

Peer review of the Expert Report of Greg Houston

Prepared by

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22 June 2016

1. Objectives and approach

The objectives of this peer review is to consider the Expert Report of Greg Houston (hereafter “The Report”) as to its findings regarding:

- The impacts of the proposed Drayton South Coal Project (hereafter “The Project”) on the operations, branding and reputations of Coolmore and Darley Studs (hereafter “The Studs”) and the Upper Hunter Equine Critical Industry Cluster (ECIC);
- The economic barriers and/or benefits of the Studs relocating; and.
- The likely impact on the ECIC of one or both Studs leaving the Upper Hunter.

In addressing these objectives, this review will also point out any analytical deficiencies and provide advice on the overall merit of the Report as an element in deciding the future of the Project.

The approach taken in this review is to first make clear any assumptions (both explicit and implicit) made in the Report that are likely to be critical to its findings and to assess the validity and significance of those assumptions. Second, some key economic concepts that relate to the issue of business location are introduced. Their relevance to the Upper Hunter context is considered and the way in which the Report has used them (or not) assessed. This conceptual analysis is important because the objectives of this review, and of the Report, involve predicting the impact of an event that has no precedent – the Drayton South mine. That means strong, direct empirical evidence is not available. Without such evidence, theory can be used as the basis of prediction. However, where empirical evidence has been presented by the Report, that is reviewed in the fourth section of this review. Conclusions and recommendations relating to further analysis are presented in the final section.

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2. Assumptions

The analysis presented in the Report is necessarily based on a series of assumptions, two of which deserve consideration here. Any analysis involving an attempt to predict the future must be grounded in some assumptions. Perfect information regarding the future is not available and so some parameters must be defined around the decisions that are being predicted. The two assumptions in question involve the motivations of decision makers and the context of their choices. These are now addressed.

2.1 Motivation

The Report attempts to forecast the impacts of the Project on the future decisions made by the owners of the Studs and other business operators in the ECIC. The Report does so under the assumption that the prime motivation of action is profit: that is, entities are 'rational economic decision maker(s)' (p.17). Many economic models take this approach and their predicative capacity across large numbers of individuals and contexts has generally proven reliable. However, where the context involves small numbers of individual decision makers, the profit maximisation assumption is potentially not as useful.

For instance, some individuals may engage in profit 'satisficing' and pursue additional non-profit goals. This means that an individual may seek a level of profit from their efforts that satisfies their requirements for financial return without maximising it, and then look to achieve other non-profit goals. These may include charitable actions or the pursuit of 'lifestyle' goals. The latter is exemplified by people taking on agricultural enterprises but doing so for the peace and quiet or the scenic views even at the expense of a financial loss. Such motivation may be termed 'utility maximisation'.

Predicting peoples' behaviour under that alternative motivation is inevitably more complex because it is impossible to know exactly what factors provide or detract from an individual's happiness. This is one element of 'behavioural economics', a branch of the discipline that is yet to provide much by way of concrete predictive capacity. However, given that the ownership of the Studs is in the hands of high wealth individuals, it could be expected that profit may not be the only or even the primary driver of decisions. The marginal utility of money (profit) to high wealth individuals can be diminished to the point where other factors become more prominent in their overall well-being (or utility).

So while statements made in the Report to the effect that breeding and racing ability is not affected by the scenery enjoyed by the stallions and brood mares, it may affect the well-being of the owners of those animals. Changes to said scenery may therefore affect decisions made by the owners. Indeed, even if the scenery doesn't objectively change but the decision makers' perception is that the scenery has changed then choices may be revised.

However, acknowledging the potential for motives other than profit to drive decision making, doesn't mean that predicting behaviour on any other grounds is likely to be superior. Furthermore, the profit maximising incentive is likely to hold considerable sway for many decision makers and so acts as a highly useful guide in the prediction process. Indeed, the pursuit of non-profit objectives mostly comes at a cost to profit and that foregone profit can be a significant moderator of actions taken.

In the absence of any better understanding of motives, and behavioural economics has to date failed to provide that, assuming that people act in their self-interest to ensure the best profitability they

can achieve – that is they are rational economic decision makers - is the most useful way forward. The alternative is conjecture regarding motivation and that would inject inappropriate subjectivity into the analysis.

2.2 The choice context

The Report focuses on the impact of the Drayton South mine (the Project) on the Studs and the ECIC. The inherent assumption made in the Report is that decision making by the Studs and other equine businesses will be driven by the development and operation of that single mine. Yet as is well understood, the Hunter region is a centre of coal mining in NSW and the Drayton South mine is the next in a continuum of mines that create a cumulative effect. Decisions are made regarding responses to the Project in the context of the accumulation of mines and the expectations (perceptions) of future prospects for further mine development. Furthermore, the report makes its predictions on the basis of the Drayton South mine being the only factor of change having an impact on Stud and ECIC decision making. In other words, the margin is defined only in terms of the Drayton South mine.

