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O/N H-1655473

INDEPENDENT PLANNING COMMISSION

MEETING WITH DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

RE: NARRABRI UNDERGROUND MINE STAGE 3 EXTENSION PROJECT

PANEL:	**PROF MARY O'KANE AC** **PROF CHRIS FELL AO** **PROF SNOW BARLOW**
ASSISTING PANEL:	**STEPHEN BARRY** **BRAD JAMES** **PHOEBE JARVIS**
DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT:	**CLAY PRESHAW** **STEVE O'DONOGHUE**
LOCATION:	**VIA VIDEO CONFERENCE**
DATE:	**9.02 AM, FRIDAY, 4 FEBRUARY 2022**

PROF M. O'KANE: Do the opening statement and then we'll get into the discussion. So good morning and welcome. Before we begin I'd like to acknowledge the traditional owners of the lands that we're variously on and pay my respects to their elders past, present and emerging, and I'm speaking from Gadigal land. Welcome to the meeting today to discuss Narrabri Underground Mine Stage 3 Extension Project SSD10269, which is currently before the commission for determination.

Narrabri Coal Operations Pty Ltd, the applicant, is the operator of the Narrabri Mine, an existing underground coal mine located approximately 25 kilometres southeast of Narrabri and approximately 60 kilometres northwest of Gunnedah. The mine is located within the Narrabri Shire Council area and in the northwest slopes and plains region of New South Wales. The applicant is seeking development consent to continue longwall mining in a major southern extension area until 2044. The project also involves the continued use of existing underground and surface infrastructure, including use of the existing coal handling and preparation plant and its approved 11 million tonnes per annum capacity.

My name is Mary O'Kane. I'm the chair of the Independent Planning Commission and of this panel. I am joined by my fellow Commissioners, Professor Snow Barlow and Chris Fell. Also in attendance are Stephen Barry, Brad James and Phoebe Jarvis from the Office of the Independent Planning Commission. In the interest of openness and transparency and to ensure the full capture of information, today's meeting is being recorded and a complete transcript will be produced and made available on the commission's website.

This meeting is one part of the commission's consideration of this matter and will form one of several sources of information upon which the commission will base its determination. It is important for the commissioners to ask questions of attendees and to clarify issues whenever it is considered appropriate. If you are asked a question and are not in a position to answer, please feel free to take the question on notice and provide any additional information in writing, which will then be put up on our website.

I request that all those here today introduce themselves before speaking for the first time and that we all ensure we do not speak over the top of each other to ensure accuracy of the transcript. We will now begin and, first of all, can I say thank you for the assessment report, which was very clear. I think it reflects the fact that our questions are more or less extensions of the issues raised. So you've got our material. Clay, is there anything you wanted to say by way of openers before we go into the particular issues?

MR C. PRESHAW: Yes, there is. Thank you, Mary. I would like to just start, I guess, by saying thank you for giving us the opportunity to meet today and discuss the project openly in this type of setting, and I did actually want to start with a few, you know, additional introductory remarks, if that's okay.

PROF O'KANE: Of course.

MR PRESHAW: So, look, I'll start by just some introductions around our roles and our roles in the assessment of this project, because I think it's important to note that the assessment of this type of project, a large-scale coal mining project actually involves a lot of people, most of whom are not present here today, but for my part, I'm Clay Preshaw, executive director of Energy, Resources and Industry Assessments, and the final sign off the assessment report.

I was mostly involved at the back end of the assessment process, but due to some recent policy issues that we'll probably touch on later, I have been perhaps more involved than I might ordinarily be for a project like this, and so Steve O'Donoghue, who's the director of the assessments team, he has been closely involved in this assessment right from the beginning, and Steve is intimately across the details of the project, but, again, there were at least five other planners involved in the assessment, who might have even greater knowledge on details of specific aspects of the project. So if Steve or I don't have the answers to your questions at hand during the meeting, then we will just let you know and can get back to you in writing later if necessary.

PROF O'KANE: Thanks.

MR PRESHAW: I'd also like to make a few brief remarks about the assessment report itself, mainly just to explain how it came together and, ultimately, what it is and, importantly, what it is not. So I think it's fair to say that preparing an assessment report for these types of project is a very difficult task. The report is, obviously, the final product, so to speak, of the assessment process, and we are confident it does provide a really good summary of our views about the project, but our report is not meant to be a full compilation of all the information and the data that has been presented to us throughout the assessment process. All of that information should be publicly available and can be accessed if necessary.

Our assessment report, rather, is really a distillation of all this material and is designed to give a decision-maker, which is in this case is the Commission, sufficient information to make the determination, but what I would say is that it's always hard to know exactly what the decision-maker is looking for. Now, I've been preparing these reports for a long time now, and you never quite know what the reader of the report will find interesting or not interesting or what parts of the report that they might potentially like more information about, which to me makes these types of meetings and, of course, the public hearing, as well, all the more important in fleshing out those issues and, ultimately, getting to the bottom of the key issues relating to a project.

And to that I would also add we are more than happy to provide additional information on particular issues if it would assist the commission in its deliberations. We will not be offended by those types of requests, as we think that really just makes the whole process of decision-making more robust and more transparent. Now, just a few more comments about our approach to the report, which is an approach we plan

to continue to adopt into the future. So with this project, we have really tried to be very open and transparent about the issues that concerned us the most.

Now, that might sound obvious, but I would say that there is sometimes a tendency in environmental impact assessment sector generally, perhaps on both the private side and the government side to an extent, to work through things in a very formulaic way with very technical language, which can have the consequence of actually obscuring the real issues of concern or, in some instances, just bearing them in a sea of technical details.

So what does that mean for this project. Well, basically, if there was something in our assessment that we thought required extra time or extra effort to investigate, then, hopefully, that should be clear to the reader of the report and that issue should be emphasised and addressed with sufficient detail in the report.

So moving to some comments about how that applies to this particular project. The first thing we have tried to make clear is the distinction between an entirely new mine, like a greenfield project, and an extension of an existing coal mine, so a brownfield project, and this project is a brownfield extension project, and that means it generally makes the assessment process easier and generally means the overall impacts have been minimised. The project doesn't, in this case, involve any changes to the proposed rate of coal extraction or processing and it uses all of the existing operational and transport infrastructure and facilities.

On top of that, looking at the strategic context broadly, there are only a few community members in close proximity to the project area. The land within the project area is generally flat, it's characterised by a semi-arid climate and there are no irrigated cropping lands in the project area. Having said all of that, the project still would have impacts that require careful consideration.

So a couple of obvious aspects of this extension project. Firstly, while most of the existing infrastructure onsite remains the same, there are some additional infrastructure and facilities proposed at the surface, which would lead to some additional impacts and, secondly, obviously, the project would substantially extend the mine life, which means many of the impacts will continue for much longer, even if the nature and the scale of those impacts remains similar to before, and then there are two other important aspects to this project that we think must be kept in mind.

