PAC HEARING

Good evening, my name is Dr Andrew McLean, I am a behaviour specialist and I have been commissioned by Coolmore and Darley Studs to ascertain the behavioural and psychological effects on their horses of the proposed Drayton South Coal Mine Project, less than one km away. For 25 years I have been Director of The Australian Equine Behaviour Centre where we specialise in the behavioural rehabilitation of problem horses and I run external clinics in 12 countries. I am now director of ESI (Equitation Science International), an educational subsidiary of the AEBC.

Contrary to the affirmations given for this project in the Department of Planning Report, I have some significant comments to make.

1. Firstly *there is no scientific literature* on the effects of open cut mine explosions on horse behaviour, let alone on thoroughbred horses. We simply do not know: obviously it is *unthinkable* that *any* would-be-stud-developer would choose to locate adjacent to a coalmine.

It is important to note that we have not been informed on the precise details of the regular explosions to be perceived at Coolmore from the proposed Project. In addition, the *timing* of the explosions has not been revealed by Anglo except to say that they will occur on average 5 times per week. This could mean a few explosions on one day and none the next. The *uncertainty* of this can add to both human and equine stress and can make the management of horses, and daily event planning very difficult.

2. The most significant aspect of this particular case from my point of view is that the general breed temperament characteristic of the thoroughbred horse is that it has an *especially strong flight response* compared to other, non-racing horse breeds. The flight response is a basic instinctive response that enables animals to escape from danger. As many of you will know, thoroughbred horses descend from three stallions from the Middle East and the importance of this, is that these horses had big cats (e.g. lions) rather than wolves as predators. Flight response behaviours such as bolting, bucking and shying are useful in avoiding being caught by cats, (but not wolves which can outlast horses) so the horses of these Middle East regions evolved a powerful flight response. Thus the modern thoroughbred has inherited these characteristics because it gives them speed plus an ability to react quickly to the jockey's urging, as well as the sudden opening of the starting gates. Testimony to this powerful flight response was the unfortunate death of the racehorse *Araldo* after the 2014 Melbourne Cup when a member of the crowd waved a flag close by as the horse returned to the mounting enclosure.

Of course there are *some* thoroughbreds that have relatively calm temperaments, however these flighty genes are nonetheless inherent in thoroughbred horses. In addition, most horse riders recognise that thoroughbreds are known as '*hot horses*' whereas draught and ponies are typically *cold horses* and sport horses are nowadays mostly *warmbloods*, somewhere in the middle.

The flight response has specific characteristics such as the production of adrenaline and cortisol. It shows up in horses as bolting, *i.e. galloping away out of control*, shying *i.e. sudden swerving* and leaping out of control. It can thus endanger both human handlers as well as the horses themselves.

3. Importantly, the unpredictable effects of explosions may have *significant effects* on developing *stress* in horses. The effects of stress include the deterioration of *learning* abilities and the tendency not to trial new learned responses. These effects can make the training of young horses difficult, for example in yearling preparation, and therefore render them dangerous to themselves and their handlers. Stress also is known to affect the horse's *gut*, potentially resulting in colic and not uncommonly, death from colic. Also, there are powerful effects of stress on the *immune* system, which can render animals more susceptible to disease. Finally, stress can have strong effects on an animal's *reproductive biology*, where stallions may become less fertile or lowered in libido, and reproductive disorders and miscarriages may occur in mares. Published research shows that some species such as elk and caribou, similar in flight response to thoroughbred horses show panic, running and miscarriages when exposed to sonic booms in Alaska from USA air force planes.

4. It is doubtful that all horses would habituate to (i.e. become used to) random explosions especially since we do not know the precise size of the charges to be used. Habituation capabilities are not uniform or universal – some individuals will not habituate and will therefore be exposed to danger.

5. Therefore it is of the *utmost importance that we apply the precautionary principle here.* Coolmore and Darley Studs, the breeding ground of the cream of Australian racing, should *not* become a science experiment on the effects of coal mine explosions on thoroughbred racehorses.