions and stable materials would justify slopes approaching 20 degrees.

Drainage

A major cause of serious erosion on newly created landforms is the lack of adequate drainage control. It is therefore essential to design and construct drainage control measures that will handle expected rainfall events. In arid regions, it is preferable to design the dump profile to be water retaining. This means that the top surface, berms and batters must be built to hold the maximum expected rainfall event. Suitably engineered impoundments should be constructed on the flat surfaces and ensure deep ripping occurs at suitable intervals on the sloping surfaces. This will generally achieve the necessary control. Minimising slope lengths will help reduce water velocity and therefore reduce erosion potential.

Revegetation

Previously cleared topsoil should be spread over all surfaces at a thickness of about 5 to 20 cm (depending on the nature of the underlying waste rock). The surfaces should then be deep ripped (minimum 1 m) on contour at appropriate spacings. It is essential that rip lines on outer slopes are survey controlled to ensure they are horizontal for their entire length.

Direct seeding at the optimal time for the region will maximise the benefit of annual rainfall events. Select a seed mix that has local native species and maximum diversity. The post-mining land use will have a bearing on the seed mix chosen.

This Environmental Note was approved for release in January 2001.

Version History

Version	Date	Changes
1.0	January 2001	Initial Publication
2.0	September 2009	Updated
2.1	August 2021	Clear guidance language updates

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