

Unit: Strategic Resource Assessment / Resource Economics
Branch: Geological Survey of NSW / Resources Policy, Planning & Programs
Division: Division of Resources & Geoscience
Subject: Dartbrook Underground Coal Mine – Modification 7
Resource & Economic Assessment

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 Assessment (EA).

This Resource & Economic Assessment conducted for the Dartbrook Underground Coal Mine – Modification 7 Project (the Project or Modification) by the Division of Resources & Geoscience (the Division) is designed to review the resource/reserve estimates stated in a proponent's EA and whether the Project will deliver significant social and economic benefits to NSW from the efficient development of the resource and that resource recovery is optimised and waste minimised. It is also to ensure an appropriate return to the State from developing the resource. As such the Division has conducted an independent calculation of the royalty to be generated over the life of the Project.

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

Section 3A Objects:

- (a) to recognise and foster the significant social and economic benefits to New South Wales that result from the efficient development of coal resources, and
- (d) 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.

AQC Dartbrook Management Pty Limited (AQC) is the proprietor of the Dartbrook Mine, located in the Upper Hunter Valley of New South Wales. Dartbrook Mine is located approximately 10 kilometres northwest of the township of Muswellbrook and approximately 4.5 kilometres southwest of the village of Aberdeen. AQC is a wholly owned subsidiary of Australian Pacific Coal Limited.

The Dartbrook Mine straddles both the Muswellbrook Shire Council and Upper Hunter Shire Council. Underground extraction via longwall methods of the Wynn Seam commenced in 1996 and was then relocated to the overlying Kayuga Seam in 2004. Only three of the 20

approved longwall panels in the Kayuga Seam were mined when a decision was made in late 2006 to place the mine on care and maintenance due to ongoing operational issues.

The current development consent provides approval for longwall mining activities in four coal seams (the Kayuga, Mt Arthur, Piercefield and Wynn) and coal clearance via the Hunter Tunnel, which is an underground passageway that connects the underground mine to the Coal Handling and Preparation Plant (CHPP) beneath the Hunter River, Dart Brook, New England Highway and Main Northern Rail Line.

Longwall equipment and the coal clearance system through the Hunter Tunnel were removed prior to APC acquiring 100% ownership of the mine in 2017. The Modification proposes an alternative mining method, that is bord and pillar first workings in the Kayuga Seam only. An alternative coal clearance system is proposed which involves trucking coal to a new downcast shaft on the western side of the New England Highway and using the Hunter Tunnel to access coal handling and rail loading facilities on the eastern side of the highway.

No change to the approved mining areas or production rate is proposed.

Size and Quality of the Resource

The Division has verified that the Project will provide approximately 10 million tonnes (Mt) of Run-Of-Mine (ROM) coal. 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 minerals exploration results, mineral resources and ore reserves.

The Kayuga and Wynn Seams were previously extracted via longwall methods. Operations ceased in late 2006 due to geological issues causing operating difficulties. These issues included gas drainage, spontaneous combustion risk management and geotechnical issues. The mine has since been on care and maintenance. The modification seeks to extract coal from the Kayuga Seam only using bord and pillar first workings extraction methods. Extraction will be limited to the approved mining area defined in the current and approved development consent. Secondary extraction (pillar extraction) is not proposed, meaning subsidence is maintained at levels that are imperceptible for all practical purposes.

The revised mining methodology was proposed over secondary extraction techniques (longwall/pillar extraction) as it reduced risks associated with the Project’s geological conditions, including spontaneous combustion, gas management and geotechnical conditions. The Kayuga Seam was prioritised in this Modification over other potential underground targets due to its relatively low gas content, existing underground access and increased geological understanding due to previous mining experience and exploration work.

ROM coal will bypass the existing CHPP which is currently on care and maintenance. All coal will be crushed on-site, then exported as a direct ship ROM product. 100% of ROM product from the Project is expected to be sold into export thermal coal markets. Most coal will be sold as a mid-high ash product with reference to the Newcastle 5,500 kcal/kg Net-As-Received (NAR) benchmark with potential in certain mining domains to meet the low ash Newcastle 6,300 Gross-As-Received (GAR) benchmark. A review of coal quality data suggests the proposed product quality and targeted export market is achievable.

