



**PART SEVEN**  
**REHABILITATION**  
**LIABILITY**  
**ASSESSMENTS**

## PART 7 REHABILITATION LIABILITY ASSESSMENTS

### 7.1 OVERVIEW

Term of Reference 10(a) requires the Board to inquire into, report on and make any recommendations it considers appropriate:

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* (Vic), and to the outcome of the Rehabilitation Bond Review Project:

a. whether the rehabilitation liability assessments referred to above are adequate.

The Rehabilitation Bond Review Project (Bond Review Project) is defined at paragraph 18 of the Terms of Reference as 'the current review into rehabilitation bonds and the methodology by which they are calculated, as referred to at page 1612, lines 7–8 of the transcript of the Hazelwood Mine Fire Inquiry dated 10 June 2014.'

The Board heard evidence from each of the Latrobe Valley mine operators and the State about the rehabilitation liability assessments submitted in 2015. The Board also heard from representatives of the State about the progress of the Bond Review Project.

This Part considers whether the mine operators' 2014–15 rehabilitation liability assessments are adequate, having regard to the outcome of the Bond Review Project. As discussed below, the Bond Review Project is incomplete. The Board's capacity to address this Term of Reference is impeded by this context.

Terms of Reference 10(b) and 10(c) are considered in Parts 8 and 9 of this report.

### 7.2 CURRENT REHABILITATION LIABILITY ASSESSMENTS

As discussed in Part 3 of this report, each mine operator is required to report annually to the Mining Regulator on the rehabilitation works completed that year, and to detail the cumulative area of the mine site that has been rehabilitated since mining commenced. Each mine operator is also required to report on the amount of the current bond for the mine site and the current estimated rehabilitation liability, and to describe the methods and assumptions used to calculate that estimate.<sup>1</sup> Under the Mineral Resources (Sustainable Development)(Mineral Industries) Regulations 2013 (Vic) (Mineral Industries Regulations), the mine operators are required to submit an Annual Activity and Expenditure Return (Annual Return),<sup>2</sup> which records these details.

For the Latrobe Valley mines, rehabilitation liabilities are determined in accordance with the *Establishment and management of rehabilitation bonds for the mining and extractive industries* (Bond Policy).<sup>3</sup> The Bond Policy states that the Mining Regulator's Rehabilitation Bond Calculator (Bond Calculator) is the recommended method for assessing a site's rehabilitation liability.<sup>4</sup> The Bond Calculator breaks down the costs across an operation into a series of 'domains' based on land use (such as workshops and plant, open pits or overburden dumps). Volumes and quantities are entered into the worksheet and costs calculated using the default third party contract rates.<sup>5</sup> The Bond Calculator automatically tallies the costs from each of the operation's domains and has an allowance for project management, contingency and monitoring expenses based on a percentage of the total cost. Contingency costs are calculated at a rate of at least 10 per cent but a higher rate may be applied 'depending on the complexity of environmental management of the operation.'<sup>6</sup>

### 7.2.1 YALLOURN MINE

On 11 August 2015, EnergyAustralia submitted its Annual Return for 2014–15 to the Mining Regulator. In it, EnergyAustralia describes its current bond for the Yallourn mine site as \$11.46 million, and the current estimated rehabilitation liability as \$46–91 million.<sup>7</sup> Mr Ronald Methel, Mine Manager at EnergyAustralia, details EnergyAustralia's calculation methods and assumptions in a letter to the Mining Regulator, dated 8 April 2015.<sup>8</sup> The letter states:

Yallourn Mine is progressively rehabilitating the mine in line with its approved Master Rehabilitation Plan flooding model... There are still a number of studies and reviews that will be needed as the mine nears completion before final rehabilitation can be undertaken in a number of areas... The rehabilitation liability can change significantly depending on the final outcome of the reviews; however the current liability is within the range of \$46 million for minimum stability work required to a conservative position of \$91 million where significant stability treatment is required.<sup>9</sup>

EnergyAustralia's estimate is based on refinements it has made to a rehabilitation liability assessment model (Liability Cost Model), which was originally prepared by geotechnical consultants GEO-Eng in 2001, and modified by GHD in 2002.<sup>10</sup>

EnergyAustralia produced spreadsheets that demonstrate the application of the Liability Cost Model. The spreadsheets show the estimated costs for the areas of the mine pit that will be flooded and the areas that will be above the proposed lake waterline. For the areas that will be flooded, the works costed include earthworks; interim stabilisation; sow to pasture; tree/shrub planting; forestry; wetland development; and ongoing maintenance. The Liability Cost Model also allocates costs for stripping topsoil and stockpiling it for rehabilitation; water diversion facilities (including regulating water in the mine); removing buildings and plant; and the installation of public facilities (for example, access road, parking areas, and pathways).<sup>11</sup> The Liability Cost Model does not contain a line item for contingencies. Rather, Mr Methel explained to the Board that the rates adopted are conservative and provide for some contingency, when compared with the rates actually incurred at the Yallourn mine.<sup>12</sup>

Mr Methel explained to the Board that the costs of completing the engineering studies referred to in his letter dated 8 April 2015 are not included in the rehabilitation liability estimate, as he considers these to be operational costs.<sup>13</sup> Mr Methel further explained that the Yallourn mine's rehabilitation plan assumes that the operator can access existing bulk entitlements to fill the mine after closure, and that it can connect its lake to existing rivers.<sup>14</sup> The Liability Cost Model does not allocate any costs for the purchase of water or other costs relating to accessing water.

### 7.2.2 HAZELWOOD MINE

GDF Suez's Annual Return for 2014–15, dated 20 August 2015, describes its current bond for the Hazelwood mine site as \$15 million, with the rehabilitation liability estimated at \$73.4 million, representing a combined cost for progressive and final rehabilitation.<sup>15</sup>

Mr James Faithful, Technical Services Manager – Mine, GDF Suez, told the Board that rehabilitation estimates will vary depending on the assumptions made, such as the timing of rehabilitation works; final batter profile; the necessary volume of overburden (including sourcing and transporting it); fire risk management; the confidence levels employed; and any unexpected costs (such as works to remediate a batter failure).<sup>16</sup>

Mr Faithful stated that the estimated rehabilitation liability contained in the Annual Return for 2014–15 reflects the current areas of the mine; progressive rehabilitation to date; future mining operations; future progressive rehabilitation works to be undertaken; rehabilitation methods to be used at end of mine life; and reasonable estimates of the rates for materials and labour. He further stated that the estimate 'constitute[s] the most up-to-date and comprehensive costings with respect to the rehabilitation of the Mine Area.'<sup>17</sup>

GDF Suez produced spreadsheets detailing the cost items that make up its estimated rehabilitation liability assessment. The cost items include bulk earthworks; end of operations liabilities; rehabilitation works (including costs for top soil, seeds and fertiliser, and decommissioning infrastructure); fire service rehabilitation; mine flooding (including costs for bore sealing, new bores, decommissioning of new bores, and operation of bores in flooding phase); and ongoing rehabilitation expenses (including costs relating to pump maintenance, maintenance and remediation of rehabilitated areas, drainage and erosion, electricity pumping costs, fire mitigation and the 'DPI stability review group').<sup>18</sup>

Mr Faithful told the Board that the costs include a contingency of between 10 and 20 per cent.<sup>19</sup>

Mr Faithful stated that the estimate is premised on the assumption that GDF Suez's current water allocations will be available for the purpose of flooding the mine.<sup>20</sup> Based on that assumption, Mr Faithful indicated that GDF Suez has not undertaken any analysis about what the potential costs might be for sourcing water in the event that the current allocations are not available for rehabilitation.<sup>21</sup>

Mr Faithful stated that the costs of research projects about issues relating to rehabilitation, such as those identified by GDF Suez consultant Dr Clint McCullough, Associate and Principal Environmental Scientist, Golder Associates,<sup>22</sup> may not all be currently included in the rehabilitation liability assessment. Mr Faithful told the Board that he was 'sure that some of that work is already covered' and that as a general proposition, research must be included as a cost of its future rehabilitation liability. Mr Faithful acknowledged that there was 'some work to progress on' in ensuring that the rehabilitation liability assessment adequately included research costs.<sup>23</sup>

Mr Faithful maintained that while 'there is still a range of work that needs to be done' with respect to understanding the likely rehabilitation costs, the rehabilitation liability estimate provided in the 2014–15 Annual Return is 'the best estimate we can give at the time.'<sup>24</sup>

### 7.2.3 LOY YANG MINE

AGL Loy Yang submitted its Annual Return for 2014–15 to the Mining Regulator on 31 July 2015. The Annual Return states that the current bond for the Loy Yang mine is \$15 million, and that the current estimated rehabilitation liability is \$53.7 million.<sup>25</sup> The Annual Return states: '[n]ote that the \$53.7 million is a non-discounted estimated liability.'<sup>26</sup>

AGL Loy Yang's estimate of \$53.7 million is derived from modelling undertaken in 2011, titled *Loy Yang Power mine rehabilitation whole of life cost report – 2011 update*.<sup>27</sup> The modelling is based on the original 1997 rehabilitation plan that envisaged the mine pit being filled with water to the RL -10m level. The modelling assumes that mine equipment and infrastructure will be removed at the end of mine life and the area made safe for public access (save for areas where the slope will be steeper than 1v:3h); and that aquifer dewatering will be ongoing but progressively reduced as the mine floods. The modelling also assumes that AGL Loy Yang's current water allocation under its bulk entitlements and groundwater licence will be available, either totally or in part, to fill the mine pit.<sup>28</sup>

The model adopts the rates in the Bond Calculator, except in circumstances where AGL Loy Yang has used its own experience of rates specific to a certain task.<sup>29</sup> The model includes costings for rehabilitation works, including the treatment of both covered and uncovered batters, and overburden dumps; removing plant and equipment and the fire service network; developing the lake including the continued aquifer dewatering until adequate weight balance is reached; and ongoing maintenance and monitoring of the site.<sup>30</sup>

Mr Stephen Rieniets, General Manager of AGL Loy Yang, stated that the estimated liability assessment includes a contingency to account for additional costs.<sup>31</sup> Mr Rieniets noted that costs for research can come from operating costs, rather than rehabilitation costs.<sup>32</sup>

In 2015, GHD developed a revised cost model based on the 2015 Loy Yang work plan variation.<sup>33</sup> A series of preliminary cost estimates were prepared to reflect the rehabilitation liability over the life of the project that will coincide with the key development stages of the work plan.<sup>34</sup> Based on the model, if the mine ceased operations at Stage B (around 2015), the rehabilitation liability is estimated to be \$112 million.<sup>35</sup> The model is only indicative, as it is based on a series of assumptions that are yet to be validated through detailed technical assessments.<sup>36</sup> Mr Rieniets told the Board that the principal change to the rehabilitation plan in the 2015 work plan variation is the difference in water levels of the pit lake, and minor changes to the mine plan. The water levels of the lake will be lower by approximately 80 metres, leaving a much larger area of exposed batters. There will be more earthworks necessary as a result of that change, to batter off and cover the exposed coal faces.<sup>37</sup>

Mr Rieniets indicated that a more detailed technical review and assessment of the rehabilitation plan will be undertaken, which will be based on geological modelling and will refine the assumptions used to inform a more accurate cost estimate of rehabilitation liability over the life of the mine.<sup>38</sup>

Mr Rieniets agreed with Mr Faithful's evidence that the assumptions and method of the modelling are critical to an accurate outcome. He noted that experts familiar with the mines are best placed to estimate the rehabilitation liability because 'the inputs are very important and a good working knowledge of the mine and the stage development of the mine will assist you to get a better estimate.'<sup>39</sup>

### 7.3 REHABILITATION BOND REVIEW PROJECT

In 2015, the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) commenced the Bond Review Project.<sup>40</sup>