Firstly, the proposed longwalls would actually be some of the longest at around 10 kilometres and widest at around 400 metres in the whole of Australia, which leads to relatively high levels of subsidence, which could affect water resources and other things and, secondly, the mine is considered to be a relatively gassy mine, which would lead to impacts in terms of fugitive emissions and, in addition to that, when you put those two aspects together, it leads to this unique need for extensive ventilation infrastructure and subsequent clearing of the land at the surface, which would, obviously, have biodiversity impacts.

So all of that has led us to the conclusion that there are four key issues for the assessment. Groundwater, surface water, biodiversity, greenhouse gas emissions. At this point in the meeting I will – well, in a moment I will step away for the most part and let Steve work through, firstly, a brief summary of those four issues, very brief, and then, secondly, we'll work through all the agenda items and our responses to your questions, but before I do that, I would like to make a few final comments about the policy context around greenhouse gas emissions, as this is one aspect of the proposal that I have personally been involved in quite closely, especially in the latter stages of the assessment.

The main point I wanted to make is that we have looked at this issue really, really closely over the past few months. We have heard the community concerns about the issue, and we take that very seriously and, on top of that, we recognise that the policy space in this area is rapidly changing at all levels of government. So as a direct result of this project, we have actually established a working group across relevant agencies to provide a forum to discuss and to collaborate on these issues and, as you would have seen in our assessment report, we've actually recommended that the existing New South Wales Independent Advisory Panel on Underground Mining should be expanded to cover issues related to greenhouse gas emissions.

So while we absolutely acknowledge that all these recent policy changes and updates appear to emphasise ..... at a broad scale, we've actually found no clear policy guidance in our investigations and discussions with other agencies which would require any major changes to the approach that has been adopted in recent coal mine assessments, particularly the approach taken by the commission. So for that reason, the department has focused on building on those recent assessments and the work of the commission in those assessments with a targeted focus on the specific characteristics of this project and its emissions.

So, overall, we believe it is important that greenhouse gas emissions are minimised over the life of the project, but we also found that the proponent through its EIS and the amended report really gave us very little in the way of proposal to capture and – or flare methane, for example, in the fugitive emissions, and for that reason we have proposed to establish an additional mechanism that would potentially allow a ratcheting down over time, which we believe is in line with current policy settings, but doesn't go beyond the powers of the consent authority.

Now, that's all I will say in relation to greenhouse gas emissions for now, but I thought it was important to give some background on the efforts that we have made in that space, in particular, and then Steve can go through some of the more technical details around that when he goes through the four key issues. As one final, I guess, minor housekeeping matter, if you do have questions along the way, which I'm sure you will, I will probably step back in at that point to either provide an answer or redirect to Steve or perhaps just flag that we'll take it on notice for the time being, if necessary. At that point I'll throw it back over to you, Steve.

PROF O'KANE: Thanks, Clay.

MR S. O'DONOGHUE: Thanks, Clay. And I know we've got a limited time, so before we get into the – I guess, the questions, I just wanted to briefly touch on, like Clay said, just some of those four issues. I won't go at great length, but just draw out some of the key points, if that's okay, or - - -

PROF O'KANE: Yes. That'll be good, and we're not too pushed for time, so, you know.

MR O'DONOGHUE: Okay. So, I guess, the first issue, really, flagged by Clay, which we thought was – it was what – the key – one of the key issues in the assessment was on groundwater, because, of course, it is of concern to the community and it was, probably, the – you know, for the local landowners out there and the local landowner group that was established, it was the key issue in terms of potential impacts on groundwater bores and take of water.

I guess the first thing to say is that the project's not predicted to have an impact on the two regional aquifers in the area, which are identified as highly productive water sources in the region. That's the Namoi alluvium, which is six kilometres to the east of the project and the pilliga sandstone, which is also a highly used aquifer, which is on the western side overlying the project area. All the modelling predicted that there would be no exceedance of the aquifer interference policies, minimal impact thresholds for those key aquifers, and that – they are the ones where – which are predominantly used for irrigation and stock and domestic use in the area.

That conclusion was informed by the groundwater modelling, which did include peer review requested by Narrabri Coal, by Brian Barnett, who's the principal groundwater model with Jacobs. It was reviewed by The Independent Expert Scientific Committee of the Commonwealth – at the Commonwealth level. The department's water groups experts also provided advice and, lastly, the New South Wales Independent Advisory Panel for Underground Mining chaired by Professor Jim Galvin, who has subsidence qualifications and experience, but also supported by Professor Rae Mackay, a groundwater expert, and Professor Neil McIntyre, surface water.

So there's quite a lot of expertise input into our consideration in the assessment and we do rely heavily also on the advisory panel that was established to look at underground mining and their expert advice. I guess the overall conclusion for groundwater that the mining panel advised was that the overall groundwater model was appropriate for assessing regional flow in impacts on reasonable aquifer systems, but they did have some concerns about predictions above the mining area, in particular, more immediate to the site, and related to other certainties for – you know, related to surface to seam cracking and how that feeds into potential groundwater drawdown and impacts.

The mining panel did recommend additional ground water monitoring above the existing area in the extension area to reduce these uncertainties and the department accepted those recommendations and incorporated that into our recommended

approval conditions. I guess the other area, apart from impacts on the highly productive aquifers, there's predicted impacts on nine privately-owned stock and domestic bores were modelled to exceed the aquifer interference threshold. This is in the less productive Permian aquifers, you know, the – and aquifers overlying the Hoskissons seam and between the Great Artesian Basin.

Narrabri Coal committed to make good measures for these bores, and the department's recommended relevant conditions to require Narrabri Coal to use its best endeavours to reach agreements with the owners of the bores within two years of the commencement of the development, and I understand Narrabri Coal Whitehaven has progressed – since we've written the report, they've had further meetings and progressed the negotiations with those landowners further, and Whitehaven will probably update you on where that is at.

A further issue considered by the panel and the department and one of the impacts is, really, brine disposal to underground workings post-mining. I know that's an agenda issue later, and we can talk more about that, but overall the mining panel accepted the findings that the disposal of residual brines in the underground areas are unlikely to lead to groundwater quality impacts, and we can touch on that a bit further, you know, with the agenda item about, you know, potential other options.

Probably the final issue is, really, licence take of water from both groundwater and surface water sources. I – the information suggests that the Narrabri Coal would be in a position to obtain all necessary water entitlements and DPI Water accepted that, but recommended conditions about further information be provided as mining progresses about it getting those entitlements. So they're the key things for groundwater.

