TRANSCRIPT OF PROCEEDINGS

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2015/16 HAZELWOOD MINE FIRE INQUIRY

MELBOURNE

TUESDAY, 15 DECEMBER 2015

THE HONOURABLE BERNARD TEAGUE AO - Chairman

PROFESSOR JOHN CATFORD - Board Member

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MS JULIET FORSYTH - AGL Loy Yang

MS LISA NICHOLS - Environment Victoria

MS EMMA PEPPLER - Environment Victoria

CHAIRMAN: Yes, Mr Rozen.

MR ROZEN: Good morning, Mr Chairman. Today's witnesses will be firstly Mr Webb from the EPA. Then we will hear from the AECOM/URS team, and then finally there will be a panel consisting of the authors of the Accent report together with Dr Gillespie, whose statement has recently been provided to us. I will call Christopher Webb.

<CHRISTOPHER EVAN WEBB, affirmed and examined:

MR ROZEN: Good morning, Mr Webb. Thank you for coming down to the Valley to give evidence in this Inquiry. Mr Webb, you are the Executive Director of Regulatory Practice and Strategy within the Environment Protection Authority?

MR WEBB: Yes, I am.

MR ROZEN: You have a direct report to the CEO of the authority?

MR WEBB: Yes.

MR ROZEN: You have been with the EPA since 2011?

MR WEBB: 2010.

MR ROZEN: 2010. Have you been in the position you are currently in for that entire time or did you hold another position prior to your present one?

MR WEBB: I have been in my current position for just over 12 months. Prior to that I was director of environmental regulation which was running the field operations for three years and for a short period when I joined I was director of environmental services which had a broad range of activities under my direction.

MR ROZEN: Before joining the EPA, you worked for the Victorian WorkCover Authority?

MR WEBB: Yes.

MR ROZEN: How long were you with the VWA?

MR WEBB: Just under three years.
MR ROZEN: What role did you perform there?
MR WEBB: I was director of construction and utilities program. So the construction industry, utilities including power generation, quarries and major events.
MR ROZEN: Before WorkCover, where were you working?
MR WEBB: I was at the Australian Grand Prix Corporation. I looked after safety risk management, strategy and human resources.
MR ROZEN: Do you have formal qualifications post secondary education?
MR WEBB: Yes, I have a Bachelor of Science with a major in chemistry.
MR ROZEN: For the purposes of this Inquiry you have made two statements; is that right?
MR WEBB: Yes.
MR ROZEN: The first of those statements is dated 17 November 2015 and for Inquiry purposes only, Mr Webb, it is behind tab 11 in volume 7 and it bears the Ringtail reference VGSO.1002.001.0001. To you it's known as the statement you made on 17 November, I think, isn't it, Mr Webb?
MR WEBB: Yes.
MR ROZEN: Do you have a copy of that in front of you?
MR WEBB: I do.
MR ROZEN: There are a couple of changes you would like to make to that statement?
MR WEBB: Yes, at paragraph 22.
MR ROZEN: So that is on page 4 of the statement, the Ringtail code ends in 0004.
MR WEBB: In the third line, if we delete the word "the", or the words after "the commencement of section 67B".

MR ROZEN: So you would like that second sentence in paragraph 22 to read as follows, "A licence condition was initially imposed on the operators requiring them to provide a proposal for a financial assurance soon after 1 October 2000."

MR WEBB: Correct.

MR ROZEN: Is there a change in paragraph 23 as well, lower down on that page?

MR WEBB: Yes, the last sentence. I would like to add the words "and during the reform process the EPA has not actively sought these".

MR ROZEN: So the final sentence of paragraph 23 will now read as follows, "However, no financial assurance has been given by any of the operators and during the reform process EPA has not actively sought these."

MR WEBB: Yes.

MR ROZEN: With those changes, are the contents of your first statement dated 17 November 2015 true and correct?

MR WEBB: Yes.

MR ROZEN: I tender that.

#EXHIBIT 39A - Statement of Christopher Webb dated 17/11/2015.

MR ROZEN: In addition, Mr Webb, in response to a further letter that came from the Inquiry, did you prepare a second statement dated 27 November 2015?

MR WEBB: Yes, I did.

MR ROZEN: You will find that behind tab 11B in volume 7 of the book in front of you and it bears the Ringtail code VGSO.1024.001.0001. Have you had a chance to read through that second statement before coming along today?

MR WEBB: Yes, I have.

MR ROZEN: Anything you want to change in that?

MR WEBB: No.
MR ROZEN: Are the contents true and correct?
MR WEBB: Yes.
MR ROZEN: That could be 39B, please, sir.
#EXHIBIT 39B - Statement of Christopher Webb dated 27/11/2015.
MR ROZEN: In relation to that second statement, before I proceed with asking Mr Webb some questions, could I draw the Board and the parties' attention and of course Mr Webb's attention to the seventh page of what is now exhibit 39B and it ends in the Ringtail code 0007. If I could draw everyone's attention to just over halfway down the page there is a section in bold that commences, "The following responses are in regards to questions regarding paragraphs 39 to 43." Do you see that, Mr Webb?
MR WEBB: Yes.
MR ROZEN: I have reflected on this part of Mr Webb's second sentence and, for reasons that I don't think I need to go into because it probably doesn't take things very far, have decided that that's not material that needs to be before this Board of Inquiry; that is, paragraphs 43 through to the end of paragraph 60. If we were somewhere else I would probably say I'm not reading those, but strictly that's not how we are proceeding here.
CHAIRMAN: Yes. The transcript will record that.
MR ROZEN: Mr Webb, the statements that you have made deal with financial assurances in general terms that may be required of particular people by the EPA?
MR WEBB: Yes.
MR ROZEN: The ability to seek financial assurances from occupiers of particular sites is part of the regulatory armoury that's available to the EPA and has been for a

number of years?

MR WEBB: Yes, and it's a power we have.

MR ROZEN: The power can be exercised in a range of circumstances. Can I summarise them as statutory requirements; that is, where either the Act or the regulations of themselves require a financial assurance to be provided to the EPA in certain circumstances that are described?

MR WEBB: The power is framed up as we "may" require one and then that is limited then to premises in certain schedules in our scheduled premises regulations, so a small group that it can be required from, but the operation of it is an operational policy decision.

MR ROZEN: In addition to that range of circumstances there are other circumstances in which, as part of the exercise of other statutory powers, for example pollution abatement notices, an obligation can be imposed to provide a financial assurance in the exercise of an administrative power. Do you agree with that?

MR WEBB: On licensed sites, yes.

MR ROZEN: On licensed sites, indeed. Governing or applying to that range of circumstances is section 67B which sets out the types of financial assurances which can be sought by the EPA in that range of circumstances?

MR WEBB: Yes.

MR ROZEN: You deal with this at paragraphs 15 and 16 of your first statement, exhibit 39A. The Ringtail code ends in 0003. You are probably aware, Mr Webb, that one of the issues that this Board of Inquiry has been asked to consider is the effectiveness of the financial assurance mechanism which exists under the Mineral Resources

Sustainable Development Act and the evidence before the Inquiry is that the regulator has sought, where it has sought financial assurance, it has been in the form of a bank guarantee. As you point out at paragraph 15 of your statement, that's also the case with the EPA. You say the EPA has historically required a financial assurance in the form of a bank guarantee. Can I just clarify has that been the universal practice or have there been ever circumstances in which a financial assurance has been sought in some other form by the EPA?

MR WEBB: I believe there are some circumstances where there have been alternatives, but bank guarantees have by far been the predominant form.

MR ROZEN: What alternatives have been utilised, to your knowledge?

MR WEBB: I would probably need to go back and give an exact list, but I believe in at least one second sense I know of where we have taken, I think, a registered mortgage, it was a hold against the property. But I couldn't be more specific. I would need to come back with more information.

MR ROZEN: I'm probably stretching the friendship if I ask you what were the circumstances that led to that?

MR WEBB: Inability to secure a bank guarantee. For new businesses it is often problematic when they are trying to raise capital to have the capital tied up under a bank guarantee.

MR ROZEN: I hope I don't need to take you to the document at the moment, but attached to your statement is what's described as a financial assurance options analysis that was carried out by PricewaterhouseCoopers in 2011. Are

you familiar with the document I'm talking about?

MR WEBB: Yes.

MR ROZEN: I see you are going to it, so I will take you to it. It is annexure 15 which starts at EPA.1007.001.0090. If you can go to page 9 of that document which ends in the Ringtail code 0102. Do you see the heading "Current operation"?

MR WEBB: Yes.

MR ROZEN: This is a description of the scheme as it was operating at the time this document was prepared in 2011. After the series of dot points setting out the alternatives that are available, the authors write, "In practice EPA must agree to the form of the financial assurance and to this point almost all financial assurances obtained to date have been in the form of a bank guarantee due to the greater certainty they provide." Then if we look at the footnote, it says, "There have also been some instances where large businesses have placed funds in trust as an EPA agreed form of financial assurance." Can you confirm the accuracy of that description of the use the EPA has made of its financial assurances? Is that an accurate summary of what's occurred?

MR WEBB: I'm probably not in a position to confirm it. I know this work was done - they worked very closely with our people. So I can only assume from that that that is based on information we have provided them.

MR ROZEN: It is likely, isn't it, that if it inaccurately described the practice, that that might have been reflected in a final report that PWC produced?

MR WEBB: Yes.

MR ROZEN: So the Board can probably take some comfort from that?

MR WEBB: Yes.

MR ROZEN: Do you agree that bank guarantees provide greater security as is said there, compared to the other means of financial assurance identified? Greater security for the regulator, I mean?

MR WEBB: Yes.

MR ROZEN: Is that the explanation for why the almost invariable practice of the EPA has been to seek bank guarantees despite having other alternatives to it?

MR WEBB: Yes.

MR ROZEN: If you can go back to paragraph 16 of your statement, please, page 3 of your statement, Ringtail 0003. You say at paragraph 16, "The EPA is currently expanding the form of financial assurance that it will accept." You make reference to a draft guideline which has been released for the purposes of consultation with the industry. Why, if the practice has been to seek bank guarantees and if you have agreed with the proposition that they provide the greatest level of security for the regulator is the EPA currently expanding the form of financial assurances that it will accept?

MR WEBB: One of the problems we have had with the implementation of the system as a whole is that bank guarantees are sometimes problematic, particularly for new businesses.

MR ROZEN: Who might not have a credit rating?

MR WEBB: Who may not have a credit rating, who may have as I've said already significant capital commitments. Our role as a fair regulator is to explore alternatives to try

to come up with a reasonable solution.

CHAIRMAN: Could I just assume that the reference 16.7 to certificate of title, that could mean a registered or even an unregistered mortgage?

MR WEBB: Yes.

MR ROZEN: The expanded range of options is really designed ultimately to give you some flexibility to deal with the sorts of cases you have described where a bank guarantee may not be available to someone, but they may have some other means by which they could assure the regulator?

MR WEBB: Yes, flexibility for us and flexibility for the business.

MR ROZEN: In your consultations has that second sort of flexibility, that is flexibility for business, been a matter that's been raised with the EPA as a desirable thing?

MR WEBB: Yes.

MR ROZEN: Is the overall philosophy that's guiding the development of the new policy framework that there may need to be a trade-off between certainty for the regulator, flexibility for business on a case by case basis?

MR WEBB: Very much on a case by case basis, yes. This is a residual risk management exercise and they need to be considered individually.

MR ROZEN: Residual risk in the sense that it kicks in after perhaps other regulatory mechanisms are available and utilised?

MR WEBB: Yes, and we have layers of works approvals and licensing and annual reporting and everything else. This is really something that will really kick in as a tool of

last resort.

MR ROZEN: Can I turn then to the situation with the Latrobe Valley mines and you describe this on page 4 of your statement, starting at paragraph 17. We need to be careful with terminology here, don't we? We are primarily concerned with the mines, and we are entirely concerned with the mines in this Inquiry, but the EPA's interest is in the operators of the power stations. They are the entities that are licensed by the EPA?

MR WEBB: Yes, the activities of the power stations fall under the scheduled premises regulations.

MR ROZEN: Yes. If we can summarise the series of exemptions and then exemptions from the exemptions which you describe in paragraphs 17 to 20, the bottom line is as you have described it in paragraph 20. The point you get to when you work through the regulatory - I won't say maze - but the regulatory provisions, is that the Latrobe Valley power stations, which you have collectively described there in paragraph 20, that is Hazelwood, Yallourn and Loy Yang, have land fills relating to non-mining activities and you attach helpfully for us aerial photographs which depict the land fill areas. I don't need to go to them. Would you agree that in relation to Hazelwood and Loy Yang at least, they are land fills of quite significant size. Do you agree with that?

MR WEBB: I believe the land fills are roughly around a hectare. In terms of land fills that's not enormous in terms of what we deal with, but they are of a considerable size.

MR ROZEN: Do you have sort of small, medium and large landfills? Are they medium size or would they be to the

small end in the overall scheme of things? How would you describe them?

MR WEBB: In my experience I'd say they are sort of in the medium size.

MR ROZEN: You note at paragraph 21 that each of the power stations currently holds an EPA licence and you have attached copies of those licences. I will go to those in a moment, but you summarise the effect of those in the remainder of paragraph 21. You say, "Each of the licences requires that the operator must maintain a financial assurance for their land fill areas calculated in accordance with the EPA method" and you draw the Board's attention to the general conditions of licence, condition 6. Perhaps if we go to one of those. Can we go to 5C, please, which is at EPA.1004.001.0104, attachment 5C. This is the licence that attaches to the Hazelwood Power Station. The licensee is Hazelwood Power Partners; is that right?

MR WEBB: Yes.

MR ROZEN: And there's a description in the middle of the page as to what that is and the relevant ARBNs and ACNs and I won't go through that in detail. But what I want to ask you about is on page 3. These are the general conditions to which you refer; is that right?

MR WEBB: Yes.

MR ROZEN: We see there are actually seven of them. The one that you draw our attention to is the final one, licence general condition 6. Is that what "LIG 6" stands for?

MR WEBB: Yes.

MR ROZEN: It is in the terms that you have described, "You must maintain a financial assurance calculated in

accordance with the EPA method."

MR WEBB: Yes.

MR ROZEN: When the licence was granted, which was back in 1997, have I got that right?

MR WEBB: Yes.

MR ROZEN: And it's been amended on a number of occasions since, including by the inclusion of general condition 6?

MR WEBB: Yes.

MR ROZEN: Did the EPA, as you understand it, have a discretion about whether to impose licence condition G6 or was that mandated by the regulatory scheme?

MR WEBB: On my understanding it was an operational policy decision in October 2000, I believe, was the date that it was then imposed on roughly 140 of the 250 licences that fell under the potential regime.

MR ROZEN: Yes, I think that's what you say in your statement. It was inserted in 2000, not specifically in relation to the three Latrobe Valley power stations, but across the Board?

MR WEBB: Across the Board.

MR ROZEN: But it has remained in each of those licences ever since as a mandatory condition; is that right?

MR WEBB: Yes.

MR ROZEN: At annexure 9 you have attached for us a determination that was made by the EPA in September 2001. It is EPA.1004.001.0034. This was a policy position that was arrived at by the EPA as to how it would administer what were then the new requirements which enabled a financial assurance to be required from the occupier of the land fill?

MR WEBB: Yes.

MR ROZEN: If we go to page 5 of the publication which ends in 0038 in the Ringtail, there's a heading in the right-hand column "Timing of introduction of financial assurances". Do you see that?

MR WEBB: Yes.

MR ROZEN: The first line reads, "Financial assurances will be introduced across all land fill licence holders, with all financial assurances established by 30 June 2002." Are we to understand that as being a gradual phasing in of the requirement that was determined as a matter of policy by the EPA?

MR WEBB: Not having been there at the time, I can only assume that would have been the intent.

MR ROZEN: Yes. It is not unusual, is it, for new requirements to have a period of grace where people have the opportunity to become aware of the new obligation and make arrangements to comply and so on?

MR WEBB: Yes, it is also incredibly intensive for the regulator to calculate and negotiate.

MR ROZEN: Yes, absolutely, so it suits everyone really to have a period of grace during which something is phased in and that's what was done here by virtue of this publicly issued document?

MR WEBB: Yes.

MR ROZEN: In September 2002, so three months after the commencement date, the practical commencement date of the requirement from annexure 9, the EPA received a letter from a company called GHD which you have attached to your statement at annexure 6, if I could take you to that. It is EPA.1005.001.0001. Just so we can get the timing right, in September 2002 licence condition G6 had been in

each of the power stations' licences for approximately two years?

MR WEBB: Yes, that would be pretty close to two years.

MR ROZEN: And it was now three months after the end of the period of grace that was granted as a phase-in period as per what we saw in annexure 9?

MR WEBB: Yes.

MR ROZEN: The letter, as I understand it, was written on behalf of each of the three power stations with GHD essentially making representations to the regulator on behalf of the three power stations. Is that your understanding of the letter?

MR WEBB: Yes.

MR ROZEN: It is written to Mr Marsiglio of the EPA here in Traralgon. Do you know, and you probably don't, what position he held at that time?

MR WEBB: No, look, I'm unaware of the specific role he held. He was part of the Gippsland team.

MR ROZEN: Yes. It commences, "I refer to recent EPA correspondence regarding land fill financial assurance submissions to Loy Yang Power, Yallourn Energy and Hazelwood Power." I don't think that correspondence has been produced to this Board. Do you have any idea what that correspondence said that this was responding to?

MR WEBB: No.

MR ROZEN: It goes on that there was a meeting between GHD and representatives of the three power stations to discuss the financial assurance issue - I'm reading from the second paragraph - "with the objective of developing an acceptable industry position regarding financial assurances." And then, "A preliminary common position was

agreed on and as such GHD on behalf of the companies is pleased to present the following for your consideration as an outline of the proposed Latrobe Valley power industries joint position regarding the detail and structure of financial assurance submissions."

I'm not going to read through the entire letter, but it was essentially a case that was being put up as to why the Latrobe Valley power stations should not have to provide a financial assurance to the EPA. It was trying to convince the EPA not to require financial assurances from them. Do you agree with that general observation?

MR WEBB: That appears to be the position, yes.

MR ROZEN: A number of bases are spelt out in the letter for why that proposition should find favour with the EPA, including if you look at the top of page 2 of the letter, under the heading "Site rehabilitation"; do you see that?

MR WEBB: Yes.

MR ROZEN: In the third line, after referring to section 80 of the Mineral Resources Development Act as it was then known, it says in the third line, "The mining licence requires that a bond be established for the sole purpose of site rehabilitation. The value of the bond is $15 million, which should satisfy EPA that adequate provisions for rehabilitation of land filled solid inert waste are already in place."

The penultimate paragraph starts, "Thank you for your open-minded flexibility on this issue to date. I trust the information provided outlines the industry's concerns and join position. GHD along with the Latrobe Valley power industry look forward to your comments regarding this matter." GHD on behalf of the power

stations was essentially asking for an exemption from an existing legal obligation, were they not?

MR WEBB: Their position was from this letter that they didn't believe it should be applied to them.

MR ROZEN: You have provided to us a response to that letter which is annexure 7, the very next annexure to your statement, EPA.1005.001.0003. It is nearly three years after the letter that a response was sent. Am I understanding that correctly?

MR WEBB: That appears to be the case.

MR ROZEN: I know you weren't there, Mr Webb, and you have been unable to determine why it took so long for a response?

MR WEBB: We have not been able to establish any reason.

MR ROZEN: The response is quite detailed and sets out various provisions of the Act. It starts off, "I refer to the ongoing debate about the development of financial assurances for the land fills under the control of the Latrobe Valley power industry," and then sets out the three matters that are addressed in the letter. But the bottom line is the letter said, "Look, the law is the law and you have to comply," didn't it?

MR WEBB: It maintains EPA's position that the financial assurances should be applied to the land fills.

MR ROZEN: And it deals with the matters that are raised in the GHD letter such as the overlap with the bond system under the mining regime and it says they serve separate purposes and there is an MOU between the two agencies that deals with overlap. If we can go to the fourth page of the letter, the Ringtail code ends in 0006, under the two dot points, the first paragraph reads, "EPA notes other matters raised in your letter to support your argument

that the power industry should not be required to provide a financial assurance. These relate to asset value" - and it goes on.

Then in the sixth line of the paragraph, "These are matters that may be taken into account when determining an appropriate financial assurance for the individual sites. You should know that the respective EPA waste discharge licences for power industry premises require that financial assurances acceptable to the authority must be in place. Currently the companies are exposed by not complying with this licence condition."

The EPA stated policy about non-compliance with conditions is that enforcement action will be taken; isn't that right?

MR WEBB: I'm not exactly sure of the compliance enforcement policy at that time. That's certainly the position today.

MR ROZEN: So the document that you have attached as annexure 1, if we could just go back to that, it starts at EPA.1004.001.0001, that's the current enforcement policy, isn't it, June 2014?

MR WEBB: Yes, that's the position.

MR ROZEN: If we look at the second page of that, the right-hand column, top of the right-hand column, "Enforcement of financial assurance requirements", it reads, "In the event of a duty holder failing to meet expectations for complying with financial assurance works approval or licence conditions, for example if an agreed timeframe for submitting a financial assurance is not met, the non-compliance will be escalated in line with EPA's compliance and enforcement policy. Continued failure to comply may result in licence or works approval suspension

or revocation." That's the current policy. If I understand you correctly, you are saying to the Board you are not sure whether that was the policy as at the date of the letter in 2005?

MR WEBB: No.

MR ROZEN: It would appear that it wasn't, because despite the terms of this letter there was no enforcement action taken, was there?

MR WEBB: No.

MR ROZEN: But you'd agree with me, wouldn't you, that the letter makes it clear that the EPA's position is that it is a legal obligation and there is an expectation by the EPA that it will be complied with?

MR WEBB: Yes.

MR ROZEN: It hasn't been complied with in the ensuing 10 years, has it, Mr Webb?

MR WEBB: No. However, the power stations through correspondence around 2012 confirmed that they acknowledged that it would apply to them, and since that point we are in the middle of a reform program and we have not actively sought to close that out. So certainly the intent exists now to comply and in fact it is our reform program that is holding them up, in which case it wouldn't be legitimate for us to apply the compliance enforcement policy when we are the ones who are controlling the time.

MR ROZEN: Do you have paragraph 22 of your first statement in front of you? The Ringtail code ends in 0004.

MR WEBB: 22, was it?

MR ROZEN: Yes, middle of the page. If I could draw your attention to the last sentence in that paragraph. This is after referring to the correspondence that I have just

taken you to. Your sentence reads, "Our review of records covering this period" - that is the period since July 2005 - "is ongoing at this stage. However, we have not so far identified any records that explain why EPA did not ultimately pursue the operators to provide the financial assurances."

MR WEBB: Yes.

MR ROZEN: I need to put this to you, Mr Webb. Isn't it the case that the EPA just succumbed to the pressure from the power stations and just didn't pursue the matter from 2005 and hasn't pursued the matter since that time?

MR WEBB: I wouldn't have any evidence to support that view. In fact, this failure to enforce at the time was one of the key reasons why we commenced the review process in 2010/11 and it was acknowledged by the EPA that we'd failed to enforce our own laws.

MR ROZEN: So your evidence to the Board is that this is part of a general failure to enforce these provisions rather than one limited to the Latrobe Valley power stations?

MR WEBB: Yes. We had about 140 sites, I believe, that had the licence condition and I believe at the commencement of the review we had secured only about 70 of those, roughly 70. There was a significant number that had not had the condition enforced.

MR ROZEN: Has the review considered the reason for that? In other words, was it because of a lack of resources or inappropriate allocation of regulatory resources? What's the explanation for that wide-scale failure to enforce the law?

MR WEBB: There are a range of factors. Some of those that you mentioned were highlighted in our compliance enforcement

review in 2010. Other factors really are around the complexities involved in the individual calculations, the difficulty in applying particular financial instruments and at the end of it really coming up with a reasonable sum, because probably the key difference in this tool to the mining ones we have been talking about, a large part of the application of this tool is for risks that may or may not eventuate. We get tied up in very significant discussions trying to calculate harm that may occur on a given site. It can be quite speculative.

In the case of landfills it is a little bit more straightforward. It is very much focused on aftercare and we can be reasonably confident of the cost involved in that. But a significant number of these you are talking to a business that may cause harm but may not and then settling on what a reasonable figure is is often quite prolonged.

MR ROZEN: But of course the discussions with the Latrobe Valley power stations never got to that level, did they, about setting the figure. It was the threshold issue of whether or not there would be a financial assurance provided that is the subject of this discussion in the correspondence?

MR WEBB: The later correspondence in 2012 I believe at least one of the power stations had a proposal for the figures.

MR ROZEN: I will take you to that presently, if I could. Before I do that, just so the Board understands how that later correspondence came to light, do you have your first statement, paragraph 23 in front of you?

MR WEBB: Yes.

MR ROZEN: Do you see in the fourth line of that paragraph you

said, "In 2012 the EPA received proposals from Hazelwood and Yallourn concerning the type and amount of financial assurances which they would be prepared to provide, and also received a request for assistance on the calculation from Loy Yang"?

MR WEBB: Yes.

MR ROZEN: It's the position, isn't it, that having provided that statement to the Board of Inquiry you then got a letter asking for some further details about those proposals?

MR WEBB: Yes.

MR ROZEN: And that's one of the things that you deal with in your second statement, is it not?

MR WEBB: Yes.

MR ROZEN: If I can take you to your second statement now, please, which is exhibit 39B and it starts at VGSO.1024.001.0001. You attach to that statement copies of correspondence relating to the proposals that were put by the power stations to the EPA?

MR WEBB: Yes.

MR ROZEN: Can I take you to attachment 14A, please, which is EPA.1007.001.0029?

MR WEBB: Yes.

MR ROZEN: That's a letter dated 19 October 2012 from the Hazelwood Power station, GDF Suez, International Power is on the heading.

MR WEBB: Yes.

MR ROZEN: After setting out some reference to what has previously taken place, on the second page of the letter the author proposes on behalf of GDF Suez a parent company guarantee as an acceptable form of collateral and there

are attached calculations which include the estimated value to fill the landfill assurance at 1.8 million and change. That's the assessment that's made in the letter?

MR WEBB: Yes.

MR ROZEN: It is not entirely clear, but do we take that as a proposal to the EPA that it accept a parent company guarantee in that sum? Is that what is being proposed in the letter.

MR WEBB: That's how I would read it, yes.

MR ROZEN: Similarly, if we go to 14B, which is the next attachment, EPA.1007.001.0043, this is a letter from Loy Yang Power, the operator of the Loy Yang power station. The opening paragraph reads, "The issue of landfill financial assurance at Loy Yang remains unresolved despite many years of discussion. The purpose of this letter is to present a position with a view to resolving this outstanding issue." What I'm having difficulty understanding, Mr Webb, and the Board may be too, is how a mandatory requirement imposed in a licence where the condition was inserted 12 years earlier than this letter is the subject of ongoing debate between the power stations and the regulator. Isn't it just a simple matter of: it is the law; you either enforce it or you remove the condition? What's the debate?

MR WEBB: That would be my view. As the regulator that is our current position and we have made quite clear that once the reform process, the implementation phase commences, the intent is that it will be applied as such.

MR ROZEN: How can anyone be satisfied that things will change? Are you saying that the policy settings will be changed and then the action will flow; that the problem was the

policy settings weren't right at this time?

MR WEBB: I think there were a range of issues, but the position we hold is made quite clear. The two draft position statements issued in I think 2014 and 2015 in terms of the calculations, yes, in February 2015, they are the publicly stated positions. They are out for consultation. We are at the stage of incorporating feedback, but the feedback doesn't substantially change the nature of our position and we will commence implementation of that early 2016.

MR ROZEN: Just for completeness you have attached 14D. If I can take you to that briefly. EPA.1007.001.0057. This is a letter dated 2 May 2012 from TRU Energy Yallourn Pty Ltd addressed to once again the EPA Gippsland regional office. It starts, the first paragraph, "Under the reformed EPA licence condition G6 TRU Energy Yallourn must maintain a financial assurance calculated in accordance with the EPA method." It goes on and refers to some GHD work that was done in 2006 for risk based assessment. There is a reference to a presentation that was made to the EPA in March 2007. Do we understand that presentation to be also attached to your witness statement at 14E; is that right?

MR WEBB: 14C.

MR ROZEN: Yes, you are absolutely right. That's a series of Powerpoint slides that was presented to the EPA by GHD on behalf of TRU Energy Yallourn.

MR WEBB: That's what I understand.

MR ROZEN: If we can just go back to the letter now, 14D. After referring to the presentation it says, "We are yet to receive EPA advice on TRU Energy Yallourn's proposal."

So that's a reference to something that happened five years earlier where the power station is making a proposal to the EPA about how it wants to go about complying and they say they didn't get a response. Have you made examination of the EPA records to see if there was a response provided.

MR WEBB: We have not been able to locate one.

MR ROZEN: Then it goes on and, as had been the case with Hazelwood, "In order to address this matter we propose to put in a financial assurance of $2.485 million based on this submission from March of 2007 attached for your review." It concludes that, "TRU Energy Yallourn is seeking to discuss with the EPA the next steps required to progress the ash landfill assurance and to confirm assurance requirements for the" relevant landfills at Yallourn. That was a letter that was provided to the EPA in May 2012?

MR WEBB: Yes.

MR ROZEN: It is the case, isn't it, that the two proposals that were provided, one from Hazelwood and one from Yallourn, and the request for assistance from Loy Yang all in that mid-2012 period, there's no correspondence responding to any of those that you have been able to dig out?

MR WEBB: Not directly, no. There are bulk emails. We were dealing with all 250 sites en masse, if you like. The decision was made through the reform process to communicate consistently with everybody. There have been discussions at local office level, but certainly no direct response we can locate to this letter.

MR ROZEN: If we can go back to your first statement, if we

could, paragraph 23. This is VGSO.1022.001.0004. Your concluding sentence in paragraph 23 - - -

MR WEBB: Is that the first statement?

MR ROZEN: Yes, the first statement, 39A, page 4 of the statement towards the bottom of the page in paragraph 23. Do you have that, Mr Webb?

MR WEBB: Paragraph 23.

MR ROZEN: So you there summarise the correspondence that I have just taken you to that's attached to your second statement. You note that there was a request for assistance from Loy Yang and so on. You say, "However, no financial assurance has been given by any of the operators." That remains the position today. I think you confirmed that earlier, didn't you?

MR WEBB: It is probably more correct to say that has been secured from any of the operators.

MR ROZEN: Offers have been made but haven't been accepted?

MR WEBB: Yes, and that's why I added the additional words when we made the correction at the start, was to make clear the EPA had not been actively seeking to finalise.

MR ROZEN: These events, the specific cases we are talking about, have been overcome by this reform process that you refer to which commenced in 2010; is that right?

MR WEBB: Yes, the review commenced in 2010 and the reform program commenced I think late 2013/2014.

MR ROZEN: However we dress it up, the bottom line here is the power stations have been operating outside of the law for some 15 years; isn't that the case?

MR WEBB: Yes.

MR ROZEN: The regulator has been complicit in that, has it not?

MR WEBB: I believe that the enforcement of the financial assurance provisions between 2000 when they came in and 2010 when we started the review was unacceptable.