The aim of the Bond Review Project is to 'independently assess the rehabilitation liabilities of the three Latrobe Valley brown coal mines to determine an accurate liability for each site.'<sup>41</sup> The project plan describes the project as comprising three stages:

1. Undertaking a desktop review of the approved work plans, rehabilitation plans and current state of rehabilitation works for the three mines.
2. Calculating the current rehabilitation liabilities for the three mines against the relevant approved work plans.
3. Reviewing key stages of progressive rehabilitation and critical rehabilitation objectives over the approved mine life for each of the three mines, and calculating costings for achieving mine closure under the rehabilitation plan. This is to include identifying the scope and timing of works necessary to carry out the rehabilitation plan, and calculating the costs of those works.<sup>42</sup>

Counsel Assisting submitted to the Board that the 2015 Bond Review Project is essentially the same project that the Board heard DEDJTR had commenced in the 2014 Hazelwood Mine Fire Inquiry during the evidence of Ms Kylie White, former Executive Director of the Mining Regulator.<sup>43</sup>

As part of the Bond Review Project, DEDJTR retained AECOM Services Pty Ltd (AECOM) to assess rehabilitation liability costs for each of the Latrobe Valley mines.<sup>44</sup> While not part of the Bond Review Project, DEDJTR also retained NERA Economic Consulting to provide advice in relation to potential bond systems. As at the date of public hearings for this Term of Reference, NERA Economic Consulting had not provided its advice to DEDJTR.<sup>45</sup>

In October 2015, the Mining Regulator, AECOM and the mine operators met to discuss the AECOM methodology and preliminary liability estimates. The mine operators provided some data to AECOM to inform the assessment.<sup>46</sup> On 13 November 2015, AECOM provided an assessment for each of the Latrobe Valley mines.<sup>47</sup> In December 2015, AECOM provided an updated assessment for the Loy Yang mine, based on the approval of its work plan variation in November 2015.<sup>48</sup>

AECOM's estimates are premised on the following assumptions:

- The costs are estimated as third party costs—namely the costs that would be incurred if someone other than the mine operator had to do the rehabilitation works, without the benefit of the mine operator's infrastructure and personnel.<sup>49</sup>
- The final pit slopes of 1v:3h (described in the mines' rehabilitation plans) will have long-term geotechnical and erosional stability.<sup>50</sup>
- The current bulk entitlements and groundwater licence allocations can be used for final rehabilitation.<sup>51</sup>

AECOM employed a 'probabilistic costing model' methodology to determine the rehabilitation liabilities for the three mines. The costing model incorporates a 'Monte Carlo simulation'—a statistical technique used to account for uncertainty in the model. The model 'recognises variables (in this case, the cost of individual mine closure items) as probability distributions rather than single numbers.'<sup>52</sup> Dr Adrian Bowden, former Senior Principal at AECOM, explained that the model is internationally recognised and is 'becoming pretty well a standard approach to carrying out cost estimation.'<sup>53</sup>

AECOM estimated the rehabilitation costs, based on the mine operators' final rehabilitation plans for both early closure and end of mine life closure, using cost information and documents from DEDJTR, data from the mine operators, the Bond Calculator rates, and AECOM's expert judgement and opinion.<sup>54</sup> The details of the cost components adopted by AECOM are set out in Appendix B in each of the reports, against various 'domains'.<sup>55</sup> The domains include infrastructure areas (for example, removal and demolition of conveyors, buildings and power lines); overburden and waste dumps; mine pits (for example, backfilling of mine pits, batter reshaping, fencing and landscaping); and execution maintenance and monitoring costs.<sup>56</sup>

Mr Geoffrey Byrne, Principal Consultant at Niboi Consulting, was subcontracted to AECOM in the development of its reports. He accepted that three of the domains costed by AECOM are not domains in the Bond Calculator, namely filling the pit with water, maintenance and monitoring, and execution management costs (for both before and after mine closure).<sup>57</sup> Mr Byrne stated that he 'view[ed] the calculator as a guideline and there is nothing to stop you adding extra domains, for example, and particular circumstances may well require slightly different approaches.'<sup>58</sup>

'Risk costs' were also factored into the rehabilitation cost estimates for both early closure and end of mine life closure scenarios. The risk costs are based on 'risk events with estimates of degrees of likelihood of occurrence and consequences.' AECOM identified risk factors such as 'batter failure in an area where infrastructure is affected'; 'batter failure in an area where no infrastructure is affected'; 'coal fire'; and 'inability to secure existing water licences'.<sup>59</sup> According to Dr Bowden, the assessment of these risk costs was made by 'expert judgment'.<sup>60</sup>

The AECOM reports state that the 'wide range of cost estimates for each option is indicative of the degree of uncertainty inherent in the risk model.' The variation or range in cost estimates is the result of imprecise data being available to AECOM.<sup>61</sup>

Two thousand trials were conducted using the model to maximise the accuracy of the results.<sup>62</sup> The outputs of the costing model are presented by reference to three confidence levels described as:

- P50 Optimistic
- P80 Conservative but realistic
- P95 Very conservative

The reference to 'P50' means that there is a 50 per cent chance that the actual figure will be more than the cost chosen by the model and a 50 per cent chance that it will be less. At the P80 confidence level, there is an 80 per cent chance that the actual cost will be less than the cost chosen by the model.<sup>63</sup> Results from the costing models are presented in Table 11.

**Table 11. AECOM liability estimates plus risk costs by confidence level**

Mine	Closure timing	Cost (\$M) by confidence level		
		P50 Optimistic	P80 Conservative but realistic	P95 Very conservative
Yallourn <sup>64</sup>	Early closure	167	199	262
	End of mine life	195	266	344
Hazelwood <sup>65</sup>	Early closure	264	305	357
	End of mine life	243	286	332
Loy Yang (1997 work plan) <sup>66</sup>	Early closure	246	270	298
	End of mine life	168	245	323
Loy Yang (2015 work plan variation) <sup>67</sup>	Early closure	221	256	319
	End of mine life	230	305	392

During the public hearings relevant to this Term of Reference, the mine operators questioned the accuracy of the assessments undertaken by AECOM.

One criticism made was that the AECOM estimates were derived from a desktop study and were not sufficiently informed by the mine operators.<sup>68</sup> GDF Suez submitted that Mr Faithful's attempts to raise concerns about the assumptions adopted by AECOM 'fell on deaf ears'.<sup>69</sup> Mr Byrne accepted that information obtained from site visits could improve the quality of the final estimates.<sup>70</sup>

In relation to the estimate for the Hazelwood mine, GDF Suez was critical of the use of the probabilistic model. GDF Suez questioned Dr Bowden in relation to the probabilistic costing method and noted that, when looking at the P80 and P95 confidence levels, the dollar amounts for each of the domain costs are skewed towards deriving high values—that is, it provides higher predicted costs to provide greater confidence that the actual costs will not be more than the predicted amount. Dr Bowden agreed.<sup>71</sup>

GDF Suez also raised concerns about the lack of transparency in the method of adding the risk costs to the liability costs, and submitted that those costs are unjustified.<sup>72</sup> Mr Bryan Chadwick, Technical Director at AECOM, agreed that the likelihood of each of the risks occurring is not set out in the report, but noted that this information could be identified from the model.<sup>73</sup>

GDF Suez further submitted that the costings adopt a number of unsound assumptions, including:

- The likely time to fill the Hazelwood mine is assumed to be 21–28 years (weight balance level) and 500 years (final level). GDF Suez stated that the correct position is seven years (weight balance level) and 30–90 years (final level) based on GHD modelling.<sup>74</sup>
- The risk that water may need to be purchased at a cost of \$6–8 million. GDF Suez stated that AECOM does not explain how it determined that sourcing water is a risk, nor how it calculated the cost of the risk.<sup>75</sup>
- The requirement to install and reinstall rip rap in the pit lake over a 500 year period at a cost of \$85–107 million. GDF Suez referred to the evidence of Mr Byrne that the assumption was not based on any particular study and was made because there was no information to suggest that it was not needed.<sup>76</sup> Mr Faithful noted that this is an area of works that is yet to be identified as necessary and so including the ‘worst case’ is not justified at this stage.<sup>77</sup>
- The risk that the vegetation planted on the rehabilitation slopes will need to be replaced or revegetated. GDF Suez submitted that notwithstanding that Mr Byrne gave evidence that the costs were assumed based on ‘industry practice and our experience’, Mr Byrne was not able to tell the Board that it was based on research or data.<sup>78</sup>

Mr Faithful told the Board that the AECOM report assumes a ‘truck and shovel’ method of covering the batters, whereas GDF Suez intend to use both ‘truck and shovel’ and the ‘dozer push’ method, the second of which is significantly cheaper.<sup>79</sup>

GDF Suez further submitted that the management and procurement fees of 15 per cent are too high, costing \$41–48 million.<sup>80</sup> It referred to the GHD report titled *Review of rehabilitation bond calculator use for brown coal mines*, dated December 2008,<sup>81</sup> which suggests that 10 per cent management fees are too high (in that case, costs amounting to \$6–7 million).<sup>82</sup> Mr Byrne told the Board that engineering procurement and construction management costs were calculated as 15 per cent of the project costs, and that the percentage was determined as a reasonable estimate based on industry practice and AECOM’s experience.<sup>83</sup> AECOM also included further closure execution management costs at five per cent of the project costs.<sup>84</sup>

GDF Suez also referred to the assumption that it will have a 100-year liability to monitor the mine site at an estimated cost of \$38–60 million. GDF Suez stated that there is no sound basis for this assumption.<sup>85</sup>

In relation to the Yallourn mine’s estimated rehabilitation liabilities, Mr Methel disagreed with AECOM’s inclusion of costs for the purchase of water to ‘top up’ the lake for a period of 100 years. Mr Methel told the Board that modelling carried out by both EnergyAustralia, in a report titled *Yallourn Mine: Final land rehabilitation lake filling model – Revision O* (dated 26 April 2012), and the peer review of that report by GHD, titled *Yallourn Mine, Lake filling model review – Findings of the model review* (dated 30 March 2012), indicates that there will be a net positive inflow, which has been tested against climate sensitivity.<sup>86</sup> The *Yallourn Mine: Final land rehabilitation lake filling model – Revision O* report states that rainfall and evaporation rates in the Yallourn region are variable and difficult to model with certainty.<sup>87</sup> The AECOM report states that AECOM conducted its own water balance review and determined that there will be a small net annual deficit of inflows during and after the pit lake is filled.<sup>88</sup>

Mr Methers also disagreed with the following assumptions or costs included in the AECOM report concerning the Yallourn mine:

- The use of overburden coverage at a depth of between 0.75 and 1.5 metres over an area of 112 hectares. Mr Methers noted that this requirement is not explained.<sup>89</sup>
- The assumption that overburden and clay will need to be long-hauled to the mine from outside of the mine. Mr Methers stated that there are substantial quantities of overburden in close proximity to the batters that need to be covered, and that overburden has been placed in the mine pit since 1940.<sup>90</sup> He said that given the access to overburden, the costs that will be incurred will be significantly less than assessed by AECOM, and in some cases, will be nil as some of the overburden will be dozer pushed over the batters.<sup>91</sup>
- The necessity for lime dosing. Mr Methers told the Board that, in his opinion, there will not be a need to treat the water based on his understanding of the river water quality and the likely effect of oxidisation on the lake water, once substantially full.<sup>92</sup>

Counsel for AGL Loy Yang was also critical of the post execution monitoring and maintenance costs included in the AECOM reports, assessed as 'a raw cost' of \$100 million.<sup>93</sup> AGL Loy Yang submitted that there was no explanation in the AECOM reports for the differences in the rates over time selected for monitoring costs (\$325,000 and \$185,000 per annum).<sup>94</sup> Further, in relation to the AECOM assessment based on Loy Yang's 2015 work plan variation, there was no explanation as to why AGL Loy Yang would incur the monitoring costs at the higher rate for 70 years. It submitted that:

