

# REHABILITATION INFORMATION RELEASE

**DATE:** 25 June 2021

## Rehabilitation of Western Emplacement Area at Ravensworth Operations

**Location:** Ravensworth Operations open cut coal mine, Ravensworth, Hunter Valley, NSW.

### Overview

Ravensworth Operations is a joint venture owned mine between Glencore (90%) and Itochu (10%), with Glencore having operational responsibility for the mine.

In June 2019, significant soil erosion was observed at a waste rock emplacement (Western Emplacement Area) at the Ravensworth Operations open cut coal mine north of Singleton in the NSW Hunter Valley.

Subsequent regulatory action has resulted in the effective rehabilitation of the Western Emplacement Area (WEA) at the mine.

### The mine

The Ravensworth Operations open cut coal mine (the mine) is about 25 kilometres north west of Singleton in the NSW Hunter Valley. The mine operates pursuant to mining lease (ML) 1669 and associated authorisations, administered under the *Mining Act 1992*. The mine has approval to operate until 2039.

ML1669 is located in coalfields which have an extensive mining history, leading to the consolidation of satellite operations forming the current Ravensworth Operations. The area surrounding and including the mine is dominated by coal mining operations which are the major landholders within the area.

Mining operations occurs 24 hours a day, seven days a week and involve the removal of overburden and interburden (non-coal bearing materials) through truck and shovel method to expose and extract coal. As mining progresses and creates a void, the non-coal bearing material removed in this process is progressively backfilled. Some of this material is then emplaced in the western out-of-pit overburden emplacement area (the WEA) located north of the mining area.

A condition of ML1669 is to undertake operations in accordance with a Mining Operations Plan (MOP) that has been approved by the NSW Resources Regulator. In June 2019, the mine was operating pursuant to “Mining Operations Plan Ravensworth Operations (MOP Amendment A – October 2018)” (the approved MOP).

## Site inspection

Inspectors from the Regulator conducted an inspection of the mine in June 2019 as part of a state-wide compliance operation. The inspection included a review of the schedule of rehabilitation works for existing erosion features at the WEA described in the approved MOP. These works were nominated to be completed by September 2018. The Regulator identified the following rehabilitation performance concerns:

- Incomplete implementation of controls to remediate and mitigate erosion on the lower slopes of rehabilitated WEA.
- A number of soil erosion features on the lower slopes of the WEA northern batter faces, including scours and gully features (refer to Figures 1, 3 and 5).

As part of the inspection it was observed that remedial works had been implemented on the upper slopes of the WEA.

## Direction to rehabilitate

In July 2019, the Regulator issued a statutory notice pursuant to section 240 of the *Mining Act 1992*, directing the holder of ML1669 to rehabilitate the rills, scours and gullies on the WEA. The notice directed the lease holder to carry out rehabilitation in accordance with the methodology that had been developed in consultation with an appropriate environmental specialist. Specifically, the notice required the mine to:

- repair all scours and gullies on the WEA northern batters as identified in the approved MOP
- develop a remediation schedule of maintenance and specified quantifiable monitoring of all rehabilitation areas of the WEA for inclusion in a new MOP Amendment (based on nominated trigger values and threshold conditions for appropriate management actions).

With the objective to:

- commit to a schedule of rehabilitation works that achieve a safe, stable and non-polluting landform.

## Rehabilitation outcomes

The lease holder subsequently carried out a range of rehabilitation works including the testing, design and installation of erosion and sediment control features. Specifically, the works involved:

- re-scheduling of rehabilitation works aligned to the approved amended MOP
- reviewing and testing erosion and sediment controls and development of detailed drainage designs by civil engineering consultants
- soil sampling and analysis by a soil scientist of topsoil and treatments of rehabilitation works
- backfilling and reshaping of gullies and scours across approximately 40 hectares of the lower northern, eastern, and western batters of the WEA
- de-silting of the toe drain along the perimeter of the WEA
- installation of erosion and sediment controls, including contour drainage
- repairing minor contour banks and constructing drainage lines utilising geomorphic principles on the western WEA
- salvaging and installing habitat features, and seeding of targeted native woodland species
- ongoing rehabilitation and erosion monitoring and maintenance in accordance with the approved MOP and the mine's improved internal quality assurance processes.

The Regulator inspected the mine in September 2020 and confirmed that the lease holder had complied with the rehabilitation requirements of the section 240 notice. In a subsequent inspection conducted by the Regulator in March 2021, it was also observed that the mine had implemented significant improvements to its process for the design, construction and monitoring of final landforms as part of its ongoing progressive rehabilitation program. These improvements included refining a geomorphic<sup>1</sup> landform design methodology and implementing a rehabilitation construction quality plan and rehabilitation scorecard process.

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<sup>1</sup> Geomorphic design is a method where a landscape is constructed based on a set of geomorphic rules such as Strahler stream order, hillslope length and curvature and stream length. These rules are derived from an analogue site which is deemed to have properties suitable for the post-mining landform.

The photographs below taken before and after execution of rehabilitation works depict the achievement of the required rehabilitation outcomes at the WEA within ML1669.