MR ROZEN: But even in the last five years conducting a review and enforcing existing obligations don't have to be mutually exclusive processes, do they?

MR WEBB: When the review and then the reform have the potential to significantly change calculations then I believe the decision we made was that in light of that and in light of the fact that this is an instrument of last resort, we have multiple other layers of control, on a risk basis we decided that it was - the decision to not seek to finalise arrangements only then to potentially have to rearrange them within a relatively short period of time, that it was the right decision to make.

MR ROZEN: Can I ask you about one final matter, and sorry to do this to you but I need to take you to 14E, which is attached to your second statement. It is EPA.1007.001.0058 . Do you have that?

MR WEBB: Yes.

MR ROZEN: This is the GHD report on behalf of TRU Energy that was provided to the EPA, February 2007, as the front page shows.

MR WEBB: Yes.

MR ROZEN: This is a body of work that was done really to advance that debate about setting a figure and satisfying the regulatory obligation to provide a financial assurance. I particularly want to ask you about something that appears on page 4 of the document, and the Ringtail code in the top right corner is EPA.1007.001.0064. It is a heading 2.2.3 "Monte Carlo analysis". Do you see that,

Mr Webb?

MR WEBB: Yes.

MR ROZEN: The author of this report refers to the way in which the work was done to reach a figure for a financial assurance. It refers to the use of a program known as a Monte Carlo analysis. Is that something you are familiar with, Mr Webb?

MR WEBB: I'm familiar with the existence of a Monte Carlo analysis. I wouldn't claim any knowledge of the working of.

MR ROZEN: It is a mathematical model that enables a range of potential costs to be used in arriving at a final figure. The output of the analysis can give you different figures according to what confidence level you want in terms of the likelihood that the figure you are using won't be exceeded. It's a very clumsy way of explaining it and you are nodding so I'm grateful for that. But that is broadly what it achieves.

MR WEBB: Yes.

MR ROZEN: As part of using the model you can select a confidence level which will give you a degree of reliability about the output.

MR WEBB: Yes.

MR ROZEN: You see going back to 2.2.3 that after referring to the premise behind the model it goes on in the third line, "Based on the cumulative probabilities, risk and associated costs, a 95th percentile cost for each event tree, (based on a Poisson random distribution of the various causes) was calculated. These were consequently summed using a Monte Carlo simulation to find a total 95th percentile remedial cost (the accepted worst case

remedial cost as defined by the EPA)". It is really those last five words I want to ask you about. I will ask it in two ways. Firstly, do you know what that's a reference to? In other words, was there a stipulation given to the power stations that this work was to be done using a 95th percentile remedial cost; in other words a very high level of certainty?

MR WEBB: I believe it's in the guidance materials from early 2000, there is a mention of a 95th percentile. We give guidance as to the methodology for calculating landfill.

MR ROZEN: I must have missed that, but that is something that is of significance to the Board. So if you are able to locate it.

MR WEBB: Annexure 9 of the first statement.

MR ROZEN: This is this policy document from 2001 that we talked about?

MR WEBB: Yes. Sorry, I hope I'm not leading counsel astray on this. I'm sure I read this last night. I can't locate it. I'm sure I came across it in one of the guidance materials. I believe it would refer to that.

MR ROZEN: That requirement for a 95th percentile calculation. Perhaps you can take it on notice, Mr Webb, and if you are able to communicate through the State's solicitors where precisely we can find that that would be helpful. But probably more importantly for present purposes you are able to confirm that that is an EPA position that it states to licensees and others that these calculations are to be done at a 95th percentile level?

MR WEBB: Yes, the guidance sets out methodologies that come from probably a more pragmatic approach rather than - the statistical analysis I think is one way of approaching

this. We have tended more towards there is good data that says post closure of a landfill you cap it, you monitor it, if you have gas wells you have to sample them and you can have a pretty high level of confidence around the costs associated with that because again we are covering a very broad audience. Through those you can actually come up with a very high confidence level we would accept based on our experience. That's why we give details of those calculations. I'm assuming where they are referring to "worst case remedial costs as defined by the EPA" means if you follow the methodology we propose.

MR ROZEN: Yes, thank you. They are the questions I have for Mr Webb. I have just been given a note that Ms Nichols has some questions. I thought there might have been some at the back. I'm not sure what order has been agreed, but I will sit down and let that happen.

MS NICHOLS: I just have one question for you. In your second statement at paragraph 38 you are discussing the financial assurance reform program. I will just let you turn to that. You mention that as part of the process the power stations will be required to provide assessments in relation to three components: operational, closure and aftercare financial assurance. Just a clarification about what is meant by aftercare and in particular does it include provision for the removal and demolition of the power station infrastructure?

MR WEBB: The first part of the question, the aftercare of a landfill - so the closure refers to capping. The aftercare then is a period of up to 30 years of monitoring, groundwater monitoring, any gas and maintaining integrity of the capping. That's what we

consider aftercare. I don't believe at this stage that there is any consideration of what may or may not happen with any demolition of the power station itself. That's an entirely separate matter to this. This is simply landfills related to waste from the operating power station.

MS NICHOLS: So that matter is not the subject of any consideration by the EPA at the moment in this package?

MR WEBB: No.

MS NICHOLS: Thank you.

MS FOLEY: Mr Webb, you were asked a number of questions by Counsel Assisting about the financial assurance regime, and in particular some questions directed I think towards the theme developed yesterday by Counsel Assisting about a concerted campaign by the mine operators to avoid providing a financial assurance. Your evidence is, isn't it, that the EPA has not actively sought a financial assurance during the reform process and in fact really hasn't been seeking one since 2002?

MR WEBB: I would say we have consciously chosen not to actively seek financial assurance since the commencement of the review process in 2010. Again, reading through the evidence provided, we maintain a position from 2002 through to 2010 that they were applicable, however we failed to enforce them.

MS FOLEY: You were taken to exhibit 14A, which was the letter from Mr Froud of GDF Suez to the EPA dated 19 October 2012. That exhibit proposed a form of financial assurance in the form of a parent guarantee and also made a proposal as to the quantum of the financial assurance. It would be correct, wouldn't it, that GDF Suez has not been seeking

to operate outside the law but has in fact been making proposals to the EPA as to how it can bring itself into compliance?

MR WEBB: Yes.

MS FOLEY: It is the case, isn't it, that at least since 2012 GDF Suez has in its annual performance statements to the EPA acknowledged the compliance with condition G6 remains outstanding?

MR WEBB: Yes.

MS FOLEY: If I can ask you to be provided with a bundle of documents, please. I won't take you to the annual performance statement. You have already confirmed that - this is an annual performance statement from 2013 - between 2012 and 2015 GDF Suez has declared that it has not complied with condition G6. I will take you to the document which is an email from Mr Froud to Mr Addis at the EPA which is dated 14 October 2013 and the reference is GDFS.0001.004.0080. This appears to be an email from Mr Addis to Mr Froud responding to what appears to be some recent queries from Mr Froud in relation to the financial assurance regime. Given the date, would you agree with me it is likely to be a response to the proposal by GDF Suez in its October 2012 letter?

MR WEBB: Just quickly, it is actually from David Guy from the EPA to Mr Addis. It refers to an enquiry. I am aware that there are regular meetings between the Gippsland team and GDF Suez on a regular basis and this matter was discussed. Whether it was the letter or whether it was an enquiry in those meetings, this is a response, yes.

MS FOLEY: As the email makes it clear, a risk based proposal has been put forward to the EPA. The EPA has indicated

there is some engagement strategy in relation to draft guidelines for financial assurances and that the issue of the parent company guarantee is with the EPA solicitors.

MR WEBB: Yes.

MS FOLEY: Then the email somewhat perceptively notes, "Hope this helps. I'd say the ball is squarely in the authority's court"?

MR WEBB: Yes.

MS FOLEY: Is it the case that the ball remains in the authority's court?

MR WEBB: Yes.

MS FOLEY: If I could just briefly take you to the document GDFS.0001.004.0099. This is an inspection report by the EPA of an inspection dated 29 May. Can I ask you to go to page 2 of that document which is at 0100 and to item 2.9. Is it the case that during the course of the inspection the EPA officer here has recorded that Hazelwood has again followed up the issue of financial assurance?

MR WEBB: Yes.

MS FOLEY: Thank you. Can I tender those, Chairman.

#EXHIBIT 40 - Bundle of documents.

DR COLLINS: Mr Webb, just a couple of questions on behalf of the operator of the Yallourn Mine, Energy Australia. You were asked some questions about annexures 14D and 14 E to your statement. Annexure 14E was the proposal, the GHD proposal, dated February 2007 on behalf of TRU Energy, as Energy Australia was then known, putting a proposal for EPA financial assurance at that date. You said in answer to a question from learned Counsel Assisting that you were unable to identify any response to that proposal?

MR WEBB: Yes.

DR COLLINS: Have your researches uncovered any consideration given by the EPA to that proposal at any time since February 2007?

MR WEBB: No, not at this stage.

DR COLLINS: You accept from exhibit 14D that there was a further attempt by the operator of the Yallourn Mine to engage with the regulator in May 2012?

MR WEBB: Yes.

DR COLLINS: Have your researches uncovered any internal consideration within the EPA of that proposal?

MR WEBB: No. All we have is an email that went out to all licence holders that fall under the regime informing them we wouldn't be seeking to actively finalise any of these matters under the reform process had begun.

DR COLLINS: For the purpose of preparing to give evidence before this Board of Inquiry I take it you have considered the contents of both annexures 14D and 14E to your statement?

MR WEBB: I made myself familiar with them, yes.

DR COLLINS: Do you accept this characterisation, that they were genuine attempts by the operator of the Yallourn Mine to engage with the EPA with a view to receiving the EPA's approval as to the amount and form of security it should provide?

MR WEBB: Yes.

DR COLLINS: It wouldn't be true to say, would it, that the operator of the Yallourn Mine has been consciously operating outside the law since at least February or March 2007?

MR WEBB: Yes.

DR COLLINS: Rather you would accept that it has been seeking

to engage with the regulator now for the best part of a decade in order to ensure that it is complying with its licence condition?

MR WEBB: Clearly since 2007.

DR COLLINS: If the Board pleases.

MR ROZEN: I have no re-examination. In those circumstances could Mr Webb please be excused.

CHAIRMAN: Yes, thank you, Mr Webb. You are excused.

<(THE WITNESS WITHDREW)

MR ROZEN: I'm conscious that the next group of witnesses will take some time and I'm also conscious of the very long day the transcribers had yesterday. Can I suggest a five-minute break at this point that has been requested.

CHAIRMAN: Yes, you can get organised and you can call me when you are ready.

(Short adjournment.)

CHAIRMAN: Yes, Mr Rozen.

MR ROZEN: Thank you, sir. I call Bryan Chadwick, Geoff Byrne and Dr Adrian Bowden. If they could please be sworn.

<GEOFFREY MICHAEL BYRNE, affirmed and examined:

<BRYAN RICHARD CHADWICK, affirmed and examined:

<ADRIAN RUSSELL BOWDEN, affirmed and examined:

MR ROZEN: Gentlemen, if you could please be seated. Thank you all for travelling down to the Latrobe Valley to give evidence here today. Mr Chadwick, if I could start with you, please. You have very recently made a statement for this Board of Inquiry; is that right?

MR CHADWICK: That's correct.

MR ROZEN: The statement is dated 11 December 2015. For Inquiry purposes the Ringtail code is WIT.0009.001.0001. You can ignore all that, Mr Chadwick, that's our internal

coding. Your statement, have you had an opportunity to read through that before coming along giving evidence this morning?

MR CHADWICK: Yes.

MR ROZEN: Is there anything in it that you wish to change?

MR CHADWICK: No.

MR ROZEN: Are the contents of the statement true and correct?

MR CHADWICK: That is correct.

MR ROZEN: I tender that statement, please. Can I suggest, sir, that we make it 41A and there will be a number of other related reports and so on which can all be part of exhibit 41.

CHAIRMAN: Yes.

#EXHIBIT 41A - Statement of Bryan Chadwick dated 11/12/2015.

MR ROZEN: Thank you. If I can start with you, Mr Chadwick. As you explain in paragraph 1 of your statement, you are a hydrogeologist by training?

MR CHADWICK: That's correct.

MR ROZEN: You in fact have a bachelor degree and a masters degree. The bachelor degree is in geology and the Master of Science is in hydrology; is that right?

MR CHADWICK: That's correct.

MR ROZEN: You have 24 years of experience in environmental aspects of mining projects?

MR CHADWICK: That's correct.

MR ROZEN: You explain in paragraph 2 of the statement that your primary area of expertise in hydrogeology is the impact of groundwater systems on a range of mine sites and you have been regularly called upon to provide expert advice and also expert evidence about subjects related to your expertise?

MR CHADWICK: That's correct.
MR ROZEN: You joined URS Australia as a principal hydrogeologist in 1999?
MR CHADWICK: I was promoted to principal at that time. I worked with URS and its precursors from 1993.
MR ROZEN: Between 1993 and 1999 you were, what, just a plain old hydrogeologist?
MR CHADWICK: Just a plain old hydrogeologist.
MR ROZEN: And then got the nod for being a principal in 1999. Just this year URS has been acquired by another firm, AECOM?
MR CHADWICK: That's correct.
MR ROZEN: And is AECOM an acronym that stands for something, out of interest?
MR CHADWICK: It is. Please don't ask me what it is.
MR ROZEN: Right. I won't ask the next question that I was going to ask you. In any event, AECOM and URS have similar types of businesses, do they?
MR CHADWICK: That's correct.
MR ROZEN: What is the business of AECOM? How would you summarise it?
MR CHADWICK: Consulting in engineering and environmental services.
MR ROZEN: Not limited to the mining industry?
MR CHADWICK: Not at all, no.
MR ROZEN: But including the mining industry?
MR CHADWICK: Yes.
MR ROZEN: Just for completion, you currently have the position of Technical Director Environment at AECOM?
MR CHADWICK: That's correct. It's a new title with the new firm.

MR ROZEN: Same role, different badge; is that it?
MR CHADWICK: That's correct.
MR ROZEN: You have attached to your statement annexure 1, a copy of your CV. Just for completeness it is at WIT.0009.001.0004. If we can just go to that briefly, you do set out in summary form the wide range of mining projects that you have had involvement with, both working for the regulator and working for mines?
MR CHADWICK: That's correct.
MR ROZEN: Many of those related to issues surrounding the closure of mines and questions of hydrogeology in that context?
MR CHADWICK: That's correct.
MR ROZEN: If I could turn then to you, please, Mr Byrne. Your CV is also attached to Mr Chadwick's statement. Do you have that in front of you?
MR BYRNE: Yes, I do.
MR ROZEN: The Ringtail code ends in 0007. You are a principal consultant with Niboi, is that the correct pronunciation?
MR BYRNE: That's correct.
MR ROZEN: Niboi Consulting. Your educational achievements are summarised in the second column on the first page of your CV?
MR BYRNE: Yes, that's correct.
MR ROZEN: I notice the third dot point says you got a "Diploma of" and then there is a gap, "Imperial College 1980". Should there be something else there, Diploma of - - -
MR BYRNE: No, that's the correct title.
MR ROZEN: And then a Master of Science from the University of London in 1980 and the rest we can read. The fields of competence that you describe immediately above that

include closure planning, risk analysis and sustainability strategies. And going back to the left-hand column of that page, in the first paragraph you describe your in excess of 40 years professional experience in the fields of mine closure planning, risk assessment, environmental management, corporate reporting, systems and performance auditing and strategic advice. You include publications that you have either authored or co-authored. Then if we go over to the second page of your CV which ends in 0008, there is a heading "Key projects" on the right-hand side of the page. Do you see that, Mr Byrne?

MR BYRNE: Yes.

MR ROZEN: It is right, isn't it, to summarise that as including dozens of situations in which you have been involved in preparation of closure plans?

MR BYRNE: That's correct.

MR ROZEN: And also costings associated with closure plans?

MR BYRNE: That's correct.

MR ROZEN: Finally, Dr Bowden, whilst we are doing introductions, your CV is attached also to Mr Chadwick's statement at the Ringtail code that ends in 0011. Do you have a copy of that in front of you?

DR BOWDEN: Yes, I do.

MR ROZEN: Starting with your educational achievements, they appear on the fifth page of the document. I know it's not numbered, but if you look in the top right-hand corner you will see a code and the last two digits are 15. Is that included on the version you have? No, it's not, Dr Bowden. I'm unintentionally misleading you. It is the second last page of the statement and you see the first thing is a dot point that says "Alice Springs NT" at the

top of the page?
DR BOWDEN: Yes.
MR ROZEN: If you go to the bottom of the page, your education and training, we need to start at the last page. You have a Bachelor of Science from the University of Tasmania?
DR BOWDEN: Yes, I do.
MR ROZEN: Then chronologically a further Bachelor of Science with Honours also from that institution, and then finally a Doctor of Philosophy also from the University of Tasmania?
DR BOWDEN: That's correct.
MR ROZEN: The subject matter of your doctorate?
DR BOWDEN: It was in quaternary geology and climate change, coastal geomorphology and groundwater.
MR ROZEN: The transcribers may well have missed the first words there.
DR BOWDEN: Quaternary geology. It is a fairly recent geological time period.
MR ROZEN: Recent in a geological sense, yes. Thank you. If we can go back to your statement, please, Mr Chadwick. In paragraph 5 you explain to the Board that URS as it then was and AECOM as it has become was in negotiation with the department, the mine regulator, DEDJTR as we have been calling it, to undertake liability costing assessments for the three Latrobe Valley mines and the contract was signed in April of this year. You go on in paragraph 6 to describe your personal role in the preparation of the liability cost assessment reports. Can you just summarise your role for us, please?
MR CHADWICK: It was essentially a coordination role with experts that we had within the team. But it was also to

input in a number of sort of technical areas, as well as obviously in terms of the water elements to closure, and supporting in terms of the coordination between DEDJTR in terms of documents that we were to rely on and interface when we did with the mines.

MR ROZEN: Was it your decision to involve Mr Byrne and Dr Bowden as experts who could assist in their particular fields of expertise?

MR CHADWICK: At the time, Dr Bowden was actually part of URS/AECOM and we collectively as the team selected subconsultants that were going to be part of our project team and we went to Geoff at that time.

MR ROZEN: Mr Byrne, if I can turn to you, you were previously associated with URS; is that right?

MR BYRNE: That's correct.

MR ROZEN: But the role you performed in this project was, as Mr Chadwick has described, as a subconsultant?

MR BYRNE: That's correct.

MR ROZEN: Can you summarise for the Board the role you played in relation to the project?

MR BYRNE: My role was to bring in some review of work plan variations in terms of how we would be structuring the cost model. Also looking at how those particular activities might be implemented, again with a view to structuring the content of the cost model, and then also reviewing the adopted rates and deciding with the team on what the adopted rates were, as well as having input into the structure of the three cost models that were developed, populating those cost models and then participating with the other team in identifying key risks and risk parameters.

MR ROZEN: Could you have a look at paragraph 9 of Mr Chadwick's statement, please. Do you have that in front of you?

MR BYRNE: Yes, I do.

MR ROZEN: Are you comfortable with Mr Chadwick's summary of the role you played in the project?

MR BYRNE: Yes, I am.

MR ROZEN: Dr Bowden, can you please summarise for the Board the role that you played in carrying out this piece of work?

DR BOWDEN: My key role was to develop the probabilistic costing approach, the methodology that was used, to structure the way it was used, to develop the model and also to sort of develop and apply the financial risk cost portion of the model as well, and to I guess also provide some sort of peer review and sort of work together with the team.

MR ROZEN: Do you have Mr Chadwick's statement in front of you? If I can draw your attention, please, to paragraph 11. Are you comfortable with that summary of the role that you performed in the project?

DR BOWDEN: Yes, I am.

MR ROZEN: Thank you. Ultimately - perhaps I can address this to you, Mr Chadwick - under your coordination the team has produced four reports, four final reports, for DEDJTR?

MR CHADWICK: That's correct.

MR ROZEN: The reports respectively estimate rehabilitation or closure costs for each of the three mines in the Latrobe Valley, that is the Yallourn Mine, the Hazelwood Mine and the Loy Yang Mine?

MR CHADWICK: That's correct.

MR ROZEN: In each case the estimates were based on the then approved rehabilitation plans that had been provided to you by DEDJTR?
MR CHADWICK: That's correct.
MR ROZEN: In addition, whilst the work was being completed, the situation changed so far as the Loy Yang Mine was concerned and a variation to their work plan was approved, I think on 1 December this year, and you were asked by DEDJTR to produce a fourth report that took into account the closure or rehabilitation plan in that work plan variation 15 as it has been referred to?
MR CHADWICK: That's the fourth report, yes.
MR ROZEN: Yes. What I would like to do now is get you to identify for us each of those reports and we will deal with the formalities concerning them and then we will turn to examine a little of the detail in them. So if we can start, please, with the Yallourn report. That appears behind, for our purposes, tab 28 in folder 11. It bears the Ringtail code of DEDJTR.1030.001.0092. Do you have a copy of that report? Just so we can confirm we are all looking at the same version, can you please open it to the third page which ends in the Ringtail code 0094. Do you see that, Mr Chadwick?
MR CHADWICK: Yes, I do.
MR ROZEN: In the box "Revision history", is the latest revision there Revision 2, 13 November 2015?
MR CHADWICK: That's what it has.
MR ROZEN: Under the heading "Details", it says "Final" and then your name and signature appear?
MR CHADWICK: That's correct.
MR ROZEN: Is that a copy of the AECOM report concerning the

Energy Australia Yallourn Mine?

MR CHADWICK: That's correct.

MR ROZEN: Could I tender that, please, as 41B.

#EXHIBIT 41B - AECOM report to DEDJTR concerning Energy Australia Yallourn Mine.

MR ROZEN: The next report that I would like you to look at appears behind tab 30. If we can go to tab 30, please. The Ringtail code is DEDJTR.1030.001.0001. This is the report concerning the GDF Suez Hazelwood Mine?

MR CHADWICK: That's correct.

MR ROZEN: Once again, could I ask you please to look at the third page and confirm that it is Revision 2, 13 November 2015, "Final"?

MR CHADWICK: Yes.

MR ROZEN: I tender that, please, sir.

#EXHIBIT 41C - AECOM report to DEDJTR concerning GDF Suez Hazelwood Mine.

MR ROZEN: If we can go back, please, to tab 29. The Ringtail code for this is DEDJTR.1030.001.0046. This is a report for the AGL Loy Yang Mine?

MR CHADWICK: That's right. This is based on the 1997 work plan.

MR ROZEN: Based on the then approved work plan, 1997. Thank you. Can I just ask you, please, to look at the page that ends in 52 in the top right-hand corner, and the page number in the report is page 2, also in the top right-hand corner. There is a heading "Methodology"; do you see that?

MR CHADWICK: Yes.

MR ROZEN: Can you look down the very last line on that page. The paragraph commences, "LIDAR data was provided to URS."

Do you see that?

MR CHADWICK: Yes, I do.

MR ROZEN: In the very last line of that paragraph there is a reference to Hazelwood management. I wonder if that should be Loy Yang management?

MR CHADWICK: That's correct.

MR ROZEN: So would you make want to make that correction there, delete the word "Hazelwood" and insert "Loy Yang"?

MR CHADWICK: Yes.

MR ROZEN: The other matter concerns the figure and table which appear on page 12 of the report. The Ringtail code ends in 0062. You will see that on page 12 there's a heading 5.2, "Model results"?

MR CHADWICK: I see that, yes.

MR ROZEN: Have you had cause just in the last couple of days to consider whether the figure 3 and table 2 are entirely accurate?

MR CHADWICK: They are not, and as a result they do need to be replaced.

MR ROZEN: Can I show you, please - you have it, I think - a revised figure 3 and table 2 which I understand you have provided to the Inquiry. This has been distributed to the parties, Mr Chairman. Can you hold up the document that is the revised figure 3 and table 2? Is that headed "Amendment to estimation of rehabilitation costs AGL Loy Yang Mine" dated 13 November 2015?

MR CHADWICK: That's correct.

MR ROZEN: And it goes on, "Correction to figure 3 and table 2"?

MR CHADWICK: That's right.

MR ROZEN: Would you ask the Board to replace figure 3 and

table 2 in the report as provided to us with this figure and that table?

MR CHADWICK: That's correct, I would like to replace that.

MR ROZEN: With those changes, can you confirm that this is the report provided by AECOM to DEDJTR for the AGL Loy Yang Mine concerning the 1997 work plan?

MR CHADWICK: Yes, I can.

MR ROZEN: I tender that.

#EXHIBIT 41D - Report provided by AECOM to DEDJTR for the AGL Loy Yang Mine concerning the 1997 work plan.

MR ROZEN: Finally, Mr Chadwick, can you turn to immediately next to that report or after it, the Ringtail code is DEDJTR.1034.001.0001, and that's the second Loy Yang report that you did taking into account the 2015 work plan variation?

MR CHADWICK: That's correct.

MR ROZEN: And once again could you just confirm on page 3 of that that it is Revision 3, 7 December 2015, "Final"?

MR CHADWICK: That's correct.

MR ROZEN: I'm not sure if I asked you to do that in relation to the first Loy Yang report. I wonder if you could just do that for completeness, please. Revision 2, 13 November, "Final"?

MR CHADWICK: That's correct.

MR ROZEN: Thank you. That's for 41D. I'm not sure I asked you, but can you confirm that the report, the 2015 one that you are looking at, is the report that was provided very recently to DEDJTR?

MR CHADWICK: That's correct.

MR ROZEN: I tender that, sir.

#EXHIBIT 41E - Second report provided by AECOM to DEDJTR for

the Loy Yang Mine concerning 2015 work plan variation.

MR ROZEN: Thank you, Mr Chadwick. If I can take you back, please, and I'm not going to go through each of the reports in detail, you will be pleased to know, but others may wish to do so. But I just want to ask you some general questions about the scope of work that you performed for DEDJTR because there are a number of important limitations, are there not, that the Board needs to be aware of?

MR CHADWICK: That's correct.

MR ROZEN: Can we do it in this way. Can you look at the first report I asked you about, the Energy Australia one which should be behind tab 28 there. Do you have that?

MR CHADWICK: I do.

MR ROZEN: If I could draw your attention, please, to the introduction page, which bears the Ringtail code that ends in 0097?

MR CHADWICK: Yes.

MR ROZEN: It should be a page headed "1. Introduction", and then "1.1. Aims and objectives".

MR CHADWICK: Yes.

MR ROZEN: If we start with the aims and objectives, firstly these aims and objectives of three dot points are the complete project that URS/AECOM were engaged by DEDJTR to do, some aspects of which are yet to be finalised; am I understanding that correctly?

MR CHADWICK: At this point my understanding is we have finished all the aims and objectives that we were required to.

MR ROZEN: Perhaps we can go through them and we may be at cross-purposes here. You see it says, "The aim and

objectives of the URS scope of works are: Provide an independent estimate of cost for closure based on the approved work plan and assumptions provided by ERR" - that's the Earth Resources Regulation branch of DEDJTR?

MR CHADWICK: That's correct.

MR ROZEN: The second one is, "Provide general advice to ERR to determine whether the existing rehabilitation bond lodged by the licence holder is appropriate to cover the cost of rehabilitation in accordance with the approved mine rehabilitation plan." And then finally, "Support ERR in any negotiation for a change in the rehabilitation bond."

MR CHADWICK: Yes.

MR ROZEN: So that's the overall scope of works that you were engaged to do. Am I right in understanding that these reports, the four reports, really address the first part of that, the estimate of costs for closure based on the work plans?

MR CHADWICK: That's correct, yes.

MR ROZEN: It is not of particular relevance to us to know whether there is ongoing work, but given that scope of work, it seems to be that this is primarily aimed at the first aspect of that?

MR CHADWICK: That's right.

MR ROZEN: We know from other evidence that DEDJTR hasn't got to a point where they are seeking to renegotiate a bond level.

MR CHADWICK: Yes.

MR ROZEN: So this is really a first step in that process, it would seem. Is that a fair characterisation?

MR CHADWICK: That appears to be the case, yes.

MR ROZEN: Can I go on to the next section which is headed

"Exclusions" and it says there, "The work undertaken in generating closure costs does not include an assessment as to whether the closure strategy provided is viable or that it provides the best outcome to any of the various stakeholders." That was just not something you were asked to look at?

MR CHADWICK: No, it was not.

MR ROZEN: It was basically said, "Here are the approved plans, take them as they are and do the costing."

MR CHADWICK: That's correct.

MR ROZEN: You go on, "The cost estimates generated herein use the information contained within the various documents provided and assumes the conclusions and assessments made are valid and will be achieved. Furthermore, the URS brief for this work was a desktop study of the rehabilitation costs and therefore did not include the following: site inspections, development of detailed closure data such as designs for final slopes, water quality modelling or closure criteria, and collection of contractor quotations." I just stop there and this is a question for you, Mr Chadwick, and perhaps the others may have a view. If you were engaged by one of these mines to do an estimate of their closure costs, are the things you have described there, site inspections and a more detailed examination of final slopes and water quality issues, collection of specific quotes for contractors, are they the sorts of things that you would do if you were operating at that level?

MR CHADWICK: I might hand that one to Geoff Byrne.

MR BYRNE: I think, Mr Rozen, that it varies and it is a mixture of all of them. Sometimes we do all three,

sometimes we do some, and sometimes it's purely a desktop review.

MR ROZEN: So all are possible?

MR BYRNE: Yes.

MR ROZEN: Do the tasks that you perform, so let's take site inspections, one would assume that that would assist in accurate closure costings, all else being equal. Is that a fair observation?

MR BYRNE: I think that's fair. It assists in getting a better understanding of the issues that might be associated with closure.

MR ROZEN: Yes. You can learn a lot from aerial photographs and other sources, but it may be that in some cases a site inspection advances your knowledge in such a way as to improve the quality of the output?

MR BYRNE: I think it's fair to say more data is better.

MR ROZEN: As a general rule, I think that's probably right. There is a reason why this is in a section that refers to limitations of the work that was performed. Going back to the text under those three matters, it goes on, "The estimate of costs has been largely based on URS experience and judgment, as well as rates included in the ERR rehabilitation bond calculator." If I could just stop there for a moment. The ERR rehabilitation bond calculator, and the Board has some evidence of that in Mr Wilson's witness statement in particular from DEDJTR. Maybe you can describe that for us, please, Mr Byrne, if you could?

MR BYRNE: It is a spreadsheet based calculator. It is presented as a tool for mines to assist them develop an idea of what the rehabilitation liability may be. It

contains a series of structured areas for the site which are called closure domains and it also has some suggested rates and there is a flexibility to be able to change those rates if you need.

MR ROZEN: Can I ask you about that expression you have just used, "closure domains", because we see it referred to throughout these four reports and also in other material. What is a closure domain?

MR BYRNE: It is just a logical way of structuring up the closure costs into either geographic areas or into subjects, if you like, that might be associated with particular activities of a common nature such as the monitoring and maintenance phase after the execution phase.

MR ROZEN: It enables you to break down into digestible chunks the overall work that needs to be done for closure?

MR BYRNE: Exactly, correct. And it also enables a cross-check to make sure one is picking up everything.