The exact same rates were adopted for the first five years at Hazelwood and Yallourn as were adopted for 70 years at Loy Yang, despite the different monitoring and maintenance regime that would undoubtedly occur at those mines over different timeframes...<sup>95</sup>

AGL Loy Yang further submitted that the AECOM reports contain different assumptions for the mines, which are not explained:

Why assume that rip rap will progressively be applied at one mine but assume instead very high monitoring costs and maintenance costs at the Loy Yang Mine instead of the application of rip rap? We say that this example of inconsistency between the report [sic] showed that there was an uncertainty on the part of the authors of those reports as to how to deal with this erosion issue. We say neither approach is warranted on the evidence.<sup>96</sup>

AGL Loy Yang was also critical of the AECOM liability estimates failing to account for the long-term costs being offset with income generated from beneficial use of the mine site (such as agricultural use that is already taking place); and for the assumption that the end of mine life will be 2037 and not 2048, the latter being the date that Loy Yang currently considers will be its closure date.<sup>97</sup>

Mr Luke Wilson, Lead Deputy Secretary of Agriculture, Energy and Resources at DEDJTR, indicated that while the Mining Regulator had received the final reports from AECOM, it might need to consult further with the mine operators about the AECOM estimates before finalising the Bond Review Project.<sup>98</sup>

In the project plan for the Bond Review Project, the final step is described as 'finalise bond levels for each brown coal mine', which was scheduled to occur by 30 November 2015.<sup>99</sup> However, for reasons including that obtaining advice from AECOM took longer than expected, this has not occurred.<sup>100</sup> The process has been described to the Board as 'ongoing.'<sup>101</sup> Mr Wilson told the Board that completing the project 'will certainly be on the other side of Christmas [2015]'.<sup>102</sup>

## 7.4 ADEQUACY OF THE REHABILITATION LIABILITY ESTIMATES

In light of the evidence about the incomplete state of the Bond Review Project, Counsel Assisting submitted that the Board has two options:

- Report that it cannot fulfil its Terms of Reference because the completion of the Bond Review Project (the outcomes of which the Board is required to consider) has not occurred and is unlikely to occur in time for it to be (fairly) considered; or
- Address the requirements of the Terms of Reference to the extent possible, based on progress to date under the Bond Review Project.<sup>103</sup>

Counsel Assisting submitted that the Board should prefer the second option and conclude that ‘the rehabilitation liability assessments by the mines do not sufficiently account for the cost of rehabilitation’ because of the many uncertainties concerning mine rehabilitation. Examples of these uncertainties have been discussed in Part 6 of this report. The Board heard that a range of issues could have significant impacts on rehabilitation costs, such as timeframes for monitoring elements such as stability and water quality;<sup>104</sup> the need for extra overburden for fire risk reduction<sup>105</sup> and stability purposes;<sup>106</sup> work required to create optimal batter angles;<sup>107</sup> and the need for wave erosion solutions, such as rip rap.<sup>108</sup> The lack of closure criteria makes it difficult to establish at what point rehabilitation has been ‘successful’,<sup>109</sup> which has implications for timeframes for rehabilitation, returning the bond and the commencement of post-closure monitoring and maintenance.

Resolving these issues, therefore, may impact the mines’ rehabilitation plans. Jacobs Group (Australia) Pty Ltd notes in its report on rehabilitation options that significant changes to the mines’ work plans can result in increased ‘operational and cost burdens’ to mine operators.<sup>110</sup>

Counsel Assisting submitted that because these uncertainties are not accounted for in the mine operators’ liability assessments, ‘they are inadequate’.<sup>111</sup> GDF Suez and EnergyAustralia submitted that their rehabilitation liability assessments for 2014–15 should be assessed by the Board as ‘adequate’; AGL Loy Yang submitted that the question of adequacy need not be answered by the Board for the Loy Yang mine.<sup>112</sup>

GDF Suez submitted that ‘there is no evidence before the Board which is capable of being relied upon to demonstrate that the rehabilitation liability assessments for Hazelwood mine are not adequate.’<sup>113</sup> GDF Suez further submitted that the Board should ensure that it compares ‘apples with apples’ with respect to comparing the rehabilitation liability assessments undertaken by the mine operators and by AECOM.<sup>114</sup>

EnergyAustralia submitted that ‘it has properly accounted for uncertainties in its rehabilitation cost assessment.’<sup>115</sup> In response to the submissions by Counsel Assisting, EnergyAustralia submitted that ‘to the extent industry is expected to reflect [the expense of research] in its rehabilitation costings, this should be made known to the industry.’<sup>116</sup>

AGL Loy Yang submitted that its 2014–15 rehabilitation liability assessment is ‘all but irrelevant due to the new work plan variation now approved.’<sup>117</sup>

## 7.5 BOARD’S DISCUSSION AND CONCLUSIONS

The Board is required to consider the 2014–15 rehabilitation liability assessments against the outcome of DEDJTR’s Bond Review Project. The Board heard that the project has not been completed and it is not clear when it will be. The Board accepts the submissions of Counsel Assisting that not answering Term of Reference 10(a) is undesirable. Accordingly, the Board considers that it must report on Term of Reference 10(a) to the extent possible—that is, considering the 2014–15 assessments in light of the steps that have been taken to date in the Bond Review Project.

The Board must also consider the meaning of the words used in Term of Reference 10(a). The Board must judge the adequacy of the rehabilitation liability assessments. According to the Macquarie Dictionary, ‘adequate’ means ‘equal to the requirement or occasion; fully sufficient, suitable, or fit.’<sup>118</sup>

The 2014–15 Annual Returns submitted by each of the Latrobe Valley mines assess their current rehabilitation liability as \$46–91 million for the Yallourn mine; \$73.4 million for the Hazelwood mine; and \$53.7 million for the Loy Yang mine.

The Board notes that these estimates are based on detailed models with costs for works including earthworks, rehabilitation costs (such as topsoil, plants and fertiliser); fire services rehabilitation; mine flooding (such as bore sealing, new bores, decommissioning of new bores, and operation of bores in flooding phases); fire mitigation; and ongoing maintenance. Each of the assessments includes a contingency amount for unexpected costs, either as a separate percentage or, in the case of EnergyAustralia, built into the contract rates. The Board accepts that the mine operators have expended significant effort in assessing estimated rehabilitation liabilities, including obtaining expert opinion from consultants, such as GHD.

The Board notes that the modelling underpinning the 2014–15 Annual Returns is mostly based on the method set out in the Bond Calculator, and that the rates applied are a mix of the Calculator's default rates and actual rates incurred by the mines.

The Board accepts the submissions of Counsel Assisting that there are several areas of potential costs that are not currently included as a specific cost in each of the estimates provided by the mine operators, such as the cost of purchasing water. The mine operators are assuming that they will be given access to the same volumes of water to which they are currently entitled for the purpose of flooding the mines to the desired level, without additional cost. The Board notes that there remains considerable uncertainty about whether the mines will be able to access the required volume of water under their current groundwater licences and bulk entitlements at no additional cost (as discussed in Part 6 of this report).

Another area raised by Counsel Assisting as insufficiently accounted for in the estimates, is the cost of research necessary to inform the mine operators about the viability of their rehabilitation plans—for example research about stability. The Board notes that research is currently viewed by some of the mine operators as an operational cost and hence is not a cost item in the estimates.

The Board notes that the mine operators' estimates are not entirely 'third party' estimates—rather, a combination of third party rates from the Bond Calculator and estimated costs that assume that the mine operators will carry out the rehabilitation works. By contrast, the considerably higher AECOM cost estimates are entirely third party estimates. As GDF Suez has submitted, the Board needs to ensure that it compares 'apples with apples'.

Schedule 19 of the Mineral Industries Regulations requires that an Annual Return contains details of land disturbance and rehabilitation including 'an estimate of the current rehabilitation liability for the licence area.'<sup>119</sup> It does not specify whether the estimates are to be third party costs or the costs that the mine operators will incur. The Board considers that estimates of the current rehabilitation liability should be based on third party costings, and that the default rates contained in the Bond Calculator should be used except in circumstances where the mine operator has provided written evidence to the Mining Regulator that another rate should be applied. In this regard, the Board considers that the mine operators should follow the procedure outlined in the Bond Policy.

The Board heard from AECOM about its assessments of the current rehabilitation liabilities of the mines for end of mine life and for early closure. The Board accepts that AECOM used an appropriate methodology (the Monte Carlo simulation method) for estimating liability, given that the estimates are based on unknown contract rates and prices that make it difficult to determine costs with pinpoint accuracy, particularly with respect to costs that will be incurred in the future. The Board considers that the probabilistic methodology is an appropriate way of assessing rehabilitation liabilities, as it more realistically reflects the potential risks associated with rehabilitation than is possible through the deterministic methodology (as used by the Bond Calculator).

As described in Part 6 of this report, the Board notes there are significant areas of the rehabilitation plans for each of the mines that are currently untested. On that basis, the estimates for rehabilitation costs are necessarily difficult to determine. The Board also notes that AECOM had limited opportunities to obtain information about the mines directly from the mine operators.

The Board has considered the submissions made by the mine operators disputing several areas of costs that AECOM has included.

### 7.5.1 HAZELWOOD MINE

GDF Suez disputes the need for rip rap. AECOM estimates this cost as \$85–107 million, for the initial and reinstallation costs over 500 years. The Board notes the discussion about rip rap and the modelled fill time for the Hazelwood mine in Part 6 of this report, where it is estimated that it will take between seven and over 200 years to reach weight balance level, depending on the fill scenario.<sup>120</sup> GDF Suez submitted that the time taken to reach the final lake level (at which time it could be assumed that rip rap would no longer need to be reinstalled), would be between 30 and 90 years. The Board notes that this is an optimistic scenario provided by the water modelling, and relies on the mine's groundwater licence allocation. As discussed in Part 6 of this report, it is not yet clear whether the mines can use their groundwater licences. Therefore, it is not possible for the Board to assess which fill scenario is the most likely.

As detailed in Part 6 of this report, the Board accepts the experts' evidence that the necessity for rip rap is uncertain. Further research is needed before there is any certainty about whether rip rap is required, whether it must be reinstalled periodically, and for how long. Given that uncertainty, the Board considers that it is appropriate that rip rap is included as a risk cost, rather than a line item, in the Hazelwood mine costing.

The Board further accepts that, based on the uncertainty regarding fill times, it is unclear what the period of necessary monitoring of the mine by the mine operator will be. It is possible that the monitoring and management costs post mine life will be less than \$60.65 million, as estimated by AECOM. However, it is also possible that some level of maintenance and monitoring will be required in the long-term, and potentially in perpetuity. It is currently unknown who will be responsible for that work.

### 7.5.2 YALLOURN MINE

EnergyAustralia disputes the estimated cost for 'top up water supply' for the Yallourn mine, on the basis that the nearby rivers will be connected to the pit lake. AECOM estimated the cost of water as in excess of \$77 million. The Board notes that whether the pit lake can be connected to the nearby rivers is yet to be determined, and will be the subject of further research and dependent on approvals by the State. The Board further notes that AECOM conducted its own water balance modelling, but does not identify how it did so or what information it relied on. The Board acknowledges the difficulty in accurately forecasting rainfall and evaporation rates in the Yallourn region, which leads to uncertainty about the veracity of the filling models. Therefore the Board concludes that the research does not yet support that a line item of \$77 million for water should be built into the estimate. However, the significant uncertainty regarding water availability means that it should be included as a risk cost at this stage.

