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GLENCORE

RESPONSE TO IPC QUESTIONS

Glendell Continued Operations Project

FINAL

March 2022

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Glendell Continued Operations Project

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Glencore

Project Director: David Holmes
Project Manager: Bridie McWhirter
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Date: March 2022

Environmental & Social Consultants

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	David Holmes	23/3/22	Barbara Crossley	23/3/22

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1.0 Introduction

On 10 March 2022, a meeting between Glencore and the Independent Planning Commission (IPC) was held on the Glendell Continued Operations Project (the Project). Following this meeting, a written request was received by Glencore on 11 March 2022 to respond to several questions posed by the IPC during the meeting.

Furthermore, the Public Hearing for the Project was held on 18 and 21 March 2022. During the Public Hearing, a number of questions were posed by the IPC to Glencore regarding a number of matters on the Project.

This document has been prepared on behalf of Glencore and provides a response to the questions posed by the IPC in the written request, and raised during the Public Hearing, in **Sections 2.0** and **3.0** respectively.

It is noted that further written submissions are anticipated to be submitted to the IPC by members of the public and organisations. Glencore will provide a further response on review of these submissions.

2.0 Response to IPC Written Request

1) How were Scope 1 emissions calculated in the EIS as opposed to the RtS? Please clarify and explain the differences in anticipated Scope 1 emissions between the two documents.

As detailed in Section 3.1.1 of the Response to Submissions Part A Report (RTS), the differences in predicted greenhouse gas (GHG) emissions between the EIS Greenhouse Gas and Energy Assessment (EIS GHGEA) (Umwelt 2019) and the Revised Greenhouse Gas and Energy Assessment (Revised GHGEA) (Umwelt 2020a) is due to the use of the Method 1 assessment approach for the EIS, and the site specific Method 2 assessment for the Revised GHGEA.

Both the Method 1 assessment used in the EIS GHGEA (Umwelt 2019) and the Method 2 assessment used the Revised GHGEA (Umwelt 2020a) are assessment methods for the purposes of reporting under the *National Greenhouse and Energy Reporting (NGER) Act 2007* (the 'NGER Act'), the *National Greenhouse and Energy Reporting Regulation 2008* (the 'NGER Regulation'). The methodology to be adopted for both methods is prescribed in the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (the 'NGER Determination').

The key differences between the two approaches are that:

- Method 1 uses a default factor applicable to all open cut coal mines in NSW, calculated based on ROM tonnes extracted, while
- Method 2 is a gas domain specific estimation method and uses actual measured levels of gases within target coal seams obtained from borehole drilling to derive a site-specific estimate of fugitive emissions.

The Method 2 approach applies differential fugitive emissions rates for different coal seams based on measured data collected from boreholes and gas reservoir calculations. The assessment is undertaken in accordance with the methods prescribed by the NGER Determination which reflect the modelling methods contained in the ACARP Guidelines for the Implementation of NGER Method 2 or 3 for Open Cut Coal Mine Fugitive GHG Emissions Reporting (the 'ACARP Guidelines'). The Method 2 approach also includes predicted emissions from strata 20m below the pit floor.

Of the two approaches, the Method 1 approach is considered to be simplistic as it uses a State based default factor, whereas the Method 2 approach will provide a significantly more accurate estimate of fugitive emissions of an operation than the Method 1 approach as it is based on site-specific data. A summary of the requirements under the NGERS reporting requirements for open cut coal mines are set out in the Clean Energy Regulator publication 'Estimating emissions and energy from coal mining guideline' (Clean Energy Regulator 2021).

At the time of the EIS GHGEA assessment, gas drilling and testing within the proposed mining area had been undertaken, however an NGER compliant model had not yet been completed for the entire area to enable a calculation using the Method 2 approach.

The NSW default factor for Method 1 was 0.054 t CO2e/ tonne of ROM coal under the NGER Determination in force at the time the EIS GHGEA was prepared in 2019[1]. The estimate of 7,301,119 t CO2-e for fugitive emissions using the Method 1 approach was obtained by multiplying the ROM tonnes produced by the

[1] It is noted that the default factor for NSW has since been increased to 0.061t CO2-e /tonne of ROM coal

Project by the default factor of 0.054 tCO2-e/ROM tonne (refer to Appendix B of the EIS GHGEA). The likelihood that the Method 1 predictions were a significant overestimate of fugitive emissions associated with the Project was specifically identified in Sections 3.1.4 of the GHGEA and Section 7.13.3.4 of the EIS based on a preliminary analysis of gas borehole data.

The NGER Determination document sets out the specific requirements for the Method 2 approach. The essence of this method includes drilling, sampling and slow desorption gas testing in a prescribed way in the gas domain or domains in which the estimate is to be prepared. The core samples of gas bearing strata must be representative of the gas bearing strata in the extraction area. The NGERS Determination and ACARP guidelines require gas from potentially gas bearing strata to be sampled and analysed including 20m below the proposed final pit floor. Further details of the sampling undertaken for the Method 2 estimates are contained in response to Question 2 below.

As discussed in the EIS GHGEA assessment (Appendix 28 of EIS), the application of the Method 1 assessment method was considered a conservative approach (i.e. likely to result in a higher estimate of fugitive emissions) based on a review of the interim fugitive gas model results available at the time.

The updated Greenhouse Gas Assessment submitted as part of the RTS Part A (Revised GHGEA) included updated Scope 1 fugitive gas emission estimates based on the Method 2 techniques. A comparison of the results between the Method 1 approach and Method 2 approach undertaken in the EIS and the RTS respectively, is provided in **Table 2.1** below which reproduces the Scope 1 estimates from Table 3.2 of the Revised GHG Assessment provided with the RTS Report A. It should be noted that in **Table 2.1,** the fugitive emission estimates are based on the global warming potential (GWP) for methane of 25 which was the applicable GWP under the NGER Regulation and NGER Determination in May 2020 when the revised assessment was prepared[2].

Table 2.1 Comparison of Scope 1 Emissions calculated in the EIS and RTS

	Scope 1 Emissions (tCO_2-e)	
	Method 1 (EIS)	Method 2 (RtS)
Diesel use	2,630,968	2,630,968
Fugitive emissions	7,301,119	3,425,585
Scope 1 Totals (tCO_2-e)	9,932,087	6,056,553

As detailed in the Glencore letter to the DPIE dated 21 January 2022, the fugitive emissions estimate increases to 3,834,680 tCO2-e when the updated GWP of 28 is applied to the methane modelled as being present within the gas domain, consistent with the current (2021-22) NGER Regulation and NGER Determination. It should be noted that draft consent condition B34 imposes performance measures in terms of Scope 1 emissions. These draft conditions are based on the more stringent Method 2 fugitive emissions specified in the 21 January 2022 Glencore letter (i.e. as calculated using the GWP for methane of 28) rather than the more conservative Method 1 predictions contained in the EIS GHGEA.

[2] The GWP for methane was increased from 25 to 28 following commencement of the National Greenhouse and Energy Reporting (Measurement) Amendment (2020 Update) Determination 2020

2) Please provide information regarding the bore hole testing that informed the Gas Domain Model (including whether the bore hole testing penetrated all coal seams to be mined, a map showing the bore hole locations and the bore hole data).

As noted in the answer to Question 1 above, the coal mine gas distribution model for the Glendell Continued Operations Project (the Project) was developed in accordance with the NGER Determination and the ACARP Guidelines.

