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# Mangoola Coal - Continued Operations Project (SSD-8642)

## Resource & Economic Assessment

Division of Resources & Geoscience

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# Executive summary

## Determination

The Division of Resources and Geoscience (Division) assessed the Mangoola Coal - Continued Operations Project (the Project or Proposal). The Division determined the Project will:

- ensure continued operations at Mangoola until 2030.
- without the Project the existing Mangoola mine would cease operations in 2026 and would decrease production, employment and royalties from 2023 onwards from the existing operation.
- improve resource recovery and be an efficient use of resources.
- ensure an appropriate return to the NSW Government including;
  - $258 million royalties (current dollars)
  - $3.3 billion total revenue (current dollars)
- ensure continued employment for a proportion of the workforce at the existing Mangoola mine until 2030.

## The project

Glencore through SSD 8642 seek a northern extension to the existing operations at Mangoola open cut coal mine that will:

- extend mine life from 2023 to 2030.
- add an additional 52.3 million tonnes (Mt) of Run-of-Mine (ROM) coal recovery.

The Project will use the existing mine workforce, equipment and approved management systems.

# Introduction

State significant development is regulated under the *Environmental Planning and Assessment Act 1979*, which requires a proponent to apply to the Department of Planning and Environment for development consent, supported by an Environmental Impact Assessment (EIS).

This Resource & Economic Assessment conducted for the Mangoola Coal - Continued Operations Project by the Division assessed:

- the social and economic benefits to NSW including royalties, capital investment, revenues and jobs.
- the resource/reserve estimates stated in the proponent's EIS.
- if the Proposal is an efficient development of the resource, that resource recovery is optimised and waste minimised.
- if the Proposal will provide an appropriate return to NSW.

The objects of the *Mining Act 1992* are to encourage and facilitate the discovery and efficient development of mineral resources in NSW. Of particular relevance to this Resource & Economic Assessment are:

Section 3A Objects:

- to recognise and foster the significant social and economic benefits to NSW that result from the efficient development of mineral resources.
- to ensure an appropriate return to the State from mineral resources.

The relevant section of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 is Part 3, Clause 15: Resource Recovery requires that resource recovery is efficient, optimised and minimises waste.

# Project overview

**Current mine history and ownership**

Mangoola is an open cut mine located about 20 kilometres west of Muswellbrook in the Hunter Valley of NSW. Mangoola is a wholly owned subsidiary of Glencore PLC (Glencore or the proponent). Glencore is the largest producer of coal in NSW.

The Mangoola mine commenced production in 2011. The mine produces thermal coal that supplies both the domestic and export markets.

DA 06_0014 (as modified 8 times) currently provides for mining operations at Mangoola until the end of 2029, producing 13.5 million tonnes per annum (Mtpa) ROM coal. Based on the current mining schedule and resource, mining operations will cease in the existing mining area by 2023.

**The proposed Mangoola Coal - Continued Operations Project**

Glencore through SSD 8642 seek a northern extension to the existing operations that will provide an additional 8 years of mining, and an additional 52.3Mt of ROM coal recovery. The Project will use the existing mine workforce, equipment and approved management systems. No change to mining methods or production rate are proposed.

The Division notes that this Resource & Economic Assessment has been undertaken in accordance with commercial-in-confidence resource and mine schedule data supplied by the proponent. The proponent indicated a Life-of-Mine (LOM) extension of 8 years and increase in ROM coal recovery of 52.3Mt.

# Size and quality of the resource

The Project proposes to mine the Wallarah, Great Northern, Fassifern and Upper Pilot coal seams of the Newcastle Coal Measures. The strata dip westerly at a shallow angle (< 2 degrees). The coal seams to be mined in the Project are the same as those mined in the existing Mangoola coal operations.

The Division has verified that the Project will provide about 52.3 Mt of additional ROM coal which will produce around 41.1Mt of product coal (yield of 78.6%).

The Proponent has completed coal resource and reserve estimation for the Project in accordance with the Australasian Code for Reporting Exploration results, Mineral Resources and Ore Reserves (the JORC Code). The JORC Code is an industry-standard professional code of practice that sets minimum standards for public reporting of mineral exploration results, mineral resources and ore reserves.

Mangoola currently sells thermal coal to domestic (27%) and export markets (73%). Two thermal products are expected to be produced from the Project:

- a 15% ash product (24.8Mt).
- a greater than 15% ash product (16.3Mt, generally 28.5% ash).

Glencore predict they will continue to supply both these products, and beyond 2026 they expect all coal products to be sold to export markets. The existing Mangoola mine has always supplied a portion of its product to domestic coal-fired generators, therefore from 2023 to 2026 some of the higher ash product coal from the Project will continue to be sold into this market.

Coal qualities in the Project area are comparable with coal currently produced from the current Mangoola operations. The amount of raw ash requires that the ROM coal be washed to meet export market specifications and maximise product value. All coal will be processed in accordance with current operational procedures at the Mangoola Coal Handling and Preparation Plant (CHPP). The product coal is then railed to Newcastle for export. A review of coal quality data confirms the proposed product quality, target export market split, and yield are achievable.

# Resource recovery

Mangoola assessed several mine designs and determined the mine design in the Project is the most appropriate. Many factors constrain a mine plan and extraction methodology and therefore the resource recovery at the Project. These include geological features, environmental constraints, and commercial viability (predominantly defined by strip ratio).

Coal resources within the mine design will be extracted via open cut truck and excavator methods. Minor coal plies too thin to be viably recovered with open cut mining equipment have been excluded from the mine design.

