HAZELWOOD COAL MINE FIRE INQUIRY

WITNESS STATEMENT - ROBERT GILLESPIE - DATED 11 December 2015

I, Robert Lindsay Gillespie, of Gillespie Economics, 13 Bigland Ave, Denistone, NSW 2114, Principle of Gillespie Economics, say as follows:

A. INTRODUCTION

1. My full name is Robert Lindsay Gillespie. My date of birth is 2 September 1963.

2. I am the Principle of Gillespie a resource and environmental economics consultancy practice.

3. In this role, which I have held since 1997, I undertake economic analysis of projects and policies based on the principles and methods of microeconomic analysis.

4. I have previously held various economist, planning and land management positions with the NSW Government.

5. I hold the qualifications of Bachelor of Science (Macquarie University), Bachelor of Economics (Macquarie University), Master of Planning (University of Technology, Sydney), Master of Economics (Macquarie University) and a Doctor of Philosophy (Australian National University).

6. My statement addresses Term of Reference 10 for the Inquiry.

7. I was engaged by AGL Loy Yang.

B. EXECUTIVE SUMMARY

8. Bonds are useful in reducing government liabilities for final rehabilitation in case of insolvency or noncompliance, and may provide some incentives for timely rehabilitation.

9. However, trying to use one instrument to achieve multiple goals is likely to be counterproductive. Following Tinbergen's principle, the number of instruments must at least equal the number of objectives.

10. While bonds can provide some incentive for timely rehabilitation they are less well equipped to achieve this goal, compared to their primary objective.

11. Bonds are also not designed to address the risk of low probability but high consequence events such as mine fires or to address legacy issues of historically abandoned mine rehabilitation.

12. A bond set at full rehabilitation liability ensures no costs to government in case of default.

13. However, a bond set at full rehabilitation liability has costs to industry.

14. These cost to industry are considerably higher than would be the case if an insurance based approach existed - in this case the cost to industry would be based on a risk management approach.

15. Where there is low risk of default, the disparity between benefits to government from having a bond and costs to industry are greatest.

16. A bond system that reflects risk management principles would be more economically efficient as the costs to industry would reflect the expected costs of rehabilitation default.

17. However, there is a trade-off for government in that should risks of rehabilitation default (that are low probability) actually eventuate then Government would not have sufficient money in bonds to cover the costs of rehabilitation.

18. An illustrative risk management framework applied to AGL Loy Yang Mine, indicates that on the basis of the assumptions made the cumulative risk to government over the mine life is $17M compared to a cost to AGL Loy Yang of $221M.

19. As the probabilities of risk events declines, the cumulative risk to government over the life of the mine approaches zero but the cost to AGL remain the same.

C. ECONOMIC EFFICIENCY AND EQUITY

20. Economic efficiency and equity are two goals of public policy.

21. Economic efficiency is one of the main focuses of economics. It refers to the allocation of scarce resources to produce goods and services that fully reflect community preferences with these being produced at minimum cost.

22. Analytical tools such as benefit costs analysis, which are based on welfare economics, havebeen developed to help identify where policies provide an improvement or reduction in economic efficiency i.e. net benefits to society.

23. While economics can provide information on how impacts are distributed, it provides no guidance on whether one distribution of wealth is superior to an alternative distribution of welfare. This is generally left to decision-makers.

24. In a competitive market with private goods, the market will allocate scarce resources to maximise community welfare i.e. economic efficiency.

25. Where there is a market failure e.g. environmental externalities, there is an economic argument for government interventions provided the benefits of government intervention to society exceed the costs.

26. Mines invariably produce environmental externalities, with regulations aimed at mitigation, compensation or offset. Internalisation of the costs of environmental externalities into a firms costs results in a more economically efficient use of resources.

27. One of the potential externalities of mining relates to losses of values to the community from unrehabilitated land. The potential environmental externalities associated with unrehabilitated mined land is initially addressed through regulation requiring the rehabilitation of mine sites. Compliance with regulatory requirements ensures that the externality costs are internalised into the firm. Notably, the regulatory requirement to rehabilitate mine sites implicitly assumes that the benefits of rehabilitation exceed the costs.

28. However, if a firm becomes insolvent or non-compliant, and rehabilitation is not undertaken, then rehabilitation costs (again assuming rehabilitation is both desirable and undertaken) falls to government. This can have both efficiency and equity implications.

D. ECONOMIC ANALYSIS OF INTERVENTION

29. As described above, environmental bonds are a form of government intervention with the primary objective of protecting the government against having to fund rehabilitation in the case of non-compliance, insolvency, financial difficulty or early closure. They attempt to shift the potential rehabilitation liability associated with the risk of default back onto the mining company. However, they do impose an economic efficiency costs on industry and government.

30. Consequently, there is a tradeoff between:

- the reduced potential financial costs to government (an equity consideration); and
- the burden imposed on companies via the costs of bonds (an economic efficiency consideration).

31. In assessing this trade-off it is necessary to:

- consider the nature and extent of the issue; and
- compare the benefits of intervention to the costs.

32. There is considerable historical evidence of rehabilitation default from mining operations. However, the evidence would appear to be less compelling in the modern regulatory environment, which includes continual oversight and monitoring and a range of legal recourses including prosecution and criminal conviction of executive officers. KPMG report that since November 2005 the DPI has had to call on 24 performance bonds. Of these, three exceeded $20,000 ($5.01m, $1.72m, and $75k). The characteristics of the mining companies and mines sites was not reported. However, this is an important consideration. Further analysis would be required to determine the extent to which the potential for rehabilitation default is an all of industry issue or specific to segments of the industry.

33. With regard to the benefits and costs of intervention, the following incremental costs and benefits of a bond system are identified.

Table 1 - Costs and Benefits of a Bond System

Costs	Benefit
Transactions costs to the government and mining company of establishing a bond	Avoided risk of rehabilitation default and cost of rehabilitation falling to government
Cost to the mining company of the bond service charge	
Opportunity cost of reducing borrowing ability of the mining company	

34. The transactions costs to the government and mining companies of establishing a bond include:

- estimating the rehabilitation liability using the bond calculator and/or other means;
- negotiations;
- documentation and administration;
- bond establishment with an appropriate financial institution.

35. There is a direct annual bond fee payable by the mining company which can range from 0.5% to 5% of the bond amount.

36. An opportunity cost to the mining company arises because, for the purpose of providing a bank guarantee, a financial institution will either:

- require a company to provide an asset or cash deposit as security for the bank guarantee
- include the guarantee as a liability when assessing a company's borrowing capacity, which limits the company's ability to access additional debt.

37. The main benefit of an environmental bond is avoided risk of rehabilitation default and the associated rehabilitation costs falling to government. The level of this benefit from a bond is therefore a function of the probability of rehabilitation default, which will in turn depend on the financial position of the operator, the characteristics of the mining operation and the viability of legal recourse to recover costs.

38. The relative costs and benefits of an environmental bond will vary from mine to mine.

39. As identified by White et al (2012), a bond policy makes more sense from an economic efficiency perspective when:

- the probability of bankruptcy is relatively high (>40%);
- the opportunity cost of the bond is relatively low; and
- the shadow price of public funds is high.

40. That is, the potential benefits are high and the economic efficiency costs are low.

41. Measures that could be taken to reduce the economic efficiency costs of bonds include:

- immediate bond reduction as rehabilitation progresses;
- bond amounts that reflect the risk of insolvency and non-compliance (White et al 2012).

42. Notably however, the second of these options would reduce the level of funds available to government in the event that non-compliance or insolvency occurs.

E. FINANCIAL ASSURANCE INSTRUMENTS

43. A range of potential financial assurance instruments for the rehabilitation of mine and quarry sites in Victoria are assessed in KMPG (2011) and Accent (2015)

44. Financial assurance instruments can potentially be developed for a range of environmental objectives (whether or not the outcome would be economically efficient).