Chapter 1 of the NGER Determination sets out the methods that may be used to estimate emissions of a particular greenhouse gas released in relation to a source, from the operation of a facility. Chapter 3, Part 3.2 contains the specific requirements for calculating fugitive emissions from coal mines. In preparation for moving to a gas domain calculation methodology (Method 2), Glencore Coal Assets Australia (GCAA) (formerly Xstrata Coal NSW (XCN)) conducted a gas exploration drilling program at Glendell Opencut and within the broader Ravensworth area between April – May 2009. GCAA completed further drilling in 2017 – 2018 to provide more detailed calculations of gas content within the Glendell Pit Extension area to meet the requirements of the ACARP Guidelines and NGERS determination with respect to the proposed Glendell Continued Operations Project. The locations of these boreholes were determined based on a detailed understanding of the geology of the broader Ravensworth area and the area immediately surrounding the Glendell Pit Extension. The core locations and number of samples was determined based on the requirements within the ACARP Guidelines.

Figure 2.1 below shows the location of regional drilling undertaken to inform Method 2 NGERS gas assessments for different Glencore operations in the Ravensworth area. **Figure 2.2** shows the boreholes specifically drilled to inform the development of the gas reservoir model for the Glendell Continued Operation Project. Further details for the bores are contained in **Table 2.2**. All boreholes were drilled targeting the full coal sequence through to the basal Hebden seam (approx. 170-230m depth) and covering the strata 20m below the proposed pit floor as required by Section 3.22 of the NGER Determination. One borehole (Borehole GN013) had to be abandoned around 100m due to due to adverse drilling conditions and therefore didn't obtain data from all targeted seams. This borehole was redrilled as GN015 further north in a location that was interpreted to exhibit similar geological and gas characteristics. Data collected from both of these boreholes as well as the other drilled were used in the gas domain analysis.

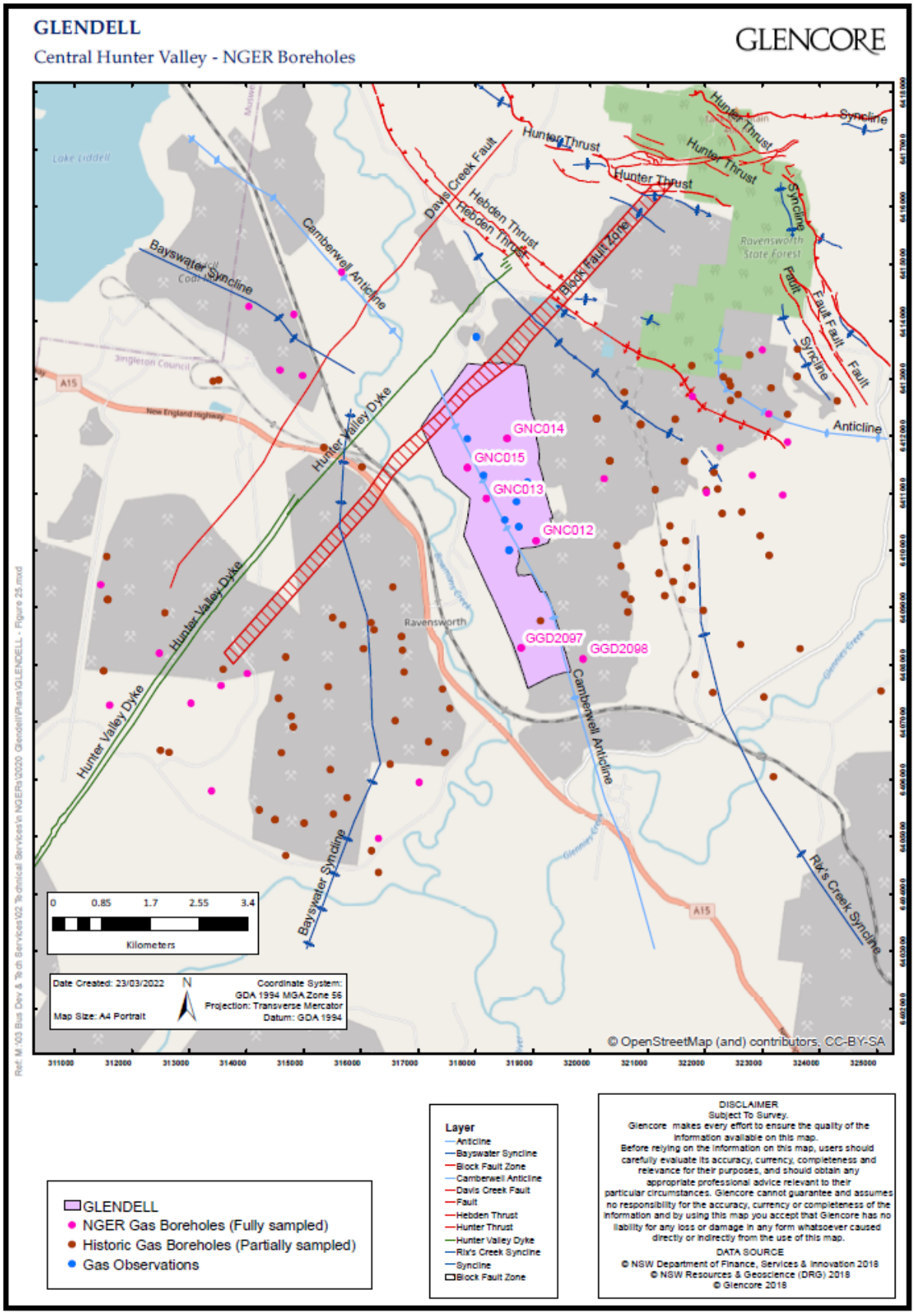


Figure 2.1 Location of regional drilling undertaken to inform Method 2 NGERS gas assessments for different Glencore operations in the Ravensworth area