Just to touch on surface water, the next issue, I guess, as Clay pointed out, the creeks affected by the project are ephemeral and there's minimal base flow, so that's an important consideration. They're unlike the situation that southern coalfields and western coalfields, where there's more deeper in size valleys and there's permanent flowing streams supported by base flows. So in terms of impacts on potential base flow reductions on the systems and surface inflows and underground workings, it's a different situation for the Narrabri Coal Mine, given it's, like, geology and climate and landforms.

Water diverted from stream flows is estimated to be 4.2 megalitres per year, compared with annual runoff from – for the project area of 5524. So, essentially, a negligible reduction in surface water flows is predicted for the project. The mining panel generally accepted that due to the ephemeral nature of the creeks and the low expected frequency of surface to seam fracturing, along with low recharge rates, it would be unlikely that measurable impacts would occur to surface water take.

Just in relation to springs, there are three springs identified as potentially significant in the proximity of the mine with minor drawdown predicted ranging from 0.5 to 0.1 metres at these springs. One spring, Mayfield, is quite close to the project area,

though. It's a couple of 100 metres away to the east. It's not directly on the mine, but given the panels, you know, and, you know, concerns about some uncertainty about predictions more directly above the mine – the underground mining panels, they were concerned about potential impacts being larger on that spring and it made recommendations that all springs should be closely monitored, you know, as mining progresses, and we've, you know, accepted those recommendations and incorporated that into the recommended conditions.

Also, I guess, the – with the subsidence effects there's certainly potential for soil erosion from ponding and changed land form from subsidence. It's fairly well understood, you know, the impacts of that, based on the impacts on the northern panels. The existing northern panels, and there are certainly management processes to adequately manage those impacts. The panel did raise, you know, some concerns in that going into a new area. There's some unknowns with potential, you know, soil risks and that and that, again, should be close monitoring and adaptive management and tarps incorporated to manage those risks, but, overall, we think that they can be satisfactorily managed for the project - - -

PROF S. BARLOW: Steve, could I just ask a question as we go through.

MR O'DONOGHUE: Sure.

PROF BARLOW: Snow Barlow, Commissioner. The question of, you know, in the subsidence, or the bays, if I might say, that, you know, where it's subsided, and we saw in our site visit the other day that they were up to 2.5 metres in change in elevation. What is the plan for the proponent to where water ponds in those areas, will it still be, you know, sensibly drained back into the watercourses, or will it be just left there?

MR PRESHAW: Happy for you to take that one, Steve.

MR O'DONOGHUE: Look, Snow, it depends on the depth of bonding. I guess in the existing area there's options there – and this is where the adaptive management comes in. There's options there to reprofile, I guess, the landform to allow stable flow out of that area back into creek lines. So that's certainly an option. So it depends on the extent of ponding, but, ultimately, the aim would be to get, like, a free-draining landform, unless there was some benefits in a particular area for retaining ponded water.

PROF BARLOW: Thank you. Yes. No, that's – that could be the case.

MR O'DONOGHUE: I'll just touch on biodiversity today. I guess, just a couple of points here. The following amendments for the project to reduce surface disturbance, so that Narrabri Coal Whitehaven went through a process to look at where they could further avoid impacts through the mine design. The total area of direct clearing of native vegetation was reduced by, I think, about 33 hectares to – so

there'd be 547 hectares of direct clearing from surface infrastructure disturbance, including the gas lines, the ventilation, et cetera, and access roads.

However, there's an additional 70 hectares from indirect impacts that were incorporated in the biodiversity development assessment report, and that's – predominantly that was from surface cracking with about 54 hectares, and I'll touch on that later in the first, sort of, question, which is about experiences from current impacts, which, sort of, goes to this question, as well, about indirect impacts on vegetation. So I'll leave that one, but that was certainly something that was incorporated from actual impacts on the ground that were unpredicted from the original consent.

So, as I touched on, that where possible surface infrastructure has been placed to avoid and reduce impacts on biodiversity, and Narrabri Coal has also committed to ongoing review of the disturbance footprint over life of the mine through the extraction plan process ..... further reduce impacts. The impacts are required to be offset, and it's proposed to be staged in six phases to align with the progression of the project. This is also – rather retiring all the offsets up front also gives the potential to reconfigure or redesign the mine, you know, at each stage to reduce impacts further on biodiversity, and there's certainly provision in the recommended consents to relook at that and reduce credit liability incentives from just credit liability as the mine progresses.

So overall the department considers that the impacts on biodiversity values from direct clearing and indirect impacts could be suitably avoided, mitigated and/or offset. I'll just touch on greenhouse gas, and we'll probably likely – and like Clay said, there might be more discussion on this later, but I'll just touch on some of the key points.

MR PRESHAW: Steve – excuse me, Steve. Could I just jump in - - -

MR O'DONOGHUE: Yes.

MR PRESHAW: - - - very quickly on biodiversity, just to make an additional remark. It's Clay Preshaw here. I would say that the extent of clearing that's proposed here for an underground mine is unusually high, and I hope we've been clear about that in our report and I just wanted to make the point again, and that is because of the nature of the proposed long and wide panels and the need for this extensive ventilation at the surface. Now, we've investigated that quite thoroughly and there really is no other option in terms of how you would safely operate the mine than to do it the way they've proposed, but what Steve said in relation to the phased – the six phases means that there is an opportunity, as time progresses and, potentially, technology changes, et cetera, to reduce the overall impacts on biodiversity, and the other thing I would say is that this is – and Steve will touch on this later, actually, in relation to one of the responses to your questions, but this is very much a worst case scenario which is being presented. So we're very much, I

guess, cognisant of the uniquely high level of disturbance on biodiversity, but we have investigated that, and it is reasonable in the circumstances. Thanks.

PROF C. FELL: Just a question. To what extent is there an impact as a result of the seam drainage through the bore holes from the surface?

MR PRESHAW: Steve, do you want to take that one.

MR O'DONOGHUE: Look, it's probably – that's one component, Chris. It's probably a result – one of the biggest clearing is the goaf drainage, as well, you know, from the surface, but – there's – which requires, you know, additional access roads and quite close spacing of bores, as well. So the company has made it, like, a commitment to minimise as far as possible, you know, surface to inseam drainage, you know, pre-drainage as far as possible, because there is – there are larger areas of impact in setting that up, but it's certainly a commitment from the company to use underground drainage as far as practical and only use surface to seam – to minimise that as far as they can. Certainly, like, the goaf drainage would still be a big component.

PROF FELL: Thank you.

PROF BARLOW: Just on that same question, in terms of – to what extent would the plan to reinject brine, sort of, delay the revegetation of the mined – you know, the mined longwalls and just closing those cleared areas off when they were mined? How much room are they going to need to reinject brine, basically, to maintain those holes open?

MR PRESHAW: Starting to – sorry, it's Clay Preshaw here. I think we're starting to overlap with one of the other questions, but I'm happy for you to get into that now, Steve, if you'd like.

