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INDEPENDENT PLANNING COMMISSION

MEETING WITH DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT – WATER GROUP (DPIE Water)

RE:	**HUME COAL AND BERRIMA RAIL PROJECTS**
PANEL:	**PETER DUNCAN AM (CHAIR)** **PROF ALICE CLARK** **CHRIS WILSON**
OFFICE OF THE IPC:	**STEPHEN BARRY** **LINDSEY BLECHER** **CASEY JOSHUA**
DPIE:	**STEPHEN O'DONOGHUE** **PHIL JONES**
DPIE WATER:	**MITCHELL ISAACS** **ANDREW DRUZYNSKI** **FABIENNE BOUDOUX D'HAUTEFEUILLE**
LOCATION:	**VIA VIDEO CONFERENCE**
DATE:	**10.03 AM, MONDAY, 19 JULY 2021**

MR P. DUNCAN AM: Good morning and welcome. Before we begin, I would like to acknowledge the traditional owners of the land from which we meet. For me, it's the Darramuragal, or Darug people. I would also like to pay my respects to elders past, present, and emerging. Welcome to the meeting today to discuss the Hume Coal Project and Berrima Rail. It is currently before the Commission for determination. Hume Coal Pty Limited is the applicant, and it's proposing to build a new underground coal mine in the Southern Highlands, regional New South Wales, and develop associated rail infrastructure to support the mining operations.

These two components are the subject of two separate development applications made to the Department of Planning, Industry, and Environment but, for the purposes of this assessment, form an integrated whole. Associated projects are located 100 kilometres southwest of Sydney and seven kilometres northwest of Moss Vale in the Wingecarribee Local Government Area. My name is Peter Duncan. I am the chair of this commission panel. I am joined by my fellow commissioners, Professor Alice Clark and Chris Wilson. We're also joined by Stephen Barry, Lindsey Blecher, and Casey Joshua from the Office of Independent Planning Commission.

In the interests of openness and transparency, and to ensure the full capture of information, today's meeting is being recorded and a complete transcript will be provided and made available on the Commission 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're asked a question and are not in a position to answer, please feel free to take the question on notice and provide any information in writing, which we will then put on our website.

I request that all members here today introduce themselves before speaking for the first time, and for all members to ensure they do not speak over the top of each other to ensure the accuracy of the transcript. We will now begin. Stephen, we've put together an agenda there, and there's really four questions that – second, third, fourth, and fifth dot points. So, if you would like to work through those, and hopefully we've got some time for questions with the Commissioners at the end.

MR S. O'DONOGHUE: Thanks, Commissioner. Well, myself – Stephen O'Donoghue, Director Resource Assessments here, and Phil Jones, Consultant and Planner for DPIE, Mitch Isaacs from DPIE Water, who is the Chief Knowledge Officer. I will just bring him forward he wanted to make a few comments before we get into starting on the Q&As there, but also to introduce his team, who have been working on the project for some time now. So I might just introduce Mitchell.

MR DUNCAN: Thank you. Go ahead, Mitchell.

MR M. ISAACS: Thanks, Steve. Thanks, Peter. Mitchell Isaacs, Chief Knowledge Officer DPIE Water. Budyari mullinawul – good morning from Darug and

Gandangara country. So as Steve said, I'm the Chief Knowledge Officer of DPIE Water, which includes our science and analytics teams as well as our assessment team, which coordinates SSD assessment. We've been involved in the assessment of this project for, as you would be aware, many years. Sorry. I just a phone call coming through on my other phone, which took over my headset. We've been involved in the assessment of this project for quite a number of years, so there may well be things, as you flagged, that we're not able to answer today, but we're more than happy to take on notice.

We've got with us today Fabienne d'Hautefeuille and Andrew Druzynski. So Fabienne is our – Manager Groundwater Science, I think, is her current title. And Andrew is the team leader for Groundwater Modelling. So they will be able to help with a lot of the technical aspects of what you're interested in today. I'm more than happy to go into anything that might help you or take things on notice if we can't address today.

MR DUNCAN: Good. Thanks, Mitchell. Well, let's get straight to the – the first question was description of the groundwater model and assumptions. As the question said, we've heard that there is a general agreement that the model is fit for purpose, but there have been some questions raised about the assumptions. So if DPIE would like to comment on that to start with.