MR ROZEN: It is a standard practice in this sort of work?

MR BYRNE: Yes.

MR ROZEN: And in these particular reports, without necessarily taking you to the detail, you have settled upon seven closure domains I think I'm right in saying?

MR BYRNE: That's correct.

MR ROZEN: Just as an example, the first of those is infrastructure areas and that deals with costs associated with that topic?

MR BYRNE: That's correct.

MR ROZEN: So we shouldn't necessarily assume that a domain is a particular geographical area like the eastern batters, for example, although it can be?

MR BYRNE: That's correct.
MR ROZEN: It is more likely to be a theme, so the work that needs to be done in reshaping the batters generally, for example?
MR BYRNE: Perhaps not. Again it is a mixture of geographic areas and themes, if you like. Infrastructure is really talking about the infrastructure outside of the pit. So. To some extent it is a geographic classification, but it is all of the areas outside of the pit area apart from the overburden dump, for example. So those domains, the first five domains, match the domains that are in the bond calculator.
MR ROZEN: Yes. Returning if I could, please, to this section "Exclusions" in your report and I want to skip over a couple of paragraphs and go to the very last paragraph on the page that starts, "It is also important to note". Do you see that, Mr Chadwick?
MR CHADWICK: Yes, I do.
MR ROZEN: It goes on, "It is also important to note that, for the closure concepts costed, URS has not considered the cumulative impact or risks of the other Latrobe Valley coal mines closing at the same time and how this might impact concept and thus costs." That a reference, I take it, to, for example, the Yallourn and Hazelwood licences both expiring at the same time in 2026. Why is that included there? What's the significance in terms of the impact of cost on, say, two mines closing at much the same time, if that was to occur?
MR CHADWICK: I can't comment on what the impact would be, but that was the direction and brief that was given to us at the commencement of the project.

MR ROZEN: I'm just trying to imagine what the impact might be. There are a number of areas the evidence would suggest might be relevant. Access to water might be one, if they are both trying to access water at the same time. Is that one possible impact?

MR CHADWICK: Conceptually, yes.

MR ROZEN: Access to contractors might be another, and that might have an impact on cost. If there is greater demand for local contractors to do work, then the law of economics would suggest that the prices might go up?

MR CHADWICK: Or down.

MR ROZEN: Or down, perhaps, depending on availability?

MR CHADWICK: There might be synergies.

MR ROZEN: And there might be other impacts. The point that is being made there is you weren't asked to consider that?

MR CHADWICK: No.

MR ROZEN: But is what you are saying to the Board that it could potentially impact on cost, both up or down, perhaps?

MR CHADWICK: That's correct.

MR ROZEN: If we can go over to the next page, please, with the heading "Scope of works". I don't think I need to trouble you to go through any detail there, but there is a heading about a third of the way down, "1.2.1 Information sources", and you have set out the range of documents that were taken into account in relation to the preparation of this report about the Yallourn Mine. That really confirms the nature of the work as being a desktop study, as you say, working from the documents and doing the costings on that basis?

MR CHADWICK: That's correct.

MR ROZEN: Can I take you over to the next page, please, where we see table 1. This is probably a question for you, Mr Byrne, and I think picks up on the discussion we were having a moment ago. This is a summary of the seven domains that were utilised in doing the costings?

MR BYRNE: Yes.

MR ROZEN: The last three, 5, 6 and 7, are the ones which are outside the department's bond calculator; is that right?

MR BYRNE: That's correct.

MR ROZEN: Can I summarise the way the bond calculator works in this way: It provides an objective basis for doing costings, a set process and set figures, whereas when you get outside the calculator you are more in the realms of exercising judgment, subjective judgment of the person doing the costings?

MR BYRNE: I think I view 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.

MR ROZEN: The department's published material about the calculator does say that it is better suited to small mines than large mines. Firstly, do you agree that's what the department says in relation to its calculator?

MR CHADWICK: As I understand it, yes.

MR ROZEN: Secondly, do you agree with that, in your experience, or is it not necessarily the case?

MR CHADWICK: I think so. To be truthful, every site is different and if one is looking at a small site, almost by definition the time that's available to be invested in doing a closure plan is somewhat limited and therefore having something like the closure calculator is better

suited where you need some guidelines and you can have something that's already structured in that regard.

MR ROZEN: Can I ask you, please, gentlemen, to go over to the sixth page of this report and the Ringtail code ends in 0102. I want to draw your attention, perhaps in the first instance, Mr Byrne, with you, to the middle of the page, "Domain 5 - management." Do you see immediately under that heading it says, "Domain 5 includes all the costs for the third party implementation of closure."

MR BYRNE: Yes.

MR ROZEN: Can you explain to us the concept of third party implementation of closure?

MR BYRNE: Essentially commercial contractors to carry out the works.

MR ROZEN: Yes, but perhaps I will approach it this way. "Third party" means it is being done by someone other than the mine? That's the case, isn't it?

MR BYRNE: That's correct.

MR ROZEN: What is the relevance of that in general terms to a costing estimate?

MR BYRNE: It is certainly a different set of rates and costs that the mine may well be using and may well have adopted in its current workings, but it's certainly not unusual for closure plans.

MR ROZEN: It is quite a common practice, is it not, to do closure plans by reference to third party implementation?

MR BYRNE: Yes.

MR ROZEN: The Inquiry Board has been provided with a publicly available document produced by the regulator, by DEDJTR, called "Establishment and management of rehabilitation bonds". It is at DEDJTR.1021.001.0001 and it is annexure

29 to Mr Wilson's first statement, for the benefit of the parties. I will just arrange for that to be put in front of you, Mr Byrne. If I could draw your attention to page 3 of the document which has a code ending in 0004 in the top right-hand corner. The evidence before the Board is that this is the current published DEDJTR guidance material in relation to this subject matter. Do you have a page with a code in the top right-hand corner ending in 0004, Mr Byrne?

MR BYRNE: Yes, I do.

MR ROZEN: Do you see that on the right side of that page there's a heading "Part A, Establishing and managing rehabilitation bonds" and then if you trace your way down the left-hand side, the heading "4.3 Third party costing"?

MR BYRNE: Yes.

MR ROZEN: If I can read out what the document says. It says, "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 department 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." It goes on and explains why. It says, "Where an operator has defaulted, the department would not have access to the operator's equipment or personnel on-site. The department would not be in a position to complete the works at the operator's costs and instead be subject to current local market costs." It goes on and explains what additional costs would be incurred.

Firstly, do you agree with that description of the way third party costing operates in general terms?

MR BYRNE: Yes, I do.

MR ROZEN: The description in that document of third party costing, are we to ascribe to the reference to third party costing in your reports or third party implementation, to be fair, are we talking about the same thing?

MR BYRNE: We are. But also third party relates to the closure activities which are different to the mining operations. So there is a different set of activities that are being conducted during closure to the activities that are being conducted during operations. It is an additional aspect of the third party contractor.

MR ROZEN: I'm not sure I necessarily understand that. I will see if I do. Are you referring there to the fact that you might have an entirely different workforce, for example, doing the closure work, to the workforce that did the mining work, for example?

MR BYRNE: Yes, and different equipment.

MR ROZEN: Different equipment and necessarily performing very different duties?

MR BYRNE: Yes.

MR ROZEN: At its simplest, filling up a hole rather than making it bigger?

MR BYRNE: Yes.

MR ROZEN: If we can put that document to one side for the moment and go back to page 6 of the Yallourn report. I want to try to get an understanding of domain 5 which is described as "management". You identify aspects of that, "All necessary investigations, studies and detail design for closure." In relation to that, the evidence before

the Board, particularly from a range of geologists and hydrogeologists and engineers last week, was that there is a general view that to advance closure and rehabilitation of these three mines there is a great deal of research that still needs to be done about questions like stability of batters, water quality, access to water and so on. I want to try to understand in what way those uncertainties and the costs associated with doing the research, in what way those costs, if they have been, have been included in the URS costings.

MR BYRNE: They are covered in this overall per cent for engineering procurement and construction management. So the engineering part of that EPCM are all of these investigation and design studies and design work that's required prior to commencing closure execution.

MR ROZEN: And an amount of 15 per cent of execution cost has been allowed for that; is that right?

MR BYRNE: That's correct.

MR ROZEN: That's common to all of the assessments that have been done?

MR BYRNE: Yes.

MR ROZEN: Where does that 15 per cent figure come from? Is that based on industry practice, your experience?

MR BYRNE: Yes, it's both, industry practice and experience, and I acknowledge that it varies. I've seen higher and I've seen lower. In this instance, given the information that was available or wasn't available, we chose 15 per cent which we think is a reasonable estimate.

MR ROZEN: If I can go on to the next domain, pit water filling. There has been a lot of evidence before the Inquiry last week about filling pits, access to water,

where is it coming from, will the existing entitlements be able to be used and so on. Under 4.2.6 it says, "It is recognised that diverting the full flow of the Morwell River and ultimately spilling back into the Latrobe River may be a practical solution for how water is sourced. However, this is not outlined in the approved work plan variation. The following based on the 2012 work plan variation have been used in the costs for filling the pit voids with water." Then it goes on, "All water used to fill pit voids to 37 metres AHD will be from the bulk water entitlement of 36.5 gigalitres per year." If I can just stop there. Why did you make that assumption, Mr Chadwick?

MR CHADWICK: They were instructions from Earth Resources, ERR.

MR ROZEN: Did they provide you with any basis for that instruction; in other words, some commitment from the relevant water authority that that water would be available for pit filling or anything along those lines?

MR CHADWICK: No, it was based on the water balance that the Yallourn Mine had and the assumptions in that that were in the approved work plan variation. That had a number of scenarios, but that was one of the scenarios that was run.

MR ROZEN: Specifically, I take it then you were instructed to assume no cost transfer of the bulk water entitlement from the power station to the mine.

MR CHADWICK: That's correct.

MR ROZEN: And also that the annual fees for use of the bulk water entitlement will be the same as currently paid by the power station?

MR CHADWICK: That's correct.

MR ROZEN: You were not tasked with making any independent

investigations about whether or not the water would be available?

MR CHADWICK: Not at all.

MR ROZEN: You were just given those riding orders, if you like, to make that assumption?

MR CHADWICK: That's correct.

MR ROZEN: At this sort of conceptual level would you each agree with me that if that assumption proved to be incorrect that could have a very significant effect on the overall costs.

MR CHADWICK: It could, and that's where we incorporated it in our risk costs.

MR ROZEN: I will come to that in a moment, how you have done that. If we go over to the next page, please, page 7, you have a domain of maintenance and monitoring. Once again this is a matter that has been the subject of a good deal of evidence before the Board. If I can summarise the evidence, there is a degree of uncertainty about the nature of monitoring of matters like water quality and batter stability and so on that will need to be carried out and in particular the duration over which the monitoring of those matters will need to be carried out and who will do it and for how long and at what cost and so on. Were you given any instructions as to assumptions you should make in relation to those matters by DEDJTR?

MR BYRNE: No.

MR ROZEN: But you have dealt with those matters as you explain or as you have already explained to us by allowing certain additional percentage amounts and also by addressing them in the risk factors that are outlined?

MR BYRNE: No, we have used them as a series of cost estimates

for maintenance and monitoring. So they are contained in our unit rates. For maintenance, for example, we have included estimates of what we think might be required for things such as maintaining erosion, repairing erosion, maintaining rehabilitation, maintaining the fire services et cetera, site security, things such as rates and buildings et cetera, we have come up with an estimate of those, and that's for the maintenance component. We have a figure there which is a higher figure for the first five years after completion of execution, and then a reduced figure until a period of five years after the final lake level is achieved.

MR ROZEN: I think that's dealt with, is it not, on the next page under the heading 4.3.3, "Post execution maintenance and monitoring phase"?

MR BYRNE: That's correct.

MR ROZEN: If I'm understanding correctly, about a third of the way down the page there's a paragraph that starts, "Maintenance and monitoring costs have been developed for two phases." That's the evidence you have just been giving, Mr Byrne?

MR BYRNE: Yes.

MR ROZEN: "A more intensive and higher cost period for 15 years following closure execution." I think you might have said five years, but it is 15?

MR BYRNE: It varies.

MR ROZEN: "And a less intensive phase extending for another five years until site relinquishment is achieved." How have those periods been selected? I know they vary, don't they, from one mine to the next?

MR BYRNE: They do.

MR ROZEN: How have you made that assessment? Were you given any instructions from DEDJTR about that?

MR BYRNE: No.

MR ROZEN: So what did you do?

MR BYRNE: It's a judgment based on our experience. For the other sites it was a five-year period where we are seeing the execution phase, which is where all the batter covering occurs, where the demolition occurs, et cetera, is a phase in itself. Then beyond that there is this intense phase which we have nominated as either between five and 15 years, depending on the site, where there is a much greater degree of scrutiny and maintenance required on the site, and then as a judgment call around the duration of that and beyond that until the time that final lake level is achieved and then another period beyond that where you can prove that you have a safe and stable landform.

MR ROZEN: Can I ask you, please, to look at 4.4, "Summary of assumptions". There are there listed 12 assumptions that have been made in doing the costing for the Yallourn Mine, and we see in each of the reports a very similar list of assumptions, do we not?

MR BYRNE: Yes.

MR ROZEN: Slight differences taking into account the specific circumstances, but broadly these are assumptions that have been made. Would you agree with me, Mr Byrne, perhaps, and others may have a view about this, that the assumptions are by and large optimistic or glass half full assumptions? Is that a fair characterisation? For example, you assume no batter instability.

MR BYRNE: Yes.

MR ROZEN: You assume, we have already discussed, access to water. No seepage and so on. If we can just take one issue, for example, the fifth one, which says, "It is assumed that final pit slopes of 1V3H will have long-term geotechnical and erosional stability." In the context of this particular mine and its very recent history of batter instability that, if I may say so, seems to be quite a brave assumption to make. What do you say?

MR BYRNE: What we are saying there is that they were the parameters we were provided with in the work plan variation and by DEDJTR. So we are saying there's an assumption given those parameters that those slopes will be stable.

MR ROZEN: Of course if that assumption proves to be incorrect then again that could have very dramatic effects on the overall costs.

MR BYRNE: That's right, and that's why that's leading to our risk cost.

MR ROZEN: And that's how it is addressed in the model?

MR BYRNE: That's exactly right.

MR ROZEN: That takes us to that topic then. At the bottom of the page there is a heading "Key risks" and it says, consistently with what you have just told me, Mr Byrne, "If the assumptions indicated above are not correct then they represent risks within the closure costing and have been incorporated into our closure costing as risk events with estimates of degrees of likelihood of occurrence and consequence." Then if we turn the page to the page that's page 9 of the report, the Ringtail ends in 0105, there are there identified I think it is seven particular risks associated with the costing; is that right?

MR BYRNE: Yes.

MR ROZEN: Let's take batter failure if we could as an example. There are two risks associated with batter failure. About a quarter of the way down the page, the second risk, "Batter failure in an area where infrastructure is affected"; do you see that?

MR BYRNE: Yes.

MR ROZEN: The risk event is described as a slope failure occurring on "a batter where there is a major public or private infrastructure that requires stabilisation. The consequence includes estimates of costs for long-term slope stabilisation, rehabilitation and compensation. The likelihood was based on whether there had been any historic events and other information based on geotechnical stability of the batters." It is the third point I want to ask you about. It may be a question for you, Dr Bowden. I don't see in the report how the likelihood of that risk event manifesting is assessed and how it that is then inputted into the costing. Is that all part of the Monte Carlo simulation model?

DR BOWDEN: It is. Basically we use the Monte Carlo simulation approach to handle uncertainty. There are predominantly two types of uncertainty that are dealt with - we need to deal with with this particular type of project and many other types. First of all, there's the uncertainty associated with the cost of known events or known activities that are carried out for each of those domains. There are uncertainties in rates and quantities.

MR ROZEN: Can you give us an example?

DR BOWDEN: If you were calculating, for example, the cost of capping or covering something you would be looking at the

cost of, say, obtaining the cover material and it might be quite uncertain as to where that material - whether it's available or where it might come from. So the type of material would sort of determine part of the cost. Also the quality of the material. These guys will probably be able to better explain that. But there are uncertainties of what the cost of, say, a cubic metre of capping material with those qualities might be.

MR ROZEN: Just before you leave that, if we just tease that out, if what you are capping batters to achieve is a reduction of fire risk then the quantity of clay in the capping material may be a very relevant consideration, and the right quantity of clay may or may not be available on-site, for example.

DR BOWDEN: Yes, for example. So therefore the probabilistic approach allows you to input a range of outcomes as an assumption as opposed to a single number.

MR ROZEN: It is not necessarily a range of outcomes. It is a range of inputs, isn't it, a range of costs?

DR BOWDEN: A range of cost outcomes, if you like. They are costs. So a range of inputs. What that allows the relevant expert to be able to do is select what they think is a reasonable best estimate of what that cost might be per cubic metre. They might say, "Well, I think most of it could be available on site" and da, da, da. It could be $3 a cubic metre. But on the other hand there is a chance or possibility that it could be much higher because it may not be available, it could come further off site. So therefore they say a high estimate of the cost which has about a 5 per cent chance of being exceeded would be around, whatever, $10. So that uncertainty is input into

the spreadsheet model as a distribution, not as a single value.

MR ROZEN: Do we see that on page 11 of the report, the lognormal distribution?

DR BOWDEN: Yes, we do.

MR ROZEN: That's Ringtail 0107. So that's what you are talking about. The example used there - the cost item is removing concrete pads, footings and foundations.

DR BOWDEN: Correct, just an example. So that difference between the P50 or the 50 per cent, the best estimate, and the P95, which has a 5 per cent which is quite a conservative estimate, and you can see the resulting curve is in fact sort of open-ended as costs are and it doesn't get to zero either as costs do. So that's one of the reasons for putting a lognormal distribution. But the uncertainty that's in the expert's or the assessor's mind is all taken up with that sort of input as opposed to them sitting down saying, "Do I be very conservative because it could go this way or could go that way?" So it clarifies, in my view, the ability of the expert to be able to include that uncertainty in our cost estimation. That uncertainty coming right down particularly from the building blocks of the spreadsheet in rates and quantities, there is also uncertainty in quantity, how much soil might be needed, what the area might be is all variable. So if you put those uncertainties in the building blocks and then when they aggregate up, which I can sort of talk about a bit later, then in the Monte Carlo methodology that uncertainty stays right through the assessment until you get - and it is used. Then when you come to the answer, how it generates an answer, the

probabilistic approach generates if you do 2,000 or 1,000 or 100 or five runs, what you are doing is calculating the spreadsheet as many times as you determine and you get, if you are doing it like we have, 2,000 trials, you get 2,000 different answers and you arrange those answers from lowest answer to highest answer so that in 2,000 trials the middle range, the P50, would be the 1,000th, the middle answer, and the lowest we ever got would be the lowest value that it achieved, and the highest it got. If we ran it for 5,000 trials it may or may not exceed both of those extremes; who knows.

MR ROZEN: I understand. I do understand that and I do want to ask you a little bit about the model and running it 2,000 times and so on. But I just want to take us back to the two areas of uncertainty that you have identified. The first I think we can all understand, or at least I can. I shouldn't speak for others. There are uncertainties associated with costs of particular items and the model enables you to take that into account. It is the less sort of tangible uncertainties that I'm concerned about, the second category of uncertainties, which is these risks. If I can come back to that risk of batter failure where infrastructure is affected, the report says, "The likelihood was based on whether there had been any historic events and other information provided on the geotechnical stability of the batters." How is that quantified?

DR BOWDEN: The process there is the likelihood, say, for example, it is a 20 per cent chance that the event will occur, then - - -

MR ROZEN: Can I just stop you there. How do you get the

20 per cent figure?

DR BOWDEN: In pretty well all cases we need to use expert judgment because, in my experience, there is very little in the way of actuarial information on occurrence, particularly for anything associated with mining operations or landfills or any range of things. So we rely a lot on expert experience and understanding of the situation. We also indicate over what time period we are concerned about the chance of that happening. So it could be an annual likelihood that they give us or usually it is the likelihood over a set time period. If it is, say, 20 per cent chance it will occur over a given time period, say, for example, during closure, then with one particular event when we do the simulation each time it calculates a new value in this particular case for this particular cost item which, say, for example, has $100 cost, then in 20 per cent of the cases it will include that cost in the cost estimate and in 80 per cent of the cases it will not. So it is actually a simulation.

So if you have five risk events, quite independent risk events, all with a 20 per cent chance of occurring then on average, but it won't always be the case, one event pretty well every simulation will occur and the cost of that will go in. But there is a chance, and in some of our outputs you can see that in 10 or 20 per cent of the cases there were no costs at all for risk events. But when it does put a cost in, in those instances in those 20 per cent of the cases where the cost gets included in the bottom line, then it picks a number from that curve. So it still uses the uncertainty. So the information we get from the expert panel is on terms

of not only the likelihood of an event occurring but the costs. They are uncertain, just the same as the others are. So it puts that value and it picks a value from the curve, the cost curve, and then that goes into the bottom line. So we treat them quite differently but use the same approach.

MR ROZEN: Can I just end from the general, which I think you have explained to us, to the specific and deal with this particular risk at this particular mine. Did you make reference to an expert panel as assisting with the evaluation of the likelihood of these particular risks?

DR BOWDEN: We based it on the knowledge of Bryan and Geoff.

MR ROZEN: This is the panel, I understand that. Taking just that risk, if we could, batter failure affecting infrastructure, where do we see what the likelihood of that risk occurring; what value is ascribed to that in the report? Mr Chadwick, is that a question for you?

MR CHADWICK: It is not presented in the report, no. It is in the model but it isn't presented in the report.

MR ROZEN: Dr Bowden referred to 20 per cent. I know it was just chosen as an example. Or is that the figure? As you sit there now are you able to tell us what the figures were that were ascribed to these various risk events?

MR BYRNE: We would have to refer to the model. I can't remember every single one.

MR ROZEN: But it would be possible to pull those out?

MR BYRNE: Yes.

MR ROZEN: Similarly, the estimate that's made of the cost of a batter failure, that could range from a few hundred thousand through to a few million, couldn't it, very easily?

MR BYRNE: Yes. They are in the millions.
MR ROZEN: Once again those figures, they would be available if we wanted them?
MR BYRNE: Yes.
MR ROZEN: But we don't see them in the report?
MR BYRNE: No.
MR ROZEN: I understand. Can we go on to examine the methodology briefly, please. We have already touched on this, Dr Bowden, and I probably don't need to go into it in much more detail. This is page 11 of the report, Ringtail 0107. "The probabilistic costing model was developed in Excel using URS's previous experience of mine closure costings and the information from the documents provided by ERR." It goes on, "The costing model built upon the costing work which was conducted in 2012 for the former Department of Primary Industries. The costing model incorporated the Monte Carlo simulation, which is a statistical technique that uses random numbers to account for uncertainty in a mathematical model." That's the description you have just given us a few minutes ago, Dr Bowden, of that model?
DR BOWDEN: Correct.
MR ROZEN: That is a model we know from other evidence that is frequently used in conducting these sorts of cost estimates?
DR BOWDEN: Yes.
MR ROZEN: Is it an internationally recognised model as appropriate to use in such exercises?
DR BOWDEN: Yes. I first used it probably from my case in 1998 or something like that in Waihi, New Zealand. I have used it in California and in cases here as well, quite a few,

and not only in mine costing but in contaminated land costing, in a huge range of applications.

The approach, for example, if you are talking about validation, the Monte Carlo simulation approach is used by, for example, and I haven't checked this out for years, but by the US EPA for public health risk assessments and there are quite clear processes there. It is becoming pretty well a standard approach to carrying out cost estimation.

MR ROZEN: Thank you for that. We have already heard from you and I think from your colleagues that the simulation was run, it is says in the report, at least 2,000 times but was it actually 2,000 times or more than 2,000 times?

DR BOWDEN: It was actually 2,000. We did some initial runs apparently earlier that went a bit longer.

MR ROZEN: Why 2,000? Why not 1,000 or 5,000? Is that just a figure that you use based on experience as providing a reasonable or the right level of accuracy?

DR BOWDEN: Well, yes, it's based on my experience of what I use but there is a reason for it. Most of our work in terms of outputs, most of our clients over the years have liked outputs, say, for example, from the P - they are interested in the middle value, they are interested in the P80 and/or P95, so depending on their level of conservatism. Usually beyond the P95 decision makers usually feel that if there is less than a 5 per cent chance of it being greater than that they can sort of live with that.

But because we are interested in sort of quoting quite often a P95, so we are interested in that high but still reasonable estimate of what the cost might be, then

when we are running a simulation we want to have enough answers in that range above that to be sure that the variation is not just simply due to chance. So if we ran 10 trials, the highest number we would have would be the P90. If we ran 100 trials we would only have five trials where we got answers more than the P95 value.

MR ROZEN: Here you have 100.

DR BOWDEN: Here we have 100. That is a judgment call, but it sounds pretty reasonable to me and it is what I have been using for 20 years plus.

MR ROZEN: This may be beyond your area of expertise, Dr Bowden, I don't know, but the report makes it clear that ultimately the selection of a confidence level in this setting is a matter at the end of the day for the regulator to decide what degree of certainty it wishes to use.

DR BOWDEN: It is actually a matter for the reader, because in a negotiating position, for example, where it's been used different people will take different attitudes. So at least you can see where someone is coming from. I usually say - and I apologise if there are any accountants in the room - they like the P99, for example, because it's very conservative. But of course that reduces opportunity if they budget such a high value with such a low chance of occurring. So usually what they do is they swing down.

The P50 is regarded by most people as being optimistic; in other words, there's a 50:50 chance that it will be more than that. But that is still the best estimate. It does depend on the organisation or the individual reading it because if you are an organisation with many operations or many issues that you are looking

at, then you might pick the P50 because you have so many issues that you are looking at that if you go over in one it will be under in another. So the real answer is more likely to be closer to the P50. So the P90, the P80, the P95 are all expressions, if you like, of contingency and that is, I guess, one of the main points of using the probabilistic approach because you don't just pick an overall percentage, so there's a very good reason for having a contingency. So the P50 is probably what the budget number would be without a contingency, and then as you get further up the level of confidence scale you are getting more conservative and the contingency gets higher.

MR ROZEN: Thank you. If I can turn then to the model results which are set out at section 5.2. These model results are presented in the report in both a tabular form and in a figure, as we can see from page 12. Perhaps, Mr Chadwick, a question for you. That's the mode that was chosen to present the outputs?

MR CHADWICK: Yes, that refers specifically to the early closure scenario that we ran.

MR ROZEN: I just want to ask you about that. If we look at the table first at the bottom of the page, table 2, if we look at the left-hand column we have four circumstances or four descriptors: early closure liability cost, early closure liability plus risk costs. They are the ones that are depicted in the figure immediately above the table; is that right?

MR CHADWICK: That's correct.

MR ROZEN: Then we have end of mine life closure liability cost and end of mine life closure liability plus risk costs. Was it part of the instructions from DEDJTR to assess both

early closure liability cost and end of mine life closure cost?

MR CHADWICK: That's correct.

MR ROZEN: Can you just explain to us very briefly what the difference is between the two; what they refer to?

MR CHADWICK: That's described in section - - -

MR ROZEN: Is it 2.2?

MR CHADWICK: It is 2.2.

MR ROZEN: Bottom of page 2, Ringtail 0098.

MR CHADWICK: That's correct, where we describe there the scenarios that we ran where we describe what we call early closure, which is essentially closure tomorrow, and then end of mine, end of mine life, which is described there in terms of the predicted maximum extent of mining footprint.

MR ROZEN: It is actually the end of the licence period, isn't it?

MR CHADWICK: Yes, but in terms of the footprint that we have costed it is the actual approved mine footprint, but we have based it on that occurring at 2026 for this example.

MR ROZEN: If we can go back then to the figure and the table. As you have already told us this is on page 12 of the report, Ringtail 0108. It is the top two lines in the table that are relevant to the figure. You have already told us that. The way we read the table, if I understand this correctly, is we start with the first figure of 149, which is the P50 - what's described as optimistic confidence level for early closure liability cost. We see the figure of $149 million is ascribed to that; is that right?

MR CHADWICK: That's correct.

MR ROZEN: If we want to line it up with the figure, we go

along the bottom of the figure to 50 per cent?

MR CHADWICK: That's correct.

MR ROZEN: Then we trace a line up to the red diamond and that's where we get the figure of 150 million as being the early closure liability cost without an addition of risk.

MR CHADWICK: 149.

MR ROZEN: Sorry, 149 without an addition of risk.

MR CHADWICK: That's correct.

MR ROZEN: The early closure risk cost is the - I think the colour is purple, but I will be corrected about that. It is the line that has the triangles in it which starts off at zero and makes its way up to a much higher figure at the 100 per cent confidence level?

MR CHADWICK: That's correct.

MR ROZEN: Am I right in understanding that that's the figure that the simulation produced after the inputs about the likelihood of risk of the issues such as batter stability and so on that we spoke about earlier?

MR CHADWICK: That's correct.

MR ROZEN: So as a result of all of that the 50 per cent confidence level for risk for early closure, if I'm doing the sums correctly, looks like $18 million. Have I got that right for P50?

MR CHADWICK: It isn't a direct - you don't take away - - -

DR BOWDEN: Just on its own.

MR ROZEN: If we are just talking about the risk costs on its own it is 18. I have just subtracted 149 from 167. Am I correct or not?

DR BOWDEN: Can I answer?

MR ROZEN: Please do.

DR BOWDEN: What the bottom line shows is just simply the risk

cost, the estimate of risk cost on its own, and the red line shows the estimate of liability on its own, without adding them both together and as output by the simulation. So we haven't provided the actual numbers for the purple one or whatever - I agree with you; it is probably purple. But that is about $20 million or whatever it is. Then as it goes further to the right it just increases. That's the risk cost on its own.

We have calculated in the Monte Carlo simulation the two costs together for each simulation as well. So if you add, for example, the P80 or the P95 for the risk cost and the P95 for the liability they don't add up because they are both very high estimates. So during the simulation, say, for example, if the risk cost in one simulation turned out to be $20 million and the liability turned out to be $100 million, then the answer for the yellow line would be 120.

MR ROZEN: Just by adding the two numbers together.

DR BOWDEN: Yes, but you add them during the calculation so that it is incorporated in the 2,000 trials. So what happens, I guess, is that the yellow line is the result of the simulation. So it is a different order. The lowest, for example, in the yellow line doesn't necessarily be the sum of the two lowest. In fact it is usually not the sum of the two lowest outcomes for both of those other components because the lowest outcome for the risk cost may have been combined with a different outcome for the liability cost to get the yellow value. The same with the two highest numbers, to give you an understanding of sort of the two extremes. So the two highest numbers for risk cost and for liability cost that were generated were

probably not generated in the same calculation, in the same run, in the same simulation.

MR ROZEN: I thought I was doing so well understanding it until you just said all of that.

DR BOWDEN: Sorry about that.

MR ROZEN: It is probably me.

DR BOWDEN: No, it is not you because one of the reasons we added that is because people usually add the numbers together. In technical terms it is really not correct to, unless you want to treat them as totally separate variables, which you can in this case. But because we are saying that the total liability is the sum of these two, the liability cost and the risk cost, then we need to simulate that as a unit within the model, not just add up the results at the end.