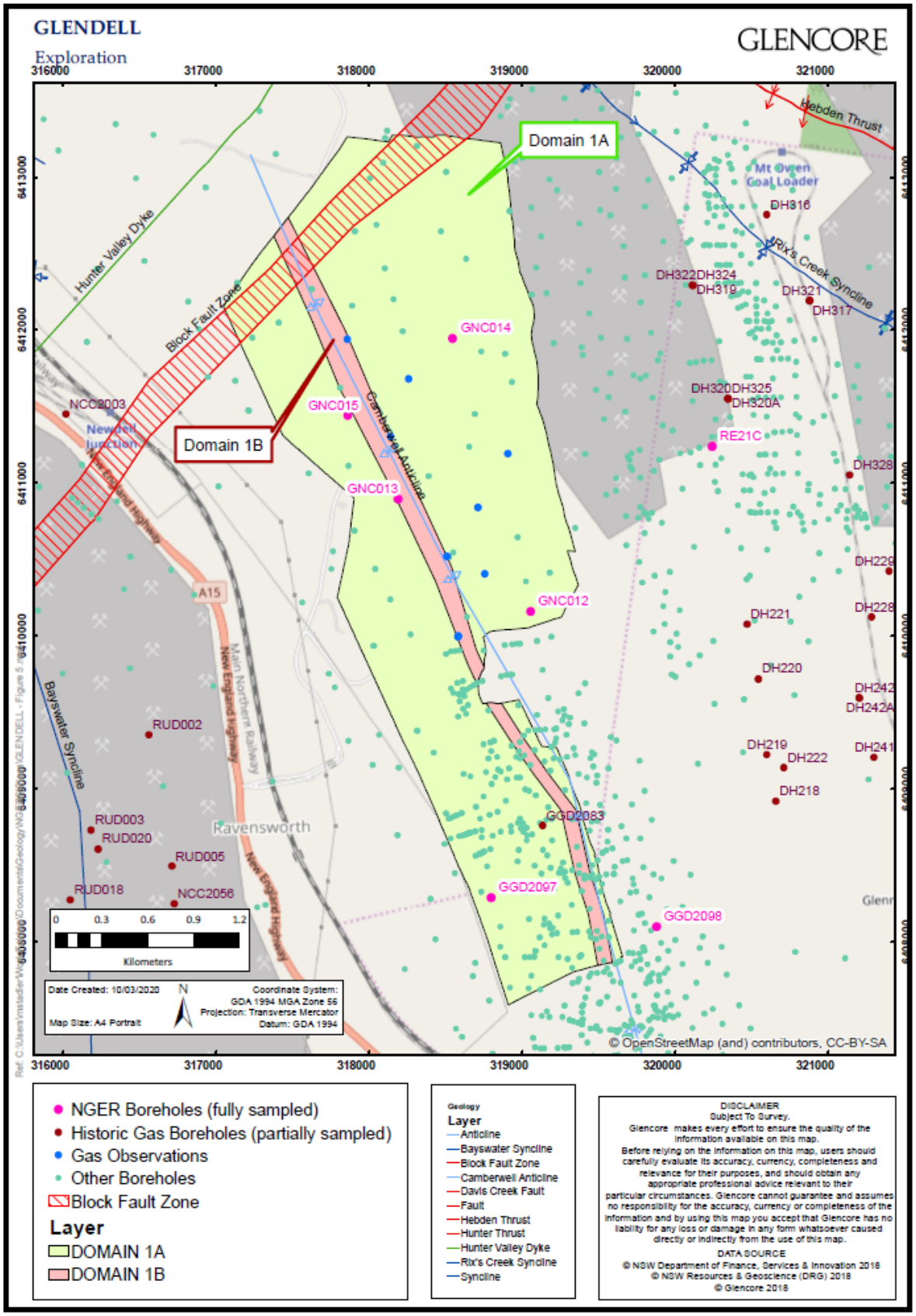


Figure 2.2 **Boreholes specifically drilled to inform the development of the gas reservoir model for the Glendell Continued Operation Project**

Table 2.2 Details of boreholes drilled to inform the development of the gas reservoir model for the Glendell Continued Operations Project

Borehole	Easting	Northing	Elevation	Depth	No. Gas Samples	Gas Content	Gas composition	Ash/ Moisture
GGD2097	318796.27	6408290.34	83.17	193.20	63	Yes	Yes	Yes
GGD2098	319877.12	6408100.05	129.63	200.86	57	Yes	Yes	Yes
GNC012	319054.94	6410162.00	81.80	210.27	22	Yes	Yes	Yes
GNC013	318187.56	6410895.50	110.70	78.30	9	Yes	Yes	Yes
GNC014	318546.41	6411946.50	114.20	303.22	36	Yes	Yes	Yes
GNC015	317860.16	6411440.00	90.80	172.44	21	Yes	Yes	Yes
Total number of gas samples:					208			

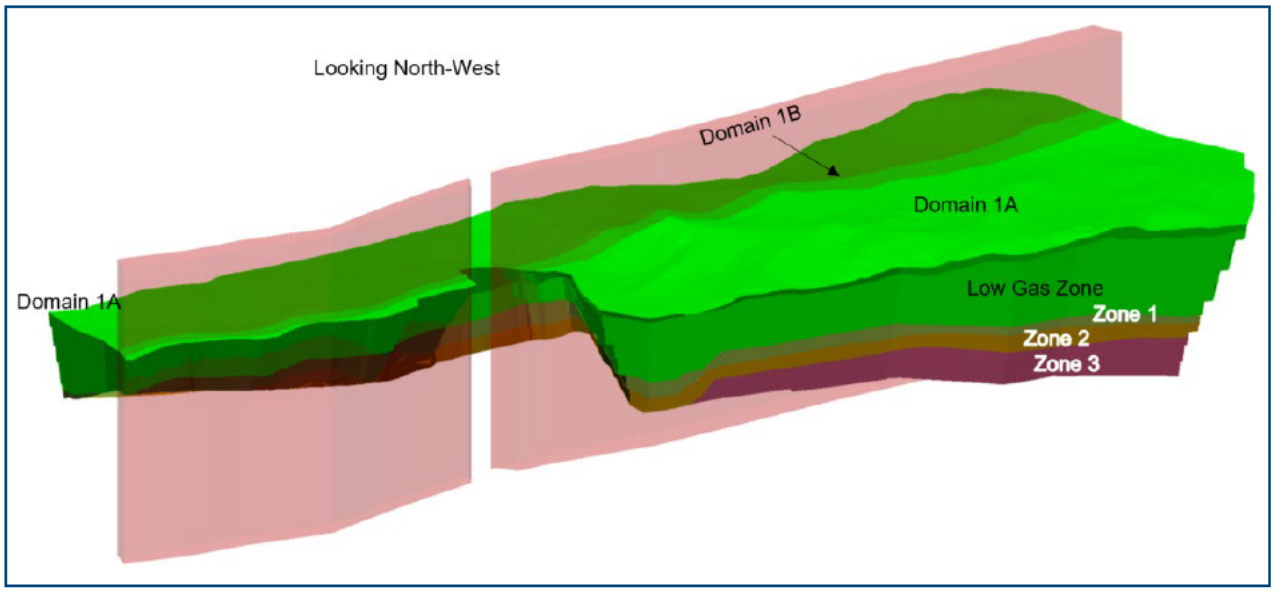


Figure 2.3 3D view of the gas model looking north-west (3x VE)

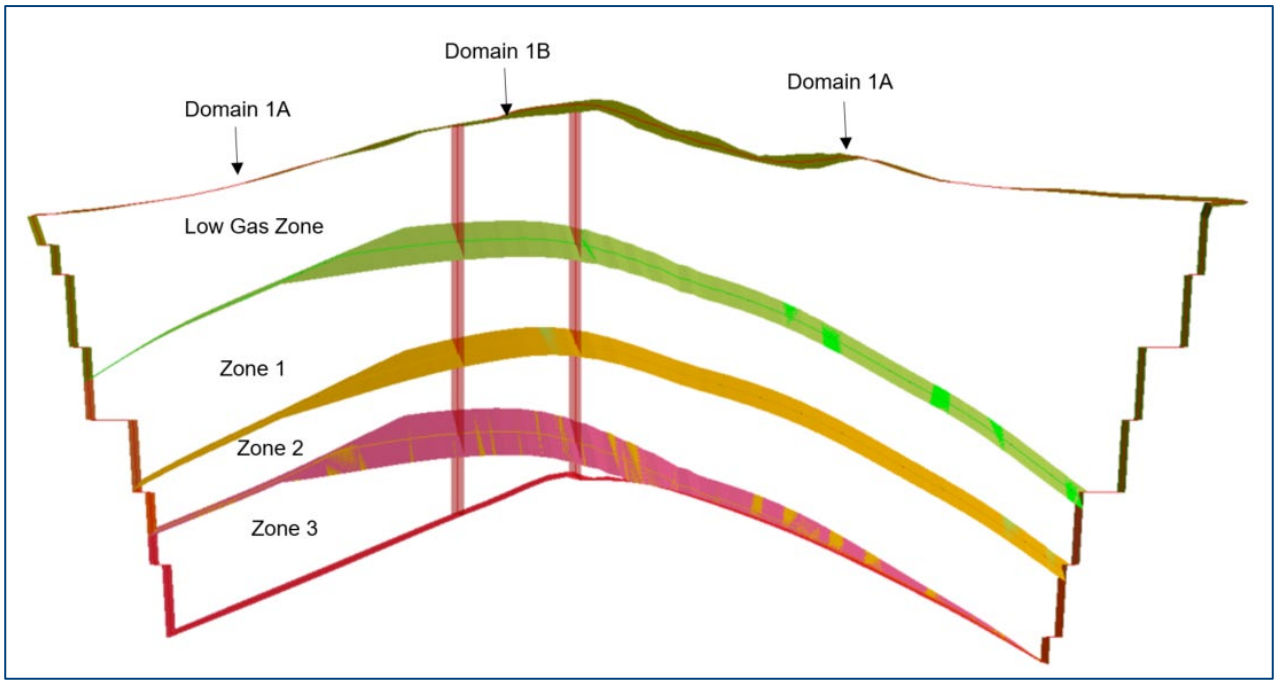


Figure 2.4 Section view through gas model showing gas domains and zones in the Glendell Pit Extension (looking north; 3xVertical Exaggeration)

Based on the gas drilling data and the detailed understanding of the local and regional geology, the Glendell Pit Extension was identified as containing a single gas domain. A single gas domain is where all gas boreholes drilled exhibit similar gas trends with depth. A domain can be further divided by zones determined by depth or seam extent and assigned a representative gas content and composition value. The shallowest zone is typically described as a Low Gas Zone (as defined by the NGER Determination) and this is normally where the gas content was sufficiently low as to not be able to be measured. The values assigned for the deeper, higher gas content zones also reflect the gas composition with respect to Methane (CH_4) and Carbon Dioxide (CO_2).

