Peer review of Guidelines for the Economic Assessment of Mining and Coal Seam Gas

Report prepared for New South Wales Department of Planning and Environment

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1 Introduction

This short document is a peer review of the draft Guidelines, by Robin Smale, Director, Vivid Economics. The peer review was carried out in the last two weeks of September.

The peer review is in two sections. The first section sets out comments on the draft Guidelines themselves. The second section comments on another peer reviewer’s report.
2 Notes on the guidance itself

There is much to commend in the Guidelines, but the comments below report focus only on areas of clarification and for improvement.

2.1 Section 3: CBA, starting from page 14

- Approach 2, a partial CBA, is unconventional and may lead to confusion, so the guidance needs to be especially clear on how to follow Approach 2.
- The drafting in relation to the payment of royalties and taxes, the cost of finance and greenhouse gases is confusing and should be made clearer.
- Further confusion may arise from the drafting in Table 3.1 relating to the treatment of payments to workers and suppliers, which should be entered as costs into the cost benefit account. It would be possible to improve the drafting around the definition of ‘direct benefits’ and ‘direct costs’ and the role of the terminal values of assets in the cost benefit analysis.
- The text suggests that project expenditures may be higher than opportunity cost. This is mentioned again on the following page. It is unclear what the basis is for this comment in the text.
- The NSW government is obliged by statute to consider only the impacts within the State, page 18/19. Although the guidance follows the statute in pro-rating company profit by NSW share of Australia’s population, the interests of NSW and of Australia as a nation may diverge.
- The drafting around the treatment of taxes and royalties could be improved, see Table 3.10 and page 24.
- Note a possible inconsistency here that greenhouse gases do not cause an impact local to NSW, see page 23.
- It is unclear whether proponents are required to carry out sensitivity analysis independently on each parameter or combine them together, see page 24. There is merit in combining them together.
- There is no discussion of inflation. Make clear that the assessment should all be carried out in real terms. Note that this may necessitate a conversion of the costs of finance from nominal to real terms.
- It is not clear whether decommissioning costs at the end of an extraction project’s life are included. They should be included if they are significant.

2.2 Section 5, starting from page 46

2.2.1 Air quality, from page 46

- The assessment covers PM. NOx and VOCs are not typically a major pollutant from the type of mining which occurs in NSW, but if mining projects are assessed where these would be major pollutants, then they should be included in the assessment of those projects.
- Impact estimates based on tonnes of emissions might be appropriate for smaller projects, but for larger projects with substantial PM emissions and a significant receptor population, full dispersion modelling may be justified. Due to the remoteness of many of the mining locations, it will not be necessary in most
cases. The justification for dispersion modelling would be a high impact estimate from the simpler ‘damage cost’ method relying on tonnes emitted and standard unit damage costs.

- It may not be appropriate to adjust unit damage costs over long periods of time by the Consumer Prices Index when a consumption adjustment, accounting for changes in real income, may be more appropriate, see page 50.
- There is no sensitivity around the unit damage costs. It would be useful to have a sensitivity range around these figures.

2.2.2 Ambient noise, from page 51

- Traffic noise appears not to be included.
- It would be helpful to include some standard noise values similar to those used for air quality.
- A physical description of number of residents affected and commentary on the levels in terms of impact on sleep and enjoyment of the indoor and outdoor environment would be desirable.

2.2.3 Biodiversity, from page 57

- It is unclear what landscape value and biodiversity values are and how they are to be estimated, but this may be specified in the Framework for Biodiversity Assessment, page 50.
- Be aware that biodiversity offsets involve risk.
- Note that the biodiversity offsets may not benefit the community which currently uses the site that is to be lost or degraded.
- Non-market valuation techniques may not be reliable for the valuation of biodiversity, page 60. The Guidance could use replacement cost as an alternative. The system effects of the loss should be considered when establishing what the appropriate replacement cost is and whether replacement is feasible.

2.2.4 GHGs, from page 61

- It may be better to count emissions from all production-related transport than to use a scope of emissions related to vehicle ownership.
- The reference to this document itself should be changed to refer to a previous version of the document, page 63.
- A wide range of GHG values is employed. It is unclear how the uncertainty here is handled in the analysis.

2.2.5 Groundwater, from page 65

- Note that dewatering and extraction can benefit surface waters if it is returned to them.
- The drafting on the valuation of groundwater is not clear, page 67. Groundwater should be valued everywhere on an opportunity cost basis for the services it provides. Where more services rely on it, it may attract a higher value.
- The drafting which says that value is associated with scarcity could be improved and refer to value in use instead, page 70/71.
- It is not clear how an aquifer could be of national significance when a water body could supply no services nationally, page 70/71.
– The guidance should note the difference between consumptive and non-consumptive use and address these types of use more clearly.
– The impact of a change in groundwater quality is not fully addressed.
– In the table on page 71, the value of water in various uses, such as household supply, manufacturing and mining are not internally consistent.