Given that the requirements made of the Report were to assess the impacts of the Drayton South mine, it is reasonable that the margin is defined by the single mine. However, it is important in considering the impacts of the mine to ensure that the analysis recognises that choices made by the Studs' owners and components of the ECIC will be based on the accumulation of mine impacts and the expectations of future mining expansions. This is not made explicit in the Report although recognition is given to the significance of other mines in the region and their impacts on the existing equine operations. Prospects for future expansions of mining in the Upper Hunter are not mentioned.

3. Conceptual analysis

In predicting future locational choice outcomes that do not have precedent, the use of theoretical concepts is important. These concepts are based on evidence established in a range of different contexts and have been demonstrated to be useful in making predictions. A number of these concepts are outlined here and their relevance to the Report's analysis is established.

3.1 Central place theory

The advantages to business of locational 'agglomeration' have been widely understood for centuries. Early economic geographers such as von Thunen and Christaller posited 'central place theory' to explain how cost savings to both buyers and sellers generate significant incentives for businesses to agglomerate in a location that is central to the market. Cost savings to buyers are in terms of their transportation costs to the location of the seller/s. Sellers' cost savings are enjoyed through the economies of scale enjoyed by providers of services to the sellers. Later, economist Harold Hotelling demonstrated the competitive pressures faced by (relatively immobile) businesses that push them toward locating adjacent to each other in the middle of the established (relatively mobile) consumer demand. Sellers can gain a competitive advantage by locating in a position that is closer to more buyers because they can access a greater segment of the demand. Competitive relocations through time will ensure all suppliers locate centrally. Moving away from the centre will reduce market share and so there is a locational equilibrium established.

3.2 Competition and market structure

Predictions about firms' decisions, including those relating to location, involve the structure of the market in which they operate. A key element that defines market structure is the level of competition faced by incumbents. Early economic theories placed emphasis on the numbers of firms that constitute the industry, with the understanding that the greater the number of firms, the more competition there would be. More recent thinking, such as that of Michael Porter in his theory of competitive advantage, focuses on the extent of barriers to entry and exit. Such barriers may include government regulations but also financial factors such as the extent of fixed costs associated with establishing a new operator, relocating an enterprise or exiting altogether to reinvest in another industry. With low entry barriers even a single firm faces competitive pressure because any profit advantage they achieve will be seen as an opportunity for new firms to enter the industry. Low exit barriers will create less inertia in any industry.

3.3 Substitution

A basic tenant of economic theory is the principle of substitution. If a buyer finds the costs of purchasing a product (including the purchase price and the transaction costs of making the purchase) to be rising, they will search for alternative suppliers or alternative products that will satisfy their requirements. Similarly, sellers search for the lowest costs of inputs. In both cases, the possibilities for substitution are investigated. It is exceptionally rare that substitutes for final products and production inputs are not available. Where substitution possibilities are limited, the prospect of profit from the development of new substitutes creates a powerful force to innovate that works to remedy the limitation.

3.4 The Report's application of economic concepts

All of the key concepts outlined have been used either directly or indirectly in the Report however it is useful to reconsider the analysis conducted in the Report, making clear and checking the appropriate application of these principles.

The first point to recognise is that the existing cluster of studs and brood mare farms demonstrates the strength of the benefits associated with locational agglomeration. The existing locational attributes that give the Upper Hunter region a comparative advantage (soils, pastures, water, topography, proximity to transportation, proximity to major urban centres, etc²) have been supplemented by the agglomeration of like businesses and service providers. Previous locational decisions support the contention that the Upper Hunter has been the best location for the businesses operating there. If it wasn't they would have moved elsewhere over time.

The question is whether or not these established benefits of agglomeration will be impacted by the proposed mine. The extent of the market that is the source of the agglomeration advantage is the broodmare farms of the ECIC. The broodmare farms are essentially the 'buyers' in the market. The 8286 broodmares in the ECIC are geographically scattered across the area. Given the requirement for mares to be 'covered' by stallions, then it is the transportation costs of mares to stallions and vice versa that is a key component of the locational decision.

Proximity to the proposed mine is not an issue for the majority of broodmare farms as they are predominantly located away from the proposed mine site. It would therefore appear to be the case that the establishment of the mine would not impact on the location of the broodmare farms. In

² The Report indicates that the gross margins in the industry are twenty times greater than what could be earned in the next best pastoral use of the land: beef cattle. This gives an indication of the extent to which the ECIC firms have a comparative advantage.

turn this suggests that the mine would not reduce the benefits of agglomeration³. Even with the mine in operation, there would be benefits to be enjoyed by a firm offering the services of stallions (the sellers) in a location central to the ECIC.

