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THE END OF AN ERA?

Pembroke Resources, Australia, explores whether the Olive Downs Complex will be the last of the large-scale greenfield steelmaking mines.

Seven years since acquiring a collection of coking coal exploration leases, Pembroke Resources' billion-dollar Olive Downs Complex, a large-scale, world class steelmaking coal mine located in the Bowen Basin of Queensland approximately 40 km southeast of Moranbah, is in the final stages of construction.

Mining operations began in June, and first coal sales are anticipated by the end of the year. When fully developed, Olive Downs

Figure 1. Pembroke – Sheldon Bridge – Olive Downs Complex.



will be one of the world's largest steelmaking coal mines, boasting over 500 000 t of opencast reserves, an impressive mine life of 79 years, and, under the current approvals, the capacity to produce up to 20 million t (ROM) annually.

Amidst the prevailing ESG and investment landscape, Olive Downs stands as a rare project. It deviates from the conventional trajectory of major mining companies that are tending to steer clear of large greenfield coal developments.

The success of Pembroke's development could lead one to conclude the path has been straightforward. Yet, even with a world class project such as Olive Downs, with strong investment and financial backing, along with superior environmental credentials and almost exclusively steelmaking coal, there have been numerous challenges to get this world class project to production.

History

Pembroke Resources, established in 2014 by Executive Chairman and CEO, Barry Tudor, and supported by prominent global private equity firm Denham Capital, holds full ownership of the Olive Downs Complex. The investment strategy was straightforward. The focus was on coking coal due to its indispensable role in steel production, via a world class asset that was capable of development without the need for excessive infrastructure.

The Olive Downs Complex perfectly aligned with this strategy. Previously under the ownership of Peabody and, prior to this, part of Macarthur Coal's asset pipeline, it had initially caught the attention of Tudor and Pembroke's Chief Operating Officer, Mark Sheldon, who were both executives at Gloucester Coal in 2009 when Gloucester Coal and Peabody were in the process of merging on the Australian Securities Exchange (ASX).



Pembroke's acquisition of Olive Downs ticked all the boxes with a huge resource of high-quality coking coal in the world's best coal basin, surrounded by multiple and mature rail and port options. Another key attribute of any potential asset was that it was 'uncontroversial'.

Tudor's experience of operating a mine in the Gloucester basin provided valuable insights into emerging ESG trends. The Gloucester basin stood out from the Hunter Valley region, as it was close to a National Park and nearby to town and numerous hobby farms. It was subject to exceptionally rigorous environmental regulations for its time. Consequently, it had to consistently meet and surpass environmental and social expectations to retain its environmental and social licence.

Construction and firsts

Pembroke has outlined plans to swiftly double the production capacity, emphasising that the mine was designed and engineered with a modular approach, facilitating future expansions in a timely manner. So, although the current construction phase will achieve annual production of six million t, several project components have been developed to support the approved capacity of 20 million tpy.

The infrastructure investments, exceeding AUS\$500 million, encompass a range of key components, such as:

- An electrified 19 km rail line and loop, establishing a connection between the operations and the Norwich Branch line.
- A 24 km water pipeline to facilitate the necessary water supply.
- An advanced two-stage coal processing plant with a capacity of 800 tph.
- Multiple road and rail bridges for efficient transportation.
- A 44 km 66 Kv electricity line and a dedicated communications tower, supporting the operations of the automated haulage system.



Figure 2. Coal handling and preparation plant.

The mine will also employ a fleet of Caterpillar autonomous-ready 794 AC haul trucks, and it is also the pioneering site to integrate both autonomous trucks and drills.

A unique opportunity to generate superior outcomes

In spite of the considerable obstacles associated with the approval and construction of a greenfield coal mine in the current environment, Pembroke recognised the significant potential for showcasing a fresh approach to mining that aligns with contemporary values concerning the environment, conservation, emissions, social responsibility, and governance.

Olive Downs is recognised as being the first mine approved under the Queensland Strong and Sustainable Communities Act, offering employees genuine options to reside within the local community. And the mine is also first in implementing three-phase clearing protocols and establishing a dedicated programme and clinic for the conservation of Koalas and Greater Gliders.

Pembroke was fully aware of the challenges involved in developing a new coal mine in the 2020s. It understood from the outset that true success would not come from merely meeting the minimum requirements, but rather by surpassing them and establishing new benchmarks. The objective was to establish new industry standards for mining in 2023.

The complex redefines the traditional concept of mine construction and development. It introduces the idea of a campus that embodies a comprehensive approach to resource mining, a first of its kind. This holistic approach was embraced from the very beginning, starting with the decision to go beyond the necessities of mining operations by acquiring over 40 000 hectares of agricultural land within and adjacent to the resource development zone. While not mandatory for mining purposes, this choice was made to facilitate the responsible implementation of these objectives for the development of the complex.

Sustainability and technological advancements are propelling innovation within the resource industry, and the Olive Downs Complex represents a comprehensive and interconnected development that embodies this ethos. Pembroke believe it is a mining approach that can only be realised through a steadfast commitment to exceptional outcomes, and the establishment of new standards well in advance of commencing operations onsite.