MR O'DONOGHUE: Look, I guess, the first thing, they're not looking to do, like, brine reinjection over the whole area. So, you know, it's in a – it would be in a limited area. So, certainly, the – a lot of the rehabilitation – the majority of the rehabilitation could be undertaken across the mine site, but we're happy to interrogate that further and get more information from the company or from the reports to provide more information.

PROF BARLOW: Thank you.

MR O'DONOGHUE: Okay. I'll just touch on just the final issue, I guess, which Clay flagged – and, like Clay said, there's a lot of policy work going on here with greenhouse gas emissions, so I'll just touch on some of the key points here without going into great depth. So, I guess, the first thing, it is quite a high greenhouse gas emissions. It's an underground mine. The majority of the emissions are fugitive, you know, by far, compared to the other sources of scope 1 and scope 2.

There's about 31 million tonnes over the life of the project that would be emitted, which is – which, as we've shown in the report in comparison tables, it is a – total emissions are quite high, compared to open cut mines, for example, but, overall, compared to some of the southern coalfields which have shorter lives and lower production rates, on an emissions intensity level it's lower than the southern coalfield mines, for example, because of the higher ROM coal that it's producing.

I guess the other key point here is that the emissions compared – intensity compared to the current operations go up – do go up significantly, because the current operations are more in a CO2 rich environment ..... lower levels of methane, so to date they haven't really got into those high ..... methane areas in the mine site. So there's a – roughly a three times higher – or three to four times higher, sort of, increase in, I guess, emissions intensity compared to current mining. I guess the other point to make is that - - -

PROF BARLOW: And that – sorry, Steve. That's entirely due to the higher methane, is it?

MR O'DONOGHUE: Heading to the – yes, the higher methane's – there's a figure in our report, which I can throw up on the screen, if you want, but there's higher methane concentrations, you know, to that – to the west.

PROF BARLOW: Yes. Yes.

MR O'DONOGHUE: Where the seam is dipping to the west and to the south. That's led the higher methane concentrations in that area, and so as longwall mining gets down to that area, some of it's already in the approved – some of that higher methane levels is already in the approved footprint, but the northern panels are predominantly in that low CO2 area. It's only when they get into the southern panels that there's a significant increase in methane which leads to that – because of the global warming potential ..... multiple it leads to much higher CO2 equivalent - - -

PROF BARLOW: Yes.

MR O'DONOGHUE: Yes. So, I guess, to date, I mean, while there's conditions for them to investigate, you know, potential for flaring to date that hasn't really been feasible, because of the low CO2 levels at the mine, and the low methane levels in the current mining area, and to be able to flare or generate electricity from that. I guess, what we've done through the process, we've asked Narrabri Coal to give further consideration to opportunities for reducing fugitive emissions by flaring. I guess, initially, in the EIS there was no proposal for flaring.

The amendment report incorporated flaring, but we did ask for more information about abatement technologies, and it's summarised in our report, but also there's the additional information provided by Narrabri Coal on abatement options and the potential to flare. I guess, the findings from Narrabri Coal is that they can only safely flare about one per cent or reduce the – they could only flare about one per

cent or reduce the greenhouse gas emissions by about one per cent through flaring, because of the nature of the gas and the gas levels, safety issues associated with mining and the cost of abatement technologies, but we go to some depth with that in our report.

PROF FELL: Can I just ask a question there, Steve.

MR O'DONOGHUE: Yes.

PROF FELL: Is it because they're moving to a more gassy area for the new longwalls that they can only do one per cent? Because they have to be flaring a reasonable amount, and flaring does drop the greenhouse gas potential quite substantially.

MR O'DONOGHUE: Look, there's two aspects. The methane concentrations are going up as they get to that southwestern area. So methane's going up, but the overall gas content's going down, you know, in terms of metres per cubic tonne of gas overall. So there is a cut-off about the ability to pre-drain when gas content overall gets too low, as well. So they've identified an area where they – look, there's potential – there is potential for methane reduction, but it is limited, because of the methane concentrations that they are ending up with in the pre-drain gas. There's limited opportunity.

PROF FELL: I'd like to ask a bit more about that later, but not in the present right now. Okay.

MR PRESHAW: Yes.

MR O'DONOGHUE: Sorry, Chris?

PROF FELL: I said I'll ask a bit more about that later, but - - -

MR O'DONOGHUE: Yes. Okay. Right. So, I guess – so on that there was further investigations of abatement technology, including methane and ventilation of air methane and post-mining goaf gas, including consideration of technologies such as membrane separation. We considered all that. I guess, the key is, as Clay said earlier, we've considered the policies settings, we've recommended conditions, I guess, that have gone, I guess, further than in the part – more recent, sort of, approvals on Tahmoor, for example, and Russell Vale.

We're requesting a – that the proponent prepare a fugitive emissions minimisation plan that's reviewed and updated every three years, but also including The Independent Advisory Panel for Underground Mining. We have spoken to them about changing the terms of reference to incorporate, you know, greenhouse gas expertise to provide advice, you know, for underground mines and management of greenhouse gas emissions and abatement technologies, which is an important issue

across all underground mines, you know, in New South Wales. So that's stepping up the role, there, I guess, to address that.

We've included performance measures for scope 1 fugitive emissions based on a peak five year rolling average and project life targets. With offsetting targets – with offsetting requirements when the targets aren't met. As Clay mentioned earlier, opportunity through that fugitive emissions minimisation plan to ratchet down the targets based on technology, you know, and looking at that advice from the mining panel to feed into that, as well, as well as other experts within the department who play a key role, you know, in this area, as well. Our climate and atmospheric science branch within the department has also provided advice on this.

The other conditions, also, is performance targets related to scope 2 emissions and, you know, Whitehaven has made commitments about where they're going with that to minimise or eliminate scope 2 emissions through offsetting or green electricity sourcing. Other key components, just from a transparency point of view, is regular reporting, you know, with specific requirements to report on greenhouse emissions and abatement in the annual reviews with input and review by the various experts, plus, also, for a specific gas extraction plan as each extraction plan gets rolled out for each phase of the mine. You know, a standalone gas extraction plan would be required. That's based on the findings from the expert input and, as Clay said, there's potential, you know, to reconfigure things to reduce biodiversity impacts, but further reduce greenhouse gas emissions. So that's probably as far I'll go on those four points. So happy to get into the specific questions.

PROF O'KANE: No, I think that's – unless Chris and Snow have anything further there, I think it would be great to move to the questions, Steve.

MR O'DONOGHUE: Okay.