Due to the effects of faulting along the Camberwell Anticline, the single gas domain was separated into two sub domains with Sub-Domain 1B occurring along the spine of the Camberwell anticline and Sub-Domain 1A extending to either side of the anticline (refer to **Figure 2.2**). Cross sections of the Glendell Pit Extension are shown in **Figure 2.3** and **Figure 2.4** which show the different zones within the gas domain relative to the pit shell and Camberwell Anticline structure. The modelled gas content of the different zones is set out in **Table 2.3**. The higher levels of methane identified for each zone are typically restricted to the narrow 1B Sub-Domain associated with the Camberwell Anticline hinge. The low gas zone was assigned the default gas content (shown in EF column below) of 0.00023 t CO2-e/ ROM tonne as per the requirements of the NGERS determination.

The calculation of Scope 1 emissions in the Revised GHGEA and 21 January 2022 letter is calculated by multiplying the applicable gas content modelled for the zone by the gas bearing strata tonnes contained within the zone and calculating the relevant tonnes of CO2-e.

Table 2.3 Gas Zones for Glendell Continued Operations Pit

Gas Zones	Approximate Depth Range	Gas Levels	Gas content ranges (m^3/t)	Gas Composition
Low Gas	0- 100 m	Below detection	<0.5	Dominated by N_2 and CO_2
Zone 1	100 - 130 m	Low	0.5 - 1.5	Dominated by CH_4
Zone 2	130 – 170 m	Low - Moderate	2.0 - 3.5	Dominated by CH_4
Zone 3	140-200m	Moderate	3.0 - 5.0	Dominated by CH_4

3) At the meeting, the Applicant advised there is no proposal to seal the coal seams in the final void because the seams are largely pre-drained due to the mining history in the local area. Please provide evidence of this and clarification of any other potential options for mitigating the escape of fugitive emissions from the coal seam as part of the mine closure plan.

As noted in response to Question 2 above, the upper strata within the Glendell Pit Extension Area (and broader region) are defined as a low gas zone where no gas exists or is under the laboratory detection limits. This zone generally extends to the first 50-100m below ground level. In the final void, exposed seams down to approximately 100m below ground level (and deeper along the eastern highwall) will be situated in the low gas zone with emissions from these seams being negligible.

Gas emissions from the final pit floor is accounted for in the Method 2 gas domain estimates by virtue of the 20m pit floor considerations as required by the NGER Determination.

Coal down dip of the final void that remains fully saturated with groundwater will typically not be able to make further significant emissions as water pressure will retain the natural seam gas within the matrix where it is greater than the desorption pressure. Where the pit is backfilled with dumped spoil the emission rates would be expected to be lower than in places where the seams remain exposed. Emissions from 'exposed' seams in the pit walls in Zones 2 and 3 would be reduced and eventually nullified as the final void is filled with water and the water table within the spoil rises to create a hydraulic head that would retain the gas within the coal matrix. As Zones 2 and 3 occur in the lower sections of the pit shell (refer to **Figure 2.5**), the pit lake and saturated areas within the spoil will cover these exposed deeper seams earlier (particularly along the eastern side of the Camberwell Anticline hinge) and raise the water table within the surrounding strata, significantly limiting or precluding ongoing release of fugitive emissions from these zones. As shown in the cross-section Figures 2.2 to 2.5 in the Response to the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development Advice dated August 2020 (Umwelt 2020a), both the water table and piezometric heads remain elevated in strata immediately surrounding the pit void and these levels recover following the cessation of mining and recovery of water levels in the pit void and spoil (refer to **Figure 2.6** to **Figure 2.10**).

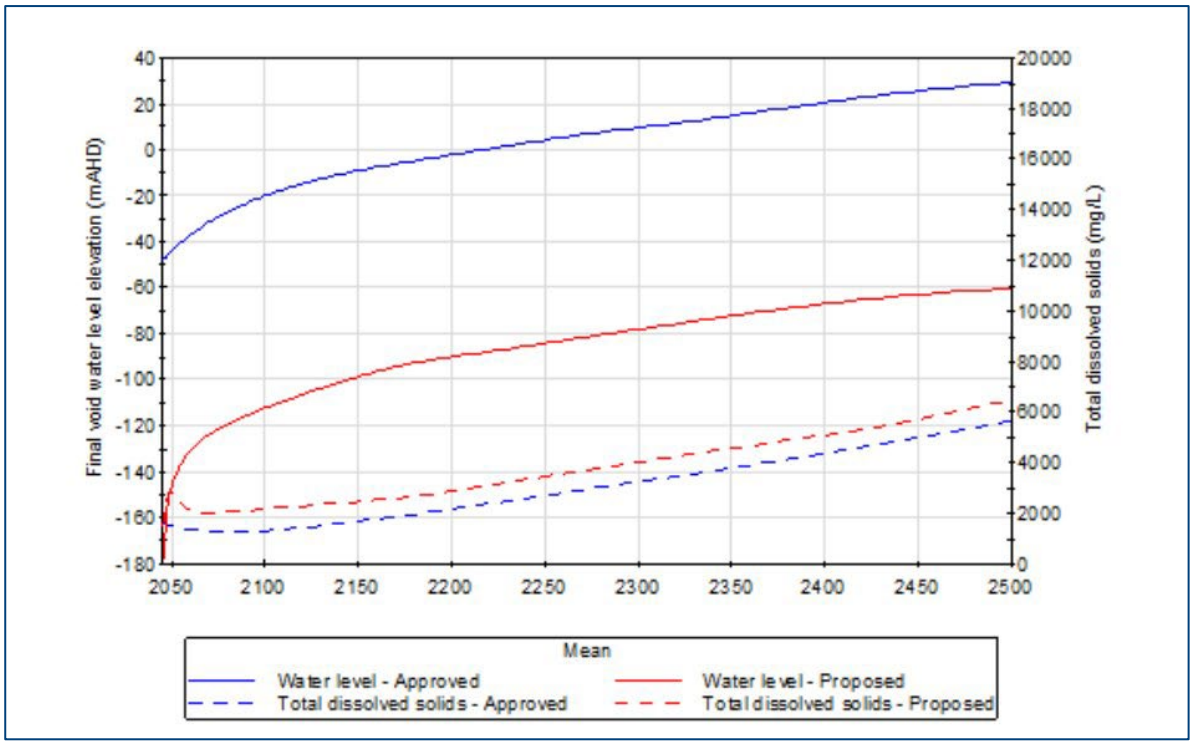


Figure 2.5 Forecast water level and TDS in approved and proposed final void

The sealing of coal seams in open cut coal mines for the purposes of preventing fugitive emissions has not been fully studied to date and, from a theoretical perspective, is considered unlikely to be effective.

Given the emplacement of overburden and recovery of water levels within the spoil and pit lake (and associated recovery of water levels within surrounding strata) will effectively limit any fugitive emissions from exposed seams in the medium to long term, this is considered to represent a practical approach to the management of these potential emissions in the post-closure landform.