45. From the documents I have read I can distinguish four different environmental issues/goals:

- risk of rehabilitation default in the event of insolvency or firm refusing to undertake final rehabilitation works;
- incentives for timely rehabilitation during the normal operation of a mine;
- risk of low probability unplanned events such as fires;
- funding for historic abandoned mine rehabilitation.

46. Evaluations that have been undertaken sometimes evaluate a single financial assurance instrument on the extent to which it addresses a number of these environmental issues/goals.

47. However, trying to use one instrument to achieve multiple goals is likely to be counterproductive. Following Tinbergen's principle (Tinbergen 1952)[1], the number of instruments must at least equal the number of objectives. A targeted policy instrument, including non-financial instruments, is needed for each separate policy goal.

48. For instance, bonds are primarily aimed at addressing the risk of rehabilitation default in the event of insolvency or firm refusing to undertake final rehabilitation works[2]. While the management and review of bonds can provide some incentive for timely rehabilitation they are less well equipped to achieve this goal, compared to their primary goal of reducing the government liability from final rehabilitation default.

49. Alternative mechanisms to promote rehabilitation goals could include a combination of regulatory oversight and non-compliance fees. The revenue from non-compliance fees could also aid in the funding of any bond shortfalls in the cases where insolvency occurs and the bonds held and subsequent legal action are insufficient to cover total rehabilitation liabilities. Such a strategy could provide the revenue base to facilitate discounts on bonds being provided where insolvency risks are small. Discounts on bonds without an alternative means to meet the residual liabilities between bond monies and rehabilitation costs in the event of default (even if the probability is very low) would increase the costs to government should default occur. This is an outcome that this protected against when bonds are at 100% of rehabilitation liabilities.

50. Bonds are also not designed to address the risk of low probability but high consequence unplanned events such as mine fires or address historic abandoned mine rehabilitation. Such liabilities can potentially be addressed via alternative mechanisms. Again, bonds are designed to address planned not unplanned rehabilitation costs.

F. KMPG GUIDING PRINCIPLES

51. The 10 principles devised by KPMG to guide the structure and operation of any system to provide security for default of a licensees rehabilitation are generally considered reasonable. However, given that economic efficiency is a primary goal of public policy, it is considered that this should also be recognised in the guiding principle e.g. the system should aim to improve economic efficiency or minimise economic efficiency losses.

52. In addition, explicit recognition of the Tinbergen principle would avoid inappropriate evaluation of single rehabilitation policy mechanisms and promote consideration of the most appropriate mechanism to address individual policy issues. e.g. the system should recognise that to achieve multiple goals, multiple instruments will be required.

G. RISK MANAGEMENT PRINCIPLES

53. The current bond system assumes 100% probability of default for all operators and all mine sites. This is despite historically only a very small percentage of bond call ins.

[1] Tinbergen, J. (1952). On the Theory of Economic Policy. North-Holland Pub. Co., Amsterdam, the Netherlands.
[2] Although it s recognised that bonds can be called in in relation to progressive rehabilitation as well as final rehabilitation.

54. Risk assessment typically involves:

- case by case identification of potential risks;
- case by case estimation of the consequences (in dollar value) should the risk event occur; and
- case by case estimation of the likelihood of those consequences occurring.

55. The current approach to mine site rehabilitation focuses on general identification of the potential risk (i.e. default on mine site rehabilitation), and case by case estimation of the consequence (i.e. the size of the liability), on a mine by mine basis. However, no consideration is given to case by case consideration of the likelihood of these consequences arising. This is inconsistent with risk management principles and results in economic efficiency losses.

56. Many factors will potentially influence the consideration of the "likelihood" of default on mine site rehabilitation, including factors related to:

- the nature of the operator e.g. size of company, ownership, assets, levels of indebtedness, record of regulatory compliance, etc; and
- the nature of the mine operation.

57. In assessing likelihood, the standard approach in risk assessment is to identify the chain of risk events that would lead to a specified consequence.

58. Some documents reviewed have identified early closure as a risk event and implied that this is all that is required for rehabilitation default. However, a chain of events would be required before a rehabilitation liability would be borne by government. This may include early closure, company insolvency and failure to recover liability via legal mechanism. Only then would the government be exposed to the rehabilitation liability. Each of these events in the chain has a probability attached to them. The likelihood of the rehabilitation liability being borne by government is the multiplication of the probabilities in the chain of events.

59. Ultimately, the risk faced by government = likelihood * consequence.

H. RISK ASSESSMENT AND BOND POLICY

60. The cost to industry of bonds set at full rehabilitation liability is considerably greater than would be the case if an insurance based approach existed. Under an insurance based approach the cost to industry would be the risk weighted default liability (based on a risk assessment) plus a management fee for the insurer.

61. However, an insurance approach does not exist and instead the government approach is based on environmental bonds. The cost to industry under this approach is considerably higher than if an insurance approach existed.

62. A discount bond system adopting risk management principles is not the same as an insurance scheme adopting risk management principles. Under an insurance approach, premiums from many operators are pooled, to provide sufficient funds to cover rehabilitation liabilities. While a discounted bond approach would reduce the costs to industry in line with the expected risk of rehabilitation default, should a default occur, the discounted bond would be insufficient to meet the rehabilitation costs and hence there would be a net liability faced by Government.

63. Additional mechanism would be required if Government wanted to ensure a no net liability position.

I. COAL MINES ARE A HIGH REHABILITATION RISK?

64. The Accent report refers to the fact that coal mines would be deemed ineligible for any performance based bond system due to their high rehabilitation risk. However, risk management principles would require individual assessment of mining operations to identify potential risks, estimation of the consequences should the risk event occur, and estimation of the likelihood of those consequences occurring. This approach to risk management should in principle apply to all mines including coal mines. A risk management approach that is tailored to individual risk will have lower economic efficiency costs.

65. However, it needs to be recognised that an individualised approach will also have higher administration costs. In some mining sectors where numerous small operators are all undertaking similar activities with similar risks a more generic approach may be more efficient. However, for large mining operations the administrative costs of a risk based approach are likely to be very small compared to potential efficiency benefits of tailored assessments.

66. The discussion further below in this report considers risk factors specific to AGL Loy Yang.

J. GENERIC RISK FACTORS

67. Factors that will impact the likelihood of rehabilitation default will include those related to the mine operator and the mine site.

68. These include, but are not limited to:

- past conduct of the mine operator;
- degree of financial stability of the mine operator;
- other assets held by a mine operator and its parent company;
- other indications of good corporate governance;
- legislative requirements for progressive rehabilitation and the quantum of rehabilitation costs at any point in time;
- stability of demand for the product and other market considerations and hence probability of unplanned closure.

K. PERIODIC ADJUSTMENT REVIEWS OF BONDS

69. If governments are willing to accept some net liability for rehabilitation in the case of default, then periodic risk assessment review that is reflected in bonds at that time would in principle be preferable from an economic efficiency perspective to one-off or multi-step linear increases in bond amounts.

70. However, risk assessment revisions come at a cost to society and hence there would be a tradeoff between the cost of risk assessment reviews and the benefits to society from undertaking them. The optimal frequency of reviews is therefore an empirical issue.

71. In broad terms, the benefits from reviews (i.e. reduced economic burden from the cost of assurance requirements) will potentially be greater with larger scale mining operations that are

likely to have greater rehabilitation liabilities. Therefore an approach of more frequent risk assessment reviews is likely to be more suitable to larger mines than smaller activities.

L. ELIGIBILITY FACTORS FOR ACCESS TO A BOND DISCOUNT

72. Eligibility factors for access to a bond discount should be based on the outcome of risk assessments which in turn would include factors consideration of factors related to the mine operator and mine - see J above. The lower the assessed risk the greater the rationale for a bond discount.