MR ISAACS: Yes. Look, I think – where we've got to is that our view is that the model presents a scenario that's not implausible, so the scenario and the results and the model presented could well be what happens. Thank you. So the – there's a really bad echo. I don't know if any – if others are getting that as well.

MR DUNCAN: Not so bad, but we're getting a little bit of it.

MR ISAACS: Well - - -

MS C. JOSHUA: I think that may be coming from Auscript. Are you able to mute yourself, please?

MR ISAACS: Okay. Let's try that again. Thank you. So the – our view is that the model presents a scenario that is plausible and that the scenario presented by the model may well happen. However, if it were better stress tested or, you know, sensitivity tested or better calibrated, for example, our view is that the range of scenarios that are plausible would only have a greater impact than what's currently presented by the model. So some of the changes – or if it was better stress tested or better sensitivity tested or other ranges of parameters put in, we don't think that the scenarios would get any – would have lower impacts than what are currently presented by the model.

So it's not an unrealistic scenario but, if the parameters were different or were changed, it's more likely to get worse than better. So that's our view of the model, and the primary parameter, really, is that vertical conductivity parameter in the Hawkesbury sandstone. That's the main parameter that we feel has a very significant

impact on the impact results and, if that were to change or the – or it were found to not be accurate or realistic, then the actual scenario and the actual results would likely be worse than are currently presented. Andrew or Fabienne might have more they can contribute on that, or there might be some specific things that you want to ask.

MR DUNCAN: Any comment? Any further comment?

PROF A. CLARK: Yes Peter, one from Alice here.

MR DUNCAN: Yes.

PROF CLARK: Mitchell, what's the likelihood of, I guess, that modelling assumption around the sandstone changing? What sort of things would result in that kind of a material change?

MR ISAACS: Look, I think the biggest uncertainty – and I will hand over to Andrew and Fabienne in just a second, but I think the biggest uncertainty is that that parameter has been selected on very, very few real data points. So I think there were four field sites, only four samples, that led to that parameter being selected by the modeller. So there's a very, very high degree of uncertainty as to if that is the right parameter or not. But I will get Andrew and Fabienne to just talk through that in a bit more detail.

MR A. DRUZYNSKI: Am I all right to go first, Fabienne, or – okay. The – what we discovered when we were looking at the report is that there was a whole range of pumping tests, pumping tests that were done to depths of 100 metres – in fact – from memory it was more than 100 metres. We found that there were many bores that had a KV value that exceeded the one metre per day. So, basically, the range was from one metre a day to, I think from memory, 15 metres per day. And so we asked that the model be run with the KV in that range of up to 10 metres per day, and that was refused. So that didn't give us a whole lot of certainty about the drawdown impacts – the possible drawdown impacts. The other issue is about the calibration of the model, but perhaps we leave that one for a little bit later. Does that answer the questions sufficiently?

PROF CLARK: I think so. I guess one of the things that you might be getting to later, and that we've been trying to wrap our heads around, is, you know, the impact of fluctuating water levels on the openings but, in particular, on the emplaced reject material at whatever time it's emplaced, and how that interaction might, you know, regenerate oxidation, regenerate acid production and then what's the conductivity. And then, how is that also impacted by this understanding, or need for a more detailed understanding, of the broader Hawkesbury sandstone water impacts. And so, I'm just trying to put all of those pieces together with the information, and your question does help a bit – your answer to my question helps a bit there.

MR DRUZYNSKI: There's also other problems in that there are some geological features that may be able to transmit water to significant depths. We're talking faults and dykes and features like that. But the other problem is that this hydraulic conductivity can only increase with the fracturing which propagates upwards towards the surface as a void is created below surface. So that would only increase these K values, where K is the metre per day transmission of water. So that is the problem - - -

PROF CLARK: With that potential for increase, would that have been able to have been discerned by that, I guess, that request to – that one to 15 metre a day modelling that you requested? Would that have been able to be unpacked through the results of that?

MR DRUZYNSKI: I believe so. Yes.

PROF CLARK: Okay. Thank you.