MR ROZEN: I had assumed that what appears in table 2 was merely the product of adding together at a given confidence level the red diamond figure and the purple triangle figure and that gives you the yellow figure which is the total of liability plus risk.

DR BOWDEN: No, it 's not exactly the case. By the way with this approach the P50 is usually with 2,000 trials again with a large number of trials, if you add up the two P50s they should be very close, within one or two per cent. The lowest number calculated should be higher than both the lowest. I am reluctant to go to the high end of the scale. But if we take the two highest values, the - - -

MR ROZEN: Sorry, which two highest values are you now referring to, the ones in the table?

DR BOWDEN: On the diagram.

MR ROZEN: If we just scroll that down if we could, please.

DR BOWDEN: It is hard to tell from here, but the two highest values - - -

MR ROZEN: On which line?

DR BOWDEN: The P100 for the purple line is, say, 300 million.

MR ROZEN: Yes, we can see that if we trace across to the very last purple triangle which is on the 100 per cent line lines up with 300 on the left-hand scale.

DR BOWDEN: Correct. It is a very similar number, actually. The highest number we got for the liability was about 300 million.

MR ROZEN: Yes, I see.

DR BOWDEN: So 600 million is much further up.

MR ROZEN: I think I understand what you are saying. So the yellow square is at 450 rather than 600. You don't just add the two figures together.

DR BOWDEN: Correct. The reason for that is in a simulation like this, if you just add them together you are being too conservative on the high side. So you are adding another level of conservatism which isn't sort of fair.

MR ROZEN: Because, by virtue of the model, it is already built into the existing figures?

DR BOWDEN: So to say the combined cost equal to - particularly if you are looking at the conservative side, one of the highest numbers you can get for risk and one of the highest numbers you can get for liability is too conservative because you might find that in reality you do finish up with a high cost for risk but a low cost for liability, which is what the yellow shows. So that's why above the P50 usually in fact the yellow line understates the cost, if you just add the two, and below P50 it slightly overstates the cost.

MR ROZEN: Can I summarise what I understand you to be saying as this. At the extremes of the figure, low and high, you can't just necessarily add the figures together?
DR BOWDEN: Yes.
MR ROZEN: But the closer you get to P50 the more acceptable that is as a methodology?
DR BOWDEN: Yes.
MR ROZEN: And do we include P80 in that category that one can pretty well just add them together?
DR BOWDEN: Well, then if you add the two P80s you are adding two conservative values; if you add the two P95s, two really conservative values. So if you want to book a number, for example, depending on your level of conservatism you would use the yellow line. There is nothing wrong with adding the two individual values as you have done in your mind, except that you just need to realise it is going to come up with an answer slightly greater than you might get in reality if you simulate it. It would be reasonable even here probably to add the P80 values for each, particularly if you are going to treat them differently.
MR ROZEN: If we go to the table that's really what we see has occurred for P80? If we look at the 80 per cent line at the bottom of the figure, we can see that the red diamond is at 170 as per what appears in the table; is that right, Dr Bowden?
DR BOWDEN: Yes.
MR ROZEN: And the purple triangle looks like it's at about 30 or so, 30 million, at the P80 level?
DR BOWDEN: Yes.
MR ROZEN: Then we add those two together and we get 199, which

is the figure for liability plus risk at a P80 assessment.

DR BOWDEN: It would be close.

MR BYRNE: But it is not correct. The yellow line is a simulated total cost.

MR ROZEN: Yes.

MR BYRNE: It is not the arithmetic sum of the two components.

MR ROZEN: I see. But in many cases it will be very close to that; is that right?

MR BYRNE: I think, as my colleague is saying, when you are looking at the P50 figures it is closer to the arithmetic sum.

MR ROZEN: The further away you get either way - - -

MR BYRNE: The modelling simulation gives you a different figure for the combined components.

DR BOWDEN: But you can get an idea, though. If you pick the P90 you can see there that the difference between the yellow line and the red line is slightly less than what you would expect the difference if you added the two. So it is about $50 million at the P90 for the risk cost and it is probably only $40 million added for the difference between the red and the yellow line .

MR ROZEN: Because it would be too conservative to add the full 50; is that what you are saying?

DR BOWDEN: Yes.

MR ROZEN: If we go back to the table, am I right in understanding the way the figures are presented that if one wanted to express the estimate of the costs including an allowance for risk and all the other matters we have talked about, if you wanted to express that as a range for the Yallourn Mine, that is a range between P50 and P95, then you could express it as somewhere between 167 and 262

million?
MR CHADWICK: Between those confidence limits, yes.
MR ROZEN: We can do the same thing for each of the figures that are identified there, both early closure and end of life?
MR CHADWICK: That's right.
MR ROZEN: The final matter I wanted to ask you about in relation to the Yallourn report is 5.2.2. If you can go to page 13 of the report, and the Ringtail is 0109, I want to try to understand the discussion of early closure contributor costs. Mr Chadwick, can you explain firstly why this section is here, what purpose it serves in the report?
MR CHADWICK: The objective was to provide a little bit more information in terms of the breakdown of costs per domain. I actually don't have a colour copy with me, but if you refer to figure 4, the red line there reflects the same as the red line on figure 3.
MR ROZEN: Because it is?
MR CHADWICK: Just the liability cost.
MR ROZEN: The assessed total of the other aspects.
MR CHADWICK: That's correct. So the red line on figure 4 is a combination of each of those domains, domains 1 through to 7.
MR ROZEN: Yes. Is what we glean from this table that if, for example, the estimate is out in relation to domain 4, that is the - what colour is that, aqua or teal or something? Do you see? It's the one that has crosses on it that's blue?
MR CHADWICK: Yes.
MR ROZEN: Early closure domain 4 active mine and voids. If

the estimates are out in that domain that is more likely to have an impact on the overall cost than if the estimates are out in relation to one of the other domains that are not quite so significant overall?

MR CHADWICK: That's right. So domain 4 contributes the most.

MR ROZEN: Thank you. I understand that. So we understand what we have got. If we go to appendix B to the Yallourn report which starts at the last four digits 0119, this is where we see the numbers, the data that is the product of the simulation; is that right?

MR CHADWICK: This is the raw costs that go into - - -

MR ROZEN: These are the inputs, yes, I'm sorry. So where you have ascribed a cost to something, it might be a year of monitoring or it might be a cubic metre of soil, this is where the figures are and it's broken down into the individual domains?

MR CHADWICK: Correct.

MR ROZEN: Without going through them, we see each individual domain is dealt with differently. Then we also see, do we not, a separate part of appendix B dealing with end of mine life rather than early closure?

MR CHADWICK: That's correct.

MR ROZEN: Just so we know what we are talking about, if we can go to Ringtail 0129, they are the figures for the seven domains in an end of mine life setting?

MR CHADWICK: Correct.

MR ROZEN: Why the difference in the detail between the two appendices? Why is there a more detailed breakdown for the early closure scenario?

MR CHADWICK: So that end of mine life page is essentially the same as the first page for the early closure, and it is an

oversight. The end of mine life detail underneath that just wasn't provided.

MR ROZEN: So the first page of the early closure is the summary of the seven domains. That's at Ringtail 0119.

MR CHADWICK: Yes.

MR ROZEN: Then what follows is nine pages where each domain is broken down into more detail?

MR CHADWICK: That's correct.

MR ROZEN: For end of mine life you have just given us the overview?

MR CHADWICK: That's correct.

MR ROZEN: Was that in accordance with instructions?

MR CHADWICK: No, that was just how we presented it. I think the other mines we may have provided the detail. I will have to go back and have a look.

MR ROZEN: With the obvious difference that in relation to the other three reports you have taken into account the approved work plans for the Hazelwood Mine and then twice for the Loy Yang Mine, the structure of the reports, the methodology and so on are identical from one to the next?

MR CHADWICK: Exactly the same.

MR ROZEN: But of course different inputs, different outcomes and we can glean all of that from those.

MR CHADWICK: That's correct.

MR ROZEN: They are the questions I have for the AECOM panel, sir. It might be an appropriate time now to have another brief break before the parties examine.

CHAIRMAN: Yes, we will take a short break.

(Short adjournment.)

MS PEPPLER: I act for Environment Victoria and I have two questions for the panel. The first is for Dr Bowden. The

questions relate to the 2015 work plan variation for Loy Yang. In that report you have assessed post closure active void filling phase to take 15 years. If it instead takes 25 to 35 years, are you able to say how that would affect the cost prediction, and I appreciate that you are unable to rerun the model at this point in time, but in particular are you able to give an indication of any magnitude of impact?

DR BOWDEN: I think maybe Geoff could - - -

MS PEPPLER: Better for Mr Byrne?

DR BOWDEN: Yes, or maybe Bryan.

MS PEPPLER: Do you need me to repeat that, Mr Byrne?

MR BYRNE: If you could. So it was if the filling period for the lake takes longer, what impact that would have?

MS PEPPLER: Correct.

MR BYRNE: Yes, I would need to have a think about that. There would be probably a longer period perhaps of more intense monitoring. The overall closure period may well extend. It depends upon how long it then takes to achieve final lake level. It is a bit hard to answer in the quantitative form.

MS PEPPLER: Thank you. Mr Byrne, I will stick with you for the second question. In the report you assume that the beneficial end use is going to be agriculture and that the final pit water quality will be suitable for that beneficial use. If you instead assumed that the beneficial end use was going to involve community recreation, including fishing and swimming on the lake, would you expect that (a) a different standard of rehabilitation needed to be implemented, and (b) what effect would that have on the cost predictions?

MR BYRNE: This is for Loy Yang?
MS PEPPLER: Yes.
MR BYRNE: Yes, in fact we have assumed there is no public access to that lake.
MS PEPPLER: If you did assume public access, what impact would that have?
MR BYRNE: We haven't looked at that in any detail because the work plan variation doesn't look at that. But it would be things such as making sure there was safe access, presumably. But we haven't looked at that in any detail, so I can't really answer it in any more complex form.
MS PEPPLER: You are unable to give an indication of whether the costs would be higher or lower?
MR BYRNE: I would expect that it would be higher.
MS PEPPLER: And any guesstimate of magnitude?
MR BYRNE: No, sorry.
MS PEPPLER: Thank you, Mr Byrne. I have no further questions.
MS DOYLE: I have a number of questions. The first I think is best directed to you, Mr Chadwick, being the coordinator of the team, from what it says in your statement. Can I take you to paragraph 12 of your statement where you set out the chronology of the steps in the project. I want to clarify a couple of matters. When was URS retained to do this work? The precise date doesn't matter, but was it about April 2015?
MR CHADWICK: That's correct.
MS DOYLE: Then we see the steps that you have set out in paragraphs 12 onwards. It looks like in late June, this is paragraph 14, there was some material provided from the mines that I take it was then used in further work done on the first draft of these reports.

MR CHADWICK: That's correct.
MS DOYLE: But up until that point you hadn't provided the draft report to the mines; is that right?
MR CHADWICK: That's correct.
MS DOYLE: Then we have a date in July URS submitted the three draft assessments to the department. Then if we turn to paragraph 16, it says that in October the drafts were provided to the mines by way of a presentation. Can I ask: between 6 July and 13 October was it the case that the draft reports were sitting with the department for consideration or was there some other body of work being undertaken by your team?
MR CHADWICK: There was a number of iterations to the work and to the models we were doing, so it wasn't sitting passively with them. There were a number of iterations.
MS DOYLE: So it remained a work in progress between July and October?
MR CHADWICK: Correct.
MS DOYLE: And 13 or 14 October is the first time the mines were given access to these costings in written form by URS; is that right?
MR CHADWICK: We presented the outputs in a presentation, a meeting with the mines, I have forgotten which date, with Hazelwood. I'm not sure exactly when DEDJTR actually forwarded those draft reports to the mines.
MS DOYLE: The balance of your statement sets out subsequent steps that were undertaken. Can I ask you about another step which intervened in terms of information supplied by Hazelwood. I would ask that the panel be given at least one copy, one copy will probably do, of exhibit 33. That's the document that has the ID GDFS.0001.004.0103.

Exhibit 33 was tendered yesterday through Mr Faithful. It's a bundle of correspondence. Mr Chadwick, I will stick with you because it was directed to you. This bundle is in reverse order, in effect. Can you go to the last three pages it of it. They are an email chain passing between you and Mr Faithful?

MR CHADWICK: Yes.

MS DOYLE: Can you see that what we have there, if we work backwards, is an email chain running between you and Mr Faithful that occupied the time between 5 November and 16 November and a chart right at the end is the last page?

MR CHADWICK: Yes, I can.

MS DOYLE: Feel free to take the time to refresh your memory about the contents of the email and the chart if you wish to, but all I wanted to confirm with you at this stage is that by dint of you and Mr Faithful filling in columns of the chart in which you responded to each other's comments, this was a way in which you and a representative of Hazelwood exchanged some information in November pertaining to the draft report?

MR CHADWICK: I believe we sent the information data request in late October. But, yes, in terms of some follow-up when Hazelwood did send us the information, there was, as you can see, some dialogue.

MS DOYLE: If you look at the email at the end of the chain, it is dated 5 November and you are asking James, Mr Faithful, "Quick email to see how you're going." He responds saying "Have got it. Being reviewed as well as the report. You won't have it until next week, though." Then on the 16th he sends through some information and you can see in the first email in the chain, you see those paragraphs

numbered 1, 2, 3, "Hi Bryan, thanks on your comments"?
MR CHADWICK: Yes, I think what's missing is that I received the information before 16 November from Hazelwood.
MS DOYLE: Yes.
MR CHADWICK: And then I responded in that table.
MS DOYLE: By adding a column to that?
MR CHADWICK: That's correct.
MS DOYLE: That accords with what Mr Faithful said. The difficulty, though, Mr Chadwick, is you had finalised the report on the 13th; is that right?
MR CHADWICK: That's correct.
MS DOYLE: So it transpires that, despite the fact that there was some toing and froing between you and Mr Faithful, in fact the contents of the report had been bedded down before the two of you finalised your liaison, if I can put it that way?
MR CHADWICK: I think I would describe it a little differently. Instructions from Earth Resources, DEDJTR, was that we were to receive the information from the data request. We would take that information, update the model, which we did, which we finalised the reports. It was on a Friday, Friday the 13th, and then the following Monday I finalised the response to Hazelwood.
MS DOYLE: But it would be fair to say, wouldn't it, that the way things were left was that there remained some areas of difference or disagreement between you and Mr Faithful, and I'm not at the moment probing who's right and who's wrong, but there remains some areas of difference and the way that it landed was that your report has different base case assumptions and some different inputs that accord with the way you had determined to finalise the report and

which don't engage with Mr Faithful in the sense that they don't accept his proposed changes?

MR CHADWICK: We didn't get to a point of resolution, no.

MS DOYLE: No. But of course, in circumstances where the mine had only had since mid-October to mid-November to respond, that was a relatively short period of time compared with the months prior to that that URS had gone through a number of iterations on its own account working with the department?

MR CHADWICK: That's correct.

MS DOYLE: Can I ask you to look at the first document. I don't know whether you have seen it or not. It is a letter that was directed to - this is a letter dated 7 December - to Mr Pendrigh who sits within the department, but it traverses a number of issues raised about the report. Has this been provided to you?

MR CHADWICK: Yes, it has, and I'm familiar with it.

MS DOYLE: Is there any suggestion or has there been any direction from the department that AECOM might revisit the report, albeit after the conclusion of these proceedings, with a view to addressing the issues raised in this letter or addressing information gleaned in these proceedings?

MR CHADWICK: Yes, I have been given recent instructions to respond to this letter.

MS DOYLE: So at this stage the indication is that you'll be asked to respond to the letter, but is there any suggestion that you will be asked to do a next iteration of the report or a revised report in light of the issues raised therein?

MR CHADWICK: We haven't been given any formal instructions as yet.

MS DOYLE: All right, if I can ask you now to put that letter to one side. I have some questions for you and perhaps other members of the panel which will all pertain to the Hazelwood report. That's exhibit 41C. I assume you have a copy in front of you. For the transcript it is DEDJTR.1030.001.0001.

MR CHADWICK: Yes.

MS DOYLE: Mr Rozen has asked you some questions about the assumptions, or the methodology and to a degree the assumptions that underpinned each of the reports. Some of my questions will go to matters that permeate the three reports, some will be Hazelwood specific. The first I want to ask you is generic, as far as I can see it. You were asked to cost out end of mine and early closure. In terms of early closure, that's in some places described in the report as "close tomorrow". I take it that it is an assumption that the worst has occurred. In short, that an operator determines to default on its responsibilities under the legislative regime and its mine licence and walk away, close the gate tomorrow?

MR CHADWICK: That's correct.

MS DOYLE: Effectively drop tools at the end of one day and not return?

MR CHADWICK: That's right. The assumption is that there is no plant that can be used, there is no operating plant, there is nothing there that can be used and for a full new workforce to take over to do closure.

MS DOYLE: Was it any part of the approach or modelling that we see in this report to assess the likelihood of that "close tomorrow" scenario in fact crystallising?

MR CHADWICK: Not at all.

MS DOYLE: Mr Rozen has traversed with you the methodology and the reality that this was confined to a desktop review, didn't include mine visits and the like. I want to now ask you rather about the way that the probabilistic model interrelates with the component of the costs described as "plus risk". So if there comes a stage where another member of the panel would be better placed to answer the question, that will work as well.

MR CHADWICK: Thank you.

MS DOYLE: As far as I understood the explanation about the workings of the probabilistic costing method, at least when one is concentrating on P80 and P95, the costs there, and I really literally mean the dollar amount, are skewed towards high values. Would that be a fair description?

DR BOWDEN: Yes.

MS DOYLE: Another way of describing it is they are skewed towards or they produce a number with respect to which one can have greater confidence it won't be exceeded?

DR BOWDEN: Yes.

MS DOYLE: One might also describe that therefore as a conservative estimate?

DR BOWDEN: Yes.

MS DOYLE: Within the probabilistic costing method, is there any tool or mechanism for assessing how likely it is that the "close tomorrow" scenario will crystallise?

DR BOWDEN: Not in that model. We haven't taken that into account at all.

MS DOYLE: Can I ask then that you go to page 13 of the report, which is 0018 in the Inquiry's numbering, and you will taken a number of time its to this figure in this chart as it pertained to another mine. But I want to ask questions

specifically about the Hazelwood chart. I will be looking at the chart, not the coloured figure above.

MR CHADWICK: Sorry, the table?

MS DOYLE: The table. Table 2, "Summary of closure costs". We have numbers there that have been applied under the three datasets, P50, P80 and P95. I can see that it works by reference to both early closure and end of mine. In the second row we have early closure liability plus risk costs. Can someone on the panel explain what in that context risk costs are and how they are devised or ascertained?

DR BOWDEN: The risk costs are obtained by receiving an estimate of the liability of a particular risk event occurring, so understanding what potential risk events might occur over the closure period, to understand what that likelihood might be over that time period and then, if it did occur, what would be the consequential costs of that.

MS DOYLE: Are these the risks that are set out on page 10 of the report or 0015 to which Mr Rozen took you, "Key risks"? 4.6 in the report?

MR CHADWICK: That's correct.

MS DOYLE: I think when Mr Rozen was exploring this with you, you indicated that percentage or likelihood of these risks crystallising are not set out in the report, is that right?

MR CHADWICK: No, they are not.

MS DOYLE: How can anyone, let alone a mine operator, look at this list of key risks and ascertain what likelihood or probability of them occurring you have assigned?

MR CHADWICK: With this report they can't.

MS DOYLE: However, if you go back to the chart I was asking you about at page 0018, it seems before we drill down to the methodology, it seems as a matter of maths that in the early closure liability plus risk costs row, that's the second row, it seems that 46 million has been calculated to be the amount referable to the risk costs, and I have simply done that by taking 264 minus 218. Is that the right way to look at it? Has it been estimated that the risk costs under an early closure liability regime are 46 million on the P50 domain?

MR CHADWICK: So risk cost alone?

MS DOYLE: Yes.

DR BOWDEN: As a matter of maths, if you put it that way, no, it's not the right way to go.

MS DOYLE: How is one to read this? As a matter of arithmetic I'm correct, I hope, and it therefore represents 21 per cent of the total early close liability costs. A mine operator might be forgiven for looking at it and saying, "Well, hang on, they're estimating that it's going to cost 218, but if you add risk costs, which I can't interrogate because the percentages aren't provided, it is plus $46 million." Why is that not the correct way to read it?

DR BOWDEN: That would be a quite a reasonable thing to do, but it is just not derived that way. So if we look - - -

MS DOYLE: Could you reverse engineer it for me then? Tell me how you got to the 46 million or the 21 per cent?

DR BOWDEN: It is an output from the model. So the bottom line, the purple line there that represents the risk cost, we have the outputs for those, those data points, and they do not add up at number for number to the total cost as a

result of the simulation. So, as I was trying to point out before, and I know it's not easy, but the risk cost, the cost simulated in the simulation 2,000 times. So you can either add the costs together as part of the simulation or you can add them separately afterwards.

MS DOYLE: I understand that's how the model works. But in the real world where an operator is provided with this cost estimate and to make it very real it seems from the terms of retainer for URS, on the basis that these are going to be used as a talking point, if not a negotiation point for a new bond, the mine operator looks at it and says, "You've costed out early close, that's close tomorrow, walk away, we default, at 218 P50 or 294 on the very conservative measure." Perhaps if we stick with the very conservative measure. In the next row down you say there is a plus risk cost and you tell me in part 4.6 of the report that all kinds of things could go wrong during rehab. Without even turning back to that page, I'm sure you can remember the big ticket items, batter failure, coal fire. You have told me all sorts of things could go wrong and on the P95 column you have costed that risk out at 63 million, because 357 take 294 is 63. And if the mine operator went further and looked across the whole row, the mine operator would discern that in each instance you have added 21 per cent of the cost to get plus risk cost. Now, the mine operator doesn't know about the Monte Carlo simulation. They know about the bottom line. How were they to understand how you divined that 63 million was a good number to represent the risk cost scenario?

DR BOWDEN: It wasn't divined. I guess the thing about that is that they can look at this, they can add the two costs

together, or they can take away those costs if they like. It is more relevant for the P50 value, as I have sort of said, and as they get further up, if they add the two costs, what will happen is they will get a higher cost. So, if they add the two costs up separately as the outputs which we haven't shown, they get a slightly higher cost than what they are combined. They get those higher confidence levels. So, they are free to do that. We have provided it in this way so that they would be able to understand what the combined cost of these two were. If they want to look at the components, they can look at the two different graphs. That's okay.

MS DOYLE: The difficulty is, sticking with P95, you have kindly suggested that if I want to, I can do it this way and for the moment I do wish to do it this way. 63 million is the difference between 357 and 294. I then turn back to the key risks page and try to ascertain how it could be that the likelihood of, for example, batter failure - how it has been assessed, what the likelihood is thought to be and why it translates to a $63 million cost on top of the overall cost?

MR CHADWICK: We haven't presented the likelihood and the consequence cost.

MS DOYLE: No, but what is it? Did you form a view about what it is?

MR CHADWICK: Yes, we have.

MS DOYLE: And it is what?

MR CHADWICK: The risk cost, the combined risk costs.

MS DOYLE: First of all, what is the likelihood of the key risks in section 4.6 occurring, crystallising?

MR BYRNE: I think in previous testimony we said that we have

that data. We would have to refer to the models because we can't remember specifically each individual risk.

MS DOYLE: And which risk assessment model did you use in order to check the likelihood of batter failure in an area with infrastructure or batter failure in an area without infrastructure and so on? Which model did you use?

MR BYRNE: We didn't use a model. We provided opinions about the likelihood and the consequence for each of those risks.

MS DOYLE: And were they all different? First of all if we stick with Hazelwood, was the likelihood different for each of the elements in section 4.6?

MR BYRNE: Yes.

MS DOYLE: Then was it different as between Hazelwood and each of the other mines?

MR BYRNE: I can't recall exactly, but we assessed each mine separately.

MS DOYLE: You didn't think that was important to disclose in the body of the report so the reader could understand how you had worked it out, first of all, and then debate or challenge it if it became necessary later?

MR BYRNE: No.

MS DOYLE: If they are all different, why is it that when I do the maths you've just added 21 per cent to every figure in early closure liability to get to the risk costs?

MR BYRNE: We haven't.

MS DOYLE: Why does it come out at 21 per cent?

MR BYRNE: That's the way the model comes out.

MS DOYLE: All right. If you look back at the chart on page 0018, and can I shift to end of mine, they are the last two rows, and perhaps take end of mine P95, very

conservative, as an example. Again, you are all happy to tell me a number of times that this is what the model spat out and I shouldn't take an arithmetical approach. But in the P95 column the difference between the end of mine liability cost and the plus risk scenario is 91 million, which is 37 per cent. Why is it that under the end of mine life assessment, why is it that the risk costs suddenly go up to 91 million as a component, compared with, say, 63 million under early closure? Why is the cost of that risk being borne regarded as so much higher?

MR BYRNE: I think I might clarify as well that you can't compare those two costs because all costs are discounted and so the end of mine life costs are discounted back from the end of mine life that we have adopted.

MS DOYLE: Discounted, but yet the ultimate result is higher.

MR BYRNE: That's correct. So in raw terms that would be even higher.

MS DOYLE: If you didn't discount?

MR BYRNE: That's correct. So, in answer to your question, I'm not so sure you can actually compare the two, but there would be a greater contributor to costs. We would need to go back and have a look at the individual risks, but one of the bigger risks was not being able to access the water and therefore having to pay commercial rates for the water.

MS DOYLE: But what you haven't disclosed in the report is which risk assessment matrix you used in order to figure out the likelihood of that situation pertaining in relation to water and then how you worked out what that would cost. I can't find the answer to those three things, can I?

MR CHADWICK: No.

MS DOYLE: Sticking to that part of the report, there are a couple of questions I had about the charts or figures set out on page 15 of the report, which is page 0020. As I understood earlier evidence, these charts and also the explanation above them in the document depict the domains or the areas of expenditure, the cost centres which are the most susceptible to variation because they are the most uncertain in some senses as to the method going to be used or the rate that should be input. Is that a fair summary?

MR BYRNE: You are you talking about section 5.2.3?

MS DOYLE: Yes, but also the figure 5 just above that.

MR BYRNE: The figure 5 shows the primary elements of contribution to the total cost.

MS DOYLE: We will stick with that then. I misunderstood what figure 5 does, but now I see what you're saying. So in figure 5 the largest contributor to early closure cost is the management expense?

MR BYRNE: Correct.

MS DOYLE: And the next is batter slope cover and so on. Is that how we should read that?

MR BYRNE: That's correct.

MS DOYLE: Even just looking at that, did that not ring alarm bells that something might be wrong or based on a wrong assumption if the biggest cost centre was management as opposed to the physical work of reshaping slopes and covering batters?

MR BYRNE: No.

MS DOYLE: Why is that? Because you have developed a level of tolerance to management or consultant fees or it doesn't

surprise you to be so high?

MR BYRNE: These are relative percentages. It really just shows that there is quite a lot of costs spread out that are contributing to the total cost.

MS DOYLE: Ys, but just as a little bit of a reality check, when it transpired that management costs on a relative basis were the biggest cost centre, did that not ring alarm bells or suggest you might need to revisit that assumption?

MR BYRNE: No.

MS DOYLE: Did it not suggest that 15 per cent might be too high a value to assign on a project of this type to the management cost centre?

MR BYRNE: No.

MS DOYLE: Going to the figure below that, figure 6, that's the figure that depicts, does it, the cost centres that are the most prone to variation or affected by variable inputs; is that right?

MR BYRNE: They are the contributors in terms of the unit rates that are the contributors to the greatest variance, yes.

MS DOYLE: Taking the largest one there as an example, but also probably it is the easiest one to explore, pit truck and shovel capping. Is that to be understood in the following way: That could vary greatly for two reasons. The method by which one caps batters might differ over time and the source of the overburden used to do so might come from closer or further away from the mine and both of those can change the cost or the rate per metre, however you want to describe it?

MR BYRNE: That relates to the sourcing of material primarily for cover of the batters, and we have applied a large

range to that cost estimate to reflect the uncertainty that exists over where that source will come and therefore how much it will cost.

MS DOYLE: That might be a generic uncertainty, but Mr Faithful attempted to address that reality at Hazelwood, did he not, with his correspondence? He explained that all overburden was intended to be sourced internally and that therefore you could discard the assumption and go with the real world example?

MR BYRNE: I could quote. We have used a range from $10 to $30, so $10 is our P50 and the $30 is the P95.

MS DOYLE: I understand that's how the model works. But when an operator says, "We will in fact source it internally which makes it cheap," can't you go with the real world numbers rather than retreating to the assumptions and the models?

MR BYRNE: Yes, I was just about to explain that. The $10 to $30 covers a whole range of sources, including on-site and off-site. The $10 is pretty close to what we think might be a figure for sourcing something on-site, given the fact that this is about sourcing it from an area on-site which you then have to go and rehabilitate work from where you sourced it. You have to then place this material on the batter and track roll it. So, it's not a matter of taking material that you already excavated for overburden and putting it in a truck and dumping it somewhere; it is a much more complicated role than just the normal rate for overburden excavation.

MS DOYLE: No, but there is no such thing really in the broad as overburden excavation. It is called mining. During operations the overburden is dumped in the internal pit

and Mr Faithful has explained the intention is to use that overburden, so in other words to source it internally.

MR BYRNE: That's correct, but for the closure tomorrow scenario we don't have that overburden. We don't actually have that overburden as a source because it is yet to be mined.

MS DOYLE: So in the closure tomorrow scenario, the footprint of the mine is vastly smaller, is it?

MR BYRNE: It is somewhat smaller. I can't remember the exact detail.

MS DOYLE: It would have to be, because close at end of life of mine, and I know there is even a difference in terms of the assumptions there, but close in 2026, it is obviously going to be a larger mine than close mid-December 2015; yes?

MR BYRNE: Yes.

MS DOYLE: So that is a huge variable, too, is it not, because while you say there may not be the overburden available, there is already overburden that sits on the floor of the mine?

MR BYRNE: Which you still have to then dig up and put on the batters.

MS DOYLE: Are you able to say what assumption was made in the early close model in terms of the footprint of the mine, where it was derived from or what size was used?

MR BYRNE: I can't quote the exact size. We would have to go back and have a look at the model. But the figures for the batter areas we obtained from available topographical information and then they were cross-checked with information provided by site.

MS DOYLE: Can I ask you about just a shopping list really of

the assumptions and in some cases the inputs that have been used. The end of mine date, it seems from the report that you were instructed to use the date drawn from the licence, 2026?

MR BYRNE: Yes.

MS DOYLE: And although Mr Faithful informed you and also there are other documents and evidence in these proceedings that would suggest that the current plan is to mine to 2033, your instructions were to stick to 2026?

MR BYRNE: Our instructions were to use 2026 as an end date, if you like. But we did use the footprint for the predicted end of mine life.

MS DOYLE: So there's a tension there, isn't there? You assumed an earlier date, but a larger footprint, and the larger footprint depends on the mine's operations going out to 2033?

MR BYRNE: Correct.