EnergyAustralia also disputes the estimated costs for rip rap. Based on the Board's observations about the uncertainty around the use of rip rap, the Board considers that it is appropriate that it is included as a risk cost, rather than a line item, in the costing for the rehabilitation of the Yallourn mine at this time.

### 7.5.3 LOY YANG MINE

AGL Loy Yang disputes, among other matters, the cost estimate of \$100 million for monitoring and maintenance after rehabilitation is complete contained in AECOM's updated assessment for the Loy Yang mine (based on the 2015 work plan variation). However, the Board is not required to consider the adequacy of the any rehabilitation liability assessment for the Loy Yang mine based on its 2015 work plan variation—it is required only to consider whether the 2014–15 rehabilitation liability estimate is adequate (which is based on the 1997 work plan).

The Board notes that the criticism made by AGL Loy Yang about monitoring and maintenance costs could equally apply to the initial AECOM cost assessment (which is based on the 1997 work plan). There is no explanation of why AECOM ascribes higher monitoring rates for the first 22 years following closure, compared with the significantly shorter period of five years for monitoring costs for the Hazelwood and Yallourn mines.

#### 7.5.4 SUMMARY

Based on the findings above, the Board is of the view that the rehabilitation liability estimates undertaken by the Latrobe Valley mine operators and recorded in their 2014–15 Annual Returns, are likely to be based on some unsound assumptions. The Board cannot compare the adequacy of the mine operators' estimates against the work of the Bond Review Project, as it is incomplete. The AECOM reports assessing the rehabilitation liability estimates contain significant costs that, in the Board's opinion, should not be included as line items based on current uncertainties. Further, the Board is concerned that it is not sufficiently clear how AECOM arrived at the costs it attributes to the various risks identified in its reports.

On closer inspection of the AECOM reports, the Board notes that there are several inconsistencies between the explanations provided in the body of the reports when compared to the detail in the appendices. For example, with respect to the Loy Yang mine, the post execution maintenance and monitoring is described as 'covering a 45 year period after completion of closure execution for the 1997 work plan scenario', whereas the costs described in Appendix B are calculated for 24 years.

The rehabilitation estimates must be contrasted with the rehabilitation bonds. They are two different amounts. As will be discussed in Part 8 of this report, the bond represents an amount that the State considers is appropriate having regard to the estimated rehabilitation costs and the risk of that cost being borne by the State (and not the mine operator). Accordingly, the Board cannot assess the rehabilitation liability estimates provided by the mine operators in the 2014–15 Annual Returns by reference to the bond amounts set by the State. However, the Board observes that the rehabilitation liability estimates in the 2014–15 Annual Returns are all significantly higher than the bond levels.

Significant further research and planning is required to accurately determine the likely rehabilitation costs for these mines. Consequently, it is not possible for the Board to determine whether the rehabilitation estimates provided by the mine operators are adequate, in the sense of being sufficient or appropriate for the current situation. Therefore, the Board cannot come to an unqualified conclusion that the estimates are inadequate. The Board does not accept the submissions of Counsel Assisting on this point.

The mine operators, the Mining Regulator and other relevant bodies, must undertake a significant amount of further work and discussion about the foundation for rehabilitation liability assessments in the short-term. The Board makes a number of recommendations to assist this process in Parts 8, 9 and 10 of this report.



Loy Yang mine  
(source: Department of Economic Development, Jobs, Transport and Resources)



**PART EIGHT**  
**EFFECTIVENESS OF**  
**THE REHABILITATION**  
**BOND SYSTEM**

## PART 8 EFFECTIVENESS OF THE REHABILITATION BOND SYSTEM

### 8.1 OVERVIEW

Term of Reference 10(b) requires the Board to inquire into, report on and make any recommendations it considers appropriate:

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* (Vic), and to the outcome of the Rehabilitation Bond Review Project:

- 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* (Vic), is, or is likely to be, effective for the Hazelwood mine, the Yallourn mine, and the Loy Yang mine.

The Board heard evidence and received submissions from each of the Latrobe Valley mine operators and representatives of the State about the current application of the rehabilitation bond system pursuant to the *Mineral Resources (Sustainable Development) Act 1990* (Vic) (Mineral Resources Act) and the Mineral Resources (Sustainable Development)(Mineral Industries) Regulations 2013 (Vic) (Mineral Industries Regulations); the progress of the Rehabilitation Bond Review Project (Bond Review Project) (discussed in Part 7 of this report); and reviews of the rehabilitation bond system undertaken to date.

The Board retained experts from Accent Environmental to provide opinions on whether there are alternative financial assurance mechanisms that could be employed to ensure that the Latrobe Valley mines are rehabilitated pursuant to the Mineral Resources Act. Accent Environmental provided a report to the Board titled *Hazelwood Mine Fire Inquiry: High-level assessment of alternative rehabilitation financial mechanisms* (Accent Environmental report). AGL Loy Yang retained Dr Robert Gillespie, Principal of Gillespie Economics, to provide his opinions on alternative financial assurance mechanisms.

This Part considers whether the current system of setting bonds is effective in providing security to the State should a mine operator default on its rehabilitation liability, and as an incentive for mine operators to progressively rehabilitate mine sites, having regard to the outcome of the Bond Review Project and the 2014–15 rehabilitation liability assessments submitted by the mine operators in their Annual Activity and Expenditure Returns (Annual Returns). As discussed in Part 7 of this report, the Board must undertake its assessment without the benefit of knowing the outcome of the State's Bond Review Project, as that project has not been completed. When considering Term of Reference 10(b), the Board must also take into account the fact that the Loy Yang 2014–15 rehabilitation liability assessment does not reflect the recently approved 2015 Loy Yang work plan variation.

Term of Reference 10(c) is considered in Part 9 of this report.

### 8.2 THE CURRENT REHABILITATION BOND SYSTEM

As discussed in Part 3 of this report, the Mineral Resources Act requires that the mine operators must enter into a rehabilitation bond for an amount set by the Minister for Energy and Resources.

Under s. 80(4) of the Mineral Resources Act, the Minister may increase a bond if the Minister is of the opinion that it is 'insufficient'. The Act does not contain criteria to guide the Minister in reaching such an opinion.

In 2010, the Mining Regulator revised the existing guidelines for the review of rehabilitation bonds, and developed its current bond policy, titled *Establishment and management of rehabilitation bonds for the mining and extractive industries* (Bond Policy).<sup>1</sup> According to the Bond Policy, the Mining Regulator is responsible for setting and reviewing bond levels on behalf of the Minister. Bonds are set having regard to the likely costs associated with completion of an approved rehabilitation plan submitted by a licensee.<sup>2</sup>

### 8.2.1 INITIAL BOND ASSESSMENT

The Bond Policy provides that, in setting a rehabilitation bond, the Mining Regulator will undertake an initial bond assessment, which is based on the maximum amount of land that can be disturbed by mining for a particular time period or stage of the work plan.<sup>3</sup>

The Mining Regulator calculates the likely cost of rehabilitation works required to implement the rehabilitation plan and achieve the planned final landform.<sup>4</sup> As mentioned in Part 7, this calculation takes into account the potential that, if the mine operator is unable to meet its rehabilitation obligations, the State will incur higher costs to complete the work than the operator would have incurred. This is termed ‘third party costing’.<sup>5</sup> As explained in the Bond Policy:

In establishing the rehabilitation liability it must be assumed that the operator is unable to complete the reclamation works and therefore rehabilitation must be managed by the [Mining Regulator] using a third party. In the majority of cases, the level of the rehabilitation bond will be significantly higher than the cost for the operator to undertake the work.

Where an operator has defaulted, the [Mining Regulator] would not have access to the operator's equipment or personnel on-site. The [Mining Regulator] would not be in a position to complete the works at the operator's costs, and instead be subject to current local market costs.<sup>6</sup>

The calculation does not include any pre-existing land disturbance that predates the current licence, unless it is specifically contained within the work plan or licence conditions.<sup>7</sup>

For mining licences on private land (as is the case for the Yallourn, Hazelwood and Loy Yang mines), the final bond amount is determined after consultation with the local council and the mine operator.<sup>8</sup>

### 8.2.2 REHABILITATION BOND CALCULATOR

The Rehabilitation Bond Calculator (Bond Calculator) is the State's recommended method for assessing the rehabilitation liability for mining operations, including open cut coal mining.<sup>9</sup> The Bond Calculator contains several domains that the mine operator completes, and contains default rates that apply automatically unless another rate is nominated.<sup>10</sup>

The default rates are based on ‘typical current market “third party” contract rates as of July 2010 and will be periodically reviewed to take into account aspects such as inflation.’<sup>11</sup> The Mining Regulator must approve a variation to the default rate. A variation should be based on current market third party contract rates and assume that all staff and equipment must be brought onto the site.<sup>12</sup> The Bond Policy provides:

Where an operator proposes rates that are significantly lower than default rates, or make a significant difference to the overall site rehabilitation liability assessment, the [Mining Regulator] will require the submission of written costings from independent contractors in support of the assessment.<sup>13</sup>

The Bond Calculator sets project management costs at 10 per cent of the total rehabilitation liability. This amount covers ‘administration and legal process of calling in a bond’; ‘project management’ of rehabilitation (for example, preparing plans, surveys and contracts); and ‘management and maintenance of the mine site by the [Mining Regulator] prior to the awarding of rehabilitation contracts.’<sup>14</sup>

The Bond Calculator also sets 10 per cent as the minimum rate for contingency costs. This amount covers costs such as rehabilitation tasks not budgeted for, and failures in rehabilitation works.<sup>15</sup> For larger sites, the Bond Calculator sets an additional monitoring cost of five per cent of the total rehabilitation liability to cover environmental monitoring during rehabilitation works.<sup>16</sup>

### 8.2.3 FORM OF REHABILITATION BOND

According to the Bond Policy, the State only accepts rehabilitation bonds in the form of an unconditional bank guarantee. Other forms of financial security, such as insurance bonds or cash bonds, are not currently accepted.<sup>17</sup> Mr Luke Wilson, Lead Deputy Secretary of Agriculture, Energy and Resources at the Department of Economic Development, Jobs, Transport and Resources (DEDJTR), noted that '[o]n 2 December 2015, the Minister for Energy and Resources announced a new cash rehabilitation bond scheme as an option for eligible mining and extractive operations'—namely, small scale mine and quarry operators with a rehabilitation liability of up to \$20,000.<sup>18</sup> This does not apply to the Latrobe Valley coal mines due to the size of their liability.

### 8.2.4 BOND REVIEW

According to the Bond Policy, the Mining Regulator periodically reviews a bond during the operational life of a mine to ensure that it remains 'at appropriate levels' throughout.<sup>19</sup> The Bond Policy notes that 'regular assessment of the rehabilitation bond against rehabilitation liability provides incentives for the operator to minimise environmental impacts and undertake progressive rehabilitation.'<sup>20</sup>

The frequency of bond reviews is based on the Mining Regulator's risk assessment of the likelihood of the rehabilitation liability falling to the State. Appendix 2 to the Bond Policy is titled *Assessment matrix for bond review periods*.<sup>21</sup> Under the assessment matrix, periodic reviews for the Yallourn, Hazelwood and Loy Yang mines are scheduled to occur every 10 years based on an assessment that while the consequences of a default are high, the likelihood of it arising is 'negligible'.<sup>22</sup> The Bond Policy also provides that a 'bond will also be reviewed when a work plan variation is submitted', a licence is transferred, or at the request of the licensee.<sup>23</sup>

The Mining Regulator may also initiate a bond review based on the estimates of rehabilitation liability in an Annual Return, or where the Minister considers that the current rehabilitation bond is insufficient.<sup>24</sup>

## 8.3 APPLICATION OF THE BOND SYSTEM TO THE LATROBE VALLEY MINES

At the time the Latrobe Valley mines were privatised, each of the mines' rehabilitation bonds was set at \$15 million.<sup>25</sup> These were 'interim figures' pending further consideration by the Mining Regulator.<sup>26</sup>

### 8.3.1 YALLOURN MINE REHABILITATION BOND

The amount of the initial bond for the Yallourn mine was derived from a combination of the forecast end of mine life liability (assessed by the mine operator), and a portion of the expected increment in annual expenditure on progressive rehabilitation (also assessed by the mine operator).<sup>27</sup> Mr Wilson explained to the Board that:

Yallourn provided information to [the Mining Regulator] prior to the setting of the \$15M bond. The [Mining Regulator's] calculation was based upon the forecast expenditure at end of mine life (\$7M), as assessed by Yallourn, and a portion of the forecast annual increment expenditure on progressive rehabilitation works (\$9.5M), as assessed by Yallourn, to mitigate the financial risk in case of the mine closing sooner than expected...