MR ISAACS: I think, to clarify, that modelling of that greater range would give you the – a broader range of impact scenarios. It won't tell you how likely it is to be between that one and 15 metre, but it will give you the impact, you know, a model impact at those higher levels.

PROF CLARK: So, Mitchell, I think you're saying that it's the consequence, but the likelihood is a different question, and part of my first question was around the likelihood.

MR ISAACS: Yes.

PROF CLARK: Can you add anything to that?

MR ISAACS: I think, with the likelihood, the issue we have is that there's so few data points that it's very hard to know – you know, if they collected another 20 samples, it may well be that they're all closer to that one, but it may also be that they're higher. So – Andrew or Fabienne, feel free to correct me on that, but I think, with the likelihood, we just don't know the likelihood.

MS F.B. D'HAUTEFEUILLE: So I will add something to what Mitch is saying. The few samples we – Mitch is referring to are down hole testing in the deeper formation, the ones just above, usually, the coal, and there's only four locations that have been tested for – I think they were the Parker tests. For a mine of that extent, we find that's a little bit limiting because it covers a wide area. The groundwater bores that Andrew referred to are usually a bit shallower, usually, and really that zone just above the coal is that area which we have a limited understanding in terms of vertical conductivity, and that's where a lot of the risk is and – yes. That's what we try – we would like to see better documented.

MR DUNCAN: Okay. Alice, anything further?

PROF CLARK: I don't think so, Peter. No. Thank you.

MR DUNCAN: All right. Mitchell, there's nothing more you want to add to that one, the first question?

MR ISAACS: No. Thank you.

MR DUNCAN: Let's move on to the next one, the clarification of groundwater concerns with reference to the Aquifer Interference Policy. There has been some views there, obviously, and we would like to get your views about that.

MR ISAACS: Yes. Thanks, Peter. I think the drawdown and inflows, I wouldn't say, are more significant than any project we've seen elsewhere, so we're not trying to say that this project has bigger drawdowns or a bigger area than any other project. However, the difference between this project and other projects are the proximity to previously unimpacted groundwater users. That's probably the main difference in our perspective from other projects. Many other projects, or other projects that have very significant drawdowns or groundwater impacts, have not had the same intersection with groundwater bores, particularly in a greenfield location.

I know that the – probably the closest parallel you could draw in terms of intersection between a groundwater impacting project and private groundwater users would be one of the Tahmoor projects. And, forgive me, I'm not entirely familiar with which Tahmoor project is which, but I know that the one that's being referred to, I think, has an impact of around about 46 bores, 46 private bores or thereabouts. This project, I think they're looking at a drawdown of more than two metres at around about 118 private bores at the 90th percentile. So it's a significantly larger number of private bores that intersect with the drawdown of more than two metres for this project, and the reason we use two metres is that's the level that's in the New South Wales Aquifer Interference Policy, of being the level that moves it into – from level 1 to level 2 impacts.

The Aquifer Interference Policy doesn't say what's acceptable or unacceptable. It says level 1, level 2. Level 1 has generally been acceptable. Level 2 is just level 2, and so two metres is that level 2 impact. So it's just that sheer number of private bores intersecting that at groundwater drawdown area of more than two metres, rather than the size and the scale of the groundwater drawdown on its own. So I think, if they were saying that there are other projects that have got a bigger drawdown or a bigger inflow or bigger tank of water, that they would be correct, but what those other projects don't have is at that number of private groundwater users in that same area.

MR C. WILSON: So – Chris Wilson here. So the bottom line is it's the impact of the groundwater drawdown in terms of the settlement pattern. Is that what you're saying? Basically, the – because it's quite densely populated and there are a high number of bores, there's a different impact.

MR ISAACS: Yes. Correct. That's what the models are showing, is that there are significantly larger number of private groundwater users that would be impacted than other projects that we've seen. And remembering, of course, that the comments we made about the model – so that 118 – I think it's 118. Sorry if I've got the number – a few wrong – at the 90th percentile is what the model is currently predicting. So if the - - -

MR WILSON: And you're saying, basically, from what you answered in your previous question, that even if they were to do sensitivity analysis, it's highly likely that the impact will be greater rather than less.