MS DOYLE: The time to fill the pit lake is obviously an important assumption or an important assumption off which other inputs might hang. You were asked some questions about this by Mr Rozen in the context of another mine. In the context of the Hazelwood Mine, page 8 of the report I think is where we will find this assumption, which is page 0013 in the Inquiry's numbering. At the top of that page it says, "End of mine and early closure time. Time taken to fill the pit void to minus 22" - which some called the stability level - "is estimated to be 28 years and 21 years respectively." Two questions: Where were those numbers derived from and why are they different?

MR CHADWICK: So 21 years is based on early closure, our estimate of what the lake volume would be at closure

tomorrow, and 28 years is an estimate of what the lake volume would be at maximum extent of approved mining.

MS DOYLE: So that does assume a smaller footprint on the close tomorrow scenario?

MR CHADWICK: Absolutely.

MS DOYLE: Here is an area in relation to which Mr Faithful has proffered different information in his efforts to engage with you. He has pointed out that he is in receipt of modelling information that tells him it will be a seven year period to fill. In what circumstances or for what reason did you determine to stick to the 21/28 year assumption rather than the seven year assumption based on the modelling available to the mine?

MR CHADWICK: We were using the approved work plan variation, the rehabilitation section in that, which didn't actually offer how long it would take to actively fill to negative 22. Based on that, there wasn't any information. We estimated what that lake volume would be and, based on the bulk water entitlement calculated, calculated what the fill was. I think Mr Faithful offered up 750 gigalitres as the rough pit lake volume in evidence yesterday. A simple calculation of 27 gig divided into 750 gig gives you just under 28 years.

MS DOYLE: If you were furnished with a modelling report prepared by GHD Consultants published in September this year which ran five scenarios drawing on different water sources, but for two of those scenarios determined that their best modelling outcome was that it would take seven years to fill to stability, would you take that into account and adjust the assumptions in terms of that time period in light of that?

MR CHADWICK: If we're offered it and the assumptions and everything else were approved by the regulator, then, yes, we would take that on Board.

MS DOYLE: The next question really flows from that and it is the question of water sources. I know the two things may be interrelated. But in your costings an assumption made was that, in order to fill the pit lake void, that the mine would need to buy water on the open market and I think in domain 6 you refer to this as a supplementary water charge and that the mine would need to spend $6 million on the early close model and $8 million on the end of mine model. What assumption is bedded in there about how Hazelwood will source and pay for its water?

MR CHADWICK: That's an incorrect statement. What we have assumed in our costing model is that the bulk water entitlement is able to be used for closure. However, there is still an annual fee for that bulk water entitlement. So the costs for lake filling are purely on the annual fee for that bulk water entitlement. In terms of purchasing water, we have put that in the risk costs.

MS DOYLE: Okay. So the 6 million and the 8 million to which I referred is hived off to a risk cost section?

MR CHADWICK: No, the time for it to be filled, 21 years or 28 years, that's the annual costs for that bulk water entitlement to fill for 21 years. The risk that you can't get that bulk water entitlement or you can't use it for closing and you have to buy on the market is put into the risk costs.

MS DOYLE: I understand. Similarly, if you received a modelling scenario and, as you say, that had been endorsed in some way in an approved work plan, you would then need

to adjust that down from 28 or 21 years down to seven, and the maths would therefore change and so would the outputs.

MR CHADWICK: Yes, that's right.

MS DOYLE: The next issue we have touched on already and that's the method by which slopes are reshaped as part of rehabilitation. One of the matters that Mr Faithful raised in his communications is that it will not all be done by the truck and shovel method, but rather a part of it will be done by dozer push which brings the cost down. Is that a matter that you took into account in assessing that, either any assumption or input that pertains to that domain?

MR BYRNE: The reshaping costs were based on dozer pushing.

MS DOYLE: Progressive rehabilitation, I take it you have assumed that a certain amount will be done and is that based on an assessment of the work plan that was available to you?

MR BYRNE: The progressive rehabilitation was based on information provided by the site or by all the sites. So each site provided an estimate or a figure as a percentage of the total area for the various batters in the mine void's domain. We have taken that at face value and put that into our models and then we have said for the end of mine situation that it would be a similar proportion based on no different information to suggest otherwise.

MS DOYLE: The other assumption that informed your calculations in that regard is there is an assumption that a certain proportion of progressive rehab will need to be re-worked. Why did you assume that and what likelihood or percentage did you assign to that?

MR BYRNE: It is not necessarily progressive rehabilitation,

but it is a per cent of the final rehabilitation. It is based on industry practice and our experience that there is a proportion of rehabilitation fails, and you have to either go back, for a range of reasons, disease, drought, plants not taking, erosion, whatever, and we have adopted a figure of 15 per cent of the total rehabilitation area needs to go back in and get re-worked.

MS DOYLE: So you said it's based on industry practice. Is there some research or some data collection that would suggest at large brown coal mines that 15 per cent is the traditional rate of failure?

MR BYRNE: No, I can't point you to that.

MS DOYLE: Mr Faithful gave evidence earlier in these proceeding and it is at transcript page 329. I will just tell you the context in which he was being asked questions. A debate arose about the depth or thickness of the coverage of soil on rehabilitated slopes and in the context of there being a debate about whether one metre was good or whether it should be more.

Mr Faithful was asked whether, in the areas that the mine has already covered with about a metre of coverage, whether any problems have emerged over time in relation to stability, erosion or takeup of vegetation, and he said no. If you were given information about that success rate so far in terms of rehabilitation, would that be something capable of affecting your 15 per cent assumption on failure?

MR BYRNE: It is possible, but I would like to see a lot more critical analysis of that. My experience on a whole range of sites around the world is that there is an element of failure of rehabilitation. So I suppose I would look at

it with a questioning mind. But if it was proved, then happy to accept it.

MS DOYLE: But equally your 15 per cent isn't the product of any robust science either, is it?

MR BYRNE: Not at all. Not at all.

MS DOYLE: You also assumed a 15 per cent failure rate on vegetation, because I notice there is a failure rate assumed for reshaping and then there is a failure rate on top of that assumed for vegetation. So similarly is that based on a feel you have for sites that you have experienced?

MR BYRNE: I've been talking about failure of revegetation. Can you point me to the bit about the reshaping?

MS DOYLE: I will just turn up where that's mentioned. I think it is actually in the narrative of the report. It pertains to domain 3. We will turn that up in a moment and I will just conclude on the other assumptions and then come back to that one. We have talked about sourcing of overburden, so the next I want to ask you about is rip rap. Could you go to page - I don't know if you have the Inquiry's numbering or not, but towards the end the appendices aren't numbered but the Inquiry's numbering is 0029?

MR CHADWICK: This is our appendix?

MS DOYLE: This is the appendix. It is appendix B, "Early closure, current footprint", first page of that.

MR BYRNE: Yes.

MS DOYLE: In the domain 4 "Active mines and voids" section, there is an allowance for rip rap and the installation of that is costed at about 9.4 million, and then there's an allowance for it made over a number of years. The

assumption made there, when I read that with the other narrative parts of the report, is that it is assumed that rip rap will be installed above the unflooded parts or at the level of the lake, I should say, and that it will need to be replaced at the intervals set out there, 50 years, 130 years, et cetera.

MR BYRNE: Correct.

MS DOYLE: When I look at the reports for the other two mines, there is just a once-off cost for rip rap for them. Don't their mines also, first of all their voids, fill slowly over time? The time periods may differ but they fill over time?

MR BYRNE: Yallourn is filling over 25 years, I think - or sorry, 17, that's right, and Loy Yang is over 70. So how we did that, with Hazelwood it's a 500-year timeframe, so our judgment call there was that because it is such a long timeframe, that level of erosion, the potential for erosion, would need protection over that long period. How we addressed both Yallourn and Loy Yang is that we put a higher cost on that intensive maintenance and monitoring period for those particular mines, rather than keep on putting in rip rap every 50 years.

MS DOYLE: Is the problem the changing level of the lake or is the problem wave action leading to erosion?

MR BYRNE: It is both. The first problem, the reason one needs rip rap is to protect against erosion from wave action in the lake. The second problem is because there is a continuing change in lake level over a very, very long period, that as it fills, the rip rap that was installed previously is then under water and therefore offers no further protection against that wave action.

MS DOYLE: The level of the lakes, of any of the lakes, may change over time up or down, up by dint of filling slowly, but also may be intentionally or unintentionally filled from other sources and down by dint of evaporation?

MR BYRNE: Yes.

MS DOYLE: The expert panel who gave evidence in these proceedings a few days ago had different views about the need for rip rap. Two experts, Dr McCullough and Dr Haberfield, said they didn't think it was likely to be required. I take it that this is a conservative assumption that you have made about the need for rip rap and its replacement and it is not based on any particular study relating to Hazelwood Mine?

MR BYRNE: It is not based on any particular study. It is a reasonable and, sure, conservative opinion in the absence of any other information suggesting that it's not needed.

MS DOYLE: But it takes place over a 500-year replacement schedule.

MR BYRNE: Correct.

MS DOYLE: As a cost centre it is therefore at least $90 million in the early close scenario that we are looking at.

MR BYRNE: It doesn't form $90 million as a component of that, and in fact from a discount perspective it forms about $15 million.

MS DOYLE: From a discount perspective?

MR BYRNE: Yes, all of our cost estimates are discounted and so that $90 million is an undiscounted amount. So, spread over 500 years you discount that $90 million back, it equates to about a $15 million input into the model.

MS DOYLE: Into the model, but when you add up these numbers,

if you go to the next page, 0030, you do get 318 million.

MR BYRNE: Correct, and these are all undiscounted figures. These are the raw costs.

MS DOYLE: Yes, but the chart we were looking at before are also the undiscounted figures, aren't they?

MR BYRNE: No, they have been discounted. They're all discounted.

MS DOYLE: They have been discounted for the three per cent for the end of mine?

MR BYRNE: Correct.

MS DOYLE: Management and mobilisation costs I have asked you a little about. But if you stick to the same page, 0029, they come out at 41 million on this early close scenario. 10 million of that is mobilisation and demobilisation. Is that solely referable to the need of an external party to engage, procure, tender whatever they need to do to bring people into the site?

MR BYRNE: Correct.

MS DOYLE: Then we have the domain in relation to - you need to go over to page 0030 - post execution monitoring. It doesn't appear there, but I think elsewhere in the report it is clear for Hazelwood you have assumed I think it is a period of 100 years of post execution monitoring; is that right?

MR BYRNE: Correct.

MS DOYLE: Why 100 years?

MR BYRNE: Essentially beyond 100 years the discounted figures don't have any change. If we spread that over 500 years or 100 years, the model result is very similar.

MS DOYLE: Sorry, in light of the answer about rip rap and combined with this answer, are you assuming that the

operator of the Hazelwood Mine maintains responsibility for 100 years or 500 years?

MR BYRNE: We are saying the operator maintains responsibility for 500 years for the cost modelling practice or activity. We spread those figures over 100 years because cross-checking over 500 years with the discounting, it did not make any difference to the total figure. So it was a convenience from the modelling perspective.

MS DOYLE: Where did the assumption of the 500 years responsibility arise from?

MR BYRNE: The work plan variation says the lake will take 500 years to fill.

MS DOYLE: So you worked backwards from the fill time to the period you assumed would be the operator's responsibility.

MR BYRNE: Well, all we have said is - this is nothing to do with the operator's responsibility or otherwise. We are making a cost estimate for closure and we are presenting that to the department. We are not making any call about who still owns the site or not, but we are saying that from a perspective of the lake filling, the estimate is 500 years. Therefore, you will still need to manage that site for 500 years.

MS DOYLE: Can I ask you, just while we are still on these pages, to go back a page to 0029. There is an item below the rip rap costs and it says "Erect a security fence around the site, 1.1 million". The site is already fenced. Does that assume a total failure of the fence or some need in the future to replace it?

MR BYRNE: No, it is based on just putting a new fence around the pit. We recognise that you don't need a fence around the entire site, so it is just a fence around the pit.

MS DOYLE: Even though the end use contemplates there might be beneficial uses including public access?

MR BYRNE: I'm not aware the end use does entail public access.

MS DOYLE: I found the reference that I was trying to take you to a moment ago. It is back on page 14, which is in the body of the report. There is a heading there, "4.3.3 Post execution maintenance and monitoring phase". It is page 9 of the report, sorry. "4.3.3 Post execution maintenance and monitoring. This begins after the closure execution phase with activities comprising ongoing water level, surface water level, groundwater, et cetera." Then the next, "Ongoing maintenance including erosion repair, replacement of failed rehabilitation areas." You can tell me if I'm wrong, but I read that as being separate from the 15 per cent failure of the vegetation which is referred to separately below.

MR BYRNE: No, that's exactly the same.

MS DOYLE: They're the same things.

MR BYRNE: Yes. It is just replacement of vegetation, not replacement of any soil or anything like that.

MS DOYLE: I have one question harking back to the question of the source of water and the need to pay for it. The evidence in the proceedings is that Hazelwood's current water entitlement requires it to pay a 20 to $30,000 fee per year to have an entitlement to the 23 gigalitres. How then did AECOM calculate those supplemental charges that I referred to?

MR CHADWICK: We were provided the annual cost from Earth Resources Regulation.

MS DOYLE: So if the information there is based on a wrong starting point or a wrong figure per year, that will then

track through to the calculations?

MR CHADWICK: Absolutely.

MS DOYLE: I have no further questions for the panel.

MS FORSYTH: I'm in the Board's hands if you would like me to commence, noting the time.

MR ROZEN: It might be helpful to get current estimates from counsel as to likely duration of questioning, in light of the questioning that has occurred already today.

CHAIRMAN: How long do you think you will be?

MS FORSYTH: Approximately 20 minutes.

DR COLLINS: About 10 minutes.

CHAIRMAN: Okay. We will just continue.

MS FORSYTH: Thank you. The first question I have is probably best directed to Dr Bowden. The methods that you have used to assess the costs of post execution monitoring are the same for all mines and perhaps I can just use the Yallourn Mine as an example, which is document 28, volume 12. The DEDJTR document ends in 0092, but the place in the document I want to take you to ends in 0119. This is in appendix B under "Early closure". In relation to Yallourn, the post execution maintenance and monitoring is set out there at approximately $14.7 million. That's the second last row of purple, if you like?

DR BOWDEN: Yes.

MS FORSYTH: The way we see that cost breakdown for Yallourn, if we flip forward in the document to the DEDJTR number ending in 0127, we see that for Yallourn this is in relation to the last section of that document, so the last purple heading is "Early closure domain 7, post execution maintenance and monitoring." For Yallourn it looks at the annual rate, the first five years after execution phase,

and the rate is given at 325,000 per year for five years. Then the rate for the subsequent monitoring rate is 185,000 for 15 years. That reflects the approach that's taken, that there is a more intensive monitoring for the first five years and then a less intensive monitoring phase for 15 years; is that the approach that's taken there?

MR BYRNE: Yes, that's correct.

MS FORSYTH: Can we do the same exercise for the Hazelwood Mine. Perhaps if I can take you first to that report which is document 30, volume 12. The way we find the same figures is if we go to the DEDJTR document which ends in 0030. At the top of that page we have the early closure domain 7 with a total figure of some 60 million.

MR BYRNE: Yes.

MS FORSYTH: If we flip forward a few pages to ending in 0036 we find down the bottom of that page domain 7, the break up, and once again the same rate has been used, 325,000 per year for that more intensive first five-year phase, and then 185,000 for in the case of Hazelwood 100 years.

MR BYRNE: Correct.

MS FORSYTH: So the same approach is taken there. I want to ask you about that situation for Loy Yang. Can I ask you perhaps to go to the December report, which is document 29, volume 12. Perhaps if I can ask you to go to appendix B. I'm still sticking with the early closure scenario. The document ends in Ringtail 0027.

MR BYRNE: What page is that?

MS FORSYTH: It is the first page after appendix B, "Early closure, current footprint".

MR BYRNE: Yes.

MS FORSYTH: If we have a look at the early closure domain post execution maintenance and monitoring there we have a figure of close to 100 million for the Loy Yang Mine.
MR BYRNE: Correct.
MS FORSYTH: If we want to have a look at the break-up in terms of post execution monitoring we flick forward to DEDJTR page ending in 0035.
MR BYRNE: I think that's correct. I'm not sure I have exactly the same page because it doesn't have the reference on it. Yes, I think that's correct.
MS FORSYTH: Early closure domain 7. If we go to the heading "Post execution monitoring" we see the annual rate for the first five years after the execution phase is 325,000, which is the same rate you have used for the other mines.
MR BYRNE: Yes.
MS FORSYTH: But you see then you have the number of years as 70 in that row and then when we go down to the subsequent monitoring after the first five years we have the lower rate at 185, but the number of years there is listed as five.
MR BYRNE: That's correct.
MS FORSYTH: That's in fact an error in this document. It is the first five years - - -
MR BYRNE: No, it's not an error.
MS FORSYTH: The first five years after the execution phase is the more intensive phase of monitoring for this mine. That's the approach you have taken consistently in relation to the other two mines?
MR BYRNE: That's the approach we have taken in relation to the other two mines, correct. Not for Loy Yang.
MS FORSYTH: You haven't explained anywhere in this document

why you have taken an approach to have a much higher monitoring phase after the first five years.

MR BYRNE: We have explained that we have taken a longer period for the intensive. I can't recall, but we probably haven't explained why and I'm happy to explain that.

MS FORSYTH: Could you please explain the rationale as to why you say that the monitoring for 70 years is going to be more expensive than the monitoring for the first five years after execution?

MR BYRNE: Yes, because we haven't adopted the same approach in relation to the rip rap as we did for Hazelwood. So instead of putting in a series of campaigns of additional rip rap as we did in Hazelwood, what we have said for Loy Yang is that will require a much more intensive management and maintenance period. So we have applied the costs over the 70 years as the lake fills rather than applying extra rip rap.

MS FORSYTH: Where does that rate of 325,000 come from?

MR BYRNE: I could refer you to I think it is appendix C which is unit rates and parameters which is here. Appendix C. It is pages 1 and 2. There is a breakdown of the maintenance and monitoring components in pages 1 and 2 of appendix C.

MS FORSYTH: When I say where does that rate come from, was that the result of specialist advice?

MR BYRNE: I guess if you call us specialist advice, yes. But we made a call based on our own experience about what would be required and what those rates would be.

MS FORSYTH: If it was the case that in fact the first five years of monitoring was the more intensive period for Loy Yang and then the subsequent phase was a less intensive

phase, then there would be a difference of some $9 million in those figures?

MR BYRNE: Not necessarily $9 million because once again they are raw costs, they are not discounted, and the discounted costs are the primary figures as inputs into the model.

MS FORSYTH: The next heading that you have there is the "Removal and disposal of contaminated water from bunded areas and sumps".

MR BYRNE: Sorry?

MS FORSYTH: I'm going back to DEDJTR ending in 0035.

MR BYRNE: We don't have those DEDJTR references.

MS FORSYTH: This is the AGL Loy Yang Mine December report. I'm in appendix B and I'm at the last page of the appendix B which deals with early closure.

MR BYRNE: Yes.

MS FORSYTH: There is a heading there, "Removal and disposal of contaminated water from bunded areas and sumps". That heading is also contained earlier in the document and it seems inconsistent with all other headings provided under this section of the report. Should it actually be post execution maintenance?

MR BYRNE: It should . That's an error.

MS FORSYTH: In relation to the post execution maintenance it talks about the annual rate the first five years after the execution phase?

MR BYRNE: Yes, and that should be the first 70 years.

MS FORSYTH: So that's an error in your report?

MR BYRNE: Yes, that's correct.

MS FORSYTH: If in fact that was meant to be the first five years after the execution phase then the next line that sets out the number of years being 70 should actually say

five?

MR BYRNE: That is not meant to be the first five years.

MS FORSYTH: That's because you have taken the view there is going to be a period of 70 years which requires intensive monitoring and maintenance due to the gradual filling of the lake at the Loy Yang Mine?

MR BYRNE: Correct.

MS FORSYTH: The next question I wanted to ask you about was in relation to the end of mine life. If we have a look at the end of mine life document which is also appendix B but it is the appendix B that follows on, I want to have a look at domain 5, so this is DEDJTR document ending in 0037.

MR BYRNE: Could you tell me the top - - -

MS FORSYTH: It is the first page of that appendix and it sets out the end of mine footprint summary document.

MR BYRNE: Yes.

MS FORSYTH: About two-thirds down the page there's domain 5, "Execution management costs".

MR BYRNE: Yes.

MS FORSYTH: That has a total value of some $46 million.

MR BYRNE: Yes.

MS FORSYTH: That's comprised of the mobilisation/demobilisation costs of some 23.7 million and the engineering procurement and construction costs of some 22.3 million?

MR BYRNE: Yes.

MS FORSYTH: If we want to see what the breakdown of that is we go over a few pages to domain 5 within the document, which is DEDJTR reference 0042 just for the Board. That's the breakdown of the figures that should be contained in

that domain number?

MR BYRNE: Yes.

MS FORSYTH: We do find the figure of 22.257953, being the engineering procurement and construction management costs, but do you see the mobilisation/demobilisation costs are a figure of about 7.5 million as opposed to the figure of 23.6 million that I have taken you to?

MR BYRNE: Yes.

MS FORSYTH: That would appear to be an error in the document?

MR BYRNE: Yes, I acknowledge that.

MS FORSYTH: I want to ask you about - this probably is a question for Dr Bowden - a set of principles that's contained in the risk assessment and management document which is document 53, which I believe is in court book 12. I don't know that it has a Ringtail version yet. Do you have a copy of that document in front of you, Dr Bowden, the risk assessment and management document by the Australian government Department of Resources, Energy and Tourism?

MR ROZEN: I don't think that document has been tendered. I'll stand corrected, but I don't recall it being tendered. I certainly haven't tendered it.

MS FORSYTH: It was sent through in the email over the weekend. But I might just have to read out the sections that I wanted to go to.

MR ROZEN: We have received it. I'm just saying it hasn't been tendered.

MS FORSYTH: I take the point and I'm about to tender it. I'm sorry. Dr Bowden, this is a document you are familiar with?

DR BOWDEN: I can't read it.

MS FORSYTH: I take it you don't have a hard copy there?
DR BOWDEN: Yes. The top right hand?
MS FORSYTH: The Australian government Department of Resources, Energy and Tourism.
DR BOWDEN: Yes.
MS FORSYTH: You are familiar with this document?
DR BOWDEN: Yes.
MS FORSYTH: In fact your name appears in it on a number of occasions?
DR BOWDEN: Yes.
MS FORSYTH: This document sets out a risk assessment approach for leading practice, sustainable development program for the mining industry?
DR BOWDEN: Possibly, yes.
MS FORSYTH: We have a hard copy. I will have that handed up to you. Page 44 of the document is the chapter that sets out risk assessment - it is headed "Risk assessment: identifying and defining risk"?
DR BOWDEN: Yes.
MS FORSYTH: It contains a statement of key messages in relation to those issues, and then goes on throughout this chapter to set out a section on introduction, establishing the context, risk identification and then process for identifying risk events at section 5.4, page 46.
DR BOWDEN: Yes.
MS FORSYTH: I just want to ask you about that section. It says, "Most risk information is obtained from experienced operators and subject matter specialists who jointly understand the activities that will be carried out, and their potential impacts on the business and the assets within the wider environment. Information from experts is

most often obtained during specifically convened workshops and subsequent ongoing follow-up and consultation with experienced operators, specialists and their teams." Would you agree with those two statements?

DR BOWDEN: Yes.

MS FORSYTH: The document then goes on to talk about risk workshops. Can I ask, firstly, whether the risk assessment that's described as section 4.6 of the various AECOM reports that have been prepared have followed this format of having a risk workshop for the identification of risks likelihood and consequence?

DR BOWDEN: Yes, but it was a two-person operation. It was the three of us. So that was basically that process in a very condensed form.

MS FORSYTH: Let me ask you now about that risk workshop process. At page 47, the second paragraph says, "Workshops can vary in length from a few hours to a few days (depending on context and scope) and follow an agenda." Would you agree the issues you had to consider in your risk workshop were complex?

DR BOWDEN: Yes.

MS FORSYTH: Another three paragraphs down it says, "To define consequences, the operator and subject matter specialists are asked to describe the nature and magnitude of consequences should a given risk event actually occur over the given timeframe." That's what should occur. Then there's also a process by which those operators and subject matter specialists are asked to ascribe a likelihood to those risk events; that's correct?

DR BOWDEN: Yes.

MS FORSYTH: Then the next page describes the documentation

that should arise in this type of process. At page 48, under section 5.6, "The outputs from the risk identification process need to be documented", and there is a whole range of dot points which say why that documentation process is important. You would agree with those?

DR BOWDEN: Yes, I do.

MS FORSYTH: It goes on to say, "In most cases, the risk assessments require full documentation of the process, the judgment values (likelihoods, costs) impacts, the rationale behind judgments and the parties responsible for providing each judgment and risk registers are commonly used to present risk information." Would you agree with that statement?

DR BOWDEN: Yes.

MS FORSYTH: Then the next paragraph sets out the typical content of risk registers, "including a tabulation of risk events considered, events excluded, likelihoods and consequences; the results of the risk analysis and evaluation; existing control measures, planned management actions, allocation of responsibility, timing of actions." Are you able to inform the Board whether or not a risk register was prepared for this particular case?

DR BOWDEN: They take different forms, risk registers. But in the model we have all of these factors apart from what can be done about it because we didn't look at the strategic side. But in terms of identifying the risks, understanding what the risks are, describing the risks, that's represented in the report. The consequences and the likelihoods are not represented in the report, but they are very clear to see in the model and are inputs to

the model. So that has been complied with. The risk ratings, which is the risk levels, have also been provided. Then the response, that's for the owner to take up that sort of process.

MS FORSYTH: You said that the mitigation measures in order to bring the risk back to residual risk haven't been looked at because they weren't important for this process. Is that the way I understand the evidence you just gave?

DR BOWDEN: Just then?

MS FORSYTH: Yes.

DR BOWDEN: No. What I was trying to say was that we have looked at the current risks as how it is considered the risks currently stand, given the situation. That doesn't take into account anything that might be done further to mitigate the risk. So it assumes, for example, that all of the capping and things that have been done have been done according to standards.

MS FORSYTH: Did the department ask you, for example, in the case of AGL Loy Yang to take into account the range of conditions on its approval which are designed specifically to reduce the risk of the events that you have identified actually occurring?

DR BOWDEN: No.

MR CHADWICK: No, that's not correct.

MR BYRNE: They did ask us.

MS FORSYTH: Have you seen those conditions?

MR CHADWICK: Yes, we have.

MS FORSYTH: Where are those conditions specifically taken into account in your risk assessment?

MR CHADWICK: We considered them as part of the 2015 report.

MS FORSYTH: I take it, for example, that the likelihood and

consequences of the outcomes of your risk assessment were reduced after having seen those conditions of approval?

MR BYRNE: For end of mine life. Not for current footprint.

MS FORSYTH: I'm just going to have an email provided to you. While that's done I want to ask whether or not you were requested by DEDJTR at some stage over the weekend, from Saturday onwards, to provide information about the values that sit behind the risk figures in the report, i.e. the consequences and likelihood of each risk, in other words the type of things we would see in a risk register, and whether or not the risk assessments were generic across the mines. Were you asked to provide that information by the department over the weekend in relation to the AGL mine?

MR CHADWICK: I don't recall, no.

MS FORSYTH: The email you have in front of you is a request by my solicitor to the Victorian Government Solicitors for that information. Can you just please have a look at the first page of that email and confirm that that is the nature of that request?

MR ROZEN: I will just clarify which first page is the witness being asked to look at. Are we looking at the first page chronologically or the first page of the document?

MS FORSYTH: The first page of the document, the front page.

MR CHADWICK: Yes, I can see the email.

MS FORSYTH: I tender that document. I also tender the risk management handbook that I referred to earlier and I should have done at the time.

#EXHIBIT 42 - Risk management handbook.

#EXHIBIT 43 - Emails.

MS FORSYTH: Your report doesn't set out, does it, that you

relied upon AGL Loy Yang's risk assessment and management plan?

MR CHADWICK: No.

MS FORSYTH: I take it that if you had relied upon that risk assessment and management plan it would have been set out in your report that you did do so?

MR CHADWICK: Correct.

MS FORSYTH: Just a few questions about the model itself. I want to take you to page 10 of the AGL Loy Yang report. That ends in DEDJTR reference 0015. Once again this is a question about the Monte Carlo simulation, so probably a question for Dr Bowden. The second paragraph of that report describes the basis of the Monte Carlo simulation, and then it goes on to say, "The probability distribution chosen for cost estimates is lognormal as this assumes the following conditions in relation to costs and other variables such as length, area and volume." Then the first line there says, "Costs are strongly skewed towards high values." If you had adopted a normal distribution as opposed to a lognormal distribution the results of the model would not have been so conservative?

DR BOWDEN: Yes, but you need to take into account - the selection of the distribution is a pretty important part of the whole thing because costs, for example, do not go below zero by definition. There is a middle value and there is no theoretical upper limit to costs. So it is open ended at the top. A normal distribution, which is what you are talking about, is also defined by - you can define it as a middle value and a P95 or any other probability and it will still produce a normal distribution. But when you use those in cost estimates

there are two things. What we usually know about costs is that they are limited to the left on the low side by zero and there is no real limit on the right-hand side to infinity, in theory.

MS FORSYTH: In theory.

DR BOWDEN: In theory. So in practice what happens is if you are putting in a normally distributed cost in many cases the cost on the left-hand side goes below zero. So you have to then figure out some way to do it which is to truncate it. That then becomes so it doesn't produce any values less than zero and it is a perfectly normal thing for somebody to do, if they understand the distribution. But the reason that we have used lognormal is that you don't have to do that because you don't have to make a call and you don't have to have a distribution in there that doesn't necessarily represent costs.

MS FORSYTH: But it wouldn't be unusual or difficult to adopt a normal distribution, would it?

DR BOWDEN: No, it is a choice.

MS FORSYTH: It is often standard practice?

DR BOWDEN: It is standard practice for costs in my experience to use lognormal distributions, yes.

MS FORSYTH: In relation to uncertainties in relation to costs themselves as opposed to risk, another way of dealing with uncertainty is just to put a contingency, isn't it?

DR BOWDEN: Yes.

MS FORSYTH: That's a much simpler and more transparent way of dealing with those uncertainties?

DR BOWDEN: I don't accept that.

MS FORSYTH: I want to ask you about the probabilistic cost assessment model and I want to ask you to go to a report

that's been prepared for the Board by Accent Environmental. It is document 6 in volume 1B of the court book and the Ringtail reference is EXP.0010.001.0033. Section 3.12 of this report describes the New Zealand model.

MR CHADWICK: Sorry, what page?

MS FORSYTH: Page 24 of that report, which is the DEDJTR reference 0033.

DR BOWDEN: Yes.

MS FORSYTH: Section 3.12 of that report discusses the New Zealand system for financial assurance. It has a section on probabilistic cost assessment at the bottom of the page.

DR BOWDEN: Yes, I can see that.