With allowance for inflation, the figure of \$15M was determined for the bond.<sup>28</sup>

Yallourn mine's 2002 work plan variation was the trigger for a bond review initiated by the Mining Regulator.<sup>29</sup> The mine operator retained mining consultant GHD to prepare a report, titled *Yallourn Energy Pty Ltd mining licence bond review "close now" liability at 30 Sep 2002 report*.<sup>30</sup> 'Close now' liability refers to the cost of rehabilitation if the mine was to close in September 2002. The GHD report notes that the model used to calculate the rehabilitation liability was based on the rehabilitation requirements under the 1999 Yallourn mine rehabilitation master plan, modified to include changes from the 2002 Yallourn work plan variation.<sup>31</sup> The GHD report states:

Where possible, rates for works were based on actual experience in the Yallourn mine and these can be compared with the [Mining Regulator's] rates published in their 1997 document: "Guidelines for the Establishment of Rehabilitation Bonds for Mining and Extractive Industry". At the closure of the mine, coal handling equipment, pipelines and dredgers will need to be dismantled, rehabilitation finished and the mine made safe for ultimate public access. Dewatering will be progressively slowed and channels, weirs and other work carried out to allow the mine to be flooded. These activities have been itemised and costed.<sup>32</sup>

GHD estimated the cost for rehabilitation under the 'close now' scenario at \$13,356,872. This estimate excluded the costs associated with installing public facilities (for example, car parks and walking tracks).<sup>33</sup>

A later version of the GHD report, dated November 2002 and titled *Yallourn Energy mining licence rehabilitation bond "close now" rehabilitation costing*, estimated 'base costs' for rehabilitation under the 'close now' scenario as \$12.8 million.<sup>34</sup> This estimate excluded costs for rehabilitating a number of areas, including the Morwell River Diversion, public facilities (as listed above), and work relating to the East Field.<sup>35</sup> However the additional estimated costs for rehabilitation of these areas are provided in the report. The inclusion of these cost areas would have increased total liability to \$15.8 million.<sup>36</sup> This report was provided to the Mining Regulator in or around November 2002.<sup>37</sup>

In 2003, staff from the Mining Regulator and the Yallourn mine participated in several consultations regarding the bond review. Some of the matters discussed during the consultations included a request from the mine operator for a revision of the fill time of the proposed lake 'due to bulk water entitlement', and a request from the Mining Regulator for further costing information relating to interconnecting the proposed pit lake with the local river system.<sup>38</sup> As a result of the consultations and the production of the 2002 GHD report, the Mining Regulator recommended that the Minister revise the bond to \$10,505,500.<sup>39</sup>

In July 2004, the Mining Regulator reduced Yallourn mine's bond from \$15 million to \$11.46 million.<sup>40</sup> In its letter to the mine operator, the Mining Regulator explains that this assessment includes a contingency of 20 per cent rather than 10 per cent 'to cover uncertainties relating to the final rehabilitation of the site'. It was noted that there was a 'need for further research, in particular in hydrology, to address this uncertainty'.<sup>41</sup> The Mining Regulator further explains that the 20 per cent contingency reflects the potential need for additional earthworks and revegetation in the event that the final lake level of RL +38m (as is planned in the Yallourn mine rehabilitation plan) is not achieved. The Mining Regulator's notice to the mine operator does not indicate the base estimate of rehabilitation costs that was used to calculate the bond level (with a 20 per cent contingency) of \$11.46 million.<sup>42</sup>

In the same letter to the Yallourn mine operator, the Mining Regulator states that '[t]he Department will be happy to initiate another rehabilitation bond review and to reduce the contingency allowance once the research has been undertaken and the uncertainties related to final rehabilitation are resolved'.<sup>43</sup>

Mr Wilson advised the Board that in 2010, the Mining Regulator reviewed Yallourn mine's rehabilitation bond using the Bond Calculator and decided not to change the bond amount.<sup>44</sup> Mr Wilson gave evidence that '[t]his is because in 2010 the Government commenced a review of rehabilitation bond policy'.<sup>45</sup> In its closing submissions to the Board, Environment Victoria submitted that Mr Wilson's explanation for the Mining Regulator not changing bonds (including the bond for Yallourn mine) is 'plainly untenable'.<sup>46</sup> It submitted that nothing in the evidence suggests that the 'bond system was incapable of being enforced or was untenable as a matter of principle' at the time of the reviews.<sup>47</sup>

EnergyAustralia's 2013–14 Annual Return records that the total amount expended on rehabilitation for that period was \$204,000; however, it does not record its estimated 'close now' rehabilitation liability.<sup>48</sup> In a revised 2013–14 Annual Return dated 8 April 2015, EnergyAustralia records that its estimate of the rehabilitation liability is between \$46–91 million, and the total amount expended on rehabilitation for that period increased to \$1,093,000.<sup>49</sup> In its 2014–15 Annual Return, EnergyAustralia's estimated rehabilitation liability remains at \$46–91 million, with the total amount expended on rehabilitation for that period recorded as \$1,185,906.<sup>50</sup>

### 8.3.2 HAZELWOOD MINE REHABILITATION BOND

In 1995, the Mining Regulator proposed that the bond for the Hazelwood mine would be set at \$15 million on the basis that:

It was stated at [a recent meeting] that the [Mining Regulator] would consider establishment of a bond to cover only the cost of the "end of life" rehabilitation works at the mine on the proviso that the rehabilitation programme was documented and continued at the maximum possible rate.

...

As these matters are not yet resolved we propose to set the rehabilitation bond for the [Hazelwood] mine at \$15million. This should be regarded as an interim figure until such time as we have assessed whatever additional information you are able to provide on these matters.<sup>51</sup>

In a letter to the Mining Regulator dated 10 October 1995, the Hazelwood mine operator indicates that 'life of mine' rehabilitation costs are \$11.7 million.<sup>52</sup>

In a briefing note dated 4 December 1995, the Mining Regulator describes the basis for assessing the Hazelwood mine rehabilitation bond. Among other things, the note states:

The total current liability for rehabilitation is thought to be in the vicinity of \$20million. However, the company has a well managed progressive rehabilitation programme with annual expenditure of approximately \$1million. [Its] aim is to have all of the progressive rehabilitation work completed by the time the mine closes.

...

Bonds are usually based on an estimate of the worst case liability during the mine life. To set a bond for this site based only on the end of life costs would be a departure from this practice. However, the importance of the mine as a part of the State's power supply infrastructure means it is very unlikely to close before the scheduled end of life. It can therefore be argued that provided progressive rehabilitation is kept up, the potential liability to the State is only the cost at closure.<sup>53</sup>

Therefore, the Mining Regulator recommended that the bond of \$15 million be maintained.<sup>54</sup>

Mr Wilson advised the Board that the Mining Regulator undertook reviews of the Hazelwood mine's rehabilitation bond in 2009 and 2011 using the Bond Calculator, and decided not to change the bond.<sup>55</sup> As with the Yallourn mine, Mr Wilson advised that this was due to the review of rehabilitation bond policy which commenced in 2010.<sup>56</sup>

GDF Suez's 2012–13 Annual Return dated 26 July 2013, does not describe the current estimated rehabilitation liability. The total amount expended on rehabilitation for that period is listed as \$206,499.<sup>57</sup> GDF Suez's 2013–14 Annual Return dated 4 September 2014, only provides an estimated rehabilitation liability limited to expenditure for the period 2014–15, in the amount of \$850,000.<sup>58</sup> The amount expended on rehabilitation in 2013–14 is listed as \$123,753.<sup>59</sup> In response to a letter from the Mining Regulator, GDF Suez provided a letter dated 9 April 2015 as an addendum to its 2013–14 Annual Return. That letter records the estimated rehabilitation liability (for progressive and final rehabilitation) as \$73.8 million.<sup>60</sup> GDF Suez's 2014–15 Annual Return records its current rehabilitation liability estimate as \$73.4 million. The total amount expended on rehabilitation for that period is recorded as \$570,516.<sup>61</sup>

### 8.3.3 LOY YANG MINE REHABILITATION BOND

In 1996, the Mining Regulator set an interim bond figure of \$15 million for the Loy Yang mine, 'based upon the calculation for Yallourn' and subject to the receipt and assessment of 'whatever additional information Loy Yang was able to provide.'<sup>62</sup>

In 2008, the Mining Regulator engaged GHD to undertake a review of Loy Yang mine's rehabilitation liability and to comment on the suitability of the Bond Calculator for use for large brown coal mines.<sup>63</sup> GHD produced a report titled *Review of Rehabilitation Bond Calculator use for brown coal mines*, dated December 2008.<sup>64</sup> GHD calculated rehabilitation liability estimates for three time periods—as at May 1997 (at privatisation); as at November 2008 (the time of the review); and as at 2018.<sup>65</sup> GHD incorporated a third party management and contingency fee of 26 per cent to its calculations.<sup>66</sup> GHD's estimates are presented in Table 12 as both a base figure, and a total including the 26 per cent allowance for management and contingencies.<sup>67</sup>

**Table 12. 2008 GHD liability estimates—base and total figures (including management and contingencies)<sup>68</sup>**

Modelled review date	Base figures (\$M)	Total (\$M)
May 1997	24.4	30.5
November 2008	27.6	34.5
2018	28.4	35.5

GHD concluded that although the Bond Calculator was a sound way of estimating rehabilitation liability, it overestimates the allowance required for project management.<sup>69</sup> GHD noted that dismantling infrastructure constitutes a significant portion of rehabilitation costs, and queries whether this is appropriate in a context where mine closure is not anticipated for 30 years.<sup>70</sup> GHD also questioned whether the method in the Bond Calculator is appropriate for large brown coal mines on the basis that:

- The mines are critical to Victoria's electricity supply and are not likely to close. It is likely that the current operators would be replaced if they did decide to walk away.
- The cost incurred in maintaining such bonds is a substantial impost on mine operators, and over a long period of time, is likely to result in the mines incurring twice the actual cost of rehabilitation (being the cost of maintaining the bond as well as the actual cost of rehabilitation).
- A changed bond may discourage transparent discussions on appropriate rehabilitation measures, particularly if the outcome of those discussions has the potential to lead to a review, and likely increase, of the bond amount.<sup>71</sup>

GHD states that the bond should 'provide credit opportunities for completed rehabilitation.'<sup>72</sup>

Despite GHD's assessments of Loy Yang's liability being greater than the bond set by the Mining Regulator, the Mining Regulator did not change the amount of the Loy Yang mine's bond.<sup>73</sup> Nor, on the evidence before the Board, did the Mining Regulator consider making changes to the Bond Calculator in light of GHD's comments that the calculator overestimates project management costs.