MR ISAACS: Correct. .....

MR WILSON: Or am I getting confused?

MR ISAACS: No, no. That's correct. If they did those further analyses, or increased the KV, the vertical conductivity values, that number of people is likely to increase, or the impact on those individuals is likely to increase.

MR WILSON: Yes. All right. Yes.

MR ISAACS: Not decrease. Yes.

MR WILSON: Thank you.

MR ISAACS: So whether it's the number of people increasing or the impact on those individuals increasing, I don't know, but I think, suffice to say, the impacts aren't – they wouldn't get less.

MR WILSON: Thank you.

MR DUNCAN: All right. Anything else, Alice, from your point of view? Is there anything we want to mention here while we're at this point about the time of the impact as well? The timeframe? Mitchell? Anything from - - -

MR ISAACS: I couldn't answer that. Is that a question as to how soon or for how long the impacts are lasting?

MR DUNCAN: .....

PROF CLARK: Can I refine that a little bit, Peter?

MR DUNCAN: Yes, sure. Very well.

PROF CLARK: I guess what would be useful for us to understand is how accurately you think the modelling reflects when it will recharge over the years post mining and whether or not you think that the modelling reflects, you know, the

potential for, I guess, re-wetting and re-oxidation of any emplaced materials, which you've partially already addressed. But that sort of long term recharge and how long that would take and how, I guess, accurate you think that modelling is.

MR ISAACS: Fabienne or Andrew, do you know the answer to that?

MR DRUZYNSKI: I don't, actually. That's a very difficult question to answer. What we are sure of however is that the model is poorly calibrated, and so, from memory, I think it's 50 per cent of the bores, the model versus the actual observed in the field, the difference is 10 metres. I think it's about 67 per cent of all bores are more than 10 metres. It's only something like 27 per cent of bores that are within two metres. So one could effectively say that, you know, well over sixty-something per cent – 67 per cent of the model is very poorly calibrated, and what that means is that the flows through the model are – right now, they're incorrect, really. It can be either too much or too much – too much or too little water over 67 per cent of the model.

So, what impact that has on drawdowns is very uncertain and, in fact, it increases an uncertainty immeasurably. The model would be the best tool to use to ascertain how long it would take for recharge to get back in and how long it would take for water levels to recover, but I think the current model, as it is – although it has the capacity to do that, the model is applicable - we believe it's applicable for the problem. We just don't believe it has been parameterised properly to be fit for the purpose.

PROF CLARK: So, Andrew, can I just ask you, are the model – have I got it correct if I say the model, in your opinion, is fit for purpose, but the inputs are where your questions are around how the model is able to be used or applied? Is that – have I got that correct?

MR DRUZYNSKI: What I want to say is that model is applicable to the problem if it was parameterised correctly, but I don't think we could go so far as to say it's fit for the purpose of the assessments that are required.

PROF CLARK: I understand. And the parameters that would need to be, I guess, fixed, for want of a better word, are they all around that one to 15 KV request that was made, or were there other parameters that would need to be addressed?

MR DRUZYNSKI: That was the top one but we also did have concerns about recharge. We have concerns about recharge values that were in the model. There was something else. It was minor, though. What impact it has we'll have to see…

PROF CLARK: Thank you, Andrew.

MR DUNCAN: Right. Well, let's move on to the next question of the function of the make good provisions in the Aquifer Interference Policy. Mitchell, do you want to take the lead on that?

MR ISAACS: Yes. Thanks, Peter. So the Make Good provisions – we don't have any formal guidance on how they would work, which I acknowledge makes it

difficult for the proponent, and I would say that the proponent, in a lack of formal guidance, has made reasonable attempts to address this issue. It's always hard to address something like that without formal guidance from government and, unlike in other jurisdictions like Queensland, we don't have statutory backing around some of those provisions, which does make it challenging for a proponent to address it, particularly for the number of users they would need to address it for.

So 118 would be, you know, that's a scale that's completely unprecedented in what we've seen before. Now, how we would see – and noting that this is our view, it's not a formal policy or guideline – the way I see Make Good is that Make Good is something that you need to ensure you have in place for impacts that are predicted for a project. So if a project said it's going to have these impacts, Make Good are the things that you need to have planned, agreed, in place before a project can commence, before those impacts happen. In consent for other projects – and this one, if it's approved, they would have – I presume they compensated a water supply condition – that's more an after the fact thing.