Figure 1 **Before** - Active scouring on the Northern batter of the WEA



Figure 2 **After** - Remediated scouring and gullies with habitat features and vegetation



Figure 3 **Before** - Deep eroded toe drain at the base of the Northern batter of the WEA



Figure 4 **After** - Armoured drainage channel and vegetation tied into to micro-relief landscape



Figure 5 **Before** - Erosion rilling, gullies and bare patches in established rehabilitation



Figure 6 **After** - Backfilling of gullies and rills. Vegetation establishing on previous identified bare patches



Figure 7 **Before** – WEA January 2019 (source: nearmap)

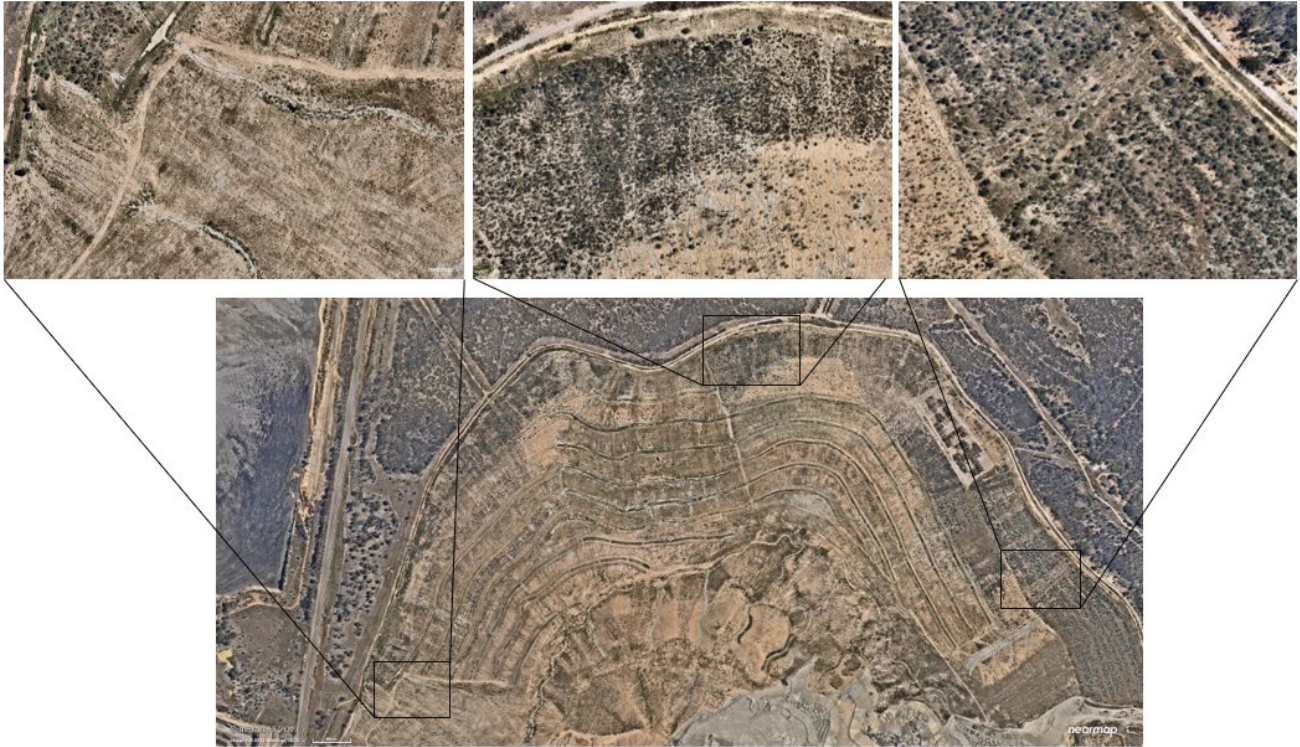


Figure 8 **After** – WEA April 2021 (source: nearmap)



## Industry recommendations

The Regulator expects lease holders to comply with their rehabilitation and regulatory obligations under the *Mining Act 1992*. This includes:

- complying with all mining lease conditions and any requirements to operate in accordance with an approved mining operations plan (MOP) or equivalent
- complying with all statutory obligations to protect the environment
- undertaking rehabilitation progressively in a timely manner
- designing final landforms to ensure that they are stable in the long term, and using geomorphic design principles
- ensuring adequate sediment and erosion controls are in place to ensure a long-term stable landform and implementing a quality assurance process that validates any structures have been constructed in accordance with the design
- monitoring rehabilitation progress and benchmark rehabilitation performance to facilitate continuous improvement
- maintaining rehabilitation records.

## Further information

Please refer to the following guidance materials:

- [The mining regulatory framework](#)
- [Regulating mine rehabilitation in NSW](#)
- [Targeted assessment program for mines](#)
- [Exploration and mining rehabilitation fact sheet](#)
- [Mining operations plan \(MOP\) guidelines](#)

## About this information release

The Regulator has issued this information to draw attention to the achievement of rehabilitation outcomes. Further information may be published as it becomes available.

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### DOCUMENT CONTROL

**NSW Resources Regulator reference**      DOC21/395286

**Date published**      25 June 2021

**Authorised by**      Director Compliance