PROF O'KANE: Steve, just before you do, I think it's worth me just summarising the point of the first one about existing operations. We, particularly noting the size of the new longwalls, their unusual size and how big they are, and also noting the unusual footprint that Clay has emphasised, and we have been particularly looking at progressive rehabilitation, and we are – we did a lot at the site inspection the other day, and that was really helpful to get a sense of it, but we're concerned here partly about the – trying to understand the impacts with the bigger longwalls and, you know, sort of, extrapolate, but the other thing we're concerned about, too, is should the coal price hit some point at some point in the future that the mine had to go into care and maintenance, would it be able to do that easily. And that's why we're, sort of, looking at – that's another reason for, particularly, looking at the existing operations. Is the rehab at a certain point, is everything up to date that it could go for a short period of, or a long period of care and maintenance. So over to you to address the question, but with a bit of that in mind.

MR O'DONOGHUE: Sure. Yes. There's probably – it probably overlaps the first question and the last question, as well, about care and maintenance.

PROF O'KANE: It does. Yes.

MR O'DONOGHUE: Yes.

PROF O'KANE: Perhaps I shouldn't have asked two, but, anyway, yes. You can join them together if you like.

MR O'DONOGHUE: So provide a bit of a response to the first one, then maybe – and maybe I can, like, bring forward that - - -

PROF O'KANE: That'd be good. Yes.

MR O'DONOGHUE: - - - last question if they're, sort of, linked together.

PROF O'KANE: They're linked. Yes.

MR O'DONOGHUE: Yes. Okay. I mean, I guess the first thing to say, like, learnings from the current mining operations, I guess, there's a couple of points here. Stage 2 of the mine, which is the longwall mining component, commenced in 2012, but prior to that there was the bord-and-pillar and the first developments, so there's probably not too many learnings from that, but certainly from, you know, when longwall mining commenced. Initially, with not quite as wide panels.

There was a mod to increase the panel width subsequently to that, but, certainly, there's, sort of, 10 years of, you know, monitoring and data collection, rehab to date and reporting in annual reviews, and in that time period there was three independent environmental audits have been completed, as well, over that period. That gives a guide on actual impacts against predicted impacts, as well. So that's important information.

I guess, all that information and data, I guess, has led – you know, has informed Whitehaven's assessment, but it also – you know, our consideration, as well, in our assessment. So, I guess, just touching on, I guess, just some points, I guess, from the audits and annual reviews, just to touch on. It doesn't directly go to the point, but I think it's worth just discussing or identifying.

I guess there's a number – there's the number of areas where, you know, it's identified non-compliances, for example, where this has led to improved management or, you know, led into learnings to go into the environmental assessment. A couple of them are in relation to compliances with noise conditions, both in relation to attended noise monitoring on receivers, but also just managing noise levels at the site is one area that both the EPA and the department, you know, have met with – and taken regulatory action and met with the proponent over and, I guess, that does lead to – since it's part of an adaptive management, improving management that does lead to, you know, better management updates and noise management plans, for example, to improve management onsite.

There's also been non-compliances in relation to Aboriginal Heritage, in terms of where – not so much from subsidence impacts, but where there's just been impacts due to not following appropriate protocols, for example, in clearing. So that's certainly an important area, you know, for the department ensuring – and for Whitehaven, as well, to ensure that, you know, those protocols are clearly undertaken and, you know, at least the direct impacts on sites are appropriately managed, you know - - -

PROF O'KANE: Particularly with the grinding grooves.

MR O'DONOGHUE: What's that, sorry?

PROF O'KANE: Is this particularly with the grinding grooves, was it?

MR O'DONOGHUE: That's right. Yes. Yes. So – well, not – in that one there was no impacts on grinding grooves. It was more of a matter of it not being appropriately fenced off.

PROF O'KANE: Right.

MR O'DONOGHUE: Right. So the impacts are more in relation to artefact scatters not appropriately, you know, identifying areas. So certainly ..... in terms of – you know, for the company to ensure that they, you know, appropriately manage it in accordance with the Cultural Heritage Management Plans and protocols. I guess, in that time, the department's compliance, in that time, we've issued one penalty notice and three warning letters, mainly over those sort of incidents, but I'll just flag – like, the EPA and Resources Regulator, you know, have also taken regulatory action in relation to various matters, including noise, water discharges and waste management, as well.

So they're management that need – you know, that need to be appropriately managed, and it's on the department's, you know, radar in terms of conditioning to, you know, ensure that happens, as well. The other point I'd say is that, I guess, the extension project – the EIS does provide some details on current performance and monitoring, which has been used to better inform the current predictions, you know, particularly in the, like, groundwater and surface water assessments, you know, that data collection.

Being a brownfield mine, I guess, a good example is groundwater where it improves calibration of the model. It's a stress system. You know, you're get – you're taking groundwater drawdown and feeding that into the modelling, so that has certainly, you know, fed into improvements in the modelling. Also mindful of the, you know, recommendations of the mining panel to get better data and to progress those models further, particularly in the mining area, and improve predictions both in relation to surface to seam – potential surface to seam cracking, but also the implication of that on water drawdown and impacts on surface features more surrounding the mine.

Noting that they were less concerned about impacts on regional groundwater impacts, like, on the Namoi alluvium, for example, given the – like, the low permeability of the – of these rocks surrounding the mining – the mine itself. So just on – just touching on, like, the groundwater aspects, just in terms of one important point to note. I guess, from the original modelling that was done or is updated, you know, from the EIS and as recalibrated that the inflows to the mine have been less than initially predicted, you know, based on previous modelling. So it's being conservative to compare to actual inflows.

There's been – partly related to, you know, differences in production rates and that sort of thing, as well, but overall has been – the inflows have been less. Sorry. So, for example, that's led to less requirement for brine storage on the surface, for example. So it hasn't moved to yet – there haven't been constructed major larger brine storages or required, you know, discharge the Namoi River, for example, so they're – so that's just one learning from that so that – and, I guess the groundwater modelling has been informed by that and, you know, which has led to the revised predictions for the extension project.

Just on drawdown, with the current approved project there was drawdown predicted at one receiver, based on the 2015 model calibration, like, to date there's been no impacts reported, you know, on bores as a result of – or private bores as a result of the existing operations. So that's probably – I could go on. I've discussed earlier, I guess, the, sort of, predictions on the – you know, from the existing project, so I won't get – I won't go into that.

I might just touch on subsidence. The subsidence impacts at the existing mine have been typically less than predicted. I guess that's the first point. Also surface to seam connectivity has not been observed to date, so I guess those findings have informed, you know, the existing round of subsidence modelling, but also the groundwater modelling, which the groundwater modelling was also peer reviewed by Bruce Hebblewhite, you know, for the proponent, so – and, certainly, Jim Galvin in the panel has reviewed that, as well.

So I guess that information's fed in. That's being considered. There's still a bit of uncertainty about, you know, as a prediction about the – how far cracking would go up, but it's certainly – the panel's recommended further, you know, monitoring and updated modelling to inform, you know, the future groundwater modelling and that predictions as the mine progresses.