M. CEILINGS ON BOND DISCOUNTS

73. In principle discounts on bond amounts should reflect the outcome of individual risk assessments with higher discounts reflecting lower risks. Where there is negligible risk there is an economic efficiency argument for exclusion from the bond scheme.

74. It is not obvious what the rationale for a maximum of 25% discount on bond levels would be.

N. FLEXIBILITY TO USE ALTERNATIVE ASSURANCE MECHANISMS

75. In principle some assurance mechanisms may have different advantages (cost savings) to different operators, while still being suitable to manage the risks to government. Risk management principles promote individual tailored approaches so as to maximise economic efficiency.

76. However, this needs to be balanced against the transaction costs of adopting and implementing multiple mechanisms across different sites. Where costs of negotiating and implementing different mechanisms is high compared to the cost savings to operators, then a formula based approach may be warranted. However, the cost savings to large operations of alternative mechanisms may be large enough to offset any addition transactions costs associated with an individual review of alternative mechanisms.

O. AGL LOY YANG CONSIDERATIONS

77. The conceptual model undertaken by GHD for AGL Loy Yang estimated an indicative current rehabilitation liability of $112M which is expected to decline over time (Stephen Rieniets Supplementary Statement). In a risk management framework, the rehabilitation liability in any particular year is the 'consequence' if there is a default on rehabilitation liabilities.

78. The 'likelihood' in any particular year requires a chain of risk events. Stephen Rieniets (Supplementary Statement) has identified the likelihood of closure in each year of the mine life. However, in addition to this, consideration would need to be given to the likelihood of insolvency or noncompliance upon closure. Relevant factors include that:

- AGL Loy Yang is a subsidiary of AGL one of Australia's oldest companies with a sound record in meeting its regulatory requirements;
- AGL Loy Yang has a good record of performing progressive rehabilitation, which is currently funded from operating funds and provisions;
- AGL Loy Yang has a range of contracts for the supply of coal and infrastructure services, including with the Victorian Government;

- AGL is a horizontally and vertically integrated company with an operating Earnings Before Interest and Tax in 2015 of $1.1B

79. The nature of the mine operation also reduces the probability of insolvency:

- demand for coal from AGL Loy Yang is derived demand linked to the demand for electricity in Victoria;
- the AGL Loy Yang Mine is the energy source for AGL Loy Yang Power Station and Engie Loy Yang B Power Station which supply over 50% of Victoria energy demand.
- because of this substantial demand the mine is not subject to the financial uncertainty that export coal mines are in the face of fluctuations in export commodity prices.
- Electricity produced by AGL Loy Yang Power Station is in the lowest quartile of electricity generators in the National Electricity Market from a merit order perspective;
- AGL Loy Yang Mine has a Mining License which runs through to 2037, with potential for extension through to its planned closure in 2048 or beyond;
- any replacement of brown coal fired electricity generation with alternative technologies is likely to many years away and gradual i.e. not leading to sudden unforseen and unplanned closure of the AGL Loy Yang Mine.

80. In addition to the likelihood of insolvency, consideration would also need to be given to the probability that the Victorian Government would be unable to recover the rehabilitation costs from legal measures. The likelihood of default in any particular year = probability of closure*probability of default*probability of failure of legal action.

81. To demonstrate this risk management framework, the risk based model framework - Table 2 of Stephen Rieniets' Supplementary Statement - has be adjusted to demonstrate the impact of including the additional risk events required for default on the rehabilitation liability. For demonstration purposes, the risk of insolvency or noncompliance in any particular year has been assumed to remain constant at 5% and the risk of failure of legal measures to recover the rehabilitation liability has been assumed to be constant at 50%.

82. On this basis the cumulative risk weighted rehabilitation liability borne by Government over the mine life is given in Table 2 as $17M in total or $3M present value. This example ignores the reduction in risk from parent company guarantees or proposed Trust fund deposits.

83. The cumulative costs to AGL Loy Yang over the life of the mine of reducing the risk faced by Government to zero via a bond at the full rehabilitation liability (assuming a bond fee of 1% of the bond amount and an opportunity cost of reduced borrowings at 7%) is estimated at $221M in total or $88M present value.

84. The cost to AGL Loy Yang of a bond at the full rehabilitation liability is considerably higher than the benefit to government, because on the assumptions made there is a very low risk of default.

85. The annual risk based liability is $1M or less - this relates to the level of bond that would be held on a risk weighted basis and reflects the very low risk of default.

Table 2 - Demonstration of Risk Based Assessment of Costs and Benefits of Environmental Bond at Full Rehabilitation Liability

Year	Consequence - Rehabilitation Liability	a. Likelihood of Closure		b. Likelihood of Insolvency	c. Likelihood of Unsuccessfull Legal Action	Likelihood a*b*c	Risk	Bond Fee @1%	Opportunity cost of reduced borrowing @ 7%
		Likelihood	Probability	Probability	Probability	Probability	Consequence * Likelihood		
2015	$112M	N/A	0.0%	5.0%	50.0%	0.0%	$0M	$1M	$8M
2016	$108M	RARE	0.1%	5.0%	50.0%	0.0%	$0M	$1M	$8M
2017	$104M		0.1%	5.0%	50.0%	0.0%	$0M	$1M	$7M
2018	$101M		0.1%	5.0%	50.0%	0.0%	$0M	$1M	$7M
2019	$97M		0.2%	5.0%	50.0%	0.0%	$0M	$1M	$7M
2020	$94M		0.4%	5.0%	50.0%	0.0%	$0M	$1M	$7M
2021	$91M		0.7%	5.0%	50.0%	0.0%	$0M	$1M	$6M
2022	$88M		1.1%	5.0%	50.0%	0.0%	$0M	$1M	$6M
2023	$85M		1.8%	5.0%	50.0%	0.0%	$0M	$1M	$6M
2024	$83M		3.0%	5.0%	50.0%	0.1%	$0M	$1M	$6M
2025	$80M		5.0%	5.0%	50.0%	0.1%	$0M	$1M	$6M
2026	$77M	UNLIKELY	6.0%	5.0%	50.0%	0.1%	$0M	$1M	$5M
2027	$75M		7.2%	5.0%	50.0%	0.2%	$0M	$1M	$5M
2028	$72M		8.6%	5.0%	50.0%	0.2%	$0M	$1M	$5M
2029	$70M		10.2%	5.0%	50.0%	0.3%	$0M	$1M	$5M
2030	$68M		12.2%	5.0%	50.0%	0.3%	$0M	$1M	$5M
2031	$65M		14.7%	5.0%	50.0%	0.4%	$0M	$1M	$5M
2032	$65M		17.5%	5.0%	50.0%	0.4%	$0M	$1M	$5M
2033	$65M		21.0%	5.0%	50.0%	0.5%	$0M	$1M	$5M
2034	$65M		25.1%	5.0%	50.0%	0.6%	$0M	$1M	$5M
2035	$65M		30.0%	5.0%	50.0%	0.8%	$0M	$1M	$5M
2036	$65M	POSSIBLE	32.4%	5.0%	50.0%	0.8%	$1M	$1M	$5M
2037	$65M		35.0%	5.0%	50.0%	0.9%	$1M	$1M	$5M
2038	$65M		37.8%	5.0%	50.0%	0.9%	$1M	$1M	$5M
2039	$65M		40.9%	5.0%	50.0%	1.0%	$1M	$1M	$5M
2040	$65M		44.2%	5.0%	50.0%	1.1%	$1M	$1M	$5M
2041	$65M		47.7%	5.0%	50.0%	1.2%	$1M	$1M	$5M
2042	$65M		51.6%	5.0%	50.0%	1.3%	$1M	$1M	$5M
2043	$65M		55.7%	5.0%	50.0%	1.4%	$1M	$1M	$5M
2044	$65M		60.2%	5.0%	50.0%	1.5%	$1M	$1M	$5M
2045	$65M		65.0%	5.0%	50.0%	1.6%	$1M	$1M	$5M
2046	$65M	LIKELY	67.5%	5.0%	50.0%	1.7%	$1M	$1M	$5M
2047	$65M		70.1%	5.0%	50.0%	1.8%	$1M	$1M	$5M
2048	$65M		72.9%	5.0%	50.0%	1.8%	$1M	$1M	$5M
2049	$49M		75.7%	5.0%	50.0%	1.9%	$1M	$0M	$3M