In its 2013–14 Annual Return dated 15 August 2014, AGL Loy Yang does not include an amount for its expenditure on rehabilitation, nor an amount for its current estimated rehabilitation liability for the site, noting that AGL Loy Yang was revising its work plan (including the rehabilitation plan) with the Mining Regulator.<sup>74</sup> However, a revised 2013–14 Annual Return dated 26 March 2015, describes the rehabilitation liability estimate as \$53.7 million, the same figure recorded in its 2014–15 Annual Return. The total amounts expended on rehabilitation for each period are recorded as \$1,478,935 and \$1,361,997 respectively.<sup>75</sup>

Since submitting its 2014–15 Annual Return, AGL Loy Yang has reviewed its estimated rehabilitation liability to reflect changes in its approved 2015 work plan variation. The revised indicative liability assessment is \$112 million.<sup>76</sup>

### 8.3.4 THE BOND POLICY

Counsel Assisting and Environment Victoria submitted that the Bond Policy contains simple and sensible provisions.<sup>77</sup> Environment Victoria considered the Bond Policy to be an effective mechanism to prevent the State from being exposed to the risk of having to pay the cost of rehabilitation.<sup>78</sup>

Counsel Assisting submitted to the Board that it is 'entirely unclear' why the Mining Regulator has not applied the Bond Policy to review and adjust the Latrobe Valley mines' bonds.<sup>79</sup> Similarly, Environment Victoria submitted that the Mining Regulator has 'neither enforced the [Bond] Policy nor, in the period before the policy was expressed in the 2010 document, managed or enforced rehabilitation bonds in the manner described in the policy.'<sup>80</sup>

Counsel Assisting submitted that one possible explanation for the Mining Regulator's failure to apply the Bond Policy may be a concern that mine operators may refuse to provide an increased bond.<sup>81</sup> The project plan for the Bond Review Project contains a risk management review which was approved by Mr Ross McGowan, Executive Director of the Mining Regulator.<sup>82</sup> In the risk management review, the likelihood of the Latrobe Valley mine operators refusing to enter into an increased bond is rated '50/50', as is the likelihood of the mine operators 'becoming insolvent, leaving the significant costs to be borne by the State' for rehabilitation.<sup>83</sup> Mr McGowan agreed with the proposition put by counsel for the State that the risks outlined in the document concern 'risks associated with this project and not matters generally.'<sup>84</sup>

Counsel Assisting submitted to the Board that when the Executive Director of the Mining Regulator signed off on the project plan (on 3 July 2015), Mr McGowan would have likely been aware that the Inquiry's Terms of Reference (dated 26 May 2015) referred expressly to the Bond Review Project. Counsel Assisting submitted that therefore, 'Mr McGowan could have been in no doubt about the importance of the project plan and its likely scrutiny by this Inquiry.'<sup>85</sup>

The risk ratings in the project plan are in contrast to the assessment matrix for bond review periods provided in the Bond Policy. The matrix states that the risk of the rehabilitation liability falling to the State is 'negligible' for major coal-fired power generators.<sup>86</sup>

EnergyAustralia submitted that the Board should attach greater weight to the risk assessment in the Bond Policy than to the risk assessment in the 2015 Bond Review Project plan. It submitted that what it described as 'Mr McGowan's comment' was 'made on a superficial basis' without reference to EnergyAustralia's financial position.<sup>87</sup> AGL Loy Yang made similar submissions.<sup>88</sup>

### 8.3.5 SECTION 79A OF THE MINERAL RESOURCES ACT

Section 79A of the Mineral Resources Act enables the Minister to require a licensee to undertake an assessment of the rehabilitation liability for the purposes of determining or reviewing the amount of a bond to be entered into.<sup>89</sup> Such assessments must be undertaken 'in the manner and form determined by the Minister' and take into account the works required to rehabilitate the land in accordance with s. 78 of the Mineral Resources Act.<sup>90</sup> In addition, pursuant to s. 79A(3), the Minister may require the licensee to engage an auditor to certify that a rehabilitation liability assessment has been prepared in the manner and form that is required and that 'it is accurate'.<sup>91</sup> For more information on s. 79A see Part 3.2.7 of this report.

Counsel Assisting submitted that the s. 79A process has a number of positive features. It requires the mines, which are best placed to estimate their liability, to bear the cost of the estimate while enabling the Minister for Energy and Resources to require an independent audit of the estimate.<sup>92</sup> GDF Suez and Environment Victoria raised similar points in their submissions.<sup>93</sup> Under s. 79A, audits are conducted by an environmental auditor accredited by the Environment Protection Authority (EPA), who prepares reports on the 'condition of the environment and any risks posed through detecting actual or potential environmental impacts.'<sup>94</sup>

The Board heard evidence that the Mining Regulator has not used its powers under s. 79A to require the mine operators to estimate their rehabilitation liabilities in a 'manner and form' determined by the Minister.<sup>95</sup> Nor have they been required to have any such estimates independently audited under s. 79A(3).<sup>96</sup> Mr Duncan Pendrigh, Director of the Hazelwood Mine Inquiry Coordination Directorate at DEDJTR, explained that the s. 79A powers were introduced at about the same time as the Bond Calculator was updated. According to Mr Pendrigh, the Bond Calculator served the same function as the s. 79A powers.<sup>97</sup>

Mr Pendrigh also told the Board that the s. 79A powers have not been exercised in relation to the Latrobe Valley coal mines because the Mining Regulator has been unsure of the 'manner and form' in which it wants the estimates to be made. Mr Pendrigh indicated that AECOM had been engaged to provide that knowledge to DEDJTR.<sup>98</sup>

Counsel Assisting submitted that the Mining Regulator must enable the Minister to use the powers conferred by s. 79A of the Mineral Resources Act. Counsel Assisting submitted that in order for this to be done, the Mining Regulator must access expert advice to determine the manner and form in which the rehabilitation liability estimate must be made, and advise the Minister of the appropriate requirements.<sup>99</sup> For example, the Mining Regulator should retain one or more experts in mine closure and rehabilitation cost assessments.<sup>100</sup> Counsel Assisting further submitted that independent advice and guidance is also of paramount importance, and that the Technical Review Board, and in particular, Ms Corinne Unger, the Technical Review Board member with rehabilitation expertise, should be consulted about strategic rehabilitation and closure advice.<sup>101</sup>

GDF Suez submitted that the State should ensure that bonds are more regularly reviewed, and that 'there is a case for a process drawing on the powers also set out in s. 79A' of the Mineral Resources Act to assess the rehabilitation liabilities of the mines and for the mine operators' estimates to be audited.<sup>102</sup> AGL Loy Yang also supported the use of s. 79A as suggested by Counsel Assisting.<sup>103</sup>

### 8.3.6 REHABILITATION BOND REVIEW PROJECT

As discussed in Part 7 of this report, the Bond Review Project began in 2015 but has not been completed. While the Mining Regulator has received final reports from AECOM assessing the estimated rehabilitation liabilities for each of the mines, Mr Wilson told the Board that there might be further consultation with the mines before the Bond Review Project is finalised.<sup>104</sup>

Mr Wilson also told the Board that DEDJTR retained NERA Economic Consulting in November 2015 to provide 'a policy analysis of options for strategic management of the Latrobe Valley coal resource, and related land use planning.'<sup>105</sup> Mr Wilson stated:

This analysis is examining the range of approaches, governance options and policy, legislative or other instruments that could be applied by Government, industry or both to integrate and coordinate the strategic management of coal resources and related land use planning in the Latrobe Valley...<sup>106</sup>

The NERA Economic Consulting analysis was expected on 16 December 2015 but has been delayed.<sup>107</sup>

## 8.4 EFFECTIVENESS OF THE REHABILITATION BOND SYSTEM

In its report for the Board, Accent Environmental advises that the current rehabilitation bonds for the Latrobe Valley coal mines present a 'risk to the State' because they are 'substantially lower' than the rehabilitation liabilities for the three mine sites.<sup>108</sup> It adds that 'the greater the gap between the rehabilitation bond and the rehabilitation liability, the greater the risk taken on by the State.'<sup>109</sup>

Accent Environmental notes that this risk is one aspect of a broad range of considerations, including:

- geotechnical, hydrogeological and fire prevention risks at the three mines which result in a degree of technical uncertainty regarding appropriate methods of rehabilitation
- market uncertainty due to falling electricity demand (which has led to over supply), increasing competition from the renewables sector and the potential for future carbon pricing. Such uncertainty could result in the early closure of one or more sites.<sup>110</sup>

Accent Environmental also advises the Board that:

[w]hile the 2015 self-reported estimates of rehabilitation liability by the mines do factor in, to some extent, the emergence of the geotechnical, hydrogeological and fire prevention risk factors, there is still uncertainty regarding the best way of managing closure to minimize these issues. It is likely that further increases in estimated rehabilitation liability will occur as these risk factors are further investigated and resolved.<sup>111</sup>

Environment Victoria submitted that the evidence before the Board clearly demonstrates that the purpose of a rehabilitation bond for a mine is to ensure that the State has sufficient money to rehabilitate the mine in circumstances where the mine operator 'walks away'.<sup>112</sup> The submission refers to the Bond Policy. As noted, the Bond Policy unambiguously provides that 'the amount of bond is calculated to address in full the rehabilitation liability'.<sup>113</sup> According to Environment Victoria, a policy that requires a bond or financial assurance of 100 per cent of the assessed rehabilitation liability 'unarguably meets that objective'.<sup>114</sup>

Ms Unger stated that '[i]t is important that the value of a bond accurately reflects the true costs of rehabilitation'.<sup>115</sup> She also told the Board that the best way to verify a rehabilitation bond is 'with an independent external audit'.<sup>116</sup>

Counsel Assisting submitted that the failure of the Mining Regulator to implement the Bond Policy is 'perplexing'.<sup>117</sup> They submitted that 'it is difficult to understand why the rehabilitation liability assessments submitted by the mines have not triggered bond reviews'.<sup>118</sup>

In their opening statement to the Inquiry, Counsel Assisting informed the Board that the evidence called would demonstrate that 'on any view of the likely cost of rehabilitating the Latrobe Valley coal mines...the current bonds are inadequate'.<sup>119</sup> In their final submissions to the Board, Counsel Assisting returned to this topic, noting that the gap between the current estimates and the bonds 'should have been ringing alarm bells' for the Mining Regulator.<sup>120</sup> Environment Victoria submitted that the bonds for each mine 'should be increased to 100% of the estimated rehabilitation costs as soon as practicable after' s. 79A assessments are completed.<sup>121</sup>

Environment Victoria further submitted that the fact that the State has the ability to recover any shortfall between the bond amount and the costs of rehabilitation under s. 83 of the Mineral Resources Act, does not necessarily provide real protection from the risk, as the 'entitlement to recover a debt is valuable only to the extent that there are assets available against which to recover'.<sup>122</sup>

Dr Gillespie's report states that a bond system that reflects risk management principles would be more economically efficient than the current system.<sup>123</sup> In his opinion:

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.<sup>124</sup>

Dr Gillespie identifies factors that should be taken into consideration when identifying the 'likelihood' of a risk occurring, such as the size, assets and ownership of the mine operator; the mine operator's history of compliance; demand for coal; and the nature of the mine operation.<sup>125</sup> He notes that while some documents identified early mine closure as a key risk, this did not necessarily equate to the mine operator defaulting on its liability, as that may depend on whether the mine operator is insolvent, or whether the liability can be recovered via a legal mechanism.<sup>126</sup> Dr Gillespie recognises that should default occur, a risk-based bond system may result in the State being left in a position of not having enough money in bonds to cover the costs of rehabilitation.<sup>127</sup>

GDF Suez submitted that the rehabilitation bond system is not 'broken'.<sup>128</sup> It submitted that the bond for the Hazelwood mine was set using a 'version of a "discounted bond" system' and that the bond is sufficient on the basis that there is an 'extremely' low risk that GDF Suez will default on its obligations to rehabilitate the mine site.<sup>129</sup>

Environment Victoria submitted that the legislative regime for the assessment of bonds is adequate; however, the Mining Regulator has failed to implement the Bond Policy and has not used the powers available to it under the Mineral Resources Act for that purpose.<sup>130</sup>

Environment Victoria referred to the fact that the Mining Regulator has not:

- sought bonds in the amount of the full estimated rehabilitation liability
- conducted bond reviews in circumstances where the mines failed to provide the estimated rehabilitation liabilities assessments in Annual Returns submitted prior to 2015
- conducted bond reviews in circumstances where the initial bond was established on an ‘interim’ basis and work plan variations have subsequently been submitted by the mine operator.<sup>131</sup>

Environment Victoria submitted that the ‘history of the administration of the bond regime reveals a lack of rigour, inertia and delay.’<sup>132</sup>

## 8.5 BOARD’S DISCUSSION AND CONCLUSIONS

The Board’s Terms of Reference ask it to report on whether the ‘current rehabilitation bond system’ is ‘effective’ for the three Latrobe Valley coal mines. The Board notes that it is not specifically asked to evaluate the *levels* of the existing bonds. However, the Board considers that it is difficult to separate the two issues, as the levels of the bonds are directly relevant to whether the bond system will provide effective protection for the State in the event that mine operators fail to meet their rehabilitation obligations. For this reason, the Board rejects the submission by GDF Suez that any consideration by the Board of the bond levels is beyond the Terms of Reference.<sup>133</sup> The Board’s consideration of the bond levels, and the recommendation below about an interim increase of the bonds, fall under Terms of Reference 10(b) and 12.