I guess the other point for that is that regardless of uncertainty about surface to inseam cracking, and that given that the nature of the surface water being ephemeral and very low recharge rates, I guess, the panel concluded that, you know, it's not a significant issue for the mine in terms of take of water and impacts, you know, on surface water features above the mine.

Just with subsidence, and I just touched on that earlier. One of the – I guess, the unpredicted impacts that did occur, you know, in the northern panels was that there

was quite a large area of tree die back in panels LW101 and 102. This was a result of low depth of cover, very dry conditions at the time and the – essentially, what happened is that there was shearing or impacts from the stresses and strains on the tree roots itself, which led to, like, tree death over that area. So that wasn't predicted in the original modelling, but I guess there was a – in a learning from that, I guess, the current round of modelling has – this is the 53 hectares that I, sort of, mentioned earlier.

The current round of modelling and biodiversity assessment incorporated that there would be an indirect – potentially an indirect impact of 53 hectares in the same – with a similar mechanism if those conditions did repeat. It's a – I guess it's a conservative assumption, because at the time there was drought conditions that led to that, as well, and that's been incorporated - - - s

PROF FELL: ..... by the fact that it's a deeper seam that they're mining?

MR O'DONOGHUE: That's right, Chris. What happened with the northern panels is once they go to 103 the depth of cover increased and those impacts didn't occur. So, really, for the extension panels, it's really – there's – it's really that additional longwall panel that's furthest to the east that's identified to be potentially impacted. I can put up a figure if that assists.

PROF BARLOW: Yes, that would be helpful, Steve.

MR O'DONOGHUE: Okay. Can I – I just have to share my screen, If I can. Yes. Can you see that?

PROF O'KANE: No, not yet.

PROF BARLOW: Not yes.

MR O'DONOGHUE: Okay.

PROF O'KANE: Don't worry too much - - -

MR O'DONOGHUE: Okay. Hang on, no I've got it.

PROF O'KANE: We've got the material with us and, of course, we flew over the site the other day with the drones. That's very clear. Thank you.

MR O'DONOGHUE: Right. Okay. So see that – the cursor there with the purple hatched area is?

PROF BARLOW: Yes.

MR O'DONOGHUE: So that's the, sort of, are that that impact – within that area impacts occurred. It's a – its where there's only 180 metres depth of cover. All

right. So, similarly, for the short or longwall panel here where there's that depth of cover, they've conservatively assumed that in that hashed area that there would be impacts and incorporated that into the – you know, the biodiversity development assessment report and offsetting requirements. So that's included in there. Like, the impacts may not occur. Like, it was a – there was a number of reasons for why it did occur in the northern panels, including moisture conditions at the time.

PROF BARLOW: Yes.

MR O'DONOGHUE: So I'll just stop sharing.

PROF BARLOW: Yes. Of course – Snow Barlow here – there's no guarantee what the moisture conditions will be.

MR O'DONOGHUE: Yes, that's right, which is why they've assumed that a similar mechanism may occur, you know, for that area.

PROF BARLOW: Steve, could I – sorry. Can I ask a further question there. Without going back and looking at the geology, is there further geological layers, you know, that emerge as you go to the west and the seam dips from 180 metres to, you know, it's about 400 metres at the western fringe. Yes. Are there other intervening geological layers there?

MR O'DONOGHUE: Look, I don't think so, Snow. I think it's more that the formations, like, thicken out, and there might be splitting. I think in the model that that did separate out, you know, different layers within formations in some areas, you know, based on where it was in the – above the workings.

PROF BARLOW: Thank you.

MR O'DONOGHUE: There is a – like, I've got another figure if you want me to show you. It's got that geological profiles, but, probably, it's in the report, as well.

PROF BARLOW: It's in the report. Okay. Thank you.

MR O'DONOGHUE: Yes. So just on rehab, I guess, the impacts on the trees is one component, because there would be rehabilitation requirements around that. I guess on the – I guess a well-established rehabilitation management plan and extraction management plan requirements for rehab, which has been incorporated into the northern panels to date. Overall, that sort of process would continue to occur, you know, for the southern panels in terms of progressive rehab at the site and, you know, as the panels extend to the south.

I guess, the one thing here is that they are quite long panels. They'll be – you know, extraction of one panel will take quite a while. There'll be still – there will still be gas drainage through that panel, you know, pre-drainage, post-drainage, which would, you know, keep some of the rehab requirements open for quite a while, you

know, as that occurs, but, I guess, the extraction plan and the rehab management plans are, I guess, the tools to manage that, and I can touch more on, I guess, particularly your concern about the care and maintenance, if you want me to - - -

PROF O'KANE: Yes. Move onto that, maybe.

MR O'DONOGHUE: Okay.

PROF O'KANE: And could you make a comment, Steve, are you happy with the rehabilitation to date? We saw – so we're fairly familiar with it at the moment. We had a really good look at it the other – a couple of days ago.

MR O'DONOGHUE: Yes, look, generally, yes, and, I guess, the Resources Regulator, I guess, take the lead role in rehab, but, certainly, in the extraction plan there's obligations, for example, to, you know, fix up the cracking and ponding elements. Like, the independent environmental audit, like, early ones, did flag concerns with delays in remediating cracks, for example, and we can provide you, you know, a copy of the – you know, the independent reports – audit reports, if you want.

PROF O'KANE: Yes, please. That'd be good.

MR O'DONOGHUE: Which does include, you know – usually through that process where the problem's identified, the proponent prepares a – you know, an action plan to address the audit findings. So, certainly, there's that process over the top of it, as well, which picks up if there's any issues with rehab or any component of the project and a requirement for the proponent to – you know, to act on the audit findings, but we can provide you a copy of those audit reports, as well.

PROF O'KANE: Okay. Thanks.

MR O'DONOGHUE: So just on, like, care and maintenance. I guess, there's – I guess, the first point is that the Resources Regulator is the lead agency for mine rehab in this. Under the Mining Act, the Minister must formally approve the suspension of mining operations, okay. So there's a formal step there, and the approval may include specific conditions for – you know, related to, you know, suspension of operations.

So there's a step there, additional conditions could be put on through the Mining Act provisions, as well, and it – I guess, the other point is that the suspension or the care and maintenance only relates to the extraction components of the project. Like, the mines are still required to comply with the other mining lease conditions. So the rehabilitation reporting and the rules required to be undertaken and revisions. If it did go into care and maintenance, there'd be necessary revisions to, you know, mine operations plan or, I guess, with the new mining reform, they'll become rehabilitation management plans will be required to be targeted specifically for the care and maintenance period, as well.