2050	$37M		78.6%	5.0%	50.0%	2.0%	$1M	$0M	$3M
2051	$28M		81.6%	5.0%	50.0%	2.0%	$1M	$0M	$2M
2052	$21M		84.8%	5.0%	50.0%	2.1%	$0M	$0M	$1M
2053	$16M		88.1%	5.0%	50.0%	2.2%	$0M	$0M	$1M
2054	$12M		91.5%	5.0%	50.0%	2.3%	$0M	$0M	$1M
2055	$9M		95.0%	5.0%	50.0%	2.4%	$0M	$0M	$1M
Total							**$17M**	**$28M**	**$193M**
NPV @ 7%							**$3M**	**$11M**	**$77M**

86. If private insurance markets existed, AGL Loy Yang would face a cost equivalent to the risk weighted cost facing the government plus an insurance premium (say 10%) i.e. $19M over the life of the mine rather than $221M. A bond system at full rehabilitation liability therefore has high costs to industry.

87. The illustrative results reported in Table 2 to are sensitive to assumptions about the probability of risk events. Table 3 compares the total risk weighted rehabilitation liability to government under varying likelihood assumptions for insolvency of AGL Loy Yang and likelihood of unsuccessful legal action, holding the probabilities of mine closure constant.

88. This shows that the cumulative risk to government over the life of the mine approaches zero as these likelihoods decrease but the cost to AGL remain the same.

Table 3 - Sensitivity Analysis of Cumulative Risk to Government over the Mine Life

Likelihood of Insolvency	Likelihood of Unsuccessfull Legal Action	Total Risk to Government	Cost to AGL
5%	50%	$17M	$220M
1%	50%	$3M	$220M
1%	25%	$1M	$220M

ATTACHMENT 1 - ROBERT GILLESPIE CURRICULUM VITAE

Robert is the Principal of Gillespie Economics and has a wealth of experience in environmental and resource economics, and environmental planning and assessment, gained from 12 years with the NSW Government and over 17 years as a consultant. He has tertiary qualifications in science, economics and planning and extensive experience in benefit cost analysis, including non market valuation techniques, and regional economic impact assessment. He co-authored the Planning NSWs' draft *Guideline on Economic Effects and Evaluation in EIA.*

Qualifications

- PhD (Australian National University) – Valuing the Environmental, Social and Cultural Impacts of Coal Mining Projects in NSW, 2010 to 2014 (part time).
- Master of Economics - Macquarie University (part time), 1995 - 1998.
- Master of Planning - University of Technology, Sydney (part time), 1992-1994. Thesis topic was “Economic Analysis in Environment Impact Assessment”.
- Bachelor of Economics - Macquarie University majoring in micro-economics (part time), 1986-89.
- Bachelor of Science - Macquarie University majoring in Land Management, 1982-84.

Employment History

- 1997 to present – Principal of Gillespie Economics
- 2002 to 2009 – Lecturer at Macquarie University in Introduction to Environmental Economics
- 2002 to 2009 – Guest Lecturer at UTS in non-market valuation;
- 2002 to 2003 – Lecturer at Sydney University in non-market valuation techniques
- 2003 – Lecturer at Sydney University in benefit cost analysis
- 1994 to 1997 – Manager, Environmental Economics Policy Unit, NSW National Parks and Wildlife Service
- 1992 to 1994 – Resource Economist, Natural Resources Branch, NSW Department of Urban Affairs and Planning
- 1990 to 1992 – Various Town Planning Positions, NSW Department of Urban Affairs and Planning
- 1986 to 1990 – Various Land Management Positions, NSW Department of Lands

Areas of Expertise

- Environmental and resource economics
- Benefit cost analysis including non-market valuation
- Regional economic impact analysis using input-output analysis techniques
- Financial appraisal
- Pricing policies
- Economic and financial instruments
- Environmental planning
- Environmental impact assessment
- Policy analysis, development and review

Consulting Experience:

- **Environment ACT:** Economic values of the environments of the ACT
- **ERM Mitchell McCotter:** Input Output Analysis of the Dendrobium Coal Mine Proposal
- **NSW DUAP:** Preparation, with Ecoservices Pty Ltd, of guidelines on *Economic Effects and Evaluation in Environmental Impact Assessment*
- **NSW DUAP:** Assessment of Direct Regional Economic Impacts of Timber Harvesting Scenarios for the Upper North East and Lower North East of NSW in relation to the Native Forestry Comprehensive Regional Assessment/Regional Forestry Agreement process.
- **NSW DUAP:** Assessment of Direct Regional Economic Impacts of Timber Harvesting Scenarios for the Southern Region of NSW in relation to the Native Forestry Comprehensive Regional Assessment/Regional Forestry Agreement process.
- **NSW DUAP:** Economic profiling of the mill sector in the Brigalow Belt as part of the Native Forestry Comprehensive Regional Assessment/Regional Forestry Agreement process.
- **NSW DUAP:** Investigation of incentive mechanism applicable to private landholders in the Brigalow Belt as part of the Native Forestry Comprehensive Regional Assessment/Regional Forestry Agreement process.