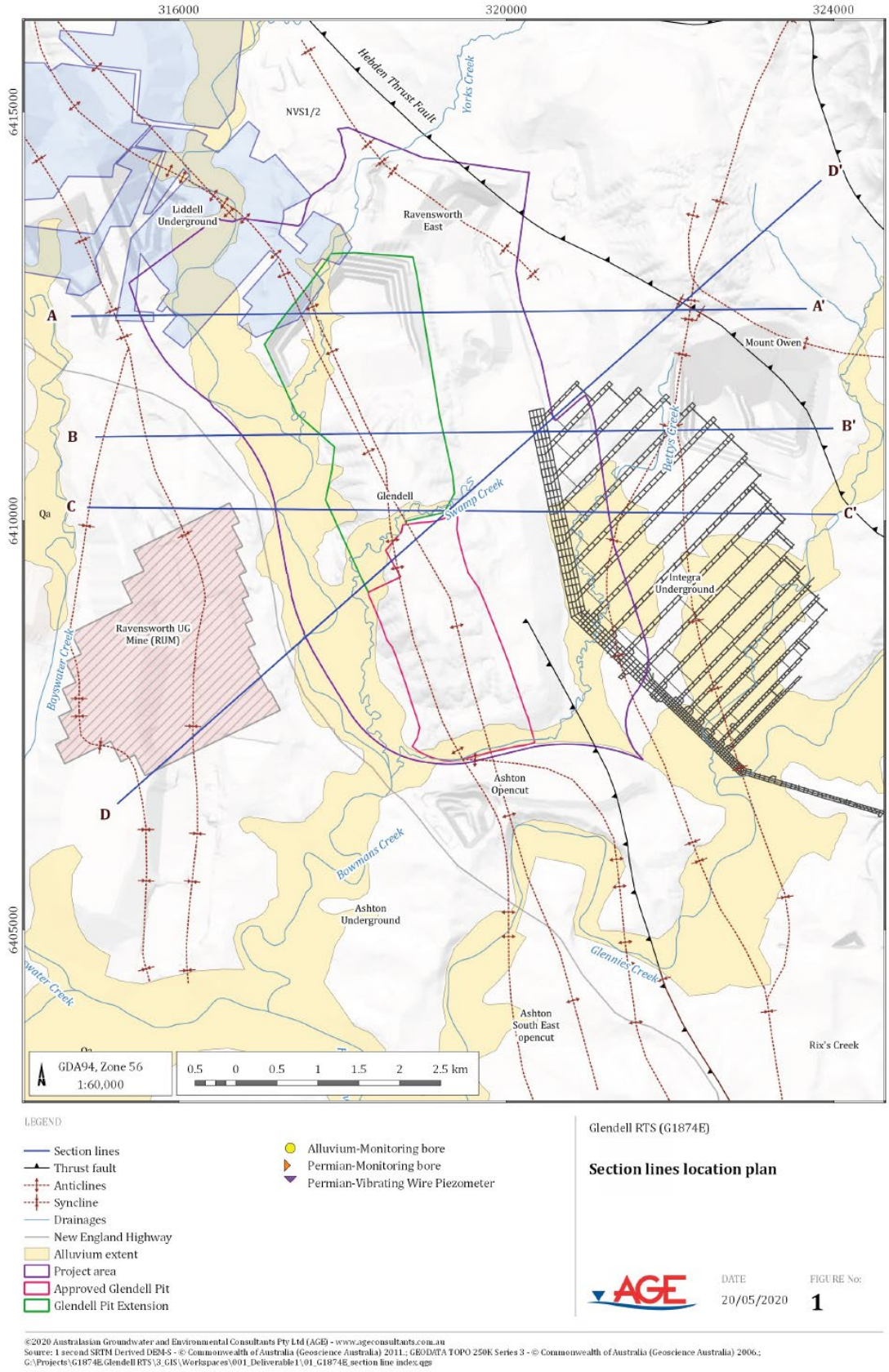
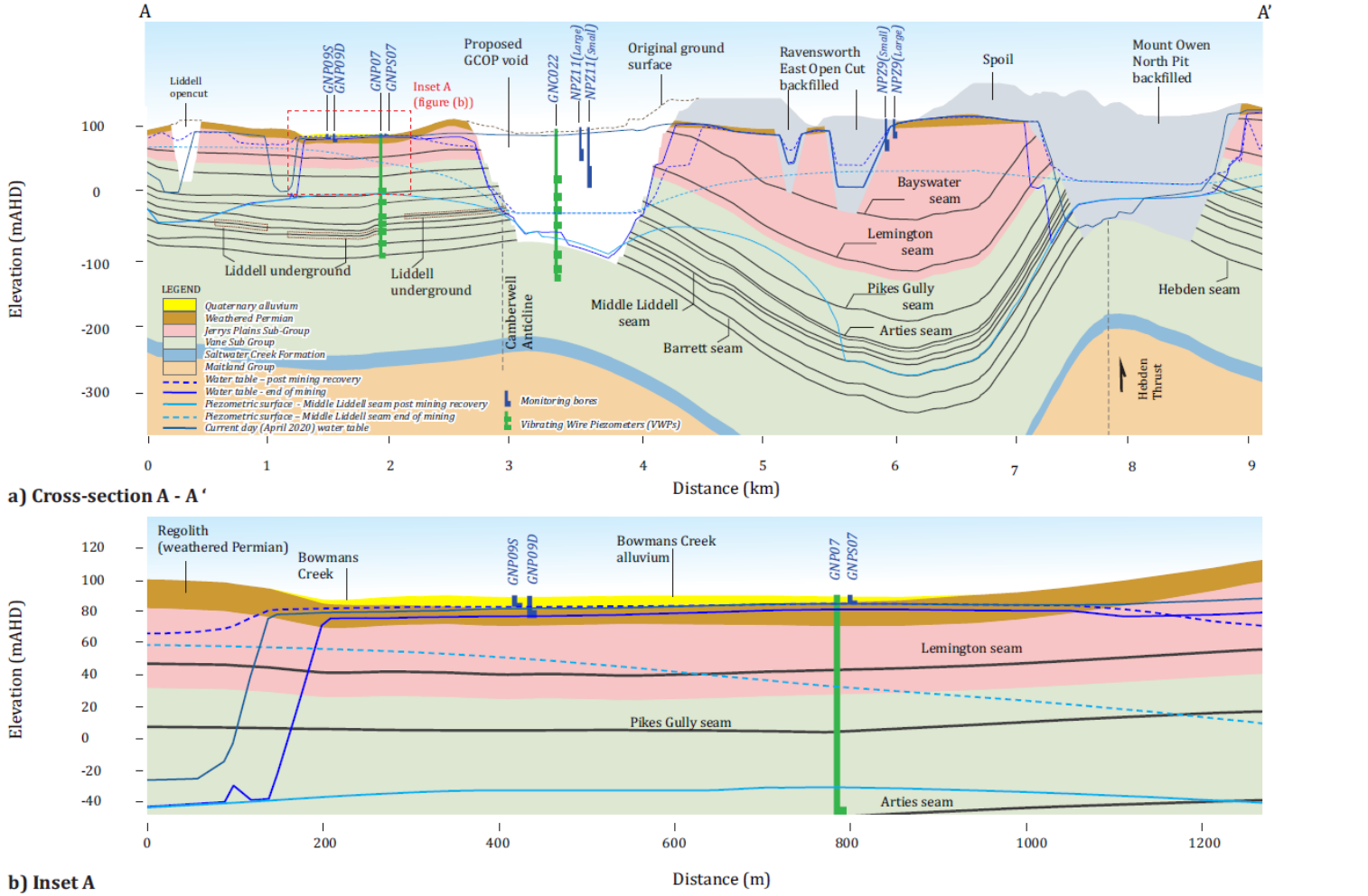