The current bond levels result from the way in which the Mining Regulator has administered the bond system, including its decision not to change bond levels in response to bond reviews. For this reason, an assessment of the effectiveness of the current rehabilitation bond system requires the Board to review the regulatory framework and its implementation.

### 8.5.1 THE CURRENT REHABILITATION BOND SYSTEM

As submitted by Counsel Assisting and Environment Victoria, the Bond Policy appears to the Board to be a simple and sensible tool to enable the Mining Regulator to exercise the important functions under Part 7 of the Mineral Resources Act, and to ensure that rehabilitation can be undertaken in the event that the mine operator is unable to meet its rehabilitation obligations. The Board notes the historical context in which the Mining Regulator has set the bonds for the Latrobe Valley mines. There is very little evidence before the Board about the criteria used by the Mining Regulator to set the initial ‘interim’ bonds. Based on the Mining Regulator’s briefing note dated 4 December 1995 regarding the Hazelwood mine bond, it appears that when setting the initial interim bond levels, the Mining Regulator used an approach that takes into account the likely rehabilitation costs at the end of the mine life; an assessment of the progressive rehabilitation plans of the mines; and an assessment of the likelihood of default. The Board assumes that a similar process was adopted for the Yallourn and Loy Yang mines.

The Board recognises that the Minister has historically applied a risk-based approach to setting bond levels. The Board accepts that a risk-based approach has utility in the context of mine rehabilitation bonds, a topic that is discussed in Part 9 of this report. However this approach is at odds with the current Bond Policy. The Board considers it surprising that the State should consistently fail to implement its own policy. Should it be applied consistently, the bonds would be set at a level that represents 100 per cent of the third party costings for rehabilitation—a level far higher than the current bond levels. However, for the reasons set out below, the Board considers that the Bond Policy is not an appropriate mechanism for assessing the bond levels for the Latrobe Valley mines. It should be reconsidered insofar as it relates to the Latrobe Valley mines (as discussed further in Part 9).

### 8.5.2 EFFECTIVENESS OF THE REHABILITATION BOND SYSTEM

The gap between the bond levels and the levels of the liability assessments (both those of the mine operators and particularly those of AECOM) exposes the State to the risk that it will bear a significant proportion of the cost of rehabilitation in the event of default by one or more of the mine operators.

The Board is conscious of the distinction between the consequence and the likelihood of this risk, as explained by Dr Gillespie. While the consequence of the risk (a mine operator defaulting on its obligations and its liability transferring to the State) is great, the Board recognises that the likelihood of this risk eventuating is less so, when factors such as the mine operators' financial stability are taken into account. The mines are currently essential to meeting the power needs of Victoria, and while market demand may change in the future, it seems unlikely to the Board that the mine operators will default before the Bond Review Project is completed. The Board accepts the submissions of the mine operators in this regard.<sup>134</sup>

Acknowledging the likelihood of default and the arguments put by the mine operators regarding the appropriateness of the bonds, the Board still considers that the failure of the State to increase bond levels has meant that any financial incentive the mines may have had to accelerate progressive rehabilitation has been removed. As noted above, in the absence of any bond increase, a significant gap has emerged over time between the existing bond levels and the reported estimated rehabilitation liabilities. The Board finds that the current bond levels are ineffective because they do not meet what Accent Environmental describes as their primary purpose of providing a high degree of certainty that adequate funding will be available to undertake final rehabilitation in the event of default by a mine operator.

The Board is concerned that the Mining Regulator has not been able to provide any reassurance to the Board that the bonds are set at an amount that it considers 'sufficient' based on its own risk analysis, as it is entitled to determine under s. 80 of the Mineral Resources Act. There is no transparency in the manner in which the Mining Regulator conducted its reviews of the bonds, particularly given that they appear to have been conducted at odds with the Bond Policy.

The Board notes that 20 years have passed since the Hazelwood and Loy Yang mines' bonds were set at \$15 million on an 'interim' basis. The Yallourn mine's bond, originally set at \$15 million at the same time, was reduced in 2004 to its present level of \$11.46 million. It is inconceivable to the Board that the liability estimates have not increased since the bonds were set. If the Bond Policy and its key tool, the Bond Calculator, have any utility, they must have shown that liabilities had increased; this ought to have justified an increase in rehabilitation bond levels.

The Board further notes that the Mining Regulator has conducted reviews of the mine operators' liabilities using the Bond Calculator (Hazelwood in 2009 and 2011, Yallourn in 2010 and Loy Yang in 2008). The Board was not provided with any evidence about the outcome of those reviews, save that the Mining Regulator determined not to make any change to the bonds pending the Bond Review Project.

The Board considers that the decision to reduce the Yallourn mine bond does not appear to have taken into account the cost modelling undertaken by the Yallourn mine's independent expert, GHD. It appears that the reduction of the bond is based on a base cost estimate of about \$9.5 million with a 20 per cent contingency amount added—this base amount reflects the estimate of costs used at the time of setting the initial bond at privatisation and not the 2002 cost estimate of GHD, which is in excess of \$12 million.

The Board is also concerned that in 2015, the Mining Regulator perceived the risk of a mine operator refusing to enter an increased bond or defaulting on their rehabilitation obligations as '50/50'. While such a rating seems to pay insufficient regard to the statutory obligation imposed by s. 80 of the Mineral Resources Act, it provides a valuable insight into the views of the Mining Regulator.

While it is true, as pointed out by EnergyAustralia, that the Board does not have a detailed explanation of the risk assessment methodology, the Board notes the submissions of Counsel Assisting that Mr McGowan must have been aware that the project plan would be scrutinised closely by this Inquiry. The Board assumes that the risk assessment in the project plan would not have been prepared lightly. At the very least, the risk assessment assists the Board to evaluate the opinion of Accent Environmental about the risk posed to the State by the current gap between the bonds and the assessments. This is a gap which must be closed or, at the very least, reduced in the short-term.

The Board finds that the rehabilitation bond system, namely the Bond Policy, is ineffective by virtue of the fact that the Mining Regulator is not effectively implementing it. If the Bond Policy was implemented, the Board accepts the submissions by Counsel Assisting and Environment Victoria that it is a simple and workable policy, which would ameliorate the risk of the State having to pay for rehabilitation works in the event of default by the mine operators. Full implementation of the Bond Policy would see the current bonds set at 100 per cent of the current liability assessments.

The Board does not find that the legislative framework itself (that is, s. 80 of the Mineral Resources Act) is ineffective, as the issues raised in this Part relate to the application of the Bond Policy. However the Board recognises that other financial assurance mechanisms, such as risk-based approaches, could be more effective than a rehabilitation bond. This is an area that is currently under review by the State, and is discussed in Part 9 of this report.

### 8.5.3 EFFECTIVENESS OF LIABILITY ASSESSMENT PROCESSES

As noted in Part 7 of this report, there is a significant gap between the mine operators' own estimates of their rehabilitation liabilities and the independent estimates produced by AECOM. The Board accepts the submissions made by the mine operators and Counsel Assisting that there are deficiencies in AECOM's work as described in the evidence before the Board. However, the Board accepts the evidence of Accent Environmental that the current estimates are likely to increase as various geotechnical, hydrogeological and fire prevention risk factors are further investigated and resolved. The Board concludes that the 2014–15 Annual Return estimates are likely to be at best the minimum rehabilitation costs.

In order for the mine operators to provide consistent rehabilitation estimates, the Mining Regulator must come to a transparent and clear determination about the manner and form in which rehabilitation cost estimates are provided. The expertise of AECOM and its work on rehabilitation liability assessments should inform this determination.

The Board heard that the Mining Regulator has not specified the 'manner and form' in which it requires the coal mine operators' estimates to be made or to seek an audit of the mines' rehabilitation liability assessments under s. 79A of the Mineral Resources Act. Given the potential usefulness of s. 79A to the process of setting bonds, the explanation for the absence of any such requirements and audits is unsatisfactory.

The Board considers it desirable that the Mining Regulator:

- specify the manner and form (that is, the structure, content areas and methods) in which it wants liability assessments to be made under ss. 79A(1) and 79A(2) of the Mineral Resources Act
- require each mine operator to undertake a rehabilitation liability assessment in that manner and form for the financial year 2016–17
- require each mine operator to engage an auditor to conduct an audit of its 2016–17 liability assessments under s. 79A(3).

The Board considers that these steps need to be commenced prior to the completion of the current Bond Review Project. However, they raise an area of concern for the Board, about the expertise required to conduct s. 79A assessments and audits.

The evidence from Mr Pendrigh and Mr Wilson is that there is insufficient expertise within the Mining Regulator to enable the Minister to request s. 79A assessments and audits. The Board recommends that this insufficiency should be remedied immediately by the Mining Regulator taking steps to employ or engage suitably experienced personnel in mine closure and rehabilitation liability assessments, and by the Mining Regulator obtaining regular advice and guidance from the Technical Review Board. The issue of regulatory expertise is discussed in more detail in Part 10 of this report.

Once the criteria for estimating rehabilitation liabilities are determined through expert consultation, the mines should be required to complete their 2016–17 rehabilitation liability assessments using this process, and those assessments should be audited. The Board notes that, pursuant to s. 77U of the Mineral Resources Act, the auditor engaged will be an ‘environmental auditor’ within the meaning of s. 53S of the *Environment Protection Act 1970* (Vic). The Board considers that s. 79A(3) audits should be comprehensive, scrutinising the assessment’s compliance with the requirements of the ‘manner and form’ set by the Minister under s. 79A(2) of the Mineral Resources Act, and its accuracy.

It is not clear to the Board whether a current EPA-accredited environmental auditor will have the necessary skills and experience to undertake the functions described in s. 79A(3) of the Mineral Resources Act and determine whether a rehabilitation liability assessment is accurate. The Board recommends that the State review the skills and experience required of its accredited environmental auditors, in consultation with the EPA, the Mining Regulator and the Technical Review Board. If appropriate, the Mineral Resources Act and the accreditation process should be amended to ensure such auditors have the required expertise to conduct mine rehabilitation liability assessment audits. Current auditors should be assessed against these criteria and, if required, further auditors should be appointed.

The Board recommends that by 31 December 2016, the State specify the manner and form of rehabilitation liability assessments for use by the Latrobe Valley mine operators in their 2016–17 rehabilitation liability assessments and future assessments.