- **NSW DUAP:** Preparation of a Native Forestry CRA/RFA Base Case - Discussion Paper
- **NSW DUAP:** Preparation of a report on the Economic Value of Recreation and Tourism in Forests of the Eden RFA
- **NSW DUAP:** Review of the economic analysis of the Lake Cowal Gold Mine Project
- **NSW DUAP:** Review of the Threshold Value Analysis for the Lake Cowal Gold Mine Project
- **NSW DUAP:** Review of the *Economic Analysis of the Liverpool-Parramatta Transitway, Working Paper*
- **NSW DUAP:** Preparation of an economic analysis of Sydney Drinking Water Draft Regional Environmental Plan and State Environmental Planning Policy No. 58 – Protecting Sydney's Water Supply.
- **NSW NPWS:** Training of NSW NPWS staff on the using input-output analysis to examine the regional economic impact of Montague Island.
- **NSW NPWS**: Review of the Economic Aspects of the Lake Victoria Preliminary Draft EIS
- **NSW NPWS:** Review of the Economic Aspects of the Lake Victoria Draft EIS
- **NSW NPWS:** Review of the socioeconomic analysis undertaken in the draft EIS for the Quarantine Station
- **NSW NPWS:** Socioeconomic Study of the Cumberland Plain Woodland draft Recovery Plan;
- **NSW NPWS:** Benefit cost analysis of a Regulatory Impact Statement regarding Little Penguin Conservation at Manly;
- **NSW NPWS:** Regional economic impact assessment of the Fitzroy Falls visitor centre;
- **NSW NPWS:** Regional economic impact of assessment of seven national parks in North East NSW;
- **NSW NPWS:** Economic values of the coastal environments of NSW;
- **NSW DEC:** Coastal Lakes Sustainability Assessments – Merimbula Lake and Back Lake Pilot Study: Estimation of Economic Values of Natural Resources and Natural Environments.
- **NSW DEC:** The Contribution of Ecosystem Services to Sustainable Water Resource Management in Coastal NSW: Case Study of the Manning River Catchment.
- **Sydney Water:** Preparation of a Financial Appraisal and Benefit Cost Analysis of the Blue Mountains Sewerage Program (Stage 1)
- **Sydney Water:** Preparation of a Financial Appraisal and Benefit Cost Analysis of the Blue Mountains Sewerage Program (Stage 2)
- **Sydney Water:** Preparation of a Financial Appraisal and Benefit Cost Analysis of the Vaucluse and Diamond Bay Sewerage Diversion, including a Dichotomous Choice Contingent Valuation Study.
- **Sydney Water:** Preparation of a Financial Appraisal and Benefit Cost Analysis of the Priority Sewerage Program. Separate analyses were undertaken for Menangle/Menangle Park, Oaks/Oakdale/Belimbla Park, Warragamba/Wallacia/Silverdale/ Mulgoa, Stanwell Park/Stanwell Tops/Coalcliff/Otford, Jamberoo, Mt Kuringai Industrial Estate, Brooklyn/Dangar Island.
- **Sydney Water:** Economic Evaluation of Developer Funded Odour Mitigation at Warriewood Sewage Treatment Plant – Peer Reviewer;
- **Hassall and Associates Pty Ltd:** Preparation of a Benefit Cost Analysis Framework for a Draft Regulatory Impact Statement for the Proposed Timber Plantation (Harvest Guarantee) Regulation for Hassall and Associates Pty Ltd.
- **Hassall and Associates Pty Ltd:** Review of the financial and economic appraisal of the NSW NPWS's proposal to upgrade camping facilities and provide cabins within the Warrumbungles National Park
- **Hassall and Associates Pty Ltd:** Review of the economic aspects of a Recreation and Tourism Study for the Southern Region RFA/CRA.
- **Hassall and Associates Pty Ltd:** Review of a study by IRIS of the Regional Economic Impacts of the Closure of Wollongong Golf Club due to expansions of the Wollongong STP.
- **NSW EPA:** Various contracts - Review of Environmental Valuation Studies for Inclusion in the ENVALUE Database
- **NSW EPA:** Search for Environmental Valuation Studies for inclusion in the ENVALUE Database.
- **NSW EPA:** Development and delivery of a short course on Benefit Cost Analysis and Environmental Valuation
- **University of Technology, Sydney:** Casual Lecturer on Environmental Valuation in the Master of Planning Program and Master of Urban Estate Program.
- **Sydney University:** Lecturer in environmental valuation to third year resource economics students.
- **Sydney University:** Lecturer in benefit cost analysis to third year resource economics students.
- **Macquarie University:** Lecturer in introduction to environmental economics students in the Graduate School of the Environment.
- **NSW Tourism:** Preparation of a report on the Application of Benefit Cost Analysis to Tourism

- **Sutherland Council:** Preliminary benefit cost analysis of Sutherland Council's proposed actions for implementing Agenda 21 in the LGA.
- **Total Environment Centre Inc.:** Preparation of a report on the Economic Benefits of Environmental Flows for the Snowy River
- **Total Environment Centre Inc.:** Economic Analysis of a Life Cycle Analysis of Waste Management Practices.
- **Total Environment Centre Inc:** Economic analysis of urban consolidation in the Sydney region, funded by DUAP, the development industry and TEC.
- **Australian Conservation Foundation:** Economic use values associated with the Murray River;
- **Australian Conservation Foundation:** The financial costs of an end to logging in 'Tasmania Together' forests
- **NSW Department of Land and Water Conservation:** Benefit Cost Analysis of the Coffs Harbour Sewerage Strategy.
- **NSW Department of Land and Water Conservation:** Review and amendment of *draft Guidelines for Determining Environmental Impact Assessments on Bushfire Management Activities* to incorporate requirements regarding economic and social assessments.
- **NSW Department of Land and Water Conservation:** Benefit cost analysis of the Catchment Protection Scheme
- **NSW Department of Land and Water Conservation:** Economic and social analysis of an application to clear native vegetation to establish a vineyard.
- **NSW Department of Land and Water Conservation:** Member of the Independent Scientific Group engaged to undertake a review of exemptions under the Native Vegetation Conservation Act and provide comment on a discussion paper on offsets for vegetation clearing in NSW.
- **NSW Department of Land and Water Conservation:** Preparation of a study on Valuing Environmental Services at the Farm Level
- **NSW Department of Land and Water Conservation:** Socioeconomic analysis of the Draft Regional Vegetation Plan for the Western Riverina Region
- **NSW Department of Land and Water Conservation:** Socioeconomic analysis of the Draft Regional Vegetation Plan for the Northern Tablelands
- **NSW Department of Land and Water Conservation:** Socioeconomic analysis of the Draft Regional Vegetation Plan for Inverell-Yallaroi
- **NSW Department of Land and Water Conservation:** Socioeconomic analysis of the Draft Regional Vegetation Plan for Tenterfield
- **NSW Department of Land and Water Conservation:** Socioeconomic analysis of the Draft Regional Vegetation Plan for Nundle
- **NSW Department of Land and Water Conservation:** Lake Macquarie Dredging Benefit Cost Analysis and Sand Supply Feasibility;
- **NSW Department of Land and Water Conservation:** Preparation of a Regulatory Impact Statement for the Hunter Catchment Management Trust Regulation 2003;
- **NSW DIPNR:** Cost benefit analysis of environmental flow regimes for sustainable use of Greater Sydney's Water
- **NSW DIPNR:** Benefit cost analysis of Stage 2 of Rouse Hill Regional Park
- **NSW Premier's Department:** Policy Analysis Relating to the Sydney Water Inquiry.
- **NSW Fisheries:** Economic Study of the NSW Abalone and Rock Lobster Fisheries.
- **King and Campbell Pty Ltd:** Review of the *Hastings Council Urban Growth Options Assessment Under the Principles of ESD* and *Draft Urban Growth Strategy 1999*.
- **King and Campbell Pty Ltd:** Review of Port Macquarie Outer Ring Road Selection Study
- **Hawkesbury Nepean Catchment Management Trust:** Contribution to Stormwater/Wastewater Socio-Economic Research Project undertaken by the Centre for Integrated Catchment Management
- **Australian Marine Park Tourism Operators:** Preparation of Input Output analysis to examine the contribution of Marine Park Tourism Operators to the Cairns-Douglas economy.
- **Victorian National Parks Association:** Economic Analysis of the Establishment of the Rushworth-Heathcote National Park
- **Murray Darling Freshwater Research Centre:** Economic Analysis of Weir Pool Manipulations on the Murray River.
- **NSW Marine Park Authority:** Pricing and Charging Review for the Solitary Islands Marine Park, Jervis Bay Marine Park and Lord Howe Island Marine Park.