MS FORSYTH: What it says there is, "The New Zealand bond system incorporates probabilistic cost assessment in setting financial assurance amounts. Probabilistic assessments consider the costs uncertainties associated with different components of rehabilitation". Then there are words in practices, and then it refers to the Monte Carlo simulation. It goes on to say, "In New Zealand, the financial assurance amounts are then set by council based on the 80th percentile (and in some cases, where other beneficiaries are included, the 95 percentile, although this is understood to be changing) cost amount."

The next paragraph says, "Financial assurance amounts set in this manner factor in the risk of cost increases during rehabilitation and typically result in much higher amounts than the deterministic estimations used in most jurisdictions (including Victoria)". Would you accept that statement in that report?

DR BOWDEN: No.

MS FORSYTH: What is the basis of you to say that you don't accept that statement?

DR BOWDEN: I haven't read this report, to be fair. Deterministic estimations, you are talking about applying a contingency; is that right?

MS FORSYTH: I wasn't the author of the report either. I'm asking you whether you agree with the statement in particular - - -

DR BOWDEN: I'm assuming that that's the case, that that's what it is. If they are talking about deterministic estimation then they are talking about, in my assumption here, adding a contingency. In some cases when there is very little uncertainty the contingency that you would add, if you picked the P80 or the P95, could be much less than 5 or 10 per cent. It just depends on the uncertainty that comes into the outcome. It depends on how much uncertainty there is associated with the issue.

MS FORSYTH: But in relation to these particular mines the approach that you have taken in undertaking the probabilistic assessment is more likely to yield high values than to take a deterministic assessment based on a contingency?

DR BOWDEN: Could I just have a look at this for a second, please?

MS FORSYTH: Certainly.

DR BOWDEN: So for Loy Yang you are looking at the early closure liability costs, 221 to 256. So the percentage difference between the P50 - as a percentage difference, that is 30 out of 200; that's about 8 per cent or something.

MS FORSYTH: How did you do those maths? What are the numbers that you used to determine that?

DR BOWDEN: On page 11 of the Loy Yang Mine report, and I'm not sure how they will turn out but we will see what happens. We have the P, 50 which is the best estimate, the $221 million, and the P80 conservative but realistic estimate is 256. That represents, if you like as a contingency - I have to have a calculator. If you divide 256 by 221 you will get 1.something. Has someone got a phone?

MS FORSYTH: Wouldn't it be 221 into 256 is 0.86?

DR BOWDEN: Yes, but it is around the other way. 256 divided by 221 equals 1.15. So it is 16 per cent. That is applying a contingency of 16 per cent, effectively. That's what it is saying. If you were looking at 15 per cent, or 16, if you look at the 319 one, which is more conservative, 319 divided by 221, so that's 44 per cent. So if you selected the P95 cost estimate of 319 you would be applying a contingency on that basis above what you think the best estimate is of 44 per cent. So you can see that if you pick the P80, the contingency at 14 per cent or something, I have forgotten now what the number was, that is well within most people's contingencies which they say, and I think I have heard 15 or 20 per cent. So if there was less uncertainty associated with that cost the contingency would be proportionally less. If there was more uncertainty it would be much greater. So what this allows you to do, instead of just putting in a contingency and not knowing how conservative that contingency is, you do know how conservative your contingency is when you look at the P50

or P95.

MS FORSYTH: Yes, that exercise has been useful. You included an item for risk of having to pay for water. You were engaged by the government to do this work. Did you ask the department whether a government would be likely to withhold water to fill these mines to achieve stable water level?

MR CHADWICK: We were asked for instructions on what to assume in terms of the bulk water entitlement and the groundwater extraction licence and whether that could be used for mine closure. Our instructions were to assume that that would be the case. We put that caveat on it that the risk of that not being the case was that we would have to purchase it on the open market.

MS FORSYTH: In understanding the risk that the government would withhold water to fill these mines quickly, can I ask you what likelihood did you ascribe that risk?

MR CHADWICK: It is not withhold; it is that the risk was that to close the mine you would have to purchase that allocation on the open market.

MS FORSYTH: Yes. Bear with me, I will just check if I have any further questions. I think those are the matters. Thank you.

DR COLLINS: Gentlemen, I'm conscious of how long you have been sitting in the witness box. Just a few questions on behalf of Energy Australia, the operator of the Yallourn Mine.

Mr Chadwick, in your statement you refer to the meeting that occurred on 13 or 14 October at which a presentation was made in the presence of representatives of the mine - this is in paragraphs 16 and 18 - and you

refer to some data being provided by Energy Australia in response to a request from the department. Apart from those two matters, did any other consultation occur with Energy Australia in respect of the matters the subject of your report?

MR CHADWICK: Not from us, no.

DR COLLINS: Since the delivery of your final report on I think about 13 November, have you had any further consultation with any of the mine operators apart from the matters which our friends have addressed today?

MR CHADWICK: No.

DR COLLINS: Nothing with Energy Australia?

MR CHADWICK: No.

DR COLLINS: Yesterday Mr Wilson, a lead deputy secretary at DEDJTR, at transcript 845, lines 18 to 20, was asked about whether in his view there had been sufficient consultation between AECOM and the operator of the Loy Yang Mine, and his answer was that there had not been sufficient consultation to finish the project. Was that a sentiment with which you would agree?

MR CHADWICK: We are doing this project based on instructions from our client, so the output is based on what we are provided.

DR COLLINS: If you were asked to reach a final report with as much consultation as you considered desirable, would you then agree that that point has not yet been reached?

MR CHADWICK: My opinion is that further engagement with the mines would help. How it materially would change our numbers, that's to be seen.

DR COLLINS: But the likelihood is there would be some change as a result of better inputs coming from the operators of

the mine?

MR CHADWICK: That's right.

DR COLLINS: Can I ask you to have a look at the report in respect of my client's mine, that's exhibit 41B, the Yallourn Mine. I just have a couple of questions about the table on page 12.

MR CHADWICK: Table 2?

DR COLLINS: Yes, the table at the foot of the page that sets out the confidence levels against the various alternatives. Just take P95 by way of example. You have given an early closure liability cost of $199 million at P95, but then an end of mine life closure liability cost that's materially lower at the same level of certainty of $166 million. You explain that in the text immediately below the table by stating that the end of mine life cost estimates are materially lower because of the application of a discount factor to bring the dollars back to today's values.

MR BYRNE: Correct.

DR COLLINS: The assumption that you have made in this report is that the date for closure of the mine is 2026.

MR CHADWICK: That's right, when the MIN expires.

DR COLLINS: Yes. I just want you to assume that the evidence before this Board is that the most likely date for closure of the mine is in fact 2032, not 2026. If you were to recalculate the end of mine life closure figure based on that end date, would it come down by the same process of application of the discount factor?

MR BYRNE: It would come down, yes.

DR COLLINS: It would come down materially?

MR BYRNE: I don't know; can't tell. But with a 3 per cent

discount figure it wouldn't come down significantly. It depends what we're defining as material.

DR COLLINS: You haven't done those calculations, I take it?

MR BYRNE: No.

DR COLLINS: Thank you. Could I ask you to turn to the raw or undiscounted costs that we see for the early closure analysis at appendix B. It is the first page of appendix B. Towards the foot of the page at the second last purple heading, we see a heading "Early closure 1 domain 6 fill pit with water" and then an eye-watering amount of $77.8 million, including the sum of $66.5 million by way of raw cost to top up the water supply. The assumption that's made here is that upon the complete filling of the lake at Yallourn it will nonetheless be necessary to top up the lake in perpetuity in order to maintain its levels?

MR CHADWICK: That's correct.

DR COLLINS: You were provided, weren't you, for the purpose of preparing this report with a lake filling model report prepared by Energy Australia, I think in 2011 or 2012?

MR CHADWICK: Yes.

DR COLLINS: And with a peer review of that report prepared by the external consultants, GHD?

MR CHADWICK: That's correct.

DR COLLINS: As you note in your report, the conclusion of those analyses was that there would be a slight positive balance or equivalence after the lake was filled such that topping up would not be necessary?

MR CHADWICK: That's correct.

DR COLLINS: You have reached a different conclusion from that contained in the internal analysis by Energy Australia and in the peer reviewed report by GHD?

MR CHADWICK: No, that's slightly incorrect. I'm not debating the water balance provided by Energy Australia. Their water balance assumes that there is a certain catchment that forms that water balance. That catchment contributes to water to filling and then post closure that catchment is contributing to that water balance. What I have assumed is that catchment that's contributing to the lake body is water that's been taken out of the catchment and it's an allocation that would need to be purchased by the water authority. So, I'm not debating the water balance. I'm just saying that the cost for that water balance in terms of the catchment needs to be paid for.

DR COLLINS: Could I just ask you to have a look at page 7 of your report. Do you see in the second paragraph on page 7 you address the water balance studies that have been done by and for Energy Australia? This is the subject matter I was just asking you questions about.

MR CHADWICK: That's correct.

DR COLLINS: Then you say towards the end of that second paragraph, "An annual comparison is problematic since it does not take account of seasonal changes" and so on and then, "For this reason URS or AECOM has made a closer examination of the rainfall evaporation differential." That was the reason for my question had you reached a different conclusion from that of Energy Australia and GHD?

MR CHADWICK: We did look at it, and advice given to me within the project team, I had a hydrologist involved, was that that was his view. But when we came to modelling we did base it on the approved work plan which had their water balance.

DR COLLINS: So you reached a different conclusion as a result of internal inquiries. We don't see those internal inquiries, by the way, anywhere in this report?
MR CHADWICK: No, we don't.
DR COLLINS: So they are not available for scrutiny?
MR CHADWICK: No.
DR COLLINS: But you say, despite having different internal advice, you relied upon the Energy Australia analysis for the purpose of costing?
MR CHADWICK: We have accounted - we have assumed the approved work plan. We are just noting it in the report that there should be some uncertainty around that.
DR COLLINS: You have made an assumption, haven't you, that post the lake being completely filled it would nonetheless remain the obligation of the mine operator to pay for topping up in perpetuity?
MR CHADWICK: That allocation would need to be accounted for in closure in perpetuity.
DR COLLINS: That's the assumption you have made?
MR CHADWICK: Correct.
DR COLLINS: The assumption is in effect that the mine operator would continue to pay for the topping up of the lake in perpetuity, even after rehabilitation had been practically completed and the usage of the land had passed to different owners or community purposes.
MR CHADWICK: We are not assuming that the mine operator is doing the closure. This is a third party activity, it is part of the liability assessment. But that is part of closure and getting to a point of safely stable and part of costs, that that would need to be accounted for.
DR COLLINS: I'm sorry, I should rephrase the question. You

assumed that a cost of rehabilitation includes topping up the lake in perpetuity even after it has passed to other purposes, whatever they might be?

MR CHADWICK: No, what I'm saying is that that lake body now has a catchment, yes, and that that catchment is feeding into the lake and that that allocation in terms of feeding the lake needs to be accounted for in terms of an allocation from the water authority in perpetuity.

DR COLLINS: I'm sorry, I think we're at cross-purposes. You have called that a rehabilitation cost.

MR CHADWICK: Correct.

DR COLLINS: You accept that's a debatable proposition?

MR CHADWICK: It is what we have assumed.

DR COLLINS: Were you asked to make that assumption?

MR CHADWICK: That's what we based it on, based on the information provided.

DR COLLINS: What information provided?

MR CHADWICK: The work plan variation and our view in terms of what it would take to close the mine.

DR COLLINS: You make an assumption in appendix B that an amount will need to be allowed for lime dosing of the flooded mine void. The figure in appendix B, the raw undiscounted cost, is $5.1 million. What was the basis of that assumption?

MR BYRNE: It is not the flooded mine void. It is for the period during the void filling. So, zero cost after the void has reached final level.

DR COLLINS: Thank you. What assumption have you made for the purpose of the Yallourn report about the availability of overburden and clay from within the confines of the mine, as opposed to needing to be hauled in from longer

distances?

MR BYRNE: A similar answer to the previous questioning. We used the same rate for all three sites in terms of a $10 to $30 per cubic metre. The $10 we think is pretty close to what would be sourced on-site, given the nature of the operations to cover the batter slopes, but it does take into account the uncertainty regarding that.

DR COLLINS: Thank you. No further questions.

MR ROZEN: Just one matter in re-examination. Could we please have attachment 29 to Mr Wilson's first statement brought up on the screen and the Ringtail reference is DEDJTR.1021.001.0001 at 0004.

Perhaps for you, Mr Chadwick. You will recall that I asked you some questions about this document. It is very hard to read. We might just get that font made a little bit bigger and if we could scroll down to 4.3, please, at the bottom of the left-hand column. This is a third party costing issue. You have been asked a lot of questions, particularly by counsel for Hazelwood, about how Mr Faithful from GDF Suez thinks that certain things could be done more cheaply by GDF Suez were they doing the rehabilitation work. My question is as follows: The task that you were doing, which was assessing third party costing, means that such issues are largely irrelevant, are they not; that is, how Hazelwood would do the rehabilitation work?

MR CHADWICK: That's correct.

MR ROZEN: Because by definition they are not there when this assessment is being made.

MR CHADWICK: That's correct.

MR ROZEN: It's the government that's doing the work, the

government paying for contractors and devising methods for doing rehabilitation, et cetera?

MR CHADWICK: That's correct.

MR ROZEN: So we need to be very careful, don't we? We can't compare an apple to an orange. It's a very different scenario once we are in the realm of third party costing, is it not?

MR CHADWICK: That's correct.

MR ROZEN: No further questions. Could the panel please be excused?

CHAIRMAN: Yes, you are excused. Thank you.

<(THE WITNESSES WITHDREW)

MR ROZEN: I may I be so bold as to suggest a shorter lunch adjournment as per yesterday's arrangements? I make it five to 2. We could even perhaps go to 2.30.

CHAIRMAN: Work on 2.30 resuming. Okay.

LUNCHEON ADJOURNMENT

UPON RESUMING AT 2.30 PM:

MR ROZEN: Our last panel for this block of hearings consists of the co-authors of the Accent report and Dr Gillespie, and they are respectively Mr Michael Cramer, Dr Joel Byrnes and Dr Robert Gillespie. I formally call the three gentlemen, if they could be sworn, please.

<JOEL DAVID BYRNES, affirmed and examined:

<MICHAEL LEIGH CRAMER, affirmed and examined:

<ROBERT LINDSAY GILLESPIE, affirmed and examined:

MR ROZEN: Thanks, gentlemen. First, if I can start with you, Mr Cramer, and I apologise for mispronouncing your name a moment ago. You have provided the Inquiry with a copy of your CV?

MR CRAMER: Yes.

MR ROZEN: For our purposes it appears at EXP.0010.001.0053. Can you confirm for us, please, that you are a director of Accent Environmental?

MR CRAMER: Yes.

MR ROZEN: What does Accent Environmental do?

MR CRAMER: We undertaken environmental and social impact assessment and management services.

MR ROZEN: That's an area in which you have worked for over 20 years?

MR CRAMER: That's correct.

MR ROZEN: And by way of your qualifications you have a Bachelor of Science with Honours specialising in earth sciences from the University of Melbourne?

MR CRAMER: Yes.

MR ROZEN: A Master of Environmental Science from Monash University?

MR CRAMER: Yes.

MR ROZEN: A number of other qualifications and training and memberships which are set out in your CV. The areas of expertise that you have are set out in summary form on the first page of your CV and they are environmental and social impact assessments, rehabilitation and site closure planning, environmental auditing and due diligence, and environmental management and management systems?

MR CRAMER: That's correct.

MR ROZEN: Dr Byrnes, if I could turn to you, please. You also have been kind enough to provide us with a copy of your CV which appears at EXP.0010.001.0059. You are an associate director with Accent?

DR BYRNES: No, associate director with Marsden Jacob Associates.

MR ROZEN: I'm sorry, you're right, you're with that firm and the two firms have collaborated on the piece of work that's been provided to the Board.

DR BYRNES: Yes, that's correct.

MR ROZEN: You have a PhD from the University of New England. What's the subject of your doctorate?

DR BYRNES: It was the study of the efficiency of water utilities in New South Wales and Victoria.

MR ROZEN: You have held your current position with Marsden Jacob since March of this year?

DR BYRNES: That's correct.

MR ROZEN: Before that, have you performed a range of roles with a number of organisations that have been referred to in this hearing, AECOM, KPMG, as well as spending some time in academia?

DR BYRNES: Yes, that's correct.

MR ROZEN: In terms of your skills and expertise, you provide

infrastructure related economic and policy advice across a range of sectors, including marine, transport, energy and water?

DR BYRNES: That's correct.

MR ROZEN: Do you have much experience in relation to mines?

DR BYRNES: I have worked on a number of mine jobs, but only a handful.

MR ROZEN: It is the case, is it not, Dr Byrnes and Mr Cramer, that you jointly produced a report for this Board of Inquiry entitled "High level assessment of alternative rehabilitation financial mechanisms"?

MR CRAMER: Yes, that's correct.

MR ROZEN: That report appears at EXP.0010.001.0001. Before tendering that, are there a number of minor changes that you wish to make to the report? It is probably best addressed to you, Mr Cramer?

MR CRAMER: Yes, there are a couple of changes.

MR ROZEN: Can I perhaps draw your attention to where I think they are and you will tell me if I have missed anything.

MR CRAMER: Sure.

MR ROZEN: The page numbers, just to orient us all, the page numbers of the report are in the bottom right-hand corner, but I or other counsel may refer you to the number in the top right-hand corner which is the Inquiry's own coding, so you will just need to bear with us about that. I will try to refer to the numbers in your report. So, firstly, page 2 of the report and in the Ringtail that ends in 0011. Is there a change you wish to make about three-quarters of the way down the page?

MR CRAMER: Yes. The second last paragraph before 1.4, it should read in brackets at the end "See section 6".

MR ROZEN: So the sources of information that are being referred to are in section 6?
MR CRAMER: That's correct.
MR ROZEN: Is the next change that you wish to make to a table which appears on page 5 of the report?
MR CRAMER: A figure, yes.
MR ROZEN: A figure, I'm sorry.
MR CRAMER: Yes, the middle column of the figure should move down by one position.
MR ROZEN: I might just stop you there, because I know what you mean but others may not. Where we see the heading "Insurance policy" in a dark blue box, you would like every box in that vertical column to move towards the bottom of the page one step?
MR CRAMER: That's correct, yes.
MR ROZEN: "Insurance policy" will then be in a light blue box?
MR CRAMER: That's correct.
MR ROZEN: And instead of the words "Insurance policy" appearing in the dark blue box, you would like the following words to appear, "Surety guaranteed by third" - is that the word "third" or figure?
MR CRAMER: Yes, "third".
MR ROZEN: And then "(commercial) party"?
MR CRAMER: That's correct.
MR ROZEN: So it will read "Surety guaranteed by third (commercial) party". Then underneath that there will be a light blue box with the words "Insurance policy" in it.
MR CRAMER: That's correct.
MR ROZEN: Is the next change on page 26 of the report, page 35 of our Ringtail coding?
MR CRAMER: Yes. The first sentence of the final paragraph on

that page says, "For example, Hazelwood's 2014 annual activity and expenditure return". Instead of "Hazelwood's" it should say "Yallourn's".

MR ROZEN: Yallourn's, which we know was within that range of 46 to 91. Then there is a final very small typographical error at the top of page 34, that's page 43 of the Ringtail coding?

MR CRAMER: Yes. Instead of "quantiative" it should say "quantitative".

MR ROZEN: Thank you. With those changes, are the contents of the report true and correct, Mr Cramer?

MR CRAMER: Yes, they are.

MR ROZEN: I should also ask you, Dr Byrnes?

DR BYRNES: Yes, they are.

MR ROZEN: And to the extent that you express opinions in the report, Mr Cramer, they are opinions that are honestly held by you?

MR CRAMER: Yes, they are.

MR ROZEN: And the same for you, Dr Byrnes?

DR BYRNES: Yes, they are.

MR ROZEN: I will tender the report, together with the two CVs.

#EXHIBIT 44 - Report entitled "High level assessment of alternative rehabilitation financial mechanisms"; curriculum vitae of Mr Michael Cramer; curriculum vitae of Dr Joel Byrnes.

MR ROZEN: Dr Gillespie, you have very recently provided the Board of Inquiry with a witness statement?

DR GILLESPIE: Correct.

MR ROZEN: Attached to that witness statement is a copy of your CV. It is at attachment 1. We don't have a Ringtail coding for this document, sir, but you will see the page

number in the bottom right-hand corner, page 12. Do you see that?

DR GILLESPIE: Yes.

MR ROZEN: You can confirm for us that is a copy of your CV as attached to your statement?

DR GILLESPIE: Yes, it is.

MR ROZEN: You are the principal of Gillespie Economics?

DR GILLESPIE: Correct.

MR ROZEN: The name may suggest what it does, but can you tell us what is Gillespie Economics' business?

DR GILLESPIE: It is an environmental and resource economics practice, so it applies economic principles and methods to analyse different policies and projects.

MR ROZEN: You have too many degrees for me to go through each of them, so I will just start at the top with the PhD that was conferred by the Australian National University ultimately in 2014, and you have included the topic of your doctorate, "Valuing the environmental, social and cultural impacts of coal mining projects in New South Wales"; is that right?

DR GILLESPIE: That's correct.

MR ROZEN: Your employment history is listed immediately under your qualifications, and can I summarise that you have 12 years of experience working within the New South Wales government and over 17 as a consultant?

DR GILLESPIE: That's correct.

MR ROZEN: And in the fields of environmental and resource economics?

DR GILLESPIE: Yes.

MR ROZEN: You list your areas of expertise and experience and that's all set out in your CV; do you agree?

DR GILLESPIE: Yes.
MR ROZEN: You were engaged by Ashurst Solicitors on behalf of AGL, the operator of the Loy Yang Mine, to provide them with a statement?
DR GILLESPIE: That's correct.
MR ROZEN: Addressing the matters that are set out in a letter dated 8 December 2015, if I could just get you to look at that, please. It is attachment 2 to your statement and you will find it at page - the letter is actually not numbered, but if you go to page 19 you can see a page that says, "Attachment 2. Letter of instruction"?
DR GILLESPIE: That's correct.
MR ROZEN: If you turn over the page you will see a letter dated 8 December 2015. That sets out the scope of work that was given to you by Ashurst?
DR GILLESPIE: Yes, it does.
MR ROZEN: I note that it is addressed to yourself and Mr Drew Collins. Did Mr Collins assist you with the work?
DR GILLESPIE: Yes, he did.
MR ROZEN: Is his area of expertise different to yours?
DR GILLESPIE: We collaborate on a number of projects each year. We have a slightly different focus. He is particularly focused on market based instruments, so that's where his expertise came into play.
MR ROZEN: I see. Is there any reason why he is not also here to give evidence about the report?
DR GILLESPIE: The report at the end of the day is my report, but I used him as a sounding board to discuss some of the principles and concepts.
MR ROZEN: I see. You are quite comfortable speaking to the report, if I can use that expression.

DR GILLESPIE: Correct.
MR ROZEN: You can confirm for us that that scope of works as set out in the letter from Ashurst of 8 December 2015 is what you had regard to in producing your report?
DR GILLESPIE: It is.
MR ROZEN: I may be missing this, but it seems that you were asked eight specific questions. If you go to page 3 of the letter, down the bottom of the page in bold, there is set out eight specific questions. Do you see that?
DR GILLESPIE: Yes.
MR ROZEN: Do you say that you have answered those eight specific questions, albeit not under headings that relate specifically to the question, but the substance of it is addressed in your report?
DR GILLESPIE: Correct.
MR ROZEN: Have you had an opportunity to read through - I keep calling it a report but it is a witness statement. Have you had an opportunity to read through the statement before coming along and giving evidence today?
DR GILLESPIE: Yes, I have.
MR ROZEN: Is there anything in that you wish to change?
DR GILLESPIE: No, there's not.
MR ROZEN: The contents are true and correct?
DR GILLESPIE: They are.
MR ROZEN: And the expressions of opinion are opinions that you honestly hold?
DR GILLESPIE: I do.
MR ROZEN: I tender Dr Gillespie's statement, including his CV and a letter of instruction.
#EXHIBIT 45 - Witness statement and curriculum vitae of Dr Robert Gillespie, together with a letter of

instruction.

MR ROZEN: Mr Cramer, can I start in a somewhat unusual way by going straight to the conclusions attached to your report on page 38?

MR CRAMER: Sure.

MR ROZEN: 47 in the Ringtail. Just before I do that, the task that you were set by this Board of Inquiry was, as the title of your report suggests and as we see in the executive summary, to provide the Board with some assistance in relation to term of reference 10(c)?

MR CRAMER: That's correct.

MR ROZEN: Just to remind us all, 10(c) asks the Board "To enquire into and report on any practical, sustainable, efficient and effective alternative mechanisms to ensure rehabilitation of the mines as required by the Mineral Resources Sustainable Development Act 1990." So that was in broad terms your brief?

MR CRAMER: Yes, it was.

MR ROZEN: Then if we go to the "Conclusions" section on page 38, just over halfway down the page we see a paragraph immediately after two dot points that starts with the word "Victoria". Do you see that?

MR CRAMER: Yes.

MR ROZEN: What is written there is this: "Victoria currently has a full financial assurance system for mining projects that requires operators to provide rehabilitation bonds equal to 100 per cent of estimated liability." If I can just pause there, what's the basis for that sentence? Why do you say that is Victoria's current system?

MR CRAMER: That sentence actually comes from the relevant guidelines which are the "Establishment and management of

rehabilitation bonds for the mining and extractive industries" document.

MR ROZEN: Is that this document, "Establishment and management of rehabilitation bonds"?

MR CRAMER: Yes, it is.

MR ROZEN: You'd agree with me that the current circumstance so far as it is prevailing with the three Latrobe Valley coal mines doesn't appear to meet that description?

MR CRAMER: Yes, I'd agree.

MR ROZEN: The paragraph goes on as follows, "The State is currently implementing a performance based discount bond system, but the coal mines are deemed ineligible due to their high rehabilitation risk." I don't want to ask you about the performance based discount bond system because it seems that's been caught up in matters of politics and whether or not it represents current Victorian Government policy, but what I am interested in is this reference to the coal mines as being of "high rehabilitation risk". Firstly, do you agree with that description of the coal mines?

MR CRAMER: Do I agree that it should be the case or - - -

MR ROZEN: No, do you agree with the description of the coal mines as being of "high rehabilitation risk"?

MR CRAMER: Yes, I do. Yes.

MR ROZEN: Why do you say that?

MR CRAMER: Because I think there are a range of factors to do with the rehabilitation of the three mines that have resulted in quite a large amount of uncertainty regarding the appropriate means of rehabilitating those mines, the same factors that have caused them to be declared mines. As a result of those factors, it is not easy to quantify

the rehabilitation liability for those sites at present.

MR ROZEN: If you go back to page 26 of your report, page 35 in the Ringtail, I think you address this topic, if I'm understanding it correctly.

MR CRAMER: Yes, that's correct.

MR ROZEN: If we look at the sentence immediately under the table, it reads as follows, "It is clear from this information" - that is the information in the table - "that the rehabilitation bonds are substantially below current estimates of rehabilitation liability at each of the three sites." That's the estimates that have been made by the mines themselves?

MR CRAMER: That's based on the most recent returns by the mines, yes.

MR ROZEN: You then go on to make reference to a number of incidents that have occurred at two of the mines, that is at Yallourn and Hazelwood, in the past few years and you say they have raised concerns about geotechnical, hydrogeological and fire prevention issues. We have heard considerable evidence about that at this Inquiry. Then the report goes on, "The Yallourn Mine batter failure study led to the amendment of section 7C of the MRSD Act to provide for the Minister for Earth Resources to declare a specific mine or quarry, where there are geotechnical or hydrogeological factors within the mine or quarry that pose a significant risk to" - and then the matters that are set out in 7C are repeated, and you note that the mines are all declared under section 7C.

Then you go on, "While 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 minimise these issues. It is likely that further increases in estimated rehabilitation liability will occur as these risk factors are further investigated and resolved." Can you explain why that is so, in your view?

MR CRAMER: I think there is undoubtedly a number of factors to do with those geotechnical and hydrogeological risks that will result in a need to modify the existing rehabilitation plans for the three mines and the modifications will almost certainly, I think, cause the rehabilitation bonds or the rehabilitation liability and therefore the need for the rehabilitation bond to be increased. We had one example that was spoken about earlier to do with batter angles where there is a current assumption in the rehabilitation plans about an appropriate batter angle. If that batter angle was to be found unstable and a gentler batter angle was to be recommended, then there would be substantial costs associated with - increased costs associated with rehabilitating the mines with that gentler batter angle. There are a whole range of factors to do with aquifer depressurisation, the stability of the floor is another one, the recent emphasis on fire protection and the costs that would be associated with covering exposed faces which may not have been fully factored in to previous rehabilitation plans. All these will put pressure on the estimate of liability, likely to cause it to be increased, and therefore put pressure on the rehabilitation bond to be increased.

MR ROZEN: Dr Byrnes, is there anything you would like to add to that fairly comprehensive response to my question?
DR BYRNES: No. Maybe if it helps if I identify the section of the report that I authored?
MR ROZEN: Yes, of course. Please do.
DR BYRNES: So I was the author of section 2.2.
MR ROZEN: Which we find on page?
DR BYRNES: Page 4.
MR ROZEN: Page 4 of the report, page 13 of the Ringtail. That includes the table that that amendment was made to and lists the various alternative financial mechanisms that are available.
DR BYRNES: Yes, that's the element of this report that I was responsible for. Every other facet to do with engineering and schemes, Mr Cramer is far more the expert.
MR ROZEN: Thank you very much for that clarification. I perhaps should have asked you that earlier. Mr Cramer, if I can just come back to you on this topic of high risk and what that means in your report. If I can ask you to look at page 33 of the report, which is page 42 in the Ringtail coding. Do you see the heading "4.3.3 Unplanned post closure costs"? Do you have that, Mr Cramer?
MR CRAMER: Yes, I do.
MR ROZEN: That's on a similar theme, is it not?
MR CRAMER: Yes, it is.
MR ROZEN: About unplanned risks, I guess, and associated costs. I just want to ask you about the third paragraph there, "The period remaining before the closure of the Latrobe Valley coal mines provides an opportunity for research and rehabilitation trials to be undertaken to better understand and mitigate key closure risk factors,

such as the long-term stability of post closure landforms. Such research could reduce the risk of significant, unplanned post closure costs to the extent that financial assurance for unplanned events is not required." Could you expand on that, please?

MR CRAMER: Yes. It is very important when undertaking rehabilitation closure planning at a mine that it is undertaken progressively during the life of the project because that allows the project proponent to essentially trial the rehabilitation that they're proposing to undertake as they go and it obviously allows them to make adjustments along the way and refine that rehabilitation process. So, in the current situation where there are a lot of unknowns about the appropriate means of rehabilitation, it is very important that the remaining mine life of those projects is used to undertake the research and investigation that's required to refine the rehabilitation plan and reduce the risk to the proponent and to the State and to the community of unplanned future events or costs exceeding estimations.

MR ROZEN: It is conceivable, is it not, that in that process of what might be called progressive rehabilitation that a better understanding of what sort of financial assurances are necessary to protect the State ultimately will emerge, but in an evolving way, potentially?

