



OUT19/14806

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Dear Mr Rode

**Airly Coal Expansion - Airly Mine MOD 3 - Production, Workforce and Train Movement  
Increases (SSD-5581-Mod-3) (Lithgow City)  
Environmental Assessment**

I refer to your email of 31 October 2019 to the Department of Planning, Industry and Environment (DPIE) Water and the Natural Resources Access Regulator (NRAR) about the above matter.

The following recommendations are provided from DPIE Water and NRAR. Please note Crown Lands, the Department of Primary Industries (DPI) – Fisheries and DPI - Agriculture all now provide a separate response directly to you. Further details are provided in **Attachment A**.

**Pre-determination Recommendations**

The proponent should:

1. Revise the Numerical Groundwater Model by incorporating all monitoring data up to the end of 2019 and the altered mining methods for the revised future mining plan and panels (i.e. post 2017) including, as a minimum fracturing patterns consistent with 'Scenario 2'.
2. Prepare a comprehensive discussion of any variations noted compared to the outcomes for the 2018 model variant. The report should include a discussion of altered impacts arising from an increased presence of active subsidence fracturing with resulting hydraulic connection to shallow aquifers and surface water systems. A revised assessment of impacts against the criteria of the NSW Aquifer Interference Policy (2012) and an update on licensing requirements if required. Further analysis should be provided of the overlying 3<sup>rd</sup> order streams and how these are being considered within the groundwater model.

**Post Determination Recommendations\***

\*The following recommendations could be post-approval, but this will depend on the level of impact and water take that the proposed modification is expected to add, and whether DPIE can have confidence in the range of impact predictions put forward when the proponent responds to the Pre-determination Recommendations 1 and 2 (as stated above). As such, the proponent should:

3. Provide an enhanced statistical analysis of modelled potentiometric levels for all monitoring boreholes, and if necessary adjust model parameters to achieve a better fit than that shown for the 10 bores presented in the Hydrogeological Report (Appendix C).
4. Provide an analysis of cumulative mine inflow predictions for the life of the mine, and address any impacts that these might have on the strata overlying the Lithgow Seam with respect to:
  - o potentiometric levels, and
  - o valley-side spring systems.

5. Provide a new listing, or an updated Table 2-1, so that the details of monitoring bores include full location details, depth of drilling, screened interval, vibrating wire piezometers (VWP) depths (in mAHD as well as mbgl), and any other relevant hydrogeological and location data.

Any further referrals to DPIE – NRAR & Water can be sent by email to:  
[landuse.enquiries@dpi.nsw.gov.au](mailto:landuse.enquiries@dpi.nsw.gov.au).

Any further referrals to (a) Crown Lands; (b) DPI – Fisheries; and (c) DPI – Agriculture can be sent by email to: (a) [lands.ministerials@industry.nsw.gov.au](mailto:lands.ministerials@industry.nsw.gov.au);  
(b) [ahp.central@dpi.nsw.gov.au](mailto:ahp.central@dpi.nsw.gov.au); and (c) [landuse.ag@dpi.nsw.gov.au](mailto:landuse.ag@dpi.nsw.gov.au) respectively.

Yours sincerely



Simon Francis  
Senior Project Officer, Assessments  
**Water – Strategic Relations**  
21 February 2020

**Airly Coal Expansion - Airly Mine MOD 3 - (SSD-5581-Mod-3)  
Environmental Assessment**

The proposal to mine at a faster rate will introduce larger groundwater impacts more quickly with a larger cumulative loss to mine inflow water compared to that for the approved mining rate. The effects will last over a longer period of time post mining than originally predicted. It is not possible to fully assess whether the cumulative impacts are within the requirements of the NSW Aquifer Interference Policy (2012) without further updating of the numerical groundwater model.

The current, updated numerical groundwater model (2018 version examined here) does not fully represent the future mining situation. It would be beneficial to amend this given that the mining process and its effects e.g. with respect to fracturing, are a vital aspect of the 67% increased production rate. Regarding this matter, the Applicant states:

“It is noted that panel extraction has not yet commenced at Airly Mine and therefore no fracturing was applied during the calibration period.”

The now predicted inflows to the mine will extract a greater volume from the overlying aquifer systems; typically >20% additional, but up to 70% more per annum. The consequences of this appear to be a longer term draw down effect on (1) the Illawarra Coal Measures (the Lithgow Seam being mined is at the base of these); and (2) the underlying Shoalhaven Group strata.

There is a risk of larger water takes from the shallow aquifer and surface water systems with the proposal to mine at a faster rate. The risk is associated with the presence of more open cracking prior to substrate settlement and fracture closure. Active fractures are likely to introduce large groundwater impacts more quickly with a larger cumulative loss as mine inflow water compared to that for the approved mining rate. The groundwater assessment infers effects will last over a longer period of time post mining than originally predicted. It is not possible to fully assess whether the cumulative impacts are within the requirements of the NSW Aquifer Interference Policy (2012) without further updating of the groundwater model. It is recommended the proponent clarifies its position on impact and water takes for both groundwater and surface water and the differences between what the project has been approved for or holds water licence. DPIE notes that the model prediction used does not take into consideration added substrate cracking that will exist prior to substrate settlement and compaction.

Some adjustment is also needed to the presentation of monitoring point data. In the EIS and other project-related Water Management Plans there is no comprehensive listing of borehole location and construction details. For example, Table 2-1 in Appendix C, which lists monitoring bores used for the numerical groundwater model, should be amended to include full location details, depth of drilling, screened interval, VWP depths, in mAHD as well as mbgl; and any other relevant hydrogeological information