11 November 2021

Joe Fittell
Team Leader - Resource Assessments
Department of Planning, Industry and Environment (DPIE)

Dear Joe,

Glendell Continued Operations Project (GCOP) – Response to Request for Additional Information in relation to Greenhouse Gas Emissions

With reference to your Request for Additional Information dated 20 October 2021, generally in relation to Greenhouse Gas, please find the below responses.

1. *Please provide further consideration of the Project's greenhouse gas emissions against the latest NetZero Plan Stage 1 2030, which includes a revised target of 50% emissions reduction by 2030 compared to 2005 levels.*

   Glendell Response:

   Glencore notes the updated NSW Government NetZero Plan Stage 1: 2020-2030 (referred to as Net Zero Plan Stage 1:2020-2030 Implementation Update, September 2021) including an emissions reduction target of 50% (47-52%) by 2030 compared to 2005 levels. We also note that the policy objective set out in this updated plan 'is not to be considered in the assessment or determination of development and infrastructure applications under the *Environmental Planning and Assessment Act 1979*' (NSW Government, September 2021). Notwithstanding, the below discusses Glencore's strategy to emissions reduction throughout its global mining business, scope 1 emissions associated with the Glendell Continued Operations Project and how they relate to the NSW Governments emissions reduction target, and how scope 1 and 2 emissions will be managed throughout the life of the Project.

   Glencore has committed to a decarbonisation pathway across its global mining business and seeks to achieve net zero total CO_2-e emissions by 2050. As part of our global climate change strategy Glencore has stated its intention to responsibly deplete its coal portfolio consistent with achieving our net zero total emissions by the 2050 goal.

   Our view is that depletion of coal assets is preferable as opposed to divestment which will not remove the associated emissions. While there is demand for coal, and it is economic to do so, Glencore will continue to responsibly operate its portfolio of mines and projects until they reach the end of their economic lives while delivering on Glencore's ambition to reduce its total emissions in line with its decarbonisation pathway.

   In the short and medium term, Glencore is targeting a 15% emission reduction by 2026 and a 50% reduction in emissions by 2035 across its global mining business. This reduction will be largely met by the depletion of Glencore's coal assets in Columbia and South Africa, with Glencore's Australian coal business continuing to supply the high quality coal required to meet global demand for their remaining life.

It is important to note that Glencore's emission reduction targets refer to total emissions – scope 1, 2 and 3.

Glencore, as one of a number of mining companies, takes its responsibility to developing the State's coal resources seriously and is committed to the role it plays in the transition to a low emission global economy. Nonetheless it's still important to note that coal remains one of the cheapest forms of energy and, while some countries are moving away from coal generated power production, industrialisation and urbanisation of developing economies, particularly in Asia, will continue to drive growth in global energy needs.

It is important to also remember that minerals, including coal, are part of our everyday life, not just electricity but also the many essential services like public transport and electronic devices we rely on. The building blocks and materials for renewable energy production come from mining and minerals, including coal. Glencore acknowledges that it is necessary to transition towards a low emission future however this transition is unlikely to be uniform across global economies.

Glencore has reviewed the Project's forecast greenhouse gas emissions inventory, and believes the Project is unlikely to materially increase the State or national effort required to reach the NSW Government's revised NetZero Plan Stage 1: 2020-2030 emission reduction target or Australia's 2030 greenhouse gas mitigation target (as previously discussed in the project's RTS Part A). The Project is forecast to produce on average 253,000 t CO_2-e per annum of scope 1 emissions, which equates to around 0.3% of the NSW Governments 2030 emissions target of 78,900,000-87,600,000 t CO_2-e (47-52% below 2005 levels) as outlined in the current publicly available NetZero Plan Stage 1: 2020-2030 Implementation Update (September 2021). In comparison, the existing Glendell open cut reported 158,721 t CO_2-e of scope 1 emissions in 2019/20. Overall, the Project will result in a net increase in scope 1 emissions of around 100,000 t CO_2-e per annum or approximately 0.1% of the NSW Governments 2030 emissions target. Glencore is required to report its greenhouse gas emissions and energy production annually from each of its Australian mining operations against an approved baseline as part of its obligations under the *National Greenhouse and Energy Reporting Act 2007 (Cwth)*, and will continue to do so for the Project. 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.

Glencore is continually looking at ways to manage its operational footprint across all its operations (Scope 1 & 2), and reduce Scope 3 emissions. Of the Project's total Scope 1 and 2 emissions, Scope 1 emissions make up approximately 93%, with over 40% of the Scope 1 emissions being from the combustion of diesel used to operate the mining fleet. The Project will mitigate Scope 1 and 2 emissions through energy efficiency initiatives. The energy efficiency of mining operations is driven by energy (diesel) use and productivity. Energy efficiency is maximized when equipment is operated at optimal capacity. Glencore's mine planning process optimises operational productivity through scheduling, haul road ramp design, haul road design and equipment selection. Key measures included in the Project design to minimise emissions from diesel combustion include:

- limiting the length of material haulage routes (where feasible), thus minimising transport distances and associated fuel consumption
- selecting equipment and vehicles that have high energy efficiency, and
- scheduling activities so that equipment and vehicle operation is optimised

Further, to assist with meeting State and Federal Government emissions reduction targets and forming part of Glencore's global decarbonisation pathway, we are also investing in key, low emissions technologies, such as the development of Carbon Capture, Utilisation & Storage (CCUS) technology in Australia, which includes Glencore's CTSCo Project. The CTSCo Project is considered Australia's most advanced onshore CCUS project.