So if something happened that you hadn't addressed beforehand, or was unpredicted, you would need to deal with. So that's what – so Make Good, the way I see it, is something you need to address up front and before the impacts happen and before the activities commence, whereas compensatory order is something that is – you would need to do if the impacts are worse or there were unforeseen impacts, or there was something you didn't predict happen, so as to make sure that people aren't adversely impacted in ways that were unforeseen. Does that help?

MR DUNCAN: It does, actually. It helps me. Explains it quite well. Thank you. Chris or Alice, do you want to ask any questions on this?

PROF CLARK: No, that has, you know, clarified my thinking around there. Thanks, Peter.

MR WILSON: I have one, Peter. So just – my understanding, then, that the Minister has a – the Minister for Water has the discretion to approve or disapprove a licence based on impacts and Make Good provisions. Is that right? I mean, the Make Good provisions are a requirement of the Aquifer Interference Policy. Is that correct?

MR ISAACS: Yes. It's a requirement of the Aquifer Interference Policy but, in a state significant development – so if we go outside the state significant development framework, the impacts would be assessed under the Water Management Act in terms of granting a water supply work approval. Let's say somebody was putting in a bore, and the licence is a separate thing, so – sorry, I apologise. I'm trying to get my phone to stop cannibalising my headset and it's not working very well. So under the Water Management Act, so if it's not State significant development, let's say somebody wanted to put in a bore. The impacts would be assessed under the water supply work approval under the Water Management Act, and the water licence is something that's separate to that.

Under State significant development, the impacts are assessed under the Environmental Planning and Assessment Act, and we use the Aquifer Interference Policy still to guide the assessment under the Environmental Planning and Assessment Act. They still need a water licence, but the water licence – it's not the impact assessment. So, provided that the water licence was within the rules of the relevant water sharing plan, it's not the tool or the mechanism to assess the impacts, whereas the development consent or, if it was outside the SSD framework, the approval would be the tool to assess the impacts. So those impacts are really not – we provide advice and guidance based on the Water Management Act, but we're not the – we don't actually make the decisions around the impacts that a project would have if it's under the SSD framework.

MR WILSON: Okay. Thank you very much.

MR DUNCAN: All right. Let's move on to the final question, then. Should some of the bulkheads deteriorate over the Long term, what are the potential impacts of groundwater quality, and potentially impact water quality in the bores? Do you wish to make a comment on that, Mitchell?

MR ISAACS: Look, I don't think it's something we've really looked at, and it's not something we have a great deal of expertise in relation to that underground mine design. However, what's probably a bigger concern to us, or bigger issue, is the quality and the material that's placed underground rather than the underground design. So if you're putting things underground that are going to create water quality concerns, that's going to create water quality concerns, whereas – I think that's probably a bigger issue from our perspective than the underground mine design, which ..... long term groundwork quality. I don't know, Andrew or Fabienne, if there's anything more that we have to say about that.

PROF CLARK: I think, just to help, you know, yourself, Andrew, and Fabienne, is it's not so much around the mine design. The question is more: if the bulkheads do fail, there will be groundwater that will enter the system that was not anticipated to enter the system, and the applicant has put, you know, some information about what that groundwater would look like. So, given the amount of groundwater that might happen to enter the system in that circumstance – and, I guess, if you're looking at the gradient of the slope of where those voids were created and where the water would flow, would you have any comment about, you know, that quality of groundwater entering the system, and what might happen? Now, you've answered some of that, I think, in the start, but it was more an impact on that whole groundwater system, should that occur, and did you look at that or have any thoughts around that?

MS D'HAUTEFEUILLE: I will answer that one. In terms of hydrogeochemistry, the only thing we looked at was the fact of sending back treated water back into the mine. So there was a report provided by a consultant which suggested that – with lime dosing, you could treat – those rejects before rejecting them in the mine workings, and that was decreasing the level of risk significantly. We haven't really looked further than that. Now, in the event – of another contamination we haven't foreseen, obviously any water which is contaminated and makes it to the Hawkesbury has the potential

to dissipate and go further afield. We don't know if that's going to be the event or not but, if it is, of course it would be a concern.