Figure 2.6 Section lines location plan

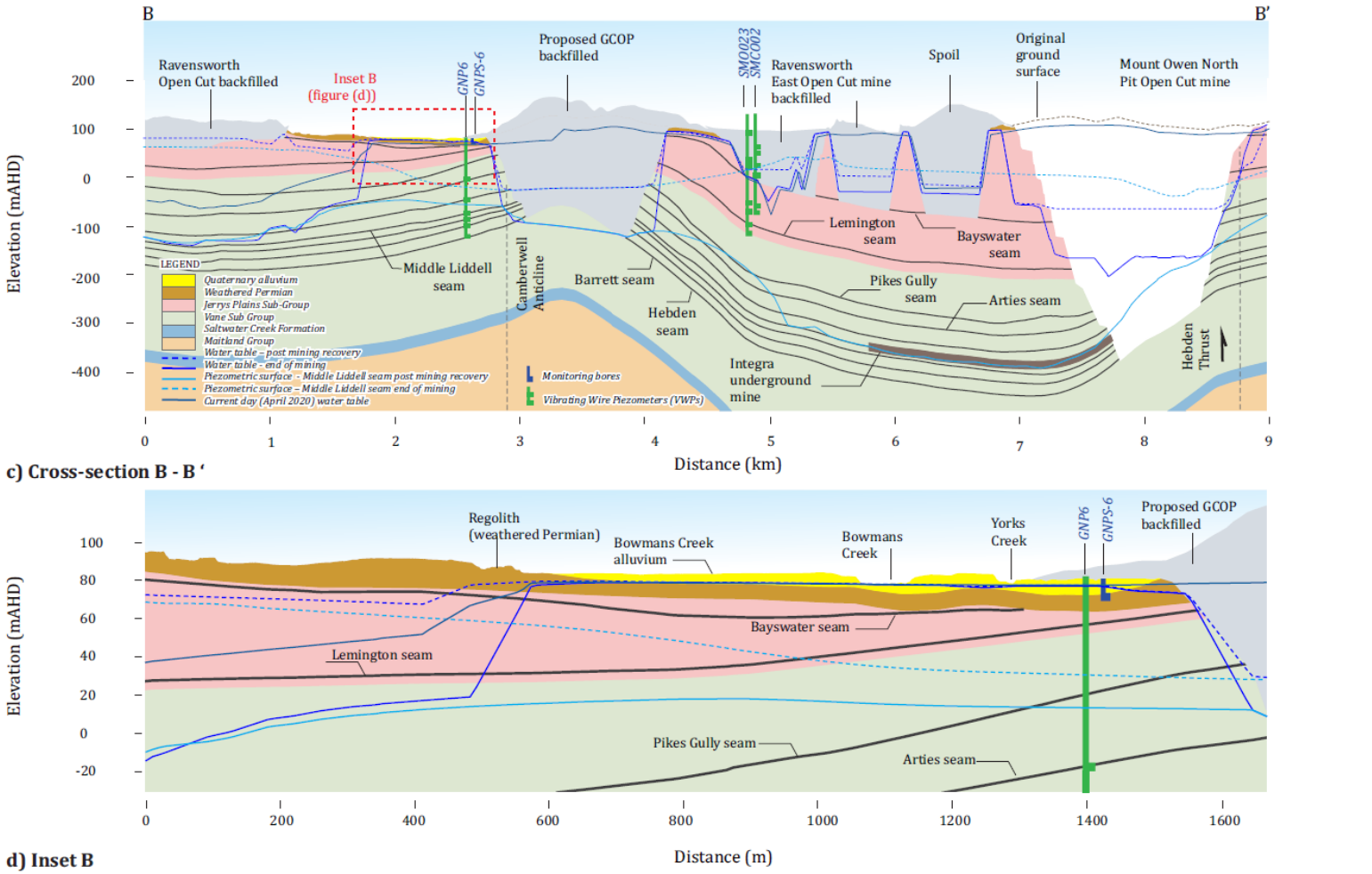


Geological cross-section A - A '

Figure - 1

Glendell RTS (G1874E)

Figure 2.7 Geological cross-section A-A

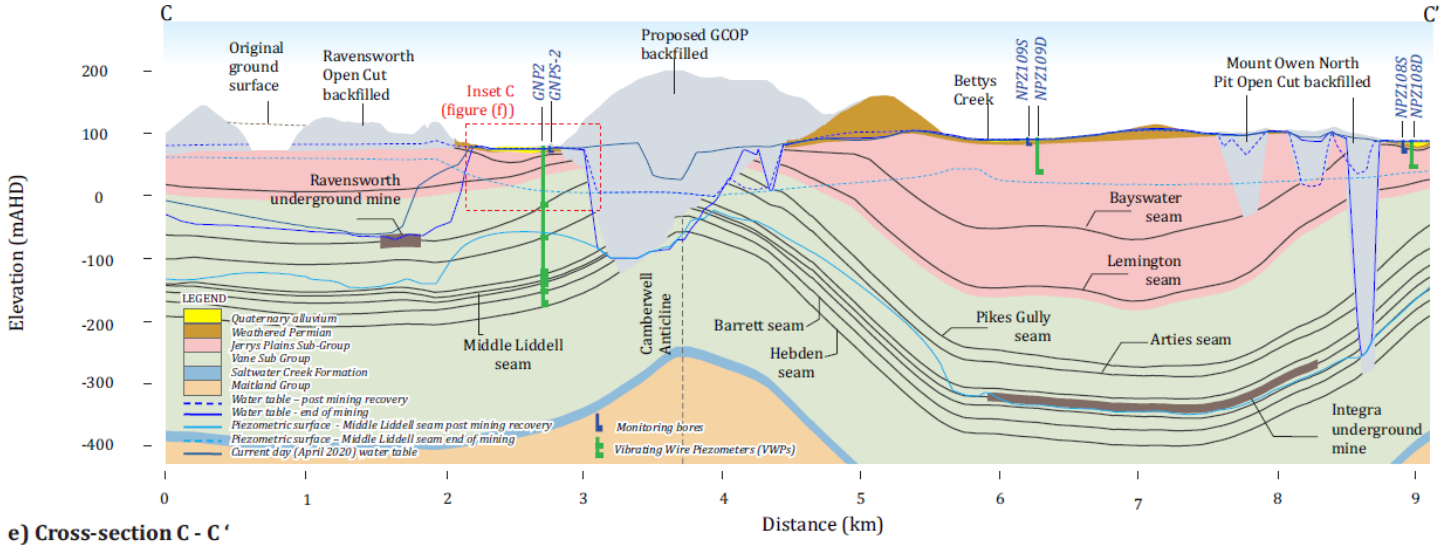


Geological cross-section B - B '