MR CRAMER: That's exactly right. The concept of mine closure planning allows for that. At the commencement of a mining project there is uncertainty about how to close the mine. Cost estimations at that stage generally have wider margins of error. But, as you progress during the mining project, you get a clearer idea of what the final mine

configuration will look like. You are able to undertake rehabilitation trials and investigations along the way and you are able to refine that estimate progressively until you approach the actual preclosure period where you are doing the detailed planning and get a much better idea of the actual liability and the rehabilitation bond can reflect that. Sometimes the bond will start higher and get lower as assumptions become more accurate. In this case they may get higher, the rehabilitation bond may increase, but towards the end of the project may again reduce with greater certainty about how to rehabilitate.

MR ROZEN: So, the pattern that's been followed at least to date here doesn't quite fit what might be thought of as that sort of normal model where the bond starts high and is progressively reduced?

MR CRAMER: That's right. You normally start with conservative assumptions and then refine them.

MR ROZEN: Yes. One of the issues the Board is interested in is the extent to which linkages can be built between the financial assurance mechanism and getting answers to those uncertainties. Do you have a view on how, based on your experience by a method of perhaps some discounting or other mechanisms, the bond mechanism can be used as a type of lever to encourage investment in research and so on? Do you understand the question?

MR CRAMER: Yes, I do. There is an issue, because one of the main purposes of rehabilitation bonds and financial assurance in general is to encourage progressive rehabilitation because the theory is you rehabilitate, reduce your liability and then your bond reduces. But for a range of factors that is often not a strong

administrative tool by the regulators to encourage progressive rehabilitation, because even with that advantage of getting the bond down, mines may still - it may be in their financial benefit to delay rehabilitation, to undertake it later rather than earlier. But things such as offering a discount in a rehabilitation bond, that is a way to encourage further rehabilitation.

MR ROZEN: It might be part of a broader array of regulatory mechanisms.

MR CRAMER: I think it requires probably greater regulatory pressure. In other words, I don't think the carrot works effectively by itself in a lot of cases and sometimes the stick is needed as well.

MR ROZEN: Perhaps together.

MR CRAMER: Together, yes.

MR ROZEN: Dr Gillespie, can I bring you in here because, as I read your statement, you consider a different type of risk, that is the risk of default. Am I right? You don't really address the sort of rehabilitation risks that Mr Cramer is talking about. Your attention is directed to risk in the sense of what risk there is to the State of being left holding the baby, if I can put it that way.

DR GILLESPIE: There is a lot of the use of the word "risk" in this forum and I think a lot of people are using it differently. "Risk" as it applies to this issue in my mind and "risk" normally is considered a combination of consequence and likelihood. We have heard this morning consequence and likelihood talked about just in relation to the rehabilitation liability, so in a very narrow focus just on how much the rehabilitation costs might be. But really "risk" in this issue is risk and consequence; the

consequence is the rehabilitation liability, how much it's going to cost to rehabilitate. Liability is what's the probability of the government being left with that cost. Those two components are very important to assessing the "risk" faced by government. Most of the focus that I have seen is on the consequence, i.e. the size of the rehabilitation costs.

Rather than whether it is likely to - - -

DR GILLESPIE: So, if you have a very, very low probability of a default as in very low probability of a mine operator walking away and leaving the government with the cost, then the "risk" which is the product of consequence and likelihood becomes very, very low.

MR ROZEN: Can I take you, please, Dr Gillespie, to table 2 in your statement on page 10. I'm correct, aren't I, that this is a table which is an adaption of a table in the witness statement of Mr Rieniets?

DR GILLESPIE: That's correct.

MR ROZEN: So if we look at the vertical columns from left to right, the left-hand column being the years, the second column rehabilitation liability, those figures are drawn directly from Mr Rieniets?

DR GILLESPIE: They are.

MR ROZEN: The next two columns are also drawn directly from Mr Rieniets under the heading "Likelihood of closure"?

DR GILLESPIE: They are.

MR ROZEN: Mr Rieniets was asked some questions about this, and I will ask you. On what possible basis could you assess the probability of the Loy Yang Mine closing in 2028 with the precision that we see here, that there is an 8.6 per cent chance of it closing? That's not seriously

put forward as your opinion, is it?

DR GILLESPIE: No, as you said, this is an adaption of Mr Rieniets' table, so I have taken the probability of closure as a given. What this table is doing is illustrating how you apply risk principles to this issue. What it is particularly showing is that the closure is only one step in a potential default in paying the rehabilitation costs. So, there needs to be a number of subsequent steps that occur for the government to be left with the cost. They include the likelihood of the mining company basically being insolvent or wilfully not paying the rehabilitation cost. It has to include things like the probability of not being able to recover the funds from some other legal recourse. In normal risk management assessment or risk assessment to determine the likelihood of an event arising, one has to multiply the probabilities of the sequence of risk steps that have to occur for that consequence to occur. So this table is just demonstrating that principle; the numbers are artificial.

MR ROZEN: We take the numbers with a grain of salt, do we?

DR GILLESPIE: Correct.

MR ROZEN: You have just accepted what Mr Rieniets has come up with, essentially, and then built on that by applying your methodology?

DR GILLESPIE: Correct.

MR ROZEN: One last question for you, Dr Gillespie. Can I draw your attention to paragraphs 64 and 65 on page 7?

DR GILLESPIE: Yes.

MR ROZEN: What you are saying at 64 is that risk management principles, if they are to be applied by a regulator to determine the likelihood of default - to use that generic

expression - necessarily has to be done on an individual assessment of each operator to identify potential risks.

DR GILLESPIE: Yes, risks will vary from mine to mine.

MR ROZEN: You accept that those risks might be internal to the company, its balance sheet and such matters, external to the company but close as in parent company arrangements, but they could be things as broad as the potential for changes to government policy, for example, that could impact on the likelihood of a mine closing; do you agree?

DR GILLESPIE: Correct.

MR ROZEN: So, future Australian government policy to give effect to the agreement in Paris on the weekend could potentially impact on each of the viability of these three coal mines, could it not?

DR GILLESPIE: That might be one step in a sequence of risk events that would have to happen to impact the viability on these mines. So that might be a first step.

MR ROZEN: Yes, but assessing the likelihood of that first step is a difficult thing for a regulator to do in many cases, is it not?

DR GILLESPIE: To be precise, certainly. But conceptually, as we heard this morning, the normal approach to risk assessment is to get a group of people in a room. It's basically a discussion approach to working out relative risk.

MR ROZEN: You accept, don't you, that as you say in paragraph 65, that this individualised approach potentially can have higher administrative costs for the regulator than a straight bond approach?

DR GILLESPIE: Correct.

MR ROZEN: It can also require the regulator to have either

in-house or access to expertise that a mining regulator might not normally have?

DR GILLESPIE: Perhaps, yes.

MR ROZEN: At the end of the day, as I understand your statement, Dr Gillespie, you say that whilst those things may be the case, you have to weigh it all in the mix and you need to have an equitable arrangement that makes realistic assessments of risk in the setting of bonds or other financial assurances?

DR GILLESPIE: Correct. You need to weigh up the costs and the benefits of the intervention.

MR ROZEN: Costs and benefits for both the State and for the mines?

DR GILLESPIE: Correct.

MR ROZEN: Thank you. They are the questions that I have for the panel, sir. If you stay there, gentlemen, there will be other counsel who will have questions for you.

MS DOYLE: Mr Cramer, I will take you also to the conclusions to your report as a starting point to asking a couple of questions arising from that. It is page 39 of the Accent Environmental report. You have been taken to a couple of these passages. My questions focus on some of the same passages, but with a different focus in terms of the question. You were taken to the passage that starts, "The greater the gap", do you see that paragraph there?

MR CRAMER: Yes.

MS DOYLE: "Between the rehabilitation bond and the rehabilitation liability, the greater the risk taken on by the State." Just pausing there, do you agree with Dr Gillespie that really that is tending to conflate cost or consequence with risk?

MR CRAMER: It is true for a given mine that the greater the gap between the rehabilitation liability and the rehabilitation bond, the greater the risk. For different mines, the same gap would not result in the same risk because some mines are inherently at greater risk of going into receivership, as Dr Gillespie is saying. So I agree with that point.

MS DOYLE: So you do agree that the process of assessing the risk, namely the question whether there is likely to be a default, and you have given one way in which that might occur, receivership, that that is something that needs to be undertaken on a site specific basis?

MR CRAMER: Ideally, yes.

MS DOYLE: The next question I'm going to ask then perhaps is best addressed by both you and Dr Gillespie. Do you both agree that in conducting a risk assessment in this context there are some factors that one might have regard to that are generic, in other words that would apply equally to all three mines that are at issue in these proceedings? First of all, you, Mr Cramer?

MR CRAMER: I'm not sure if I would say that. Certainly there are common risks at play with each of the three mines. Whether they translate into the same level of risk, I think you need to - - -

MS DOYLE: I'm not saying they would have the same outcome. Perhaps I will ask the question all in one go. There are some that will be common across the mines and some that will be specific and each will generate a different answer. Would you agree with that?

MR CRAMER: Yes, I would agree with that.

MS DOYLE: And you, Dr Gillespie?

DR GILLESPIE: I would.
MS DOYLE: When assessing the likelihood of this risk occurring, and I will stick with your example, Mr Cramer, of a mine closing in circumstances where the operator has gone into receivership, would it be relevant to take into account whether there are any documented cases of that having occurred in the past in relation to similar mines, say a brown coal mine of a large size in Australia?
MR CRAMER: I think it would, but I think industry wide looking beyond just coal mining, for the mining industry as a whole it is far more common for a mine to close ahead of its expected mine life than it is to reach its expected mine life and then close. So, mines more often than not will close before their predicted mine life has been reached.
MS DOYLE: Would it be important in that context to know whether any closure, if you were looking at a historical survey, whether any closure was planned and controlled or unplanned in a walk away mode?
MR CRAMER: Yes, it makes all the difference. It can close early and be planned and there is no issue, or it can close early because of unforeseen circumstances that have caused financial hardship and then there is an issue.
MS DOYLE: We have talked about the broad. Would it not also be important to consider the past conduct and the mode of operating its business of the particular mine you are assessing? First you, Mr Cramer, and then Dr Gillespie.
MR CRAMER: In what context? Setting the bond, do you mean?
MS DOYLE: In assessing the risk, the likelihood of the risk crystallising. Each time I ask that, I mean the likelihood of the operator walking away and defaulting on

its rehabilitation liability.

MR CRAMER: If you can repeat the question then?

MS DOYLE: Would it be relevant in assessing the likelihood of that risk occurring to consider the past conduct of the specific operator of the mine?

MR CRAMER: Yes, it would.

MS DOYLE: Dr Gillespie, would you agree?

DR GILLESPIE: Yes.

MS DOYLE: You have each been asked some questions about progressive rehabilitation or rehabilitation done during the life of the mine. Is it relevant to look at an operator's track record in that regard perhaps for at least two reasons: one, it might show that if someone has been doing it you can draw the inference they will continue to do it; secondly, in a real sense it means the size of the task left to be done has been diminished in some respect?

MR CRAMER: Yes.

MS DOYLE: I'll take you each in turn. Do you agree that's why that might be a relevant criterion?

MR CRAMER: Yes.

MS DOYLE: Do you agree, Dr Gillespie?

DR GILLESPIE: Yes.

MS DOYLE: Would it also be relevant to consider, and I'm still asking all of these questions under the umbrella question: In assessing the likelihood of the risk of default crystallising, would it be relevant to have regard to the degree of financial stability of the particular mine operator?

MR CRAMER: Yes, it would.

MS DOYLE: Do you agree, Dr Gillespie?

DR GILLESPIE: Yes.

MS DOYLE: Would it be relevant - I think you will agree with this because of an example Mr Rozen put to you. I take it you both agree it would be relevant to consider the product or service that the operator of the mine is delivering and whether or not there is an extant market for it?

MR CRAMER: Yes.

DR GILLESPIE: Yes.

MS DOYLE: In the context of going back to progressive rehabilitation which I asked about a moment ago, you at least, Mr Cramer, have had the opportunity to express your view about how the bond system might provide an enticement or an incentive to undertake it. You said the carrot alone may not work. Perhaps I will ask you, Dr Gillespie. If a goal of the bond system is to promote adherence to progressive rehabilitation targets, from your perspective what are the economic levers or instruments that might advance that goal or promote that goal?

DR GILLESPIE: I would probably say that a bond is not primarily designed to encourage progressive rehabilitation. The primary goal of a bond is to deal with closure costs when they occur, if the mining company defaults, and that they provide only a weak incentive for progressive rehabilitation. In my witness statement I refer to something called the Tinbergen's principle, Tinbergen being a Dutch economist who has done a lot of work with market based instruments. Basically his view, which is adopted by most authors who write in this space, is that if you have, for example, three objectives that you are trying to achieve, you need at least three

instruments or methods of achieving them, that it is counterproductive to rely on one instrument to achieve multiple goals. So, I would say that in regards to progressive rehabilitation that's not the main game of environmental bonds, although it can offer some incentive for progressive rehabilitation. But if that is your focus, then some alternative approach is required. We have heard, I think it was this morning or yesterday, that there are lots of other regulatory levers that can be pushed to encourage progressive rehabilitation that are separate to a bond.

MS DOYLE: Is one of the reasons why the current bond system is not likely to provide a good lever with respect to progressive rehabilitation that it is a blunt instrument, if I can put it that way, it is an amount that is locked away or put away? Could some modification to the bond system, either a stepped increase or an entitlement to a discount, provide the sort of economic lever that might encourage progressive rehabilitation?

DR GILLESPIE: It might, but again it all comes down to the relative costs and benefits of a bond discount compared to the costs of actually doing the progressive rehabilitation.

MS DOYLE: Is that an example of a transactional cost in the sense that if there were the entitlement to access bond discounts and if that needed to have a suite of criteria that would enliven your right to a discount, there would be costs associated with setting up the system that would review and regulate that?

DR GILLESPIE: That is true, but I was actually thinking more in terms of there would be - for any bond discount there's

a benefit to the mining company from not having to pay the fees associated with it and the opportunity cost on borrowings that it imposes. But to get that gain from a reduced discount you do the actual rehabilitation cost which also has a cost to the company. So, it is a relative cost and benefit story to the company. I think it is the KPMG report, although it may also be in the Accent report, that says that that cost benefit equation may not be a strong incentive.

MS DOYLE: It may be then that the traditional regulatory modes, those to which you have made a passing reference, Dr Gillespie, remain the best levers and those are - I'm not going to track them through in detail - essentially conditions attached to a mining licence that in turn refers back to some sanctions under the Act.

DR GILLESPIE: That would be my view.

MS DOYLE: One of the things you say early in your paper, Dr Gillespie, is that bonds are not apt or don't well address the risk of low probability, high consequence events. Can you just explain the economic principles or the efficiency principles that drive you to that conclusion?

DR GILLESPIE: What I was thinking of there was things like catastrophic mine fires and those types of events. Bonds aren't designed to deal with those. They are designed to deal with sort of planned closure costs that don't get carried through. To deal with sort of low probability events, I'm not sure what you'd use, but there's things in New South Wales, mine rescue levies, which are sort of low probability events that still need the costs covered and they are dealt with through levies and other alternative

approaches.

MS DOYLE: Can I go back to you for a moment, Mr Cramer, back to page (iii) in the executive summary of your report and you were also taken to this passage by Mr Rozen. The second to last main paragraph says, "Victoria currently has" and you were asked some questions about whether that is reflective of the current system. The second sentence says, "The State is currently implementing a performance based discount bond system, but the coal mines are deemed ineligible due to their high rehabilitation risk." Just as the first sentence came from the State's publications on this question, is it the case that that second sentence is drawn from the State's literature?

MR CRAMER: That's correct, yes.

MS DOYLE: You yourself haven't undertaken a risk assessment of any particular mine in order to ascertain whether it constitutes a high rehabilitation risk in the sense we have been discussing, namely a high probability that it will default?

MR CRAMER: No. No formal risk assessment.

MS DOYLE: Have you ever seen such a risk assessment undertaken by the State with respect to the probability of that event occurring?

MR CRAMER: No, I haven't.

MS DOYLE: I think one of the documents provided to you - there was a long list of things provided to you for the purposes of preparing your report - but one of them was the KPMG 2011 report. Do you recall looking at that?

MR CRAMER: Yes, I do.

MS DOYLE: And the 10 principles suggested by KPMG for devising a bond policy have received some attention in the evidence

in these proceedings. Do you recall those in broad terms, that there were 10 principles set out earlier in the report?

MR CRAMER: Yes, we refer to those in 2.1.

MS DOYLE: You have set them out. You will recall that the first principle that KPMG enunciated was that the system should reflect the fact that a rehabilitation failure rate of 100 per cent is unlikely?

MR CRAMER: Yes.

MS DOYLE: Are you aware that, although the details of the dataset that KPMG had regard to aren't set out in full in their report, it seems KPMG were given some historical data which enabled them to conclude that the failure rate of 100 per cent was unlikely?

MR CRAMER: I'm not aware of what KPMG were given or not given. I agree that the 100 per cent failure rate is unlikely. Mines occasionally do fail, but they generally don't.

MS DOYLE: I think the Accent report refers to this in passing, but it is perhaps more the domain of you, Dr Gillespie. One of the things you have mentioned in your report, and also this afternoon, is the opportunity cost of obtaining or paying for the credit costs associated with a bank guarantee. Your indication in your report is that the cost of that to any individual mine operator might range between 0.5 per cent to 5 per cent of the value of the guarantee itself?

DR GILLESPIE: That's what's in my report, yes.

MS DOYLE: You characterise that as an opportunity cost in circumstances where I think part of your answer earlier was that any mine operator, you would think, would look at that cost and weigh it against the cost of the progressive

rehabilitation target for that year and other costs that it has to take into account?

DR GILLESPIE: Yes, that's right. There are two sets of costs that accrue to mining companies. One would be the cost of the fee on the bond, which is 0.5 to 5 per cent. I'm just quoting from somewhere else on those numbers.

MS DOYLE: It will always lie in the hand of the bank or whatever financial institution is approached.

DR GILLESPIE: Correct. The second is the opportunity cost of the guarantee itself, in terms of reduced ability to borrow. There is an opportunity cost associated with that.

MS DOYLE: Yes, and some commentators - I'm not sure if you had regard to the KPMG paper as well - but commentators including KPMG have suggested that one flaw in the bond system is that on one view it requires the mine operator to pay the money twice, in the sense that you may have hundreds of thousands or millions of dollars tied up paying for the bank guarantee and that may very well be money that could have been spent that year on progressive rehabilitation. Do you agree with that? It is a simple analysis, but do you agree that could be the case?

DR GILLESPIE: I would agree with that.

MS DOYLE: Could I ask both of you - this is stepping back a bit to consider the scenario of early closure. I think you may have already in part answered this, Mr Cramer. Do you agree that there can be circumstances where a mine's plan or a mine's licence might suggest an end date of 2026, but nevertheless in planned and managed circumstances that date could be brought forward and all rehabilitation tasks and liabilities could be met by the

operator nonetheless?

MR CRAMER: Yes, that's commonly the occurrence.

MS DOYLE: One situation in which that might occur is precisely the hypothetical Mr Rozen put to you, namely a change in government policy leading to a series of changes along the path that might include changes to demand, but there might therefore be an earlier closure, but nevertheless one that ticks all the rehabilitation boxes?

MR CRAMER: Yes.

MS DOYLE: In those circumstances, the costs of rehabilitation might go up and they might go down, but they will still be met by the operator and so no risk to the State.

MR CRAMER: If they are met by the operator, yes, no risk to the State.

MS DOYLE: Yes. I take it, Dr Gillespie, from what you have said in your report, including in particular paragraph 58, you have also considered the question of early closure and you would suggest that, in circumstances where one is assessing the impact of that occurring, you still need to go through the links in the chain in your chart, look at the likelihood of it ever occurring, and then multiply that out by a series of links in a chain. In the circumstance or the hypothetical I have put forward, an early but planned and managed closure, what does that do to the risk profile for the State?

DR GILLESPIE: An early closure, we have some example probabilities of early closure in each year in the table 2 example. The second one is that there is insolvency. The probability in that second step would go to approximate zero. The next one, failure to recover liability, would go to some approximation of zero. So, zero times zero

times 28 per cent likelihood of early closure gives you a number close to zero. So that's the likelihood of a default occurring. In a risk assessment approach you would have to multiply that by the consequence, whatever that may be, but if you multiply any number by something approximating zero, it approximates zero. So, what that would mean is that there is a very small probability of the government wearing that liability and therefore, in an assessment of the costs and benefits of a bond in that particular example, there is not very much in the way of benefits, but there is a lot in the way of costs. So from an economic efficiency perspective that's sort of a net loss, if you like, to society or to the community.

MS DOYLE: Is that for reasons including money that's been tied up paying for the bank guarantee during that period of time has not been deployed either to progressive rehabilitation or research in relation to rehabilitation?

DR GILLESPIE: It is just the opportunity cost value of that money which is just reflected in its actual value, but it could potentially be used for those other things, but that doesn't change its opportunity cost. It is just that there are costs borne of having a bond by industry and there may or may not be much in the way of a reduction in risk in its true definition which is consequence times liability.

MS DOYLE: One last question, and I think it is planned to have a break at about this time. So the last question just goes back to the issues pertaining to how would one be eligible for a bond discount? I should have taken you, Dr Gillespie, to paragraph 72 of your report in that context. You suggest there that even when looking at

eligibility to entitlement to some species of discount, even in that domain one should use risk assessment principles in order to ascertain whether one would be eligible to take advantage of a discount. Could you just give us an example of how you would see that happening? Perhaps give an example of a criterion that entitles you to the discount and then how you apply risk assessment?

DR GILLESPIE: The criterion feed into the assessment of likelihood, basically. So we know from the bond calculator or alternative methods that we heard of this afternoon about ways of assessing the consequence or the rehabilitation costs, and there is some debate around the fringes of whether it is 200 or 150 million or whatever. But the second component would be to go, "What's the risk of default and the government having to pick up the consequence?" The things that factor in are what we said before, which is the early closure, but then the second thing, the big one, is really the risk of insolvency which has all those factors inherent in it as in the structure of the company, its financial position, whether there's been any examples of that company in the past not dealing with its liabilities, issues around the nature of the mine and what it's actually supplying, whether it is subject to rapid changes in commodity prices or whether it is some other sort of demand. All those sort of things would factor into the risk of insolvency, and then the subsequent risk factors - I shouldn't say risk factors - the subsequent likelihood factors that one would have to consider as well, which is things like, "Let's say all that did happen, does that mean 100 per cent likelihood that the government can't recover the money through other

legal mechanisms, through director liability and all those sorts of things?" So, all those things need to feature in an assessment of risk. If it were deemed that when you do that analysis that you get to the zero times zero times 300 million thing, then you could argue that in that situation for that particular mine they might not have to have the full bond because there is low risk.

MS DOYLE: To use an example closer to home, is it analogous to this situation: When landlords, for example, ask for a bond to be put up, they don't ask for the bond to replicate the entire period of the lease. There is some portion of that chosen, a month's rent or two month's rent, because in a back of the envelope way a risk assessment has been conducted of what the likely cost might be of dealing with any issues if the lease is broken or if there is anything damaged.

DR GILLESPIE: Yes, perhaps. The bond really should reflect a year by year expected value of the liability to be borne by the government. So year by year there's some cost, there is some consequence, I should say, there is some likelihood, whatever that may be, of default and that may go up and down. We saw the consequence part of that equation can go up and down. The likelihood of default probably is a lot more stable, but the multiplication of those two, it would go up or down. So, if you are doing a risk based approach, that's how you would calculate the annual bond. It wouldn't be the liability of the entire operation; it would be the liability for that particular year.

MS DOYLE: I just noticed one thing before I sit down. In paragraph 74, you did note there in the context of

discounts it is not obvious why there would be a maximum of 25 per cent discount. I don't know myself whether there is any magic in the number, but from an economic principle perspective or seeing it through that prism, is there any reason why one would posit a ceiling or a maximum discount if there were a discount system?

DR GILLESPIE: No reason.

MS DOYLE: I have no further questions for the panel and I understand from Mr Rozen it is intended to have a short break.

CHAIRMAN: Can I just check as to approximate times of others? Dr Collins?

DR COLLINS: We have no questions.

CHAIRMAN: Ms Forsyth?

MS FORSYTH: I have very few, given the questions by Ms Doyle.

CHAIRMAN: Ms Nichols?

MS NICHOLS: About fifteen minutes.

CHAIRMAN: The verdict from the man that really matters because of his particular problem that I am concerned about says keep going. Are you happy with that, Mr Rozen?

MR ROZEN: At the risk of sounding paternalistic towards the man that really matters, I think we should have a break.

CHAIRMAN: All right, we will take a break.

(Short adjournment.)

MS FORSYTH: Dr Gillespie, were you asked about paragraph 65 of your witness statement which is Ringtail AGL.0001.006.0007. You were taken to the first part of that paragraph which talks about the fact that an individualised approach will also have higher administration costs. You go on to discuss that issue in more detail. Can you just please explain what you mean by

the following sentences in that paragraph?

DR GILLESPIE: There is transaction costs associated with an individualised risk based approach, but for larger mining operations it's likely that the benefits as in reductions, if you get reductions in bonds as you assess the liability going forward, as things change, that the reduction is more likely to outweigh the increased administration cost. That may not be the case for very small mining operations, so I guess the cost benefit story is more likely to hold for annual risk reviews and risk assessments based on large mines.

MS FORSYTH: Is that concept also taken up at paragraph 76 of your witness statement where you are discussing flexibility to use alternative assurance mechanisms and you say in the last sentence, "However, the cost savings to large operations of alternative mechanisms may be large enough to offset any additional transactions costs associated with an individual review of alternative mechanisms."?

DR GILLESPIE: It is exactly the same principle.

MS FORSYTH: Mr Cramer, you acknowledge at page 31 of your report that a trust fund such as the Loy Yang complex agreement sits towards the secure end of the spectrum of risk?

MR CRAMER: Yes.

MS FORSYTH: Back to you, Dr Gillespie. Can you please explain what the economic efficiency implications are of taking a very conservative approach to rehabilitation liability assessments such as the P95 confidence levels that were discussed this morning?

DR GILLESPIE: P95 confidence levels affects the consequence

calculation. So, if a bond were to be held for 100 per cent of the liability, then there would be an increased bond fee for a mining company. There would also be increased opportunity costs of reductions in borrowing capabilities. So it would have the effect of increasing the cost to industry, whereas one has to still think of what is the benefit to government in terms of that risk framework which is consequence times likelihood.

MS FORSYTH: They are my questions. Thank you.

CHAIRMAN: Dr Collins?

DR COLLINS: Nothing from me.

MS NICHOLS: Dr Gillespie, I have a few questions for you to start with. I just want to ask you about what you discuss at paragraph 16 of your statement. Do you have that there? You mention that, "A bond system that reflects risk management principles would be more economically efficient as the costs to industry would reflect the expected costs of rehabilitation default." You go on at paragraph 17 to say, "However, there is a trade-off for government in that should the risks of rehabilitation default (that are low probability) actually eventuate, then the government would not have sufficient money in bonds to recover the costs of rehabilitation."

In your model what you are really doing is balancing off, on the one hand of the ledger, the benefits to the State in having rehabilitation risk covered and, on the other hand of the ledger, the costs to the industry in providing that security; that's right, isn't it?

DR GILLESPIE: The trade-offs between the risk based avoided cost to government and the cost to industry of holding a bond. So that's the cost benefit trade-off. But the

interesting quirk of that is you could still have a situation where there's very little benefit from an economic point of view accruing from holding the bond for government because the probability of default is very, very, very, low. But if that very, very, very low probability actually did happen at some point in time, then there would not be sufficient bond to make that rehabilitation occur.

MS NICHOLS: Indeed. I think we understand that. But my simple question is you have public interests on one side of the ledger and private interests on the other, haven't you?

DR GILLESPIE: Perhaps that's one way of categorising it. Economics doesn't distinguish that greatly between the two.

MS NICHOLS: But other aspects of policy making do, don't they?

DR GILLESPIE: Economics is about costs and benefits.

MS NICHOLS: Yes. I'm really seeking to put your analysis in context and I appreciate you are an economist and that's your level of expertise. Nevertheless, this is an Inquiry into public policy and, as you acknowledge in your report, correctly, at 20, economic efficiency and equity are two goals of public policy. You accept that, don't you?

DR GILLESPIE: Absolutely.

MS NICHOLS: And you say informatively at paragraph 23 that, "While economics can provide information on how impacts are distributed, it provides no guidance on whether one distribution of wealth is superior to an alternative distribution of wealth, and that is generally left to decision makers."

DR GILLESPIE: Correct.

MS NICHOLS: So the analysis that you have undertaken is the economic efficiency one. But you would accept that there may well be other values that come into public policy making in this area?

DR GILLESPIE: Absolutely.

MS NICHOLS: One example might be the value expressed in this way: that a licence to extract minerals carries with it a social licence that the State grants on behalf of the community to permit the licensee to profit from disturbing the land in a way that affects the landscape and the community and that, as a result, the licensee is to restore the land at no or negligible cost to the State. That's an example of a value which is expressing something other than economic efficiency, isn't it?

DR GILLESPIE: Sure.

MS NICHOLS: It may be that in policy making in this area a regulator might say, "Well, there are other values which either determine the policy or which will ameliorate the extent to which efficiency considerations are taken into account." That's correct, isn't it?

DR GILLESPIE: That's correct. I would say that other objectives can override economic efficiency, but one should always be mindful of what the costs are.

MS NICHOLS: Of course. So the ultimate question about the relative place in the value system of economic efficiency is one that itself is a value judgement.

DR GILLESPIE: Correct.

MS NICHOLS: Can I ask you about some of the considerations you have taken into account in relation to the efficiency considerations. You agreed with Mr Rozen before that one would need to take into account transaction costs of

monitoring risk if the government were to accept anything less than 100 per cent financial assurance. That's not controversial, is it?

DR GILLESPIE: Can you say it one more time for me?

MS NICHOLS: If a model were to be accepted where less than 100 per cent financial assurance was obtained so that there was some risk, however low, the government would necessarily incur transaction costs in monitoring and assessing that risk. You agreed with Mr Rozen that that was the case, didn't you?

DR GILLESPIE: I don't actually recall agreeing to that specific thing. But there would be monitoring costs. Whether they would change between an undiscounted or discounted model is not for me to say.

MS NICHOLS: But if you were building a full economic model about the relative risks and benefits, one item you would need to include and assess on proper data would be transaction costs?

DR GILLESPIE: Yes.

MS NICHOLS: Your simple model that you have produced doesn't actually do that because you don't have the data at present to do that, do you?

DR GILLESPIE: No, it didn't include transaction costs.

MS NICHOLS: What about the opportunity costs for government in relation to the risk that it will need to cover rehabilitation costs and it needs to spend those funds on rehabilitation that it would otherwise have spent on other priorities, education, health and so on? How do you factor those in economically?

DR GILLESPIE: The cost potentially borne by government is just the risk. It's the consequence times by the likelihood.

So the value of rehabilitation reflects the opportunity costs. It's the same thing.