PROF CLARK: So, in terms of the lime dosing application in that report, were you satisfied that that would help ameliorate some of the chemical contaminants that might be exposed? Did you have any thoughts on, I guess, the geochemistry of that?

MS D'HAUTEFEUILLE: Yes. We were quite satisfied with that report. We thought it was quite thorough. And what I don't remember is whether it considered the mine as a stable environment or not, if there was potentially … or not. That, I do not remember.

PROF CLARK: Thank you, Fabienne.

MR DUNCAN: Chris, anything further from you?

MR WILSON: Yes. Just one more. You mentioned there might be some uncertainty in terms of recharge. How does that affect Make Good provisions after closure, if at all?

MR ISAACS: Look, I think, at the highest level, there's uncertainty because it's a bit untested for us. In – you know, if we look at the Aquifer Interference Policy, it has been in place for nine years, which is quite a long time for a government policy but, in terms of testing it in the real world, it's not actually that long. I think what I would say is that I would expect that Make Good provisions would need to be able to cater for that range of uncertainty. So if there was a reasonable chance that a bore – let's say, a private bore wouldn't recover for, say, somewhere between 10 and 50 years, then that Make Good provision should be able to deal with that full range of uncertainty.

Because the intent of the Make Good provision is that the impacts on private users are acceptable or in that acceptable range which, according to the policy, is less than two metres. So if that impact was going to continue somewhere between 10 and 50 years, and we didn't know, as an example, how long in between that 10 and 50 years, our view is that it should be in place to deal with that length of uncertainty. That's how I would see it being addressed under Make Good.

MR WILSON: So this comes back to your previous comment where you said that you thought that the Make Good provisions really are there for – and I don't want to put words in your mouth, so correct me if I'm wrong – they're there to sort of address uncertainties or where predictions may not go to plan or predictions may not meet actuality.

MR ISAACS: No, I would say that's the compensatory water provisions.

MR WILSON: Okay. Sorry, I got it around the wrong way.

MR ISAACS: The Make Good – which is what's under the Aquifer Interference Policy – are the things that should be in place for predicted likely impacts. So, if your predictions are saying that impact could continue somewhere between 10 and 50 years, obviously that is a predicted likely impact, and therefore the Make Good should address that for that period of uncertainty

MR WILSON: Okay. Right. Yes. .....

MR ISAACS: If it was predicted to go – like if you had a pretty good estimate that said this impact is going to continue for 20 years, you had a Make Good in place for 20 years. But let's say you got to 20 years and it hadn't recovered, that's where the compensatory provisions would come in place.

MR WILSON: Okay.

MR ISAACS: If the Make Good agreement hadn't addressed that.

MR WILSON: Okay. Thank you. That's all for me, Peter.

MR DUNCAN: Okay. Thanks, Chris. Alice, anything from you?

PROF CLARK: No, that's all from me. Thanks, Peter.

MR DUNCAN: Okay. I think, Stephen and Phil, we've – that has been quite helpful. Is there anything either of you want to add to this discussion at this stage?

MR O'DONOGHUE: Look, my only additional comment – I think we touched on the other day – with the Make Good components is that, if the – we generally put conditions in for, you know, verifying model performance and proving models over you know, the life of a project as it gets stressed. So, in terms of that, like, future impact as – if a mine progresses, it would be more information feeding into the model development to get, I guess, a better prediction to reduce that uncertainty about those predictions as the mining progresses. So that's probably one other point I would make.

MR DUNCAN: Okay. Anything from anybody else at this stage? All right. Well, Stephen and Phil, thank you for being here again, but Fabienne, Mitchell, and Andrew, really appreciate your time today and your help with these questions.

MR DRUZYNSKI: Thank you.

MR DUNCAN: Thanks.

MR ISAACS: No problems.

MS D'HAUTEFEUILLE: Thanks.

MR ISAACS: Thanks, and good luck with it.

MR DUNCAN: Thank you very much. ..... We will stop the recording.

RECORDING CONCLUDED **[10.38 am]**