If the benefits of agglomeration are likely to remain with the mine operating, the next question is which firm will be in the best position to take advantage of them. This is a matter of industry structure and substitution.

Barriers to entry to the provision of stallion services are relatively low (confirmed by the ACCC). This is particularly exemplified by the growth in use of 'shuttle stallions' that are brought from overseas to the Upper Hunter each year: shuttle stallions account for 23% of mares covered. Furthermore, there is competition between local stallion suppliers across the ECIC. In other words, stallion services, even of very high breeding quality, are readily substitutable, mobile and can be established in a location at relatively low cost.

The conclusion to be drawn is that the existing ECIC agglomeration of broodmare farms will continue to be an attractive source of business for stallion suppliers even with the proposed mine in operation.

The next step in the logic is to consider the role of the Studs in the provision of these stallion services. With the benefits of agglomeration still available, the Studs' business model would not change materially with the operation of the mine. Given that:

1. the choices made to establish in their current locations indicates the superiority of those sites relative to alternatives (say in Victoria or NZ);
2. the advent of the mine will not impact on their basic business model⁴; and,
3. there would be re-establishment costs associated with moving location,

it would appear that a profit motivated operator would choose not to move location in the event of the Project proceeding. This conclusion is in line with that of the Report.

Should the Studs choose to move away from their current locations for non-profit related but utility maximising motives such as lifestyle impacts, then the next question involves their choice of alternative locations. At least two alternatives are possible: Within the ECIC or an interstate or overseas location.

Making a judgement on the relative attractiveness of these two alternatives is very difficult without evidence of the relativities of the re-establishment costs and the inherent comparative advantages of alternative locations (in factors such as soils, topography, water etc). However, the lower re-establishment costs associated with a move to an alternative local position within the ECIC would be a strong driver of that choice.

³ Note that the broodmares held by the Studs constitute a relatively small proportion of the total broodmares in the ECIC: For example, Darley holds 250 of the 8286 total in the ECIC. Also, the concentration of firms in the broodmare sector of the industry is relatively low with 80 per cent of breeders in the ECIC having fewer than three mares.

⁴ The Studs are not 'location leaders' in the market even though they supply 36 per cent of covers in the ECIC. That is, the broodmare farms did not locate in the ECIC area because of the presence of the Studs. The ECIC arose because of the attraction of the region to the broodmare industry. Competition between stallion suppliers means that the relocation of the Studs would be unlikely to draw broodmare farms away from the ECIC.

In many ways however, that choice of alternative locations is of little consequence to the future of the ECIC. That is because if the Studs did choose to relocate away from the ECIC, the ease of entry into the industry and the benefits of agglomeration would mean that substitute suppliers of stallion services (competitors) would quickly emerge. The loss of the Studs' broodmares would reduce the size of the industry in the ECIC, at least in the short term. However this reduction could be swiftly reversed with favourable economic conditions driving growth in the racing industry which is the source of the derived demand for foals.

These conclusions are consistent with those drawn by the Report but the Report does not go far enough in recognising the competitive potential in the stallion services supply and the prospect for substitution of the segment of the market currently occupied by the Studs. While the Studs currently occupy what appears to be a prominent position with the ECIC, their leaving the region would be unlikely to trigger an exodus of broodmare farms from the ECIC. To the contrary, the Studs' exit would open the market to the entry of substitutes that would in a relatively short period of time, fill the vacated market niche. While the Report's appendix looks at the capacity of existing studs to fill this niche, it does not consider the potential for growth in the supply of shuttle stallions. With the regulations relating to the age of race horses creating definite seasons in the northern and southern hemispheres, there is a clear competitive advantage to stallion owners to increase the rates of return by increasing the capacity utilisation of their stallions. At low marginal costs (associated with transportation) revenue can be significantly increased by supplying services in both hemispheres.

This conclusion is important given the possibility that profit maximisation is not the main motivation of the Studs' owners (and hence a breach of that key assumption). Relocation of the Studs may occur because of the owners' displeasure (for whatever reason) at having their properties located adjacent to an operating mine. However, in terms of the ECIC's continued existence, such a non-profit motivated choice is likely to have little long term influence on the industry in the region given that the majority of broodmare farm owners are profit motivated and not subject to utility impacts associated with the location of the mine.

4. Empirical Evidence

The Report takes advantage of some empirical evidence relating to the effects of coal mine location on other stud farms. In particular, the case of Edinglassie is used to demonstrate that another stud farm is able to continue to operate successfully in the near presence of an active coal mine (Bengalla). The Edinglassie case does not provide a contextual parallel to the context of the Studs. There are significant differences in ownership and in the nature of the operation conducted. However, in the absence of any closer contexts for comparison, there are important conclusions to be drawn from the Edinglassie case.