MS NICHOLS: Yes, but your consequence in your analysis is limited to the payment of the rehabilitation costs in the event that that risk arises. My question really is if you look at the economic considerations a bit more holistically, how do you deal with the fact that if government in fact has to pay for rehabilitation it will divert funds it would otherwise have spent that might have had other positive economic implications on to rehabilitation liability? How do you account for that?

DR GILLESPIE: It is still the same thing. Money is money. So the rehabilitation cost reflects its opportunity cost in other activities.

MS NICHOLS: So you would have to factor in an opportunity cost for government in using funds expended on rehabilitation liability?

DR GILLESPIE: It is just the same thing. It is the dollar value of the rehabilitation.

MS NICHOLS: Yes, and you could calculate the opportunity cost of having spent that.

DR GILLESPIE: That is the opportunity cost.

MS NICHOLS: What about the cost of government having to provision for that amount of money? Let's assume it was a very large amount of money, not quite in the order of magnitude in your table, but larger. What about the opportunity cost of government having to at least notionally set aside funds to cover that risk?

DR GILLESPIE: I don't know whether they would do that. Would you put money aside for a one in - it depends on the likelihood, of course - but would you put money aside for

a one in 1,000-year event?

MS NICHOLS: I don't think either you or I can answer that question. But my question is really at the level of principle. If there was a need for a provision on the government's side of the ledger, a full economic model would need to take that into account, wouldn't it?

DR GILLESPIE: Sure, to the extent that it exists, maybe. I don't see it as part of the equation, to tell you the truth.

MS NICHOLS: But opportunity costs are not just one-sided, are they?

DR GILLESPIE: No.

MS NICHOLS: You accept that. All right. Can I ask you a bit about risk factors and Ms Doyle asked you a question before and she said would one of the risk factors be or the positive considerations relevant to assessing the level of risk be whether there was an extant market for the product under consideration, and you said "Yes", and I think, Mr Cramer, you agreed with that. It would also be relevant, though, wouldn't it, to consider likely or possible changes to that market? That's correct, isn't it?

DR GILLESPIE: Sure.

MS NICHOLS: Mr Cramer, do you agree with that?

MR CRAMER: Yes.

MS NICHOLS: You were asked another question by Ms Doyle, Dr Gillespie, about planned and managed closure. What was put to you was if closure was planned and managed, how would that alter the risk, in substance? Dr Gillespie, you said, "Well, it would probably mean that there would be a much lower risk," in substance, didn't you?

DR GILLESPIE: I'm not sure what I said. But what I would say now is that closure is just one step in the risk chain. So closure doesn't do anything in particular; there has to be other steps in the risk chain. So it is a combination of all of them.

MS NICHOLS: We will come to that in a moment. But just focusing on planned and managed closure, I think what Ms Doyle was putting to you was that in circumstances where a plant closes down early, and we will just focus on that part of the equation, if it is planned and managed the risk will be lower, and you referred to a figure of zero times zero by reference to your chart; do you remember that?

DR GILLESPIE: I do.

MS NICHOLS: I want to explore this with you. In order to proffer an opinion about whether the closure aspect of your calculation would really significantly alter the risk, you would have to know the facts about the particular closure scenario under consideration, wouldn't you?

DR GILLESPIE: Yes, I think so. Yes.

MS NICHOLS: And insofar as you were attempting to answer Ms Doyle's question by reference to the figures in your chart, you said at the beginning of your evidence that those figures are really quite artificial. You can't really look at the chart and say, "Provided there is something generally called planned and managed closure, the risk is going to be low," can you?

DR GILLESPIE: No. As I said, it is a combination of a whole lot of things and these are illustrative numbers to show how a risk assessment is done.

MS NICHOLS: It is just intended to illustrate the model, isn't it?

DR GILLESPIE: Correct.

MS NICHOLS: Mr Cramer, can I ask you a question. I mentioned changes in the market before. Mr Rozen put a question to Dr Gillespie early on about changes connected with climate policy and so on. Would you consider the changes directed to the implementation of cutting greenhouse gas emissions and renewable energy targets would be something that would be relevant to consider in assessing the likely risks in this kind of a model?

MR CRAMER: I think so, because we are talking about planned closure. Depending how quickly that planned closure happens, if it happens quickly it can actually limit the extent of the planning. So it may be a planned closure, but if it happens over just a few years then there may be limited time to prepare for that closure.

MS NICHOLS: Is it also true that the terms of a particular planned closure - let me restate that. Government regulation directed to, say, reducing emissions or introducing renewables and making changes to the market might have impacts on the profitability of an existing operation with older technology, mightn't it?

MR CRAMER: Yes.

MS NICHOLS: That would be a relevant consideration in assessing risk.

MR CRAMER: Yes.

MS NICHOLS: You referred to a planned closure that might happen over a short period of time. Are you aware of and can you tell the Board anything about the policy that was introduced but not ultimately effected by the Commonwealth

Government in about 2012 called "Contracts for closure"?

MR CRAMER: I only have limited knowledge of that. I know they were looking to retire 2,000 megawatts, I believe it was, by 2020 and that the previous Federal Government put up a sum of money to help compensate the operators that were ultimately to close their site, but that that process was abandoned.

MS NICHOLS: Yes, and do you recall that the planned closure period was 2016 to 2020?

MR CRAMER: I don't recall that.

MS NICHOLS: Can I ask you, Dr Gillespie, about your calculation of risk and the chain of reasoning to which you referred earlier, and I will just refer you to paragraph 58 of your statement which I think sets out the core of your reasoning. You say, starting with the second sentence for brevity, "A chain of events would be required before a rehabilitation liability would be borne by government. This may include early closure, company insolvency and a failure to recover liability via legal mechanisms. Only then would the government be exposed to rehabilitation liability."

I will return to the rest of the sentence in a few moments. But focusing on that, can I ask you this question. You have identified three important elements, one of which is closure, one of which is insolvency and the other of which is the ability of the government to recover money through some kind of legal process. It is the case, isn't it, that in the real world there is likely to be a relationship between those factors? Is that a yes?

DR GILLESPIE: I'm just thinking. There is certainly a

likelihood of a link between the first couple, yes.

MS NICHOLS: Can you elaborate on that?

DR GILLESPIE: If you are insolvent, you may close.

MS NICHOLS: If you close in circumstances in which you are not insolvent, it is not all happening at the one time, it may be the case, particularly if there have been regulatory changes that affect profitability, that that might affect the solvency position of an entity that's been operating a mine?

DR GILLESPIE: Perhaps.

MS NICHOLS: I accept you are not an insolvency expert, but you can't rule out that those circumstances might be linked, can you?

DR GILLESPIE: No.

MS NICHOLS: It might be the case that if an operator divests itself of the plant representing the mine and that happens to be its major asset, that that might affect its solvency position.

DR GILLESPIE: If they divest themselves of it, they might improve their insolvency position.

MS NICHOLS: Yes, but it might depend on the structure of the corporate group, mightn't it, because you might have a parent entity that makes the decision in relation to a subsidiary and decides to in effect wind up that subsidiary?

DR GILLESPIE: Perhaps.

MS NICHOLS: And that subsidiary might well be the licence holder.

DR GILLESPIE: It could be.

MS NICHOLS: Of course, in relation to the final factor, the question of seeking to recover money through a legal

process, that is not going to arise unless you have either an insolvency situation or a situation where the mine operator is simply refusing to pay the liability. That's right, isn't it?

DR GILLESPIE: Correct.

MS NICHOLS: So there is very well likely to be a link - there is a link between insolvency and the need to chase money through the courts in that situation?

DR GILLESPIE: Perhaps, yes.

MS NICHOLS: Just to return to the factor I mentioned a moment ago, one of the other independent risk factors that might not depend on solvency or closure is that the operator decides not to comply with the requirement to pay rehabilitation costs?

DR GILLESPIE: (Witness nods.)

MS NICHOLS: Having regard to that, can I just ask you about table 2. The factors that you have identified that you have called A, B and C for likelihood, which are likelihood of insolvency, likelihood of unsuccessful legal action and closure, you have calculated the consequence outcome by simply multiplying those factors, so A times B times C. That's correct, isn't it?

DR GILLESPIE: Yes, that's correct.

MS NICHOLS: It is correct as a matter of statistical theory, isn't it, that when you have related events, the proper way of assessing the likelihood is not to simply multiply out the probability of each; isn't that right?

DR GILLESPIE: You are getting way above me in probability mathematics, but I suspect you're right.

MS NICHOLS: I will just put this to you. We don't have a whiteboard in front of us, so I will limit what I'm

saying. But it is correct, isn't it, that if you want to - to keep it simple, suppose you have two related events. If you wanted to work out what is the probability of event B given event A where they are related, you don't just say it is probability of A times probability of B. You calculate the probability of A and B and then you divide that by the probability of A. That's the correct method, isn't it?

DR GILLESPIE: You're way above my pay station on that. But I take your point. If they're not independent probabilities, then there's problems with multiplying them. That's not really the purpose of this table. The purpose of this table is to demonstrate the steps of identifying a risk chain are standard procedures in doing a risk assessment and the standard approach is to multiply the probabilities of events in the risk chain. Those don't necessarily comprise the risk chain. They are illustrating an example of if they are in the risk chain.

MS NICHOLS: Accepted, and I won't take this too much further, but you may or may not be able to answer this. If you did the calculation to which I just referred, you would get a higher number, wouldn't you, a higher probability of the ultimate event occurring?

DR GILLESPIE: I suspect you're right.

MS NICHOLS: We'll stop the mathematics there.

DR GILLESPIE: Please.

MS NICHOLS: But just to be very clear about what it is you're doing, as you've said, the numbers are artificial in this chart and you've taken the inputs really from Mr Rieniets. So you're not attempting to validate any of these particular numbers in this scenario?

DR GILLESPIE: Correct.

MS NICHOLS: And that includes the 50 per cent in your column C. That's right, isn't it?

DR GILLESPIE: Illustrative purposes only.

MS NICHOLS: Only, okay. Is there a particular reason why you picked 50 per cent and 5 per cent?

DR GILLESPIE: Not particularly, except my thoughts were, as a panel of one discussing risk as opposed to a panel of three, that the likelihood of insolvency would be at the lower end of the spectrum and not being a lawyer I had no idea what the risk of recovering money would be in the court, so I took a middle ground.

MS NICHOLS: You might find that the lawyers in the room have a different view about that, but I don't need to trouble you. But as a matter of principle, just to illustrate the model, as you have correctly pointed out, the table is sensitive to these assumptions. So, if you had a 5 per cent chance of recovering money on insolvency through the courts, your numbers in the consequence - the likelihood would be much higher, wouldn't they?

DR GILLESPIE: Yes. I think the point of this table is that a risk assessment needs to be done. That's the point of it. And this is how you do it and that you have to consider likelihood. That's the key point.

MS NICHOLS: But the caveat to that proposition is this is how you do it provided you do the calculations the right way and don't just multiply them out simply in that sense.

DR GILLESPIE: Absolutely. I would defer to a risk management specialist.

MS NICHOLS: Understood. So the purpose of your evidence is not to advance any particular proposition about whether in

fact any particular level of bond held or proposed to be held by the Victorian Government in respect of AGL or any other mine is or isn't economically efficient. That's right, isn't it?

DR GILLESPIE: That is correct. My principle is that one should assess the costs and the benefits of the bond and one should include both parts of a risk assessment, not just the consequence part.

MS NICHOLS: Can I ask you this question, and I'm almost finished and you can go home. If we look at your model, just taking table 2, if we take 2036 as an example, the liability on the numbers given to you by Mr Rieniets is at that point $65 million and on that model the bond is set at $1 million. That's the risk. Do you see that?

DR GILLESPIE: Yes.

MS NICHOLS: Accepting they are indicative numbers, but that's how the relationships play out on your model.

DR GILLESPIE: Correct.

MS NICHOLS: What do you say from an economic perspective about the fact that if you have the theoretical recalcitrant mine operator who does not want to comply and who might have decisions made for it elsewhere by its controlling entities that help it along that path, but has a very large liability that may in fact be a lot larger than that and a very small bond, what do you say about the failure of that system to incentivise the licensee to actually do the rehabilitation rather than to leave without doing it?

DR GILLESPIE: It is a little bit of a circular argument, since to get to that point one would have had to assess that the probability of all these things is low, and that's why a low bond is appropriate.

MS NICHOLS: Yes, but I put to you before that there might be a completely independent consideration from solvency or risk of closure in that you might have a decision made by a licensee or one of its controlling entities, and you would be the regulator in that situation, that might come out of the blue as far as the regulator is concerned and change the policy position of the entity and decide to in effect leave the jurisdiction. I'm asking you about the incentivisation issue from an economic perspective. Isn't it important economically for these sorts of settings to incentivise good behaviour?

DR GILLESPIE: The proper economic efficiency incentive is to price at marginal cost, and marginal cost is expected value, which is probability times by consequence. So that's the economically efficient aspect. From an equity perspective, which I think is where you're coming from, in the low probability event, and I've already said this, in the low probability event that it actually occurs, then there isn't sufficient funds to undertake the rehabilitation, in which case there are arguments for other mechanisms to supplement a bond system that might pick up the cost of those low probability sort of events occurring.

MS NICHOLS: Can I ask, Mr Cramer, do you have an opinion about that issue?

MR CRAMER: Do you want to restate it?

MS NICHOLS: Yes. If you have a situation where you have a high rehabilitation liability on the mine operator, it is going to have to spend a lot of money to rehabilitation the mine and you have a very low bond, so the risk to it is not great, it can walk away without rehabilitating the

mine and forfeit the bond. What do you say about that?

MR CRAMER: I think in that case there is a degree of moral hazard that exists, yes, because it may be in the proponent's interest to walk away from the site from a purely financial perspective, forgetting about other issues such as reputational risk or whatever. But from a purely financial consideration it may be in their interest to walk away from the site if they think that they can achieve that.

MS NICHOLS: Can you just explain briefly what is the concept of moral hazard, because that is an economic concept, isn't it?

MR CRAMER: It is. Joel, do you want to - - -

DR BYRNES: You go, and if you get it wrong I'll correct you.

MR CRAMER: Moral hazard is when you're making decisions about your own activities based on the fact that someone else is bearing the risk or some of the risk for those activities. So you are not bearing the entire risk yourself, another party is bearing some of that risk, and you're making decisions on that basis.

MS NICHOLS: I might direct this to you, Dr Byrnes, because I haven't asked you anything. A situation where you have a high rehabilitation liability which is accruing and a very low bond, that gives rise to a high moral hazard quotient, doesn't it?

DR BYRNES: Everything else held constant, yes. But there would be other considerations. It has to do with the incentives that arise, the whole package of incentives.

MS NICHOLS: Yes, of course. Can I just ask about one more matter, and that is, Dr Gillespie, you referred to the Tinbergen's principle about having a number of instruments

to deal with a number of objectives. Can I just ask you about how that might operate in the context of end of mine life rehabilitation tasks which might extend very far into the future, such as long-term water quality monitoring. Would you see a role for a different instrument such as a post closure trust account to deal with long-term liabilities?

DR GILLESPIE: That is outside my field of expertise. I think the principle that I wanted to make was not trying to get a bond to do everything and that different things required different mechanisms. I just noticed in some of the reviews of different mechanisms that they say, "It does this but it doesn't do that," and often it is because it's not meant to. So Tinbergen's principle is basically, if you have multiple problems that you are trying to address, you need multiple instruments.

MS NICHOLS: Finally, I might just ask that question of Mr Cramer. You mention this at part 4.3.4 of your report, and Mr Chairman, I apologise, I don't have a Ringtail number for that because my document doesn't have it. But do you have that there? It's page 35 of the document.

MR CRAMER: Page 35, the Ringtail is 0044 in fact.

MS NICHOLS: Thank you. You say a post closure trust fund is an option and you say about the middle of that page that, "Long-term post closure management maintenance and monitoring of the Latrobe Valley coal mines will almost certainly be required", which I think is understood. You talk about the fund characteristics in the second half of that page. In the third paragraph you say, "The fund was also designed to meet separate community objectives. In these objectives an estimate of costs and contributions

could be negotiated between operators, community representatives and various levels of government." What do you have in mind there when you say "separate community objectives"?

MR CRAMER: I actually talk about that a little more fully in the next subheading there, "Post closure community fund". It is possible, given the profound nature that the closure of these mines would have for the local community here, that as part of any closure process, closure planning process, there would be some sort of funding provision made and it may be by government and operators in combination that would go beyond just the technical requirements of rehabilitation, but would look to address some of the social issues associated with rehabilitation.

MS NICHOLS: At the risk of asking you a question outside your expertise, and tell me if it is, what would you identify as the social issues?

MR CRAMER: Employment for one. Whenever a mine closes, the community around it suffers an immediate loss of income and employment and we all know the sort of social issues that are associated with that. So that's a key one. And the actual loss of population that can follow which is a related issue to loss of employment. There is reduction in population, reduction in community facilities, funding, community spirit, culture. There's a whole range.

MS NICHOLS: Thank you. You say that, returning to page 35, "Operators could be required to maintain a bond during operations to guarantee the availability of money for the post closure trust fund in the event of operator insolvency, and upon site relinquishment the operator would provide funds to pay the post closure fund and the

guarantee bond would be returned." Is that an example of perhaps using the principle that Dr Gillespie mentioned of two different instruments working at different times to provide security?

MR CRAMER: I think that's a good example.

MS NICHOLS: I don't have any further questions. Thank you.

MR ROZEN: I have no re-examination. Could Drs Byrnes and Gillespie and Mr Cramer please be excused?

CHAIRMAN: Yes.

MR ROZEN: We express our gratitude to you all for coming along this afternoon.

<(THE WITNESSES WITHDREW)

MR ROZEN: We probably have a small list of housekeeping matters that need to be tidied up. Most of them fall in my lap, but there's one matter that Ms Doyle wishes to raise and also a matter that Dr Collins has foreshadowed that he wasn't to briefly address the Board on. Perhaps if they do that and then I will tidy up.

CHAIRMAN: Yes.

MS DOYLE: If the Board pleases, the first issue is when Dr McCullough was giving evidence, in the running of things two reports were tendered through him and it wasn't possible for us on the run to determine what the differences between the two documents were. We have liaised with the Inquiry and just want to confirm on transcript that insofar as there are exhibits 22A and 22B, it is exhibit 22B which should stand as the report of Dr McCullough. It is dated 30 November 2015, GDFS.0001.003.0001. There is no substantive difference between the two reports. What happened was there was a missing annexure supplied with the first version. When it

was attached, the page numbering changed. So, anyone who is referring to that report should refer to exhibit 22B.

If the Board pleases, the second issue is that over the weekend each of the mines was asked to provide certain financial information through the witnesses who would comprise the mine panel when Mr Faithful and others were recalled. As it transpired, and I let Mr Rozen know this over the weekend and into early Monday morning, Mr Faithful was in a position to obtain this information but could not have enlightened anyone as to its contents. It was just simply information he received from the finance team. In those circumstances it was agreed between Mr Rozen and me that I would instead just address this matter from the Bar table as there would be no difference had Mr Faithful simply handed up the same documents.

So, in that context I want to tender - I think it will be three documents in total. The best way to understand them is that there is a document attached to Mr Faithful's current statement. It was called "Confidential annexure 1" but that has been replaced with a document that's not confidential. It sets out in simplified form the corporate structure of the entities that operate and hold the mine licence for the Hazelwood Mine and Power Station. Anyone seeking to understand the three documents I'm about to tender will find that easier if they do so by reference to that annexure.

In response to the questions asked of us, what I can furnish the Inquiry with are the following: a chart headed "Hazelwood Power Partnership and its controlled entities, annual reports to ASIC 2012 to 2014." What we

have done is take from these three successive years of annual reports to ASIC figures set out in a chart: operating profit, unrealised gains or losses, and operating profit excluding financial instruments. I won't read out those figures. The chart will be handed to anyone who needs it.

We also, again fulfilling the request made of us, furnish as part of that suite of material the annual report for the financial year ended 31 December 2014 for Hazelwood Power Partnership. The annual results for the parent company, now known as Engie SA, as you will see from the chart attached to Mr Faithful's statement, but for the purposes of this Inquiry has been referred to as GDF Suez, that's the 2014 annual results and the presentation is dated February 26, 2015.

I think its just as well, Chairman, if I tender those three documents and call it a global exhibit of financial documents pertaining to GDF Suez.

#EXHIBIT 46 - Financial documents pertaining to GDF Suez.

MS DOYLE: The last request we received in terms of finances was that we were asked to indicate whether we had any information about the cost of maintaining a bank guarantee. The information from our finance team is in line with the evidence given by Dr Gillespie. The information is that presently the annual cost of maintaining the bank guarantees is in the order of $102,000. However, it is expected that should new bank guarantees need to be lodged, that that historical arrangement would be revisited and that it would be likely that the costs of maintaining a higher bank guarantee would be in the order of between 2.5 per cent of the

amount of the guarantee and 5 per cent of the amount of the guarantee.

I think that completes the requests that were made of us over the weekend in terms of finances.

CHAIRMAN: Yes, thank you. Dr Collins.

DR COLLINS: Thank you, Chair. We received the same two requests on the weekend for financial information. I raised this with learned Counsel Assisting on Monday morning and by agreement I make this statement from the Bar table.

Energy Australia Yallourn Pty Ltd is the owner of the Yallourn Mine and Power Station. The mine is a cost centre for the purposes of that larger business. The mine does not separately calculate or record its profits or losses and nor does Energy Australia Yallourn Pty Ltd in respect of the entirety of its business. That is because there is a deed of cross-guarantee under which Energy Australia Holdings and other members of the Energy Australia Group provide guarantees in relation to the obligations of each other member of the group. The deed of cross-guarantee is in the form prescribed by ASIC.

In broad terms, because Energy Australia Yallourn is a wholly owned subsidiary of Energy Australia Holdings and is a party to a deed of cross-guarantee, it is excused from the obligation to produce financial accounts under the Corporations Act.

Some information in relation to the financial position, capacity and substance of Energy Australia Holdings is available in Mr Mether's witness statement at paragraphs 12 to 18. In short, the total assets of the group were $7.9 billion as at 31 December 2014. That's

the end of the most recent reporting period. Energy Australia Holdings has a Standard & Poor's investment grade credit rating of triple B minus, stable.

In respect of the price of a bank guarantee, the Energy Australia Group has the capacity to purchase bank guarantees on behalf of members of the group. The price of those guarantees fluctuates, each time in particular the group refinances its debt requirements. That typically happens at least once per year. The price can also fluctuate when the credit rating changes according to complicated formulae. The rate is negotiated by the Energy Australia Group and its banks, and I'm instructed that the group uses five separate banks for that purpose.

For much the same reasons as Ms Doyle identified, we agree with the range given by Dr Gillespie in his statement at paragraph 35 that the range is generally between about 0.5 and 5 per cent. The number is presently at a relatively low rate historically in line with the cost of capital elsewhere in the market.

They are the matters that we say by way of answer to the questions from the Board.

MR ROZEN: If the Board pleases, can I clarify a couple of matters that have arisen in the evidence that should be dealt with on transcript. The first matter concerns what's referred to in Mr Wilson's second statement dated 30 November 2015 at paragraph 43 as the "NERA report". The evidence before the Board is that that's an ongoing review, yet another one it seems, by DEDJTR concerning bonds and other matters. Mr Wilson at paragraph 43 of that statement makes an open-ended offer to the Board to provide it with a copy of the NERA report when it is

received by DEDJTR, which is anticipated to be 23 December, in his statement as was corrected when he gave evidence last week.

The Board will recall that my learned friend Ms Forsyth made a call in effect for that or invited Mr Wilson, rather, to provide the Board with any document that DEDJTR currently has outlining the project, and Mr Wilson said that he was prepared to do that.

I have discussed the matter with Ms Forsyth and with other counsel and my view, and subject to the views of any of the other parties, is that the Board would really not be assisted by that project outline, essentially for two reasons. It is an ongoing project, but, more importantly, there has to be a line drawn about the evidence that the Board is able to consider in relation to terms of reference 8, 9 and 10. The difficulty that would be presented to the Board by receipt of a new document, say, some time next week and certainly leading up to Christmas, means that the document can't be tested and we end up in much the same position we ended up with with term of reference 6.

CHAIRMAN: What I said there was only in exceptional circumstances would we bear a repetition of what had happened in unusual circumstances before. I think we really have the same situation apply. These don't seem to qualify on that score. It may well be it needs to be reviewed. At this stage I'm disposed to take the conservative line.

MR ROZEN: Yes, I would submit that perhaps the appropriate course is for Ms Stansen to write to Mr Wilson via the Victorian Government Solicitors Office thanking him for

that offer, but perhaps politely rejecting the offer that that report be provided to the Board. The difficulty, of course, for the Board is once it is received by the Board, then the Board is in a position where it has to decide whether or not to take it into account and, if it does, it has procedural fairness obligations. There is the rub.

The second matter is a simple matter of tendering one outstanding document that's in the hearing book which Counsel Assisting considers should be tendered, and that is the document that's presently behind tab 34. It is AGL.0001.003.0001 and it is a copy of the Loy Yang licence application, the original Loy Yang licence application from 1996. It has been referred to with one or two witnesses and it should be tendered as a separate exhibit, sir, please.

#EXHIBIT 47 - Copy of original Loy Yang licence application from 1996.

MR ROZEN: The next matter concerns two documents which have been provided to Counsel Assisting by counsel for Environment Victoria. The two documents concern electricity sector emissions and a document that concerns the contracts for closure matter that has been the subject of discussion with some of the witnesses.

I've had some preliminary discussions about that with Ms Nichols and also with counsel for the mines who are potentially affected by the tender of that document. I understand that Ms Nichols wishes to make some submissions about why the Board ought to receive it, so perhaps the best course is that she do that and the matter can then be dealt with in the normal way.

MS NICHOLS: Can I deal with the contracts for closure

document. I will take you to that and explain what it is.

CHAIRMAN: Sorry, I have in front of me two documents. One, "Securing a clean energy future" it is headed up.

MS NICHOLS: That's the first one. I misdescribed it. Can I deal with that one?

CHAIRMAN: You wish to deal with that one?

MS NICHOLS: Yes, "Securing a clean energy future". You will see that that is on its face a statement by the Honourable Greg Combet in his capacity as Minister for Climate Change and Energy dated 8 May 2012. It is, if you look in the front cover of the document, a Commonwealth of Australia document. I can tell you that it is a publicly available document that my instructors have obtained.

If you look at the third page, which is obviously only part of the document, it is an extract, it addresses the energy security program. Do you see there - - -

CHAIRMAN: Can I just clarify the position. You say the whole of this document should go in?

MS NICHOLS: Yes.

CHAIRMAN: I take it there is opposition?

MS NICHOLS: There is opposition to it. Ms Doyle opposes it. That's why I'm making a submission about it.

CHAIRMAN: How long are you likely to take? This is not a matter that can be resolved between you?

MS NICHOLS: Ms Doyle opposes it and I would like to tender it. I will only be a few minutes and I very much doubt, given how efficient Ms Doyle is, that she would take very long either.

CHAIRMAN: My disposition in relation to this, because of the way this process operates, is I'm disposed to accept it but with the reservation that the extent to which it may

be relied upon is clearly going to be very problematic, but Ms Doyle may say even that is totally unacceptable. Is that what it really comes down to, Ms Doyle? I can't imagine how a document that comes in in this way is likely to be of any significant value, but it seems easier to take it and accept it with a statement from you and Ms Nichols briefly outlining the positions either way and that's to be taken into account when anyone has regard to it.

MS DOYLE: Yes. I put our position formally under the rubric of an objection, but I take on board your observations. It is a very short point. It is that this represents a policy two or three ministers ago, but certainly a government ago, a policy that was not implemented.

Insofar as it on the final page refers to some closure proposals that were submitted and discussed, they never went anywhere and we haven't had the opportunity to put any of those discussions in context. Mr Faithful didn't know very much about it. In order to put it in any context we would have needed to call another witness.

So it is in those circumstances and in light of the fact that the policy was never implemented that we say it's unlikely to assist the Board. So it is a short point.

CHAIRMAN: Yes. If you could put your position shortly, what I'm disposed to do is to accept it. But it is only to be viewed in the light of any comments that you may choose to make and in the light of what Ms Doyle has said and what anyone else may choose to say on this occasion.

MS NICHOLS: I understand. This question of the contracts for closure has been referred to by a number of witnesses. It

was mentioned in Mr Faithful's statement. He purported not to know anything about it, but it is referred to. It does gives some context and explains what the program is about. It is introduced by Mr Faithful.

It goes to the question of risk, because the position of the mines is that bonds are calculated on a risk basis and one of the risks we have been putting to the witnesses and this by way of example is that the future of the mines is potentially influenced by external events. It was accepted by Mr Wilson in evidence that changes in government policy settings, including in relation to climate policy, are relevant matters to be taken into account by the regulator.

Quite simply, this is a very concrete example and it puts flesh on those bones. Although it is past policy, at the time it involved Commonwealth policy to close plants or invite tenders for the closure of the plants within the period of 2016 to 2020. So, it is an example of government policy settings potentially significantly changing the operating life of mines. That's why it is relevant. These factors have been accepted as relevant by the economists who gave evidence this afternoon. So, that's the relevance of it.

CHAIRMAN: Yes, thank you. Does any other counsel wish to make any point? Thank you.

MR ROZEN: Counsel Assisting is agnostic on this issue, I must say. We don't have - - -

CHAIRMAN: You sit on the fence.

MR ROZEN: We sit on the fence on this issue. We say perhaps the most appropriate course is to receive it on the basis you've suggested and the parties can make submissions

about it.

CHAIRMAN: Yes.

MR ROZEN: On that basis, I think we have got to a position where it should be given an exhibit number.

CHAIRMAN: You're right. Exhibit 48.

#EXHIBIT 48 - Document entitled "Securing a clean energy future".

MR ROZEN: Could I just clarify. I take it you don't press for the tender of the other document?

MS NICHOLS: No, I don't.

CHAIRMAN: The other document is this one?

MR ROZEN: It is not pressed. The application to tender that is not pressed.

CHAIRMAN: That's fine.

MR ROZEN: The final matter, subject to anything that anyone else has to raise, concerns submissions on Friday and the timetable. The discussions I've had with the parties have been along the following lines. I think I can say this is an agreed position. Counsel Assisting will go first on Friday and a maximum period of two hours is allocated for the submissions of Counsel Assisting. The State of Victoria may or may not make oral submissions, but the agreement I have reached with Mr Attiwill is that we need to allow half an hour for that eventuality. The mines will each make oral submissions and an hour maximum is to be allowed for each of them. Environment Victoria is the same; that is, an hour is to be allowed for them.

Other than Counsel Assisting going first, that's not an agreed order for submissions. That is perhaps something that can be discussed between the parties. It doesn't need to be resolved now. But on my maths that's

the potential for six and a half hours of submissions and therefore I would suggest that a 9 o'clock start might be advisable because if we have an hour for lunch, that's already 4.30 and it's a Friday.

CHAIRMAN: Yes.

MR ROZEN: So that's the proposal.

CHAIRMAN: Yes, we will resume at 9 o'clock on Friday.

MR ROZEN: If the Board pleases.

ADJOURNED UNTIL FRIDAY, 18 DECEMBER 2015 AT 9.00 AM