2. *The EIS states that it would be uneconomic to pre-drain the relevant coal seams in order to reduce fugitive emissions, however limited justification is provided for this conclusion. Given this, please provide further information on the following:*
   i. *how the estimation of fugitive emissions based on actual on-site data was calculated (i.e. Method 2 approach), including additional information on average CH4/CO2 percentages; and*

Glendell Response:

Fugitive emissions from the proposed open cut operation have been estimated using a gas distribution model of the Project. This is based on the Method 2 approach described in the *National Greenhouse and Energy Reporting (NGER) (Measurement) Determination 2008*.

The gas distribution model is based on data from eight boreholes (involving drill core gas sampling and analysis) and comprises one single gas domain over the Project area. The single gas domain contains two separate sub-domains that are structurally controlled by the Camberwell Anticline (which runs generally north-south through the middle of proposed mining area) and referred to as:

- Sub-domain 1A – runs either side of the Camberwell Anticline and makes up 90% of the proposed mining area with the majority of seams having very low gas content (<1m^3/t) apart from a number of deeper seams situated at the base of the stratigraphy (Liddell, Barrett and Hebden seams) that have a gas content less than 4m^3/t.
- Sub-domain 1B – runs along the hinge of the Camberwell Anticline (typically 100m wide) forming a restricted area of increased gas accumulation area (where the gas is trapped in the coal matrix and against the various fault planes that form the fold axis complex). The majority of seams in this sub-domain contain gas contents of 4-6m^3/t.

Each sub-domain is further broken into five gas zones including a low gas zone and zone situated 20m below the floor of the proposed open cut pit (as required by the NGER legislation). The fugitive emissions from the proposed mining area is then estimated by applying the gas content and composition (taken from drill core gas sampling and analysis) of each zone within each sub-domain and multiplying it across the in situ coal tonnes located within each zone and sub-domain.

The total fugitive emissions estimate from the proposed GCOP mining area using Method 2 is 3,425,585 t CO_2-e (or approximately 0.03 t CO_2-e per tonne of coal), as documented in section 3.1.5 (Table 3.2) of the Revised Greenhouse Gas and Energy Assessment prepared by Umwelt (May 2020). In comparison the fugitive emissions estimate under Method 1 (as documented in the *National Greenhouse Accounts (NGA) Factors, 2018*) is 0.054 t CO_2-e per tonne of coal. Of the total fugitive emissions, approximately 99.5% is estimated to be methane (CH_4) with the remainder being CO_2.

ii. further justification for why it is not reasonable or feasible to pre-drain the relevant coal seams prior to mining, including the potential of flaring methane emissions to reduce Scope 1 fugitive emissions.

Glendell Response:

Underground mines typically have high gas contents and undertake gas drainage as a safety imperative to mitigate the risk of outbursts and to allow underground mines to operate productively and at safe gas levels as required by legislation. The drainage of gas from underground mines is generally limited to horizons (coal seams) with in situ gas contents of approximately 9m^3/t being reduced to around 4m^3/t with pre-drainage activities.

Conversely, there is not an equivalent set of safety drivers, productivity benefits or regulatory requirements that warrant the need for gas drainage ahead of open cut mining. Fugitive emissions are dealt with under the *National Greenhouse and Energy Reporting Act 2007 (Cwth)* with each operation required to report annually against the approved emission baseline. 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.

The proposed Glendell Continued Operations Project mining area comprises in excess of 150 coal plies over seven major coal seam groups varying in thickness from 0.2m (Lemington seam group) to 1.8m (Barrett seam group). The majority of coal plies are less than 1.5m thick, and the thicker coal seams, such as the Barrett, contain stone bands between plies. In addition, the mining area 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. Further, the mining area is in a low gas environment with almost one third of the in situ coal reserves classified as Low Gas Zone (<1m^3/t) with over 90% of the total proposed mining area already having a gas content less than 4m^3/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.

Over the last 10 years Glencore's Australian coal business has abated over 28Mt CO_2-e emissions through flaring waste gas or generating electricity (by third parties) from its gassy underground operations. Glencore's Australian coal business will continue to consider and implement gas abatement opportunities in line with its global decarbonisation pathway where it is considered reasonable and feasible to do so.

Please contact the undersigned should you wish to discuss the above responses further.

Yours sincerely,

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