- **BHP:** Regional economic impact assessment of the proposed Dendrobium Coal Mine on the Illawarra and NSW economies.
- **NSW Native Vegetation Advisory Council:** Preparation of a Background Paper on the Economic Values of Native Vegetation.
- **Roads and Traffic Authority:** Economic Analysis of Afflux from Proposed Bridge over the Murray River at Corowa.
- **Resource Strategies Pty Ltd:** Preparation of a preliminary Benefit Cost Analysis and Regional Economic Impact Analysis of the Ridgeway Gold Mine
- **Resource Strategies Pty Ltd:** Preparation of a Benefit Cost Analysis and Regional Economic Impact Analysis of the Ridgeway Gold Mine including an assessment of the cumulative regional economic impacts of the Cadia and Ridgeway gold mines
- **Resource Strategies Pty Ltd:** Review of economic methodology for a study of the Stawell Big Hill Gold Mine Project.
- **Resource Strategies Pty Ltd:** Benefit cost analysis and regional economic impact analysis of the proposed Syerston Nickel-Cobalt mine.
- **Resource Strategies Pty Ltd:** Benefit cost analysis and regional economic impact analysis of the proposed Ginkgo Mineral Sands mine.
- **Resource Strategies Pty Ltd:** Benefit cost analysis and regional economic impact analysis of the proposed Ginkgo Mineral Separation Plant.
- **Resource Strategies Pty Ltd:** Benefit cost analysis of the Bowens Road North Open Cut Coal Mine Proposal for inclusion in the EIS;
- **Resource Strategies Pty Ltd:** Benefit cost analysis and regional economic impact assessment of the Telfer Gold Mine in Western Australia;
- **Resource Strategies Pty Ltd:** Benefit cost analysis and regional economic impact assessment of the Wambo Coal Mine Development Project;
- **Resource Strategies Pty Ltd:** Benefit cost analysis and regional economic impact assessment of the Wilpinjong Coal Mine Project;
- **Resource Strategies Pty Ltd:** Ex-post evaluation of the Cadia Ridgeway Gold Mine
- **Resource Strategies Pty Ltd:** Benefit cost analysis and regional economic impact assessment of NCIG Coal Export Terminal
- **Resource Strategies Pty Ltd:** Benefit cost analysis, regional economic impact assessment and social impact assessment of the Snapper Mineral Sands Mine;
- **Centennial Hunter Pty Limited:** Benefit cost analysis and regional economic impact assessment of the Anvil Hill Coal Project
- **Concrite Quarries Pty Ltd:** Preparation of a report on the Employment Aspects of the Exeter Quarry Extension
- **Concrite Quarries Pty Ltd:** Expert witness at a Commission of Inquiry into the Exeter Quarry Extension.
- **Concrite Quarries Pty Ltd:** Preparation of a Benefit Cost Analysis and Regional Economic Impact Assessment of the Extension of Exeter Quarry
- **Cleary Bros (Bombo) Pty Ltd:** Preparation of a preliminary benefit cost analysis and regional economic impacts study of a quarry extension
- **Cleary Bros (Bombo) Pty Ltd:** Benefit cost analysis and regional economic impact assessment of extraction of the Gerroa Sand Resource;
- **Consolidated Rutile Limited:** Benefit cost analysis and regional economic impact assessment of mineral sand mining on North Stradbroke Island.
- **Consolidated Rutile Limited:** Benefit cost analysis and regional economic impact assessment of mineral sand mining on North Stradbroke Island, update.
- **Murray Darling Basin Commission:** Choice modelling study into alternative environmental flows.
- **Barlings Beach Community Pty Ltd:** Benefit cost analysis of clearing of native vegetation for a residential subdivision at Barlings Beach.
- **Brenex:** Armidale Bulky Goods Rezoning Proposal Retail Impact Assessment Report;
- **Jonvana:** Retail Impact Assessment Report – For a Development Application for new retail development.
- **Major Projects Victoria:** Regional economic impact assessment of the proposed Long Term Containment Facility, Mildura.
- **Institute of Public Affairs:** Australias' Hazardous Waste Disposal: Persistent Organic Pollutants
- **Dept of Commerce:** Benefit cost analysis of environmental flows in the Shoalhaven and Transfers to Sydney

- **South East Community Water Recycling Scheme Reference Group**: Community benefits study – benefit cost analysis of wastewater recycling scheme.
- **South East Water Limited**: Benefit cost analysis of the Mornington Peninsula Sustainable Water Initiative.
- **Patterson Britton**: Socio-Economic Assessment of the Stony Creek 2 Off-Stream Storage Near Bodalla.
- **Excel Coal Ltd:** Economic Assessment of Newstan-Awaba Coal Mines.
- **DIPNR:** Benefit cost analysis of the proposed Penrith Lakes Regional Environmental Plan.
- **Helensburgh Coal Pty Ltd:** Economic analysis of Mining Longwalls 14-17 at Metropolitan Colliery
- **DIPNR:** Panel member for inquiry into fifth berth at Port Botany
- **DIPNR:** Review of financial and economic aspects of proposal by Coca-cola for a High Bay Warehouse at North Mead
- **DECC:** Travel Cost Studies of Visitors to NSW Marine Parks
- **Australian Farm Institute:** Estimating the Value of Environmental Services Provided by Australian Farmers
- **Victorian Environmental Assessment Council:** Benefit cost analysis and regional impact assessment for the River Red Gum Inquiry.
- **NSW Minerals Council:** Preparation of Socio-economic Submission to the Independent Expert Panel into Underground Mining in the Southern Coalfield
- **NSW Minerals Council:** Preparation of Socio-economic Submission to the Strategic Inquiry into Potential Coal Mining Impacts in Wyong LGA
- **DECC:** Economic evaluation of volunteering in the DECC, Parks and Wildlife Group
- **Commonwealth Department of Environment and Water Resources:** Social and Economic Impacts of Protected Areas
- **Commonwealth Department of Environment and Water Resources:** Regional Economic Impacts of Australia's World Heritage Areas
- **Commonwealth Department of Environment and Water Resources:** Economic analysis of bioresources for the biotechnology sector.
- **Commonwealth Department of Environment and Water Resources:** Review of the Socio-economic Analysis in the Public Environment Report for Rezoning of the Heritage Estates Land
- **Helensburgh Coal Pty Ltd:** Socio-economic analysis of Metropolitan Coal Project
- **Newcrest:** Preparation of a Benefit Cost Analysis and Regional Economic Impact Analysis of the Cadia East Gold Mine Project.
- **Commonwealth Department of the Environment, Water, Heritage and Arts:** Analysis of social and environmental valuation methodologies for waste management.
- **The HUB Action Group:** Review of the economic analysis for the HUB Regional Resource Reprocessing Facility
- **Great Lakes Council:** Economic Values (Benefits) of Water Quality Improvements in the Great Lakes
- **DECC:** Economic Impact of Linking Protected Areas Under the A2A-Initiative (Border Ranges Priority Area) Part 1
- **Sydney Catchment Authority:** Evaluation of Braidwood options - including accounting for the impact on SCA carbon emissions for energy and electricity
- **DECCW:** Economic Assessment of Biocertification
- **DECCW:** Review of Economic Studies on Marine Parks.
- **BHP Billiton:** Socio economic assessment of Bulli Seam Operations
- **Coal and Allied:** Socio economic assessment of the Warkworth Mine Extension
- **Duralie Coal Pty Ltd:** Socio economic assessment of the Duralie Coal Project
- **Boggabri Coal Pty Ltd:** Economic assessment of the continuation of the Boggabri Coal Mine
- **Hunter Valley Energy Coal Pty Ltd:** Economic assessment of the Mount Arthur Coal Consolidation Project
- **Ravensworth Operations Pty Ltd:** Economic assessment of the Ravensworth Operations Project
- **Oceanic Coal Australia Ltd:** Economic assessment of the West Wallsend Colliery Continued Operations Project
- **DECCW:** Economic analysis of the proposed Environmental Outcomes Assessment Methodology;
- **DECCW:** Economic analysis of Biocertification
- **NSW Department of Finance and Services:** Economic appraisal of Warragamba Dam environmental flow options
- **NSW Department of Finance and Services:** The economic value of recreational activity along the Hawkesbury-Nepean River
- **NSW Department of Primary Industries:** Economic analysis of the NSW commercial fisheries reform package

- **LakeCoal**: Economic analysis of alternative coal transport options

Professional Memberships

- Australian Agriculture and Resource Economics Society
- Society of Benefit Cost Analysis