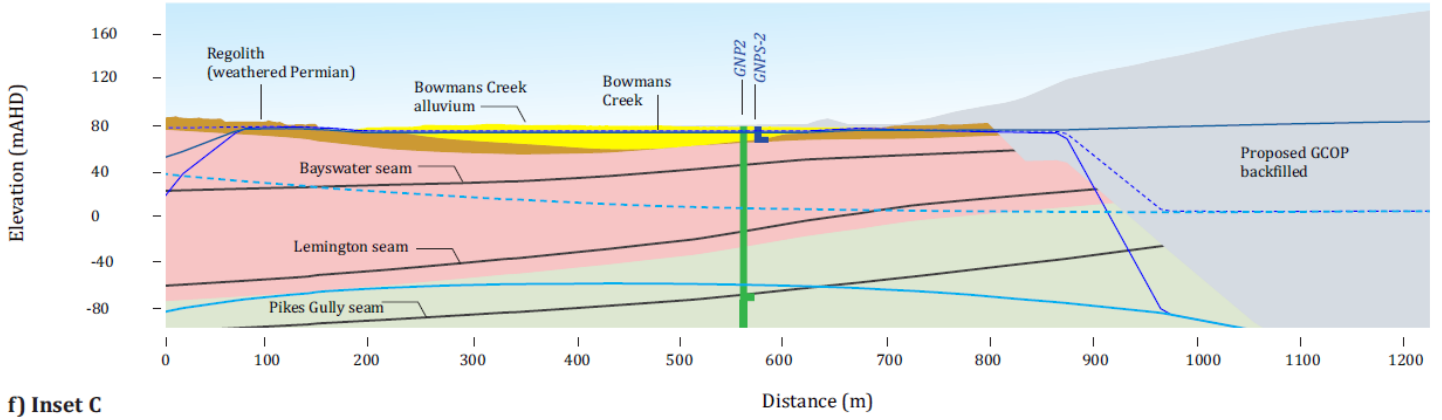
Figure - 2

Glendell RTS (G1874E)

Figure 2.8 Geological cross-section B-B



e) Cross-section C - C '



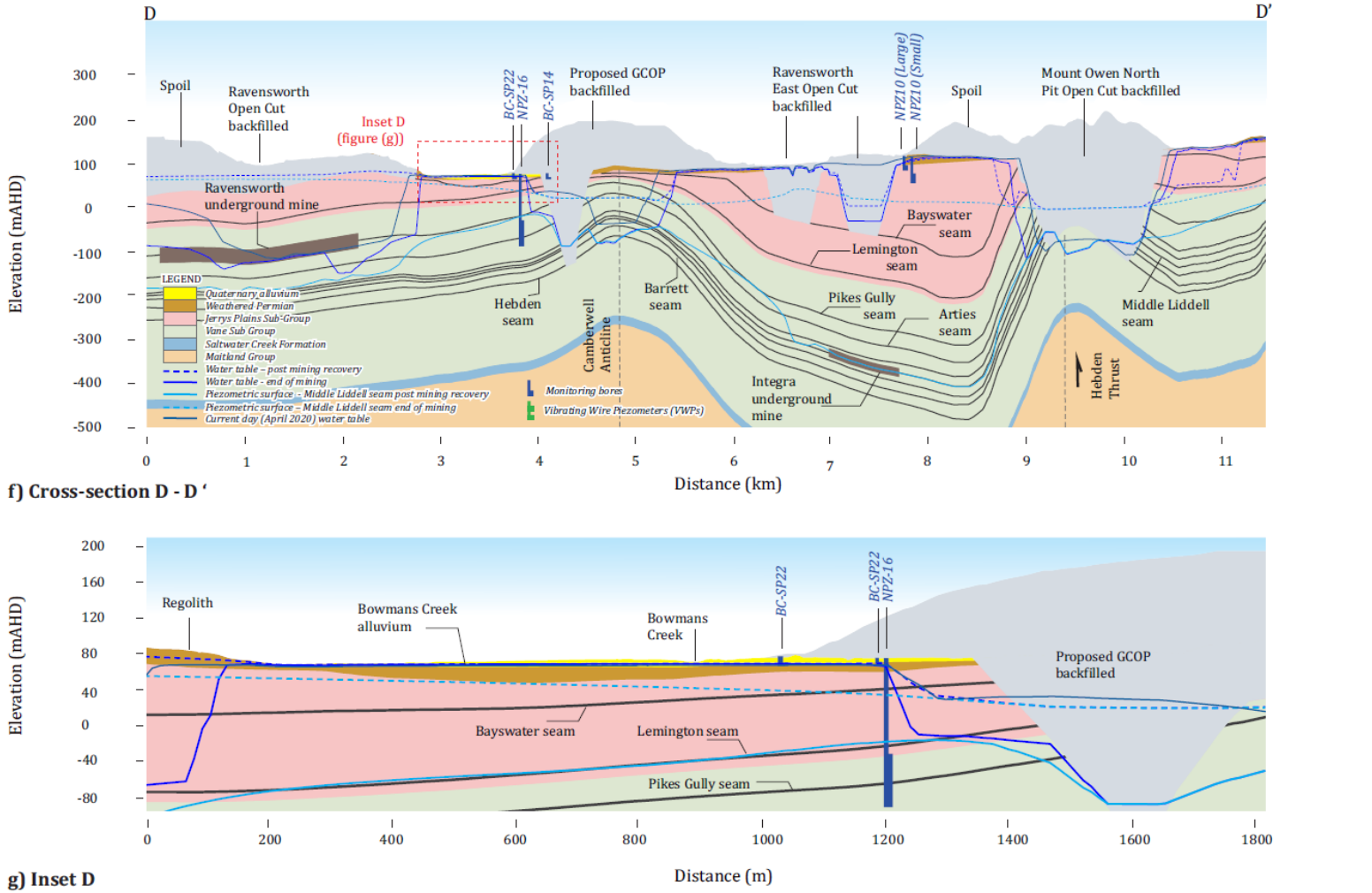
f) Inset C

Geological cross-section C - C '

Figure - 3

Glendell RTS (G1874E)

Figure 2.9 Geological cross-section C-C



Geological cross-section D - D '

Figure - 4

Glendell RTS (G1874E)

Figure 2.10 Geological cross-section D-D

4) The Commission understands the Applicant's position with respect to pre-draining the coal seams prior to the commencement of mining operations to reduce emissions as described at the meeting. However, please provide details of any other mitigation measures that may be available to reduce the Scope 1 emissions (including the fugitive and diesel emissions) before or during operations.

Section 5.2.1 of the Revised GHGEA includes detailed consideration of potential Scope 1 and 2 mitigation measures. The ability to mitigate fugitive emissions is effectively limited to pre-mining gas drainage and in summary, this is not feasible because:

- the thin multi-ply nature of coal seams presents difficulties in the installation of gas drainage bores
- the gas content of target strata is low relative to traditional gas drainage operations with the existing gas contents similar to or less than post-drainage gas content levels where pre-drainage has historically been undertaken.

This issue is comprehensively addressed in the Glencore letter to the DPIE date 11 November 2021 and is not considered further in this response.

Potential measures to mitigate other Scope 1 and 2 emissions are discussed further below.

The non-fugitive Scope 1 emissions associated with the Project are almost entirely attributable to diesel combustion. Scope 2 emissions are primarily associated with electricity use. As detailed in both the meeting and assessment documentation provided (including Section 8.3.4 of the EIS which covers consideration of ESD principles and the valuation of resources), there are significant financial drivers for Glencore to optimise efficiency of diesel use and electricity consumption. These issues are considered specifically in Sections 5.1 and 5.2 of the Revised GHGEA (and the EIS GHGEA)

Table 5.1 and 5.2 from the Revised GHGEA includes specific consideration of measures to mitigate diesel use and electricity use. These tables are reproduced as **Table 2.4** and **Table 2.5** below:

Table 2.4 Consideration of Measures to reduce Scope 1 emissions from diesel use

Energy use during extraction		
Potential Mitigation Measure	Planned for the Project	Reason for Inclusion/Exclusion
Limiting the length of material haulage routes	Yes	Length of haulage routes has been optimised to minimise dust, noise and fuel use
Optimising ramp gradients	Yes	Ramp gradients have been optimised according to pit geometry parameters
Fuel efficient haul trucks	Yes	Fuel use efficiency has been an important selection criteria when allocating existing trucks to operations. New fuel use technology will be considered should any new trucks be purchased over the life of the Project
Payload Management	Yes	Payload will be constantly monitored and actively managed to maintain efficiency