After examination of the proponent's EIS, the Division considers the Project an efficient development of coal resources that provides an appropriate return to the State, within the mine footprint, giving due consideration to the constraints of the location.

# Final Landform

The Division has examined the final landform for the Project outlined by the proponent. Seven different scenarios were developed and assessed by Glencore and ranked according to mine design, engineering feasibility, economic feasibility and the balance provided for appropriate environmental and social outcomes.

The case chosen by Glencore and included in the Mangoola EIS is estimated by Glencore to take an additional six months, with additional costs compared with their baseline of $75 million but provides the best-balanced outcome.

It is recommended that if time permits an independent expert examination of the proposed final landform be undertaken, focusing on whether the project case selected by the proponent is the best option.

The assessment of measures to mitigate environmental impacts associated with the Project is a matter for the NSW Resources Regulator.

# Economic benefits of the resource

Over the life of the Project, assuming the majority of production would be sold on the export thermal market, the Division has estimated that the value of the coal produced would be around $3.3 billion in current dollars, with the net present value of this revenue stream of around $2.1 billion at a real discount rate of seven percent.

Export income is vital for the health of both the NSW and Australian economies. Export income also contributes to the Nation's balance of trade, which provides benefits to both the state and Australian credit ratings, plus it generally has a positive impact on the value of the Australian dollar exchange rate. If approved, the additional export income from the Project would contribute to the around $19.7 billion (2017-18 total) of coal exports annually from NSW. Coal exports are the largest value export from NSW, representing around 45 percent of the state's merchandised goods exports.

The Project, if approved, would provide up to 330 full time operational jobs from 2027 to 2030. Without the Project the existing Mangoola mine would close at the end of 2026. The Division estimates that these direct mine jobs would result in around an additional around 1300 indirect jobs in both mine and non-mine related services. Initial capital investment for the Project would be of the order of $150 million while ongoing capital expenditure would be of the order of around $200 million. In 2017-18 the proponent has stated that around $153 million of employee's salaries and wages as well as supplier contracts were spent in relation to the existing Mangoola mine. By far most of this expenditure was spent in the regional economy of the Upper Hunter, Muswellbrook and Hunter localities.

Although the Project would not employ as many people as the existing Mangoola mine, which currently employs around 400 people, it would employ up to 330 people at the maximum Project production rate. The Project is important to the region in that without this extension the existing Mangoola operations closes in 2026 and production and employment is quickly reduced in 2023, with this trend continuing until 2026 when the mine closes. Initial capital expenditure from the Project is around $150 million, and ongoing capital expenditure is nearly $200 million.

The Division also notes from the Economic Assessment prepared by the Proponent's economic consultant (Cadence Economics) that the Project would deliver a net benefit to NSW in NPV terms of $408.6 million.

# Coal royalty calculation

The Project is a proposed open cut mine therefore a royalty rate of 8.2 percent applies to all saleable production. This rate is applicable to the net disposal value. Net disposal value is the price received per tonne minus any allowable deductions. The main allowable deduction is for coal beneficiation, which is either $3.50 per tonne for coal subjected to a full washing cycle, $2.00 per tonne for coal subjected to a simple washing process, or $0.50 per tonne for coal that is washed and screened.

As a majority of ROM coal from the operation is subject to the full washing cycle, a deduction of $3.50 per tonne from the value of coal produced applies. A deduction for levies also applies which would amount to no more than $1.00 per tonne. Hence allowable deductions for royalty for the Project are $4.50 per tonne.

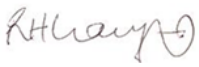
One of the most important assumptions in the calculation of future royalty is the estimate of a future coal price over the life of a project. Coal from the Project is expected to be sold into the export thermal market. A review of coal quality information by the Division suggests this is achievable. Coal from the Project typically has a higher ash content than most export thermal coal mines in NSW and therefore would attract a lower average price due to its lower energy content.

Coal price forecasting is inherently difficult and over the project life variations in coal prices are expected. An average price of around A$95 per tonne for export thermal coal from the Project have been used by the Division. This average price has been adjusted downwards by the Division based on the energy content of the two products to be produced from the Project. The Division considers these prices to be conservative and at the bottom end of potential coal price scenarios. The small amount of coal to be sold into the domestic coal-fired generation market from the Project has been assumed to attract the export parity price.

Another important aspect of future royalty calculation for a proposed coal project is estimation of future annual production. The Division has estimated that if the Project is approved, around 41 Mt of product coal would be able to be economically mined from the Project.

Using the above parameters, the Division has calculated that the State will receive around $258 million in current dollars, and around $160 million in NPV terms (real discount rate of 7 percent) in royalty from the Project. In a typical year at full production the NSW Government would receive around $35 million in royalties from the Project.

# Approvals

| Approved by | Signature | Date |
|---|---|---|
| Assessing Officer: Gwen Stefani & Erin Holmes<br>Position: Senior Geologist - Coal Resource Assessment | Approved in CM9 | 5/8/2019 |
| Assessing Officer: Bryan Whitlock<br>Position: Senior Resource Analyst – Resource economics | Approved in CM9 | 5/8/2019 |
| Approving Officer: Robert Larkings<br>Position: Manager - Coal Resource Assessment |  | 9/8/2019 |
| Approving Officer: Dr Minh Ho<br>Position: Manager – Resource economics |  | 12/8/19 |
| Endorsing Officer: Dr David Blackmore<br>A/Executive Director Resource Operations | Approved in CM9 | 20/8/19 |