First, it demonstrates the strength of the agglomeration benefits available from the ECIC. Second, it shows that the physical operations of a stud farm are not compromised by the proximity of coal mining operations. Hence, from a purely production and profitability angle, Edinglassie is proof that the Studs' operational potential will not be compromised by the Drayton South operation. It seems clear that stallions' capacity to cover is not impacted by adjacent mining operations. This conclusion is substantiated by the PAC in its acknowledgement that the Project will not cause offsite impacts that are any worse than those of mines elsewhere in the Hunter that have received approval.

The Edinglassie case does not, however, give any evidence regarding the prospects of the Studs' future location decisions. The ownership characteristics (between BHP as the land - but not the business - owner for Edinglassie, and the Sheik for Darley) are too different to achieve that. What

the example does is to show that in the event of the Studs deciding to leave the ECIC, it is highly likely that alternative stallion suppliers (either new entrants or expanded existing operators) will set up/expand to fill the vacated market niche given the profit incentive to do so.

Other cases of equine operations being located adjacent to mines are also provided in the Report. For example, Woodlands is located five kilometres from the Mt Arthur mine. The Report also points out that Darley Kelvinside was located adjacent to a tannery which produced off-site effects that did not impact its operations.

Empirical evidence regarding the mobility of stallion service providers that supports that conclusion is also provided by the Report. That evidence is in the form of data relating to entry and exit of firms into and out of the ECIC. The cases of Newgate and Patinack in particular demonstrate the flexibility existing in the industry.

5. Conclusions

I am in agreement with the major conclusions drawn by the Report. My approach to considering the questions addressed in the Report is somewhat different but the end point is fundamentally the same.

The Report employs sound economic analysis that is reinforced by the formal presentation of the conceptual principles that are set out in this review.

In short, the benefits of agglomeration and the forces of competition are too strong to see the ECIC disbanded, with or without the continued presence of the Stud.

The decisions regarding location to be taken by the Stud cannot be readily predicted given the prospects of non-profit incentives driving owners' choices. There is certainly good profit based reasons for the Stud to stay in their current locations. And it would appear that a second-best outcome in terms of profitability would be for them to relocate to an alternative site within the ECIC. However, there remains the prospect that both Darley and Coolmore will move away. This however should not be seen as the end of the ECIC. Rather, it is likely that alternative suppliers will take up the market niche vacated by the Stud and the ECIC will, over a relatively short period of time, return to its current size and standing.

Given that the physical off-site effects of the Project (eg. Dust and noise) have been acknowledged as within accepted guidelines, there is nothing to suggest that the capacity of the Stud to carry on with their existing operations would be impeded by the mine. The immediate visual impacts of the mine from the Stud are also negligible. Once on site, clients of the Stud would not be aware of the adjacent mining activities. They would of course be aware of the mine and the numerous other mines in the region in travelling to and from the Stud. This may impact on clients' perceptions of the Stud but it is dubious to conclude that business would be lost by the Stud as a result. There is little doubt that the overriding factors in clients' (broodmare owners) decision making regarding the use of a stallion are the bloodline of the animal and the cost of covering. These factors are not influenced by the Project⁵.

⁵ The debate highlighted in the Report regarding the importance of gardening costs at the Stud is inconsequential in light of this conclusion. The attractiveness or otherwise of the Stud's gardens is not likely to be a key driver of clients' purchases of stallion services in comparison to the bloodline of the available stallions and their costs.

The analysis conducted in this review and that of the Report do not take into account the prospect of further mining developments being located within the ECIC. The cumulative impact of such expansion may give rise to different conclusions, especially if mining expansion was to reduce significantly the number of broodmares in the ECIC. Such reductions could jeopardize the existence of the agglomeration benefits currently enjoyed. Even if equine industry expectations were that mining expansion will continue into the ECIC, then current locational decisions may be affected.

The future locational decisions of broodmare farm owners are thus very important to the continued viability of the ECIC. A study to investigate the factors that drive those decisions would provide information useful to the planning of the region. Such a study could involve an 'ex post' analysis of what factors were important in past decisions or an 'ex ante' analysis of likely impacts of future changes in location choice drivers. Both types of studies involve complexities associated with collecting reliable data from broodmare farm owners given incentives to answer questions 'strategically' in an attempt to secure favourable planning outcomes. One option is to conduct a 'choice experiment' in which current broodmare farm owners are asked how they would react to a sequence of different contexts, where the contexts are described in terms of variations in key locational drivers including costs of relocation, differential profitability and proximity to coal mining activities. The analysis of choices made in the alternative contexts would allow a better understanding of the impact of mining relative to other factors.