Published or Conference Papers

- Gillespie, R. (1993) Do Retail Hierarchies Exist? An Investigation in the Epping-Eastwood-Ryde Area, *Land Economics Review*, Vol. 4, No. 2, pp 24-30.
- Bennett, J., Gillespie, R., Powell, R. and Chalmers, L. 1995 *The Economic Value and Regional Economic Impact of National Parks*. Proceedings of Ecological Economics Conference, Coffs Harbour 1995.
- Bennett, J., Gillespie, R., Powell, R. and Chalmers, L. 1995 *The Economic Value and Regional Economic Impact of National Parks*. Australian Journal of Environmental Management, Vol. 3, No. 4, pp. 229-239.
- Gillespie, R. (1997) *The Economic Value and Regional Economic Impact of Minnamurra Rainforest Centre, Budderoo National Park*, NSW National Parks and Wildlife Service, Environmental Economics Series.
- Gillespie, R. and Bennett, J. (1999) Using Contingent Valuation to Estimate Environmental Improvements Associated with Wastewater Treatment, *Australian Journal of Environmental Management*, Vol. 6, No. 1, pp. 14 - 20.
- Gillespie, R. (1999) What do I need to know about benefit cost analysis? In: *Valuing Tourism: Methods and Techniques*, Bureau of Tourism Research, Occasional Paper No. 28, Edited by Corcoran, K., Allcock, A., Frost, T., and Johnson, L.
- Gillespie, R (2000) *The Economic Values of Native Vegetation*, Background Paper No. 4, Native Vegetation Advisory Council of NSW.
- Gillespie, R. (2000) *Multi-criteria Analysis: A Critique from an Economist's Perspective*, Presented to the 2000 Australian Agricultural and Resource Economics Society Conference, Adelaide.
- Gillespie, R. (2002) *Measuring the Benefits of Reticulated Sewerage: Expectations and Expert Property Valuation*, Presented to the 2002 Australian Agricultural and Resource Economics Society Conference, Canberra.
- Gillespie, R. (2004) *Linking Science, Community Consultation and Economics: The Living Murray Project*, Presented to be presented to the 2004 Australian Agricultural and Resource Economics Society Conference, Melbourne.
- Gillespie, R (2004) Economic evaluation and market based instruments, *Journal of Ecological Management and Restoration*, V5, Issue 3, pg 225.
- Crase, L. and Gillespie, R (2006) A Preliminary Consideration of Use and Non-Use Values Circumscribing the Lake Hume Water and Foreshore Management Plan, Presented to the 2006 Australian Agricultural and Resource Economics Society Conference, Melbourne.
- Gillespie, R. (2007) Mine Subsidence At Waratah Rivulet: A Case Study Of The Consideration Of Environmental Costs And Benefits Of Underground Longwall Mining, presented to the Mine Subsidence Technical Society Conference, Wollongong, 26-27 November.
- Gillespie. R. (2008) Economics of Global Warming, paper to be presented at the 52nd AARES Conference, Canberra, Australia, February 2008
- Bennett, J., Dumsday, R. and Gillespie, R. (2008) Analysing Options for the Red Gum Forests Along the Murray River, Paper To Be Presented At The 52nd AARES Conference, Canberra, Australia, February 2008
- Bennett, J., Dumsday, R. and Gillespie, R. (2008) Australian Economic Development and the Environment: Conflict or Synergy, Paper To Be Presented At The 52nd AARES Conference, Canberra, Australia, February 2008
- Crase, L. and Gillespie, R. (2007) The impact of water quality and water level on the recreation values of Lake Hume, *Australasian Journal Of Environmental Management*—Volume 15, pg. 31-39.
- Gillespie, R. (2008) *Estimating Community Values for Environmental Impacts of Mining Using Choice Modelling*, NSW Minerals Council Environment and Community Conference 2008.
- Gillespie, R. and Kragt, M. (2010) Valuing the Impacts of Underground Coal Mining in the Southern Coalfield, Paper Presented At The 54th AARES Conference, Adelaide, Australia, February 2010
- Gillespie, R. and Bennett, J. (2011) Willingness to Pay for Kerbside Recycling, Environmental Economics Research Hub.

- Gillespie, R. and Bennett, J. (2010) Willingness to Pay for Recycling Food Waste, Environmental Economics Research Hub.
- Gillespie, R. and Bennett, J. (2010) Non Use Economic Values Of Marine Protected Areas In The South-West Marine Region , Environmental Economics Research Hub.
- Gillespie, R. and Bennett, J. (2012) Valuing the Environmental, Cultural and Social Impacts of Open Cut Coal Mining in the Hunter Valley of NSW, Australia, *Journal of Environmental Economics and Policy*, Volume 1, Issue 3, 1-13.
- Gillespie, R. and Kragt, M. (2012) Accounting for nonmarket impacts in a benefit-cost analysis of underground coal mining in New South Wales, Australia, *Journal of Benefit Cost Analysis*, 3(2): article 4.
- Gillespie, R. and Bennett, J. (2012) Willingness to pay for kerbside recycling in Brisbane, Australia, *Journal of Environmental Planning and Management*, 1-16.
- Gillespie, R. and Bennett, J. (2014) *Benefit Cost Analysis of Coal Mine Projects in New South Wales, Australia,* presented to the Sixth Annual Conference and Meeting of the Society for Benefit-Cost Analysis, George Washington University, Washington DC.
- Gillespie, R. and Bennett, J. (2015) Challenges in including BCA in planning approval processes: Coal mine projects in New South Wales, Australia, *Journal of Benefit Cost Analysis, Vol. 6(2)..*
- Gillespie, R. (2015) Mining Offsets in NSW, In: *Protecting the Environment, Privately*, Ed. Bennett, J., World Scientific Publishing, UK.

ATTACHMENT 2 - LETTER OF INSTRUCTION

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08 December 2015

Robert Gillespie, Gillespie Economics
Drew Collins, BDA Group

By email:
gillecon@bigpond.net.au and
drewcollins@bdagroup.net

ashurst

Dear Rob and Drew

Economic assessment of the bond setting process

Ashurst acts for AGL Loy Yang in relation to the Hazelwood Mine Fire Inquiry.

Instructions and Assumptions

You are briefed to prepare a witness statement, and if requested by the Board of Inquiry, appear to give evidence before the Inquiry on either Monday 14 or Tuesday 15 December 2015. We would like to receive a witness statement in draft by 4pm on Thursday 10 December 2015.

Your attention is drawn to Term of Reference 10 for the Inquiry, which is in the following terms:

> 10. Having regard to the rehabilitation liability assessments that have been or will be reported in 2015 by the operators of each of the Hazelwood Mine, the Yallourn Mine, and the Loy Yang Mine, as required by the **Mineral Resources (Sustainable Development) Act 1990**, and to the outcome of the Rehabilitation Bond Review Project:
>
> (a) whether the rehabilitation liability assessments referred to above are adequate;
>
> (b) whether the current rehabilitation bond system, being one of the measures to provide for progressive rehabilitation by end of mine life as required under the **Mineral Resources (Sustainable Development) Act 1990**, is, or is likely to be, effective for the Hazelwood Mine, the Yallourn Mine, and the Loy Yang Mine; and
>
> (c) any practical, sustainable, efficient and effective alternative mechanisms to ensure rehabilitation of the mines as required by the **Mineral Resources (Sustainable Development) Act 1990**;

In order to assist with its consideration of paragraph 10(b) and (c) the Board of Inquiry has commissioned reports and evidence, which are described in more detail below.

You are asked to make the following assumptions and have regard to the following materials in providing your expert opinion.

1. The basis upon which rehabilitation bonds for mines have been set in Victoria and the history of the use of such of such bonds is in part described in the attached documents:

    1.1 **Accent Environmental Report** dated November 2015, "High Level Assessment of Alternative Rehabilitation Financial Mechanisms"

1.2 **Statement of Luke Cameron Wilson dated 20 November 2015 (**Lead Deputy Secretary, Agriculture, Energy and Resources Department of Economic Development, Jobs, Transport and Resources) and Annexures 25 to 37 thereof, especially at paragraphs [104] – [178]

2. The basis upon which rehabilitation bonds have been set and calculated in Victoria has been the subject of a number of reviews. In 2011, KPMG provided a report to the State: **'Options for Financial Assurance for Rehabilitation of Mine and Quarry Sites in Victoria'**.