Resource Recovery

A number of factors constrain the mine plan and extraction methodology and therefore the resource recovery at the Project. These include geological features, mining conditions and the existing development consent.

The Upper Piercefield Seam known as the Kayuga Seam at Dartbrook is extracted in the nearby Bengalla Mine and approved for extraction in the Mount Pleasant Mine. Both adjacent mines are open cut operations. The Kayuga Seam is split into two main plies at Dartbrook namely the KYA and KYB plies. The proposed underground working section in the Modification will extract four sub-plies of the KYA ply that were targeted during previous longwall operations. The proposed working section will necessarily leave some coal in the roof and floor for geotechnical reasons and to control dilution.

The Modification will not result in significant caving of overlying strata and will not affect the ability to undertake the currently approved mining activities within the Mt Arthur, Piercefield and Wynn seams or seams not included in the current development consent.

Given the constraints outlined in the proponent's EA, the Division's Strategic Resource Assessment & Advice Unit considers the Modification an efficient development of coal resources that provides an appropriate return to the State, within the mine footprint, giving due consideration to the particular constraints of the location.

Economic Benefits of the Resource

Over the life of the Modification, assuming production is sold on the export thermal coal market, the value of the additional coal produced would be around \$900 million in current dollars, with the net present value of this revenue stream of around \$525 million at a real discount rate of 7% (calculated over 10 years).

Export income is vital for the health of both the NSW and Australian economy. Export income also contributes to the Nation's balance of trade which provides benefits to both the NSW and Australian credit rating. This additional export income will contribute to the around \$18.2 billion (2016-17 total) of coal exports annually. Coal exports are by far the largest value export from NSW, representing around 35% of NSW merchandised goods exports.

The Modification, if approved, would provide 99 additional full-time operational jobs. Capital investment for this Modification would be of the order of \$45 million.

The Division also notes from the Economic Impact Assessment conducted by Gillespie Economics on behalf of AQC that the following incremental direct annual effects will flow to the local economy as a result of the operation of the Modification:

- \$89m to \$95m in output
- \$52m to \$54m in value-added
- \$11m to \$12m in wages of which \$8m to \$9m will accrue to the local labour force

Coal Royalty Calculation

The Project is a proposed underground mine and as such a royalty rate of 7.2% 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, or \$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 all ROM coal from the underground operations is only crushed and screened, a deduction of \$0.50 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 would amount to \$1.50 per tonne.

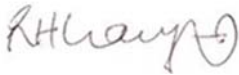
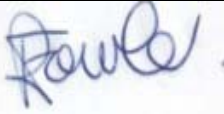
One of the most important assumptions in the calculation of future royalty for a coal proposal is the estimate of a future coal price over the life of a project. The additional coal from the Modification is expected to be sold into the export thermal market. A review of coal quality information by the Division suggests this is achievable.

Coal price forecasting is inherently difficult and over the project life there could be variations in coal prices. An average price of A\$90 per tonne for the export thermal coal from the Modification has been used by the Division.

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 Modification is approved, around 10 million tonnes of additional product coal would be able to be economically mined from the Modification.

Using the above parameters the Division has calculated that the State will receive around \$64 million in current dollars, and around \$37 million in net present value terms (real discount rate of 7%) in additional royalty as a result of the Modification, over the life of the Project.

Approvals:

Position	Signature	Date
Approving Officer: Rob Larkings Manager Coal Resource Assessment		16/07/18
Approving Officer: Bryan Whitlock A/Manager Resource Economics	Approved in CM9	13/07/2018
Endorsing Officer: Samuel McDermott A/Director Strategic Resource Assessment & Advice (02) 4063 6751		16/07/2018
Endorsing Officer: Rick Fowler A/Director Resources Planning & Programs (02) 8229 2898		17/07/2018