Energy use during extraction		
Reducing rolling resistance of haul roads	Yes	Haul roads are planned to be constructed of rock rather than of soil or subsoil material. Where practical road materials are selectively sourced which may include crushed rock for use in on-site roads to provide improved road surfaces and reduced rolling resistance
Scheduling activities so that equipment and vehicle operation is optimised	Yes	Scheduling activities to optimise plant and vehicle operation is a routine activity. The Proponent will continue to prepare long, medium and short term plans to optimise production
Alternative fuels	-	Biodiesel products may be considered with regard to engine performance and maintenance impacts
Replacing trucks with conveyors	No	The use of conveyors is not feasible or cost effective given the short haul distances and relatively short life of the Project
Fuel efficient equipment	Yes	Fuel use efficiency has been an important selection criterion when allocating existing equipment to operations. New fuel use technology will be considered should any new equipment be purchased over the life of the Project
Blasting strategies to improve extraction efficiency	Yes	Through seam blasting will be employed to minimise the need for ripping and parting
Maximising resource recovery efficiency	Yes	Long, medium and short term operational plans will be developed to optimise the recovery of approved resources
Working machines to their upper design performance	Yes	Glencore's business objectives support and promote effective equipment utilisation and performance rates
Electric drills	No	Electric drills are not used at Glendell due to the lack of availability of in-pit supply of electricity and small work areas requiring regular walking of the drills or relocations
Preventing unnecessary water ingress	Yes	The surface water management system is designed to maximise separation of clean and dirty water systems. Clean water is diverted away from mining areas where practicable
In-pit servicing	Yes	A current operational practice that will continue
Replace lighting plants with LED	Likely	Glencore has conducted a review of LED lighting plants across its operations and is currently considering the implementation of LED technology
Use of chemical dust suppressants to reduce energy consumption by water carts	Yes	Dust suppressants will be used on roads at Glendell

Table 2.5 CHPP energy use options assessed

Energy use during processing		
Potential Mitigation Measure	Planned for Proposed Project	Reason for Inclusion/Exclusion
Reducing reject percentage	Yes	CHPP density set points are monitored each shift and product coal scan ash analysers are used to extract highest yield and thus lowest amount of reject
Automatically shutting down CHPP when not in use	N/A	CHPP runs 24 hours, 7 days per week other than for maintenance, Christmas and Boxing Days
High efficiency motors	Yes	These are installed and will be maintained for the life of the Project
Variable Speed Drives	Yes	These are installed and will be maintained for the life of the Project
Optimising motor size to load	Yes	This has been implemented at the CHPP
LED lighting for the MIA and parking areas	Yes	The new MIA and parking areas constructed for the Project will use LED lighting technology

Conveyors can be an energy efficient means of transporting materials but the feasibility for their use in open cut coal mining is generally limited to circumstances where there is a centralised extraction point and centralised destination and the conveyor infrastructure can remain in place for an extended period of time. Circumstances where the conveyor system requires constant relocation, as would be the case for this Project, limits the feasibility for their use due to the down time during construction and relocation and also the high costs associated with relocation. For this reason, in-pit conveyors are not considered to be practical or feasible.

While it would be possible to run a conveyor from the point of truck egress from the pit to the Mount Owen CHPP, there are a range of reasons which this is not reasonable or feasible, nor is it likely to have a significant impact on GHG emissions. Reasons include:

- Haulage of coal from the point of extraction at the pit floor to a bin and crushing plant at the pit crest for loading onto the conveyor to transport to the CHPP would still require trucks and associated diesel use. The haulage of coal from the pit floor to the pit crest is the most fuel intensive aspect of the haul with haulage along the relatively flat grade to the CHPP having significantly lower diesel usage rates.
- The ability for coal haulage via truck to the CHPP would need to be maintained to cover the period of conveyor construction and maintenance. Accordingly, cost saving in terms of reduced truck numbers is likely to be negligible and/or offset by reduced production rates during conveyor down-time. During these periods, there would be no benefits from a conveyor in terms of GHG emissions.

- The conveyor system would need to be constantly relocated during the life of the Project as the pit moves to the north and the proposed coal haulage route moves from the egress point near West Pit to the proposed haulage route over the Ravensworth East Emplacement Area from approximately Year 13 of the Project onwards (refer to Sections 3.2.1 and 3.2.3.3 of the EIS). Truck haulage would be required during this relocation period.
- The construction and operation of a conveyor has its own GHG emissions (Scope 1 and Scope 2) which need to be considered.

It should be noted that the use of a conveyor for overburden movement is not considered feasible at all due to the proposed in-pit emplacement.

Further, for every tonne of ROM coal extracted, approximately 13 tonnes of overburden have to be removed and emplaced. Accordingly, coal represents approximately 8% of total material movement. The combustion of diesel associated with ROM coal handling represents only approximately 3% of total Scope 1 emissions.

5) At the meeting, the Applicant described that relocating the Ravensworth Homestead back to its original location post-rehabilitation of the site may not be possible because of subsidence issues. Please document this reasoning for the Commission.

Reinstatement of the Ravensworth Homestead back into its existing location (i.e. uplifting the homestead during mining and then reinstating post mining) has not been proposed and is not considered to be reasonable or feasible nor is it likely to deliver any additional benefits in terms of heritage outcomes relative to the proposed Ravensworth Farm relocation option.

The conceptual final landform proposed includes a final void and the existing location of the homestead is located within this proposed void area. **Figure 2.11** shows the current location of Ravensworth Homestead relative to the proposed final void and **Figure 2.12** shows a cross section of the conceptual final landform with the existing location of the homestead. Almost complete backfilling of the void would be required to ensure that the heritage value of returning the homestead to its pre-mining location were realised. This would require a rehandle of approximately 255 million cubic metres of overburden with associated environmental impacts (noting that, during peak operations only 60 million cubic metres of overburden material are handled (refer to Figure 3.11 of the EIS)) and an associated delay in progressive rehabilitation and landform establishment in the areas from which this overburden is sourced. The consideration of complete backfilling of the void necessary to realise this reinstatement option is considered in Section 5.4 and 5.5 of the Mine Planning Options Report (Appendix 1 of the EIS).

This complete backfilling of the void would make the Project financially unviable and, as discussed in the meeting with the IPC on 10 March 2022, the complete backfilling of the void is considered to create a potential long term seepage risk through spoil as groundwater levels recover.

A brief summary of some of the additional factors for not considering this option further are:

- The option would require two moves of the homestead buildings and garden features which increases the risk of harm to the structures and garden features and significantly increases the costs of the relocation.
- During mining operations, under the reinstatement option, the homestead would be unlikely to be usable subject to the temporary storage requirements prior to moving back to the reinstatement location. This period where the homestead would be in storage is likely to be in the order of 30 years (allowing for additional time to backfill the void).

- The backfilled void would undergo settlement and this settlement (the subsidence issues referred to in the question) would pose potential structural hazards for the buildings once reinstated which is likely to impact structural integrity and affect heritage outcomes.
- Even if reinstated, the archaeological features currently present in the surrounds of the homestead site would be removed as part of salvage and mining operations. In this regard, this option provides no additional benefits relative to the Ravensworth Farm option.
- Significant features of the landscape relevant to the current context would not be present in Homestead reinstatement context, including Hebden Road and Yorks Creek. Reinstatement of Yorks Creek back to its original alignment would present technical difficulties due to it needing to be constructed over mine spoil. Similar issues would also apply to the further realignment of Hebden Road back to its original alignment. Additionally, a second realignment of Yorks Creek back to the original alignment would not be recommended from an aquatic ecology and riparian habitat perspective as these features would be expected to be well established within the Yorks Creek realignment by this time and a further realignment would result in additional impacts. Accordingly, these significant aspects of the landscape features of the existing site would not be present in a reinstated landform.

Overall, the proposed Ravensworth Farm relocation option is considered to provide far greater certainty of achieving heritage outcomes to a reinstatement option at considerably less cost and lower environmental impacts.