The other point to note is that, so last year there was a change to the mining regulation that brought in some important reforms, sort of, in this space. So it brought in prescribed new standard rehabilitation conditions that will apply to all new mining leases, and there's a transitional period where it will be incorporated into existing leases, as well. So, I guess, the key things there, you know, they're required to prevent or minimise harm to the environment, which is a standard condition in environment protection licences consents, you know, and mining leases, anyway.

I guess, the key here is that there's required to rehabilitate land and owner as soon as reasonably practicable after disturbance occurs. So that's – along with our, you know, progressive rehab condition, the mining lease itself will have a specific condition that the Resources Regulator will regulate to be able to take those as reasonably practical after disturbance occurs. So, certainly, there's a few drivers there that even if it's in care and maintenance, about the regulation in the space to ensure that, you know, appropriate rehab is done.

From our point of – from our view, the rehab – progressive rehab conditions often largely related to trying to minimise other impacts, like dust impacts, you know, from open areas and it could include, you know, temporary stabilisation, not final rehab, which is more in the court of the Resources Regulator, but the progressive rehab is really ensuring that other impacts – offsite impacts are appropriately managed to minimise, you know, dust or sediment erosion concerns and that sort of thing, as well.

Probably the – the mining reform, also, incorporates a – the requirement for a detailed risk – a rehabilitation risk assessment to be undertaken for all mines, and that would certainly be part of this, as well, and part of that will be looking at care and maintenance and the potential, you know, for impacts in care and maintenance and how you can manage those risks through that process. So, I guess, they're the – like, that's, from a rehab point of view. I guess, the other point is that rehabilitation security bonds are required. So that would still be in place, even in care and maintenance, and it would be targeted to – you know, to ensure the – you know, the money is there to undertake works if required, and it would cover all – whatever liability as at that time.

PROF O'KANE: Thank you. That's very helpful, Steve. Should we go onto the water questions.

MR O'DONOGHUE: Yes. Yes. Okay. So this is the brine reinjection question.

PROF O'KANE: Brine reinjection question, yes.

MR O'DONOGHUE: Yes. Okay. Okay. Look, I – just the first point I'd make is that it's just important to note that the brine reinjection, including the brine point of construction are already a component of the approved project. So, I guess, in - - -

PROF FELL: Just on that, though, it wouldn't happen until 2031.

MR O'DONOGHUE: In terms of the reinjection? Yes, that's right. Well, it would be – in the case of the existing mine, since it – that's correct. There was potential – it depends on the sequence of extraction of whether they can safely put brine underground and, you know, where water flows, but it would've been delayed in terms of that, too, Chris, but, certainly, the approval would extend the timeframe and there would be more, you know, brine generated, you know, over the life of the project, as well. So they're important considerations.

PROF FELL: I guess, Steve, is anybody else doing this? Any other mining company?

MR O'DONOGHUE: Look, we had a look at the – there's – Narrabri is the only one that has a specific condition, I guess. If you look at the existing conditions for it, they flagged it in the original EIS for the project, but they – we also put conditions in there about, you know – to continue to investigate where there was potential for beneficial reuse of brine. So that's an existing conditions. That's – and which we've extended into the current condition. So to continue to look at what options there may be to avoid, you know, brine storage disposal and reinjection.

With – in New South Wales, I guess, there's some underground mine – again, it's about underground mines, mainly, or a combination of underground and open cut, in the Hunter and in the south and western coalfields that do manage mine water, and in the case of the Austar Mine in the Hunter Valley brine, as well. Often in these mines there is brine and mine water co-storage in surface to surface storages, but in the Austar Mine there are – there is pumping of surface water underground workings is quite routine of water – mine water where surface storages are unavailable, and there's available storage in the goaf for underground working.

So it is a common – it is a reasonably common process to store the water and, like in the case of Austar, brine. It's generally been temporarily, though. It's not a – it's part of the water management system, rather than a – you know, a final solution for management of brine. It's more, you know, there's available storage, putting in underground workings, pumping it back out of the underground working. So it's more of a water management approach for the site, rather than a – like, a final, you know, disposal option in there. So - - -

PROF FELL: Yes. Just - - -

MR O'DONOGHUE: So Narrabri's fairly, yes, unique in that sense.

PROF FELL: ..... site, though ..... was a fact that over a three-year period they were disposing of 260,000 tonnes salt into the goaf.

MR O'DONOGHUE: Yes.

PROF FELL: Although they say that it's only five per cent of the open volume of the goaf, it looks, through the 20 boreholes, to be put into a fairly narrow area of the

goaf, and one wonders if, in fact, that down there could, in fact, cause problems. I mean, it's said that the goaf is rehydrated, if you like, from the upper and lower seams over 200 years, but are you and DPI Water, are they generally happy with that study - - -

MR O'DONOGHUE: Well - - -

PROF O'KANE: - - - to say it won't get along somewhere else?

MR O'DONOGHUE: Look, we had the – we are – like, we had the mining panel, you know, that was part of their brief to look at this, the brine reinjection. So they, essentially, agreed that there was very little prospect of contamination and the brine would stay – you know, it wouldn't migrate to aquifers that are beneficial – highly used for beneficial use or, you know – or even the aquifers currently used by – you know, in the overlying rocks, and the reasons – I guess, the reasons for that, as you've flagged, Chris, is that the – and the panel was comfortable with this is that the hydraulic gradients would be towards the mine for about a 200 year period post-mining, as the groundwater recovers, and so the brine would be diluted, you know, by inflowing water over that period.

The long-term total dissolved solid concentrations, you know, are predicted to be around 8800 milligrams per litre. Without brine reinjection, about, like, 10,100 with reinjection. So there's not a lot of difference in the groundwater modelling between – you know, with or without injection, partly because of the – you know, the dilution over that time. And once the ground – once the ..... waste, as I guess we covered, the modelling predicts that flows would be downwards into the underlying formation, which is more saline than the goaf water at about 12,000.

PROF FELL: ..... one. Yes.

MR O'DONOGHUE: Yes. So the mining panel were quite – you know, they were quite comfortable with the predictions about – around this – you know, is the advice that we received from the panel.

PROF FELL: Just one last question on that. Given that the Narrabri Gas Plant actually recovers the salt and is looking at the potential of being beneficially used - - -

MR O'DONOGHUE: Yes.

PROF O'KANE: - - - and they're talking – we're talking about 31 per cent of the salt Narrabri Gas Plant recovers, would it make sense to ask them to have a look at this as a long-term prospect?

MR O'DONOGHUE: Certainly, Chris, I think – and I – like I say, there's existing conditions for ongoing review of beneficial reuse options and what they can do, and I know partly it does come to that question as per Narrabri Gas is the type of salt,

whether it's carbonated salt or chloride salt, as well. So, I mean, part of – some of the figures in the EIS, the Piper diagram, et cetera, indicating the Hoskissons seam is carbonate dominant salt, like, similar to Narrabri Gas. So that does improve the prospect of, you know, beneficial reuse options as, sort of – that was considered in the Narrabri Gas Project, as well.