3. Alternative approaches to the imposition and calculation of the level of rehabilitation bonds (and rehabilitation fund levies) are in place in other jurisdictions: see summary in the **Accent Environmental Report** dated November 2015, "High Level Assessment of Alternative Rehabilitation Financial Mechanisms" Sections 3.2 to 3.13.

4. As is stated at paragraphs [109] – [116] of the Wilson Statement, rehabilitation bonds have been registered against each of the three coal mines in the Latrobe Valley in accordance with section 80 of the *Mineral Resources (Sustainable Development) Act*. The amounts of each bond are at present:

   (a) Yallourn $11,460,500

   (b) Hazelwood $15,000,000

   (c) Loy Yang $15,000,000

5. In its 2011 report, KPMG devised 10 principles to guide the structure and operation of any system to provide security for default of a licensee's rehabilitation (see at page 6):

   (a) The system should reflect the fact that a rehabilitation failure rate of 100% is unlikely;

   (b) The system should avoid creating moral hazard (i.e. the licensee avoiding discharging rehabilitation obligations without penalty);

   (c) The system should reward past good behaviour;

   (d) The system should also encourage future good behaviour and discourage future bad behaviour ;

   (e) The system should be based on risk management principles;

   (f) The system should avoid cross-subsidies;

   (g) The system should attempt to avoid large and uncertain increases in the amount of financial insurance;

   (h) The government will seek to manage its financial risks to minimise any budgetary impact;

   (i) Any model should, where possible, not materially increase the administrative burden;

   (j) Financial assurance should be readily converted into cash.

6. The Accent Environmental Report also considers a number of alternative options to respond to what it describes as "trends in financial assurance management" which will address the costs risks associated with mine closure: see Accent Environmental Report at page 28, namely:

   (a) Single step increase

   (b) Multi step increase

   (c) Bond discount

   (d) Trust fund for rehabilitation

   (e) Insurance based

   (f) Pooled fund

   (g) Unplanned events insurance

   (h) Unplanned events fund

   (i) Post closure trust fund.

7. The various reviews which have been conducted in relation to the imposition of rehabilitation bonds in Victoria appear to have proceeded on the basis of an assumption that:

   (a) the purpose of the imposition of a rehabilitation bond in respect of coal mines in Victoria is to reduce the risk that the State will be required to assume the liability for the costs of rehabilitation of coal mines ('the rehabilitation risk");

   (b) a model which encourages progressive rehabilitation by mine operators is to be preferred.

8. By way of a specific example, AGL Loy Yang is party to an agreement with the owner of the Loy Yang B power station and the State of Victoria, the Loy Yang Complex Agreement, under which the owners of the Loy Yang A and Loy Yang B station owners have agreed to contribute to a special trust fund, from 2023, an amount of money equivalent to 10% of the cost of rehabilitating the Loy Yang mine, each year for 10 years. The money in the trust fund may be used to fund the progressive rehabilitation of the mine from its establishment. The LYCA trust fund is separate and additional to AGL Loy Yang's obligation to provide a rehabilitation bond in relation to the Loy Yang mine as a condition of its mining license.

In light of the above stated information and assumptions, and the materials provided, you are asked to provide your expert opinion in relation to the following questions. In providing an answer to these questions, make reference to any additional materials on which you rely in providing your answer.

1. Do the 10 principles developed by KPMG provide an appropriate guide for the development of a rehabilitation bond policy for Victoria's coal mines, namely a policy designed to reduce the risk that the State will be required to assume the liability for the costs of rehabilitation of coal mines?

2. One of the principles referred to by KPMG in its report is "risk management principles". What are the appropriate "risk management principles" in this context ? How should

they be applied in the context of development of a policy applicable setting rehabilitation bonds ?

3. The Accent Environmental Report (page iv) says that the State has to assess the likelihood and consequences of rehabilitation default, its willingness to take on risk and balance this against the commercial needs of the operators. The Accent Environmental Report goes on to state (page iii) that coal mines are currently ineligible for the State's performance based discount bond system "due to their high rehabilitation risk". Do you agree ?

4. In order for the State to "assess the likelihood" of the risk of it being required to assume liability for rehabilitation occurring, what factors are relevant for it to consider ? Do those factors include, for example:

    (a) Whether there are any documented cases in Victoria of an operator of a major coal mine failing or refusing to adhere to its rehabilitation obligations ?

    (b) The past conduct in respect of rehabilitation obligations of a particular mine operator, or mine operators generally ?

    (c) The degree of financial stability of the particular mine operator?

    (d) The other assets held by the particular mine operator and their parent companies?

    (e) Other indicators of good corporate governance on the part of the mine operator?

    (f) The fact that the mine operators are engaged in conducting a business which involves supply of a product used to supply an essential service in Victoria?

    (g) The likelihood of the continued demand for electricity in Victoria and the lead time required to establish alternative sources of supply?

    (h) The advance planning work done by major suppliers of electricity, including major coal operators and their parent companies, to plan for and transition to a changing energy market and regulatory environment?

    (i) The fact that the coal mine operators are required to undertake progressive rehabilitation?

    (j) Any other financial assurance mechanisms already in place to address the same rehabilitation risks?

    (k) The risks of unplanned closure combined with the mine operator's financial incapacity to fulfil rehabilitation obligations over the projected timeframe of the mine (including mine rehabilitation)?

    (l) The quantum of the rehabilitation costs at any particular point in time as measured against the risk of closure as at that point in time?

(m) Are there any other factors which are relevant to assessment of likelihood of risk ?

5. If a model which specifically recognised a progressive adjustment to the bond level were adopted, should it permit a multi step linear increase in the bond amount, or should it reflect the assessed risk of unplanned mine closure and rehabilitation costs at each point in time at which an increase is under review? If a risk based progressive adjustment approach was taken, how often should the risk be re-assessed?

6. If a model for setting rehabilitation bonds was adopted which permitted a discount for 'good behaviour' and/or 'reduced risk' (the bond discount model) what are the sorts of factors which, in your opinion, ought to render an operator eligible to access the discount?

7. Is there any reason to set the bond discount at a ceiling of 25% or should the discount available to any particular operator be flexible dependent upon the factors identified in your answer to the previous question?

8. In the Supplementary Statement of Stephen Gerard Rieniets dated 4 December 2015, Mr Rieniets sets out:

   (a) A probabilistic assessment of the likelihood of mine closure and a number of factors that supported his conclusion that the risk of closure is currently low now and will remain so for many years to come (see para 33-36);

   (b) A summary of the range of commercial and operational factors that AGL considers support a conclusion that the risk of mine closure and mining rehabilitation default is very low (see para 50-57); and

   (c) A possible conceptual model for the determination of a "risk-weighted" rehabilitation bond (see paras 47-49) including a "worked example" of how such a bond could be set.

   To the extent that the referenced matters discussed in Mr Rieniets statement fall within your area of expertise, please comment on your assessment of their relevance to the Board's consideration of Term of Reference 10.

Yours faithfully

Ashurst Australia

Enc

Accent Environmental, High Level Assessment of Alternative Rehabilitation Financial Mechanisms, November 2015

Statement of *Luke Cameron Wilson* dated 20 November 2015

KPMG, Options for Financial Assurance for Rehabilitation of Mine and Quarry Sites in Victoria, 2011

State of Victoria, Establishment and Management of Rehabilitation Bonds for the Mining and Extractive Industries, 2015.

Supplementary Statement of *Stephen Gerard Rieniets* dated 4 December 2015