



Steve O'Donoghue
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By email:
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Dear Steve,

Subject: Advice in relation to the Glendell Continued Operations Project, Predicted Greenhouse Gas Emissions

We provide advice in relation to the greenhouse gas emissions assessment for the Glendell Continued Operations Project. We have undertaken a review of the key documents provided for consideration^{1,2}. Our findings and recommendations follow.

Technical review of estimated greenhouse gas Scope 1, 2 and 3 emission calculations

The revised greenhouse gas (GHG) assessment by Umwelt (2020)¹ addresses the relevant sources and scopes. Emission estimates are consistent with contemporary practice and emission factors and appear to be adequately calculated. The original GHG assessment² used the default NSW Method 1 fugitive emissions factor of 0.054 t CO₂-e/ROM tonnes. This was not adequate for an accurate assessment of the Project. The revision calculates fugitive emissions using Method 2 of the National Greenhouse and Energy Reporting Scheme (NGER) (Measurement) Determination 2008. The calculation utilised a gas distribution model based on results of drill core gas sampling and analysis. The Method 2 approach is correct and produces more accurate results than using the default emission factor.

Improvement points for the assessment are:

- 1) The Method 1 approach applied to calculate emissions (excepting fugitive emissions) is consistent with (NGER) Technical Guidance, however global warming potentials (GWPs) from the International Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) rather than the Fourth Assessment Report (AR4) should be applied.
- 2) The proponent should provide assumptions for Scope 1 diesel consumption, materials transport, and how much product coal can be obtained from 1 tonne of ROM coal.
- 3) The Scope 3 emissions are estimated satisfactorily however the source of emission factors used in calculations should be provided for traceability. This applies to the materials emission factors in Appendix A and rail and shipping emission factors in Appendix B.

Consistency with DPIE modelling for Net Zero Stage 1: 2020-2030 Implementation Update

The Glendell Continued Operations Project was accounted for in DPIE NZEM's emission projections. The total ROM coal production of 135 million tonnes (Mt) used in the modelling was the same as the proponent has forecast. The DPIE NZEM projections uses the Minerals, Exploration and Geoscience Group (MEG; DRNSW) annual ROM coal production forecasts for the Project, which are more granular than the total ROM figure provided in the GHG assessment.

Despite comparable total ROM coal production rates, DPIE NZEM's emission projections for the Project are lower than reported in the GHG assessment due to the projections applying a lower fugitive emissions intensity (0.008 t CO₂-e/tonne ROM) based on NGER emissions data for existing Glendell mine operations. The Project's intensity reported in the GHG assessment is almost three times higher (0.025 t CO₂-e/t ROM). Given the higher emission intensity given in the GHG assessment was deduced for the revised GHG assessment using NGERs Method 2, it is considered more robust and will be adopted by DPIE NZEM in future projection updates.

The revised fugitive emission intensity is accepted as correct, but the proponent should comment on the relatively low fugitive emission intensities reported for the Glendell mine under NGERs up to and including FY 2019-20.

The diesel combustion emissions intensity applied in the GHG assessment is identical to that used in the projections, and the electricity intensity differs by about 15%.

Review of the Proposed GHG Mitigation Measures

We were requested to consider measures to minimise the Scope 1 and 2 emissions of the project and any additional measures that could be implemented to mitigate Scope 1 and 2 emissions to the greatest extent practicable over the life of the project. A synthesis of our review is at Attachment 1, and our recommendation is as follows:

- The proponent should review the option of using conveyors in light of the potential for reducing diesel consumption and hence reducing GHG emissions for the Project
- The proponent should consider the feasibility of offsetting the residual emissions beyond the requirements of the Safeguard Mechanism.

Yours sincerely,



Matthew Riley

Director Climate and Atmospheric Science
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Appendix 1 – Overview of Greenhouse Gas Mitigation Information received

The proponent proposes to mitigate scope 1 and 2 emissions through energy efficiency measures. This will be achieved by optimising operational productivity through e.g. scheduling activities so that equipment and vehicle operation is optimised, optimise haul road and ramp design, and select energy efficient equipment and vehicles. Table 5.1 lists a number of measures to improve diesel fuel use efficiency. These measures appear consistent with industry practice in Australian coal mining.

The use of conveyors was ruled out due to the short haul distance and short life of the project. Did the proponent perform any analysis on this option in relation to reduced diesel consumption before ruling it out?

Table 5.2 lists energy efficiency measures for the existing (and approved) coal handling and preparation plant (CHPP). High efficiency motors, variable speed drives, optimal motor size for loads and LED lighting have been either installed or will be. Again, these measures are consistent with industry practice.

Section 5.3 mentions that the Project will be covered by the Commonwealth Government's Safeguard Mechanism. The mechanism sets an emissions cap on all Australian facilities that emit over 100,000 t CO₂-e of scope 1 emissions per year. If the facility's emissions exceed the cap, then it must offset the exceedance by surrendering Australian Carbon Credit Units (ACCUs).

The current Glendell Mine emission cap is 448,015 t CO₂-e. The project is expected to emit 253,000 t CO₂-e per year, on top of existing mine emissions. The proponent adds if a mining operation exceeds its approved baseline then the operation is required to purchase Australian carbon credit units in order to acquit its liability.

In response to questions from the DPIE Planning and Assessment Group (PAG) regarding pre-drainage of the relevant coal seams, the proponent states in their response letter³:

- the mining area for the Project contains geological features (such as the Camberwell Anticline) and faults with strata dips ranging from 2 to 15 degrees. These aspects are all unfavourable to effective gas drainage.
- the mining area is in a low gas environment with almost one third of the in-situ coal reserves classified as Low Gas Zone (<1 m³/t) with over 90% of the total proposed mining area already having a gas content less than 4 m³/t.
- given the structurally complex (faulted) domain around the Camberwell Anticline, the overall nature of the geology (thin coal plies, geological structure) and low gas content over the majority of the proposed mining area, gas pre-drainage ahead of open cut mining is not considered practical, reasonable or feasible.

DPIE NZEM does not possess sufficient technical knowledge to assess whether pre-drainage is feasible in light of the Proponent's response.

¹ Glendell Continued Operations Project – Response to Submissions, Appendix 2: Revised Greenhouse Gas and Energy Assessment Greenhouse Gas Assessment in Section 9 of the Air Quality and Greenhouse Gas Assessment (Jacobs, 2020) <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=EXH-2641%2120200526T065214.456%20GMT>

² Glendell Continued Operations Project, Appendix 28: Greenhouse Gas and Energy Assessment <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-9349%2120191209T222458.979%20GMT>

³ Glendell Continued Operations Project (GCOP) – Response to Request for Additional Information in relation to Greenhouse Gas Emissions. Response letter from Shane Scott (Glencore) to Joe Fittell (PGA) dated 11 November 2021.