So I think it's something – I think there's provision for that, to do that, you know, ongoing, sort of, review and looking at options for that that would – again, the benefits of that would be to, you know, reduce environmental impacts associated with brine storage on the surface, as well. I mean, you know, that's one aspect, and the risks around doing that, apart from, you know, pumping into underground workings. So it's certainly something that can continue to be looked at and options considered where – you know, where it's certainly feasible – reasonable and feasible to do it.

PROF O'KANE: And they said they had been talking to Santos in the past, so they were open to that. Yes. So - - -

PROF BARLOW: Well, it was along that fine line, Mary. In those discussions, interestingly – we probably hadn't thought of this, but, you know, in the, sort of, droughts in 16 to 18, in that area, they were talking to Santos because their interest was at that point, I don't think, so much in disposing of the - - -

PROF O'KANE: .....

PROF BARLOW: It was actually bringing the fresh water from the very efficient RO that occurs at Santos back this way and, of course, if – it's only 30 kilometres, and a pipeline could go both ways quite easily.

PROF FELL: Well, just on that, Santos would practice recovery of 94 per cent of the water, whereas this current project is talking about 70 per cent – 75, I'm sorry. So, anyway, thanks. That's been helpful, Steve. I'm mad keen to discuss greenhouse gas, because - - -

PROF O'KANE: .....

MR O'DONOGHUE: Clay's been waiting for this one, so - - -

PROF O'KANE: .....

PROF FELL: Where did you get those figures?

MR O'DONOGHUE: Right. Okay. So they're based on the amendment report. There's an appendice there by Jacobs with revised greenhouse gas estimates. So - - -

PROF FELL: ..... 155. I agree with that, but it seems, if you're cranking down on them, the top two conditions are a bit more liberal.

MR O'DONOGHUE: Like, it's based on the actual – I guess, what it is, it's based on the – looking at the period 2022 to 2042. 2043 wasn't included, because it was, sort of, an outlier, because it was the last year of mining and a very small production rate, which skewed the figures, but it was looking at, you know, the 2022 to 2043 and looking at the peak intensity over that period.

PROF FELL: ..... 31,000 - - -

MR O'DONOGHUE: Yes.

PROF FELL: - - - tonnes of CO2 and a production of 201 million tonnes per year, that was.

MR O'DONOGHUE: So it's based on - - -

PROF FELL: .....

MR O'DONOGHUE: So I guess the peak year was in 2040, because the – I mean, the bottom line is you're getting – you're really getting into the – you know, probably from about, you know, 2020/30, you really get – 2029, 28, you're getting into the gassier part of the mine, and that's when the intensities, sort of, ramp up. So the sort of figures that are driving it in the later half of the mine life, because that's when you're getting your higher emissions, you know, through those periods, but it's, essentially, based on the Jacobs mineral report data, which was informed by Palaris' calculations of fugitive emissions.

It also does include post-mining fugitive scope 1 emissions, which is – which in the parlance of the greenhouse gas estimates, it's not post-mining, ceasing mining, it's post-mining means when coal's brought to the surface and you're getting continuing emissions from stockpiles, et cetera, that adds to fugitive emissions over the life of the project. So there'll be a – there's an estimate each year for, sort of, those post-mining emissions from stockpiles, which is also incorporated into the calculation.

PROF BARLOW: So they are, essentially, surface emissions, aren't they? They - - -

MR O'DONOGHUE: That's right. They end up being – yes. They end up being, you know, fugitive emissions through the chain, I guess, from bringing the coal to the surface.

PROF BARLOW: Yes.

PROF FELL: Well, I think the concept that you put forward is most interesting, but my only question would be it's based on somewhat – 25 per cent less production than there actually would be given permission for, which is 11,000 – 11 million, I'm sorry, tonnes per year.

MR O'DONOGHUE: Well, I mean, I guess, if they – I guess, in that – in some sense, it's a bit more conservative, because if they do increase, potentially, you know – it'll depend on the relationship between emissions and the production rate at that year.

PROF O'KANE: Are you cogitating or speaking?

PROF FELL: I'm just adjusting it at the moment.

PROF O'KANE: Okay. All right. I just – yes.

PROF FELL: Okay. No, look, the concept of encouraging the company to lower their emissions is, obviously, a very good one, and this approach is quite an interesting idea, and I probably need to comment no further. I mean, Steve has explained where he got the figures from.

PROF O'KANE: Okay.

PROF FELL: The question of how you set a ..... captured for flaring is the hard one. We could possibly ask the applicant whether lending of gas could help that situation, and I'm quite interested about how they reticulate the underground seam capture so that – and would it be possible to actually take gas from a more gassy area and blend it with less-methane content gas to be able to flare, you know, if it was – anyway, we - - -

PROF O'KANE: Do you have any comments on that, Steve or Clay?

MR PRESHAW: Yes. Look, I think what you're asking has, in some respects, been requested by the department and provided by the company. So I'm happy for that to become a question that you put to us maybe in writing, and we can provide – if we think we can provide the response based on the information we have, we will, but if we think there's further information, I don't think the company will be surprised to receive a request for further information.

PROF FELL: Thank you.

PROF O'KANE: Okay. All right. Any other comments on the greenhouse gas issues that either of you wanted to make?

PROF FELL: No, thanks. I'm all right.

PROF O'KANE: Yes. It's more I was asking Steve and Clay, really, if they had anything else they wanted to say, but if they don't, Snow or Chris, any other questions?

PROF BARLOW: Not from me. Thank you, Mary.

PROF O'KANE: My only thing I just wanted to bounce onto the table, Clay, was we sent you the letter that we had from Lock the Gate. I don't know if you wanted to make any comment at this stage or you'll still working out replies?

MR PRESHAW: I think it's – yes, I think it's fair to say we're still considering our response to that. We actually do have a regular catch-up with Lock the Gate every two months, and it happens that that meeting is falling, I think, next week. So - - -

PROF O'KANE: That's good.

MR PRESHAW: We're just – we're working on a response, and we'll talk directly with them about it, as well.

PROF O'KANE: That's very helpful. That's good to know. Any other comments from anyone? I don't have anything extra. It's been a very helpful meeting, indeed.

MR O'DONOGHUE: Thank you.

PROF O'KANE: So thank you, and we'll, possibly, you know, follow up with something in writing. We'll see how we go. Thank you.

MR PRESHAW: Thanks for your time.

PROF BARLOW: Thanks a lot.

PROF FELL: Cheerio.

PROF O'KANE: Bye.

MR PRESHAW: Cheers.

RECORDING CONCLUDED **[10.23 am]**