The Board recommends that the State require that the 2016–17 rehabilitation liability assessments provided by mine operators are conducted in accordance with the requirements developed under the recommendation above.

The Board recommends that by 30 June 2017, the State require each of the Latrobe Valley mine operators to engage an auditor, under s. 79A(3) of the *Mineral Resources (Sustainable Development) Act 1990* (Vic), to certify that its 2016–17 rehabilitation liability assessment has been prepared in accordance with the rehabilitation liability assessment guidelines (as per the recommendations above); to certify that the assessment is accurate; and pursuant to s. 79A(4) of the Act, to forward a copy of the certificate to the Minister for Energy and Resources.

The Board recommends that the State redress gaps in expertise by employing or engaging suitably skilled and experienced personnel in mine closure and rehabilitation liability assessments, and obtaining regular advice and guidance from the Technical Review Board.

The Board recommends that by 31 December 2016, the State review whether the criteria for accreditation of auditors under s. 53S of the *Environment Protection Act 1970* (Vic) are appropriate having regard to the necessary skills and expertise required to conduct an audit under s. 79A of the *Mineral Resources (Sustainable Development) Act 1990* (Vic). If necessary, the Mineral Resources Act and the accreditation process should be amended to ensure appropriately qualified auditors can be engaged for s. 79A audits.

#### 8.5.4 MOVING FORWARD: INTERIM BOND INCREASES

While the Board considers that the implementation of these recommendations will address the concerns it has about the bond system in the medium to long-term, it is concerned about the existing gap between the bonds and the rehabilitation liability assessments remaining until those recommendations are implemented.

For the Yallourn mine, the higher figure in its liability estimate range is more than seven times its bond. Put another way, the bond represents 12.5 per cent of the upper range of the mine operator's self-assessed liability. The evidence before the Board is that, under the existing Bond Policy, it should represent 100 per cent. While the gap between the Hazelwood mine's bond and its liability is not as great, it remains a very significant shortfall. The position with AGL Loy Yang is more complicated. As noted earlier, its 2014–15 Annual Return's liability assessment is \$53.7 million against a bond of \$15 million. However, the figure of \$53.7 million was based on the 1997 work plan, which has now been significantly varied by the 2015 work plan variation. The revised indicative liability assessment is \$112 million, which is more than seven times the bond.

As noted, the advice received by the Board from Accent Environmental is that these shortfalls represent a risk to the State. The State should not continue to be exposed to that level of risk while the Board's recommendations are implemented. The Board is conscious of the time that will be needed to adequately complete the s. 79A process given the evidence it has heard about the lack of expertise within the Mining Regulator and the need for the Mining Regulator to consult with the mine operators and other government agencies, such as the EPA. Based on the evidence before the Board concerning the time the Mining Regulator has taken to complete similar tasks in the past, the Board does not share the confidence of GDF Suez that the various recommendations will be implemented in full 'before the end of 2016'.<sup>135</sup>

Under s. 80(4) of the Mineral Resources Act, if the Minister is of the opinion that the current bonds are insufficient, the Minister may serve a notice on the mine operators requiring each of them to provide an increased bond within 28 days of receiving notice of the bond increase. The Board recommends that, on the evidence it has heard, the Minister should, pursuant to s. 80(4) of the Mineral Resources Act, consider the sufficiency of the existing bonds on an interim basis pending the completion of the Bond Review Project.

Each of the mine operators made submissions opposing such a recommendation.

EnergyAustralia submitted that there is no basis in the evidence before the Board to recommend an interim increase to its bond as there is 'no imminent risk to the State' justifying such a recommendation. It points to the 'ample evidence before the Board of the financial capability of EnergyAustralia'.<sup>136</sup> It submitted that 'the proper course would be for the Board to allow the Bond Review Project to proceed, no doubt influenced by the findings of the Board and the engagement of the other mine operators, including EnergyAustralia'.<sup>137</sup>

AGL Loy Yang made similar submissions. It submitted that there is 'no basis for the Board to conclude that an interim increase in the current bond is necessary to adequately protect the State's interest'.<sup>138</sup> It referred to the Loy Yang Complex Agreement (as discussed in Part 9 of this report) as a source of security for the State that the State will not be left with the responsibility for rehabilitating the site.<sup>139</sup> It further submitted that it would be sufficient for the Board to allow the Bond Review Project and the implementation of the Board's recommendations regarding s. 79A to proceed.<sup>140</sup>

GDF Suez also submitted that the Board could only make a recommendation for an interim increase in its bond level if it is 'satisfied that there exists a real risk that a mine operator might default in the period between implementation of the Board's recommendations pertaining to the s. 79A process and the conclusion of that process.'<sup>141</sup> It submitted that such a conclusion cannot be reached on the evidence before the Board.

None of the mine operators submitted that the Board should disregard the advice from Accent Environmental that the State is exposed to a risk due to the current bonds being 'substantially lower than the rehabilitation liability of the sites' and that the greater the gap between the two, the greater the risk.

Based on the evidence from Accent Environmental, and the evidence about the gap between the bonds and the mine operators' own rehabilitation liability assessments, the Board considers that there is a basis to recommend to the Minister that the bonds should be set on an interim basis at 100 per cent of the current rehabilitation liability assessments, as provided in the 2014–15 Annual Returns in the case of EnergyAustralia and GDF Suez, and the liability estimate that relates to the 2015 work plan variation in the case of AGL Loy Yang. This would give full effect to the current Bond Policy.

However, having regard to the submissions of the mine operators, the totality of the evidence and the factors noted below, the Board accepts that it is not appropriate that bond levels should be increased to the full 2014–15 rehabilitation liability assessment levels as an interim measure, prior to the Mining Regulator's review of bonds being completed. In particular, the Board notes:

- These are interim bonds—they are designed to reduce the risk to the State only until the Board's recommendations in Part 8.5.3 are implemented and the State is able to set new bonds or other financial assurance mechanisms based on accurate liability assessments.
- The mines provide essential services to the State—therefore it is unlikely that demand for coal will decrease to a degree that would result in early closure of one or more of the mines before the Board's recommendations in Part 8.5.3 can be implemented.<sup>142</sup>
- The mine operators are not likely to default in the interim—even if early closure were to occur, the mine operators and their parent companies appear to be financially stable and have considerable assets, decreasing the likelihood that the responsibility and financial liability for rehabilitation will revert to the State.<sup>143</sup>
- A high bond level could potentially have negative financial impacts for the mine operators, with resulting opportunity costs. The bond could potentially tie up funds in the immediate short-term that could otherwise be used for progressive rehabilitation and vital research.<sup>144</sup>

However, contrary to the submissions of the mine operators, the Board does not accept that bond levels should be maintained at their current levels in the interim for the following reasons:

- There is a clear gap between the current bond levels and the mine operators' own liability assessments.
- There is uncertainty about the accuracy of the mines' liability assessments—the AECOM modelling suggests that third party costings for rehabilitation could be significantly higher, and there is a major body of research that will need to be conducted as part of rehabilitation to resolve complex issues, which Accent Environmental considers is likely to result in increases to the current estimates.
- There will be a considerable period of time until new bond levels or other financial assurances will be set—the Bond Review Project, reassessment of liabilities, attracting the necessary expertise to the Mining Regulator, resolving the question of appropriate auditors, identification of the optimal financial assurance mechanism and setting of financial assurance levels, will all take some time.
- There are major consequences of default—while the likelihood may be low, a default would have significant consequences for the State financially.

The Board has chosen to recommend that the Minister considers a bond level that recognises these two sets of somewhat competing considerations, while emphasising that it is an interim level that requires review as soon as practicable. The Board recommends that, in relation to EnergyAustralia and GDF Suez, the Minister should reconsider the sufficiency of the existing rehabilitation bonds pursuant to s. 80(4) of the Mineral Resources Act, having regard to this report and any other relevant material. If, as a result of that consideration, the Minister is of the opinion that the bond levels are insufficient, the Minister should consider requiring that the mine operators enter into further rehabilitation bonds on an interim basis at a rate of at least 50 per cent of the rehabilitation liability assessment provided by those mine operators in their 2014–15 Annual Return for Hazelwood and Yallourn mines (as set out in Table 13).

The position with AGL Loy Yang is more complex. During the course of this Inquiry, the Mining Regulator approved the 2015 Loy Yang work plan variation. The rehabilitation plan in the 2015 work plan variation is very different to that contained in the earlier 1997 work plan. For example, because the level of the proposed lake is much lower in the 2015 work plan, the area of exposed batters is correspondingly greater and so will cost more to rehabilitate. AGL Loy Yang's own estimate for the implementation of its 2015 work plan is \$112 million, more than double the assessment based on its earlier 1997 work plan of \$53.7 million.

Counsel for AGL Loy Yang correctly submitted that the 'reported rehabilitation liability assessment [of \$53.7m] is all but irrelevant due to the new work plan variation now approved.'<sup>145</sup> This submission was made in relation to Term of Reference 10(a). However, AGL Loy Yang has also submitted that if, contrary to its primary submissions, the Board is intending to recommend an interim increase in the AGL Loy Yang bond, 'any such increased bond should be set at 50% of the last rehabilitation liability assessment provided to the Mining Regulator of \$53.7m.'<sup>146</sup> The Board fails to see how that figure could be 'irrelevant' for the purposes of Term of Reference 10(a) but relevant for Term of Reference 10(b). It rejects this submission. The most relevant estimate is the \$112 million prepared by mining consultants GHD. The Board notes the evidence of Mr Rieniets that 'the GHD model utilises data...which is more accurate than approximations...used in some other models.'<sup>147</sup>

**Table 13. Current estimated rehabilitation liabilities**

Mine	Current estimated rehabilitation liability*	50% of estimated rehabilitation liability
Yallourn mine	\$46–\$91 million	\$34.25 million <sup>†</sup>
Hazelwood mine	\$73.4 million	\$36.7 million
Loy Yang mine	\$112 million	\$56 million

\* Sources: Hazelwood and Yallourn mines' Annual Returns 2014–15; Loy Yang's revised liability assessment based on the 2015 Loy Yang work plan variation

<sup>†</sup> This represents 50 per cent of the midpoint (\$68.5 million) of the range provided in the 2014–15 Annual Return.

The Board recommends that upon completion of the Bond Review Project, the Minister should review the amount of the bond required by each mine operator. This should be in accordance with the mine operators' 2016–17 rehabilitation liability assessments, conducted as per the Board's recommendations in Part 8.5.3. The Minister should then require the mine operators to enter into new bonds.

The Board recommends that by 30 June 2016, the State request the Minister for Energy and Resources to consider the sufficiency of the existing rehabilitation bonds pursuant to s. 80(4) of the *Mineral Resources (Sustainable Development) Act 1990* (Vic) having regard to this report and any other relevant material.

- If the Minister for Energy and Resources deems the existing rehabilitation bonds insufficient, the Minister should consider increasing the rehabilitation bonds on an interim basis to at least:
  - Yallourn mine: \$34.25 million
  - Hazelwood mine: \$36.7 million
  - Loy Yang mine: \$56 million

The interim increase should be undertaken in accordance with s. 80(4) of the Mineral Resources Act.

- If the Minister deems the existing rehabilitation bonds sufficient, the Minister should publish a statement setting out the reasons for that conclusion on the website of the Department of Economic Development, Jobs, Transport and Resources.

The Board recommends that upon completing the Bond Review Project, the State review the bond amount required by the mine operators. This should take into account the mine operators' 2016–17 rehabilitation liability assessment, conducted in accordance with the Board's recommendations in Part 8.5.3 and the findings of this Inquiry. The Minister for Energy and Resources should then require the mine operators to enter into further rehabilitation bonds, if the rehabilitation bonds are deemed to be insufficient.