The integrated mining concept

The Olive Downs Complex encompasses a diverse range of components, including:

- Over 20 000 hectares of designated conservation areas dedicated to preserving fauna and ecological habitats.

- A specialised clinic for Koalas and Greater Gliders, staffed by expert veterinarians and wildlife ecologists; offering ground-breaking research, protection, and conservation.
- Pioneering fauna tracking programmes, bolstered by veterinary assistance and community education initiatives.
- A 10 ha. solar farm and green energy project designed to offset power demand and promote sustainable practices.
- 20 000 ha. of pastoral activities, fostering agricultural pursuits and land utilisation.
- An indigenous cultural centre dedicated to celebrating and promoting the rich indigenous history of the region.
- An eco-village that adheres to world's best practices in construction and minimises environmental impact, incorporating sustainability considerations from the design stage and fostering development for the wider community.
- The Olive Downs open cut mine, featuring state of the art automation technology for key mining equipment, ensuring heightened safety and efficiency.

Over the past two decades, the Australian mining industry has witnessed notable advancements



Figure 3. The 19 km rail loop connecting Olive Downs to the Norwich Branch line.

in specific areas. However, many existing mines face limitations in their overall effectiveness due to lingering residual or legacy issues, impeding their ability to fully integrate and offset their environmental impact.

Most mining projects prioritise the rapid attainment of production and revenue targets, often neglecting other crucial considerations. This approach can lead to operations burdened with legacy issues, posing challenges in achieving sustainable outcomes.

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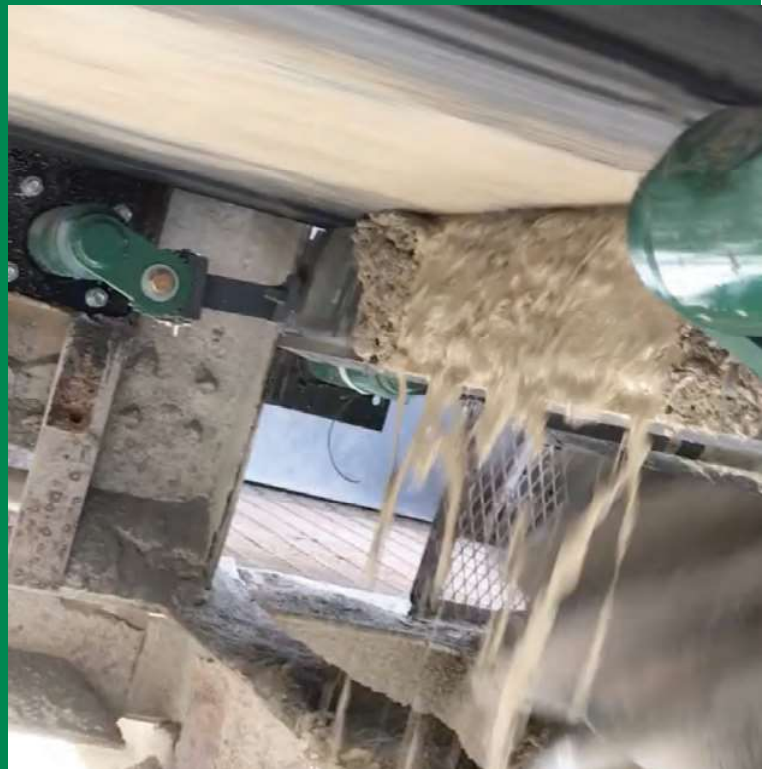
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One example of how Pembroke is dealing with these issues differently at Olive Downs can be seen in its approach to the protection of native wildlife during clearing operations. In contrast to conventional mining practices that may result in substantial harm to wildlife inhabiting vegetated areas, Olive Downs has implemented a three-stage protocol. This protocol involves three thorough checks for wildlife before clearing each tree, employing specially trained 'spotter catchers', drones, and elevated work platforms.


This unique approach showcases the mine's commitment to minimising the impact on wildlife and ensuring their well-being throughout the clearing process. Similarly, the purpose-built Koala and Greater Glider clinic is utilised to conserve and protect native wildlife, and the integrated fauna tracking programme creates research data for the protection and study of native wildlife.

Steelmaking coal – demand and supply

Coking coal remains indispensable in the production of high-quality steel, and there is currently no viable substitute available and so it seems that the reliance on coking coal will

persist for several decades. Given its vital role in numerous aspects of people's lives – including consumer goods, transportation, construction, infrastructure, and the transition to renewable energy – the significance of steelmaking coal cannot be understated.

While the demand for coking coal, particularly in rapidly developing regions like Southeast Asia, remains robust, the supply side will face constraints. During this phase of the market cycle, new producers would usually enter the market, expanding capacity through large-scale projects. However, the challenges encountered in bringing Olive Downs into production are even more formidable for new entrants, resulting in a scarcity of such projects.

At a time where investors and lenders are reluctant to commit to a long-term project, given the uncertainties around ESG and government policy, many jurisdictions are unlikely to approve major new coal mines. While existing mines are depleting, it is easy to understand why the Australian Financial Review reported recently that the Olive Downs Complex may be the last of the large-scale greenfield steelmaking mines. 



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