2.2.6 Surface water, from page 80
– This and other similar valuation tables would be improved by the inclusion of valuation estimates, page 83.
– The category of use and non-use values is insufficiently described to allow a person to follow the guidelines, page 84. In addition, the reference to entitlement trading and average water allocation prices in the table merit explanation.
– In citing studies in the table on page 85, clarify that these are examples of reference studies and advise proponents to choose the most relevant recent studies and take care to make appropriate transfers of benefit estimates to their project.

2.2.7 Traffic, from page 86
– The assessment could be extended to cover damage to the road, especially from heavy axle traffic, and accident costs should include the costs of medical treatment and emergency service attendance plus legal costs and impacts on third parties.

2.2.8 Visual amenity, from page 93
– The reference on page 83 is now rather old, although the principles remain.
– Hedonic pricing is probably the best method here. Both A and B methods are appropriate.
– The text on page 98 suggests that hedonic pricing includes the value of air quality. The value of air quality may not be fully captured by hedonic pricing because people may not be able to sense and may not be aware of its health impact. In contrast, people may be able to fully price noise into their property purchases.
– The drafting needs correcting where changes in property value are discounted as if they were a flow rather than a capital item.

2.2.9 Discount rates
– The guidelines follow the whole of government guidelines on discounting, to ensure consistency across government. Seven per cent is a high figure compared with the figures used in other jurisdictions. The UK uses 3.5 per cent declining slowly after 30 years and France uses 4 per cent declining immediately to 2 per cent after 30 years. The Office of Management and Budget in the US uses both 3 per cent and 7 per cent but allows lower discount rates to be used for intergenerational impacts.¹

¹ An entry into the literature on the subject can be found in Arrow K. et al. (2014), ‘Should Governments Use a Declining Discount Rate in Project Analysis?’, Review of Environmental Economics and Policy, volume 8, issue 2, Summer 2014, pp. 145–163. This document cites some of the key references and the principal authors in the field. It can be downloaded here http://scholar.harvard.edu/files/weitzman/files/rev_environ_econ_policy-2014-arrow-145-63_0.pdf.
The consequences of using high figures are that the government takes a short-term view in its decision making and that questions of intergenerational equity are discarded. Projects with high up-front costs and long-term benefits are disadvantaged and those with high future costs are advantaged. The choice of these high figures could lead to confusion about the role of the social discount rate, which should be used in public cost benefit analysis, and the private discount rate, which proponents should use to ensure the cashflows of their projects provide sufficient compensation to their investors for the risks which those investors absorb. Most jurisdictions and many academic papers recommend a narrower range of discount rates for the social cost benefit analysis of all projects. There is a strong case for applying a declining rate for long future dated impacts but not a strong case for applying different rates to different types of project or impact. However, it is common for confusion to arise between private and social discount rates, which a report I wrote for Oxera attempts to resolve.² It reviewed policy practice and took academic advice and concluded that the cost of finance, sometimes called the private sector discount rate, should be included in the cost benefit analysis as a cost to which the social discount rate is applied. The private sector discount rate should not be used to discount flows of costs and benefits in the calculation of a present value in social cost benefit analysis.

² This issue is the subject of Oxera (2006), Economic analysis for the Water Framework Directive: Discounting and the calculation of the present value, Oxera, Oxford
3 Observations on another peer reviewer’s comments

The previous peer reviewer, Quentin Grafton, states that a positive NPV is insufficient for a project to proceed and that the project should consider social, economic and environmental costs and benefits, together with their distributions. It seems that these wider costs and benefits and their distribution are captured in the guidelines and, where possible, the guidelines require their value to be monetised.

Dr Grafton suggests use of Monte Carlo analysis rather than sensitivity analysis alone. Monte Carlo can be useful if there are correlations between variables or known probability distributions of variables, but suggest that it is not necessary otherwise. If there are no correlations and distributions are not known, the higher and lower ranges of the input parameter values can be combined together to give the full potential value of the output parameters of interest.

He also suggests examining the option value of land in an alternative use. This might only be worth doing if there is a reasonable prospect of the land having a higher value in the future than the proposed use, otherwise the value of the option is zero.

He mentions that the Net Present Value is not a sufficient condition because of risk. This may be true if one is risk averse, but governments are sufficiently diversified that they may have a very low level of risk aversion.

Dr Grafton suggests conducting a household expenditure survey for the local area to derive local expenditure multipliers. This seems excessive effort unless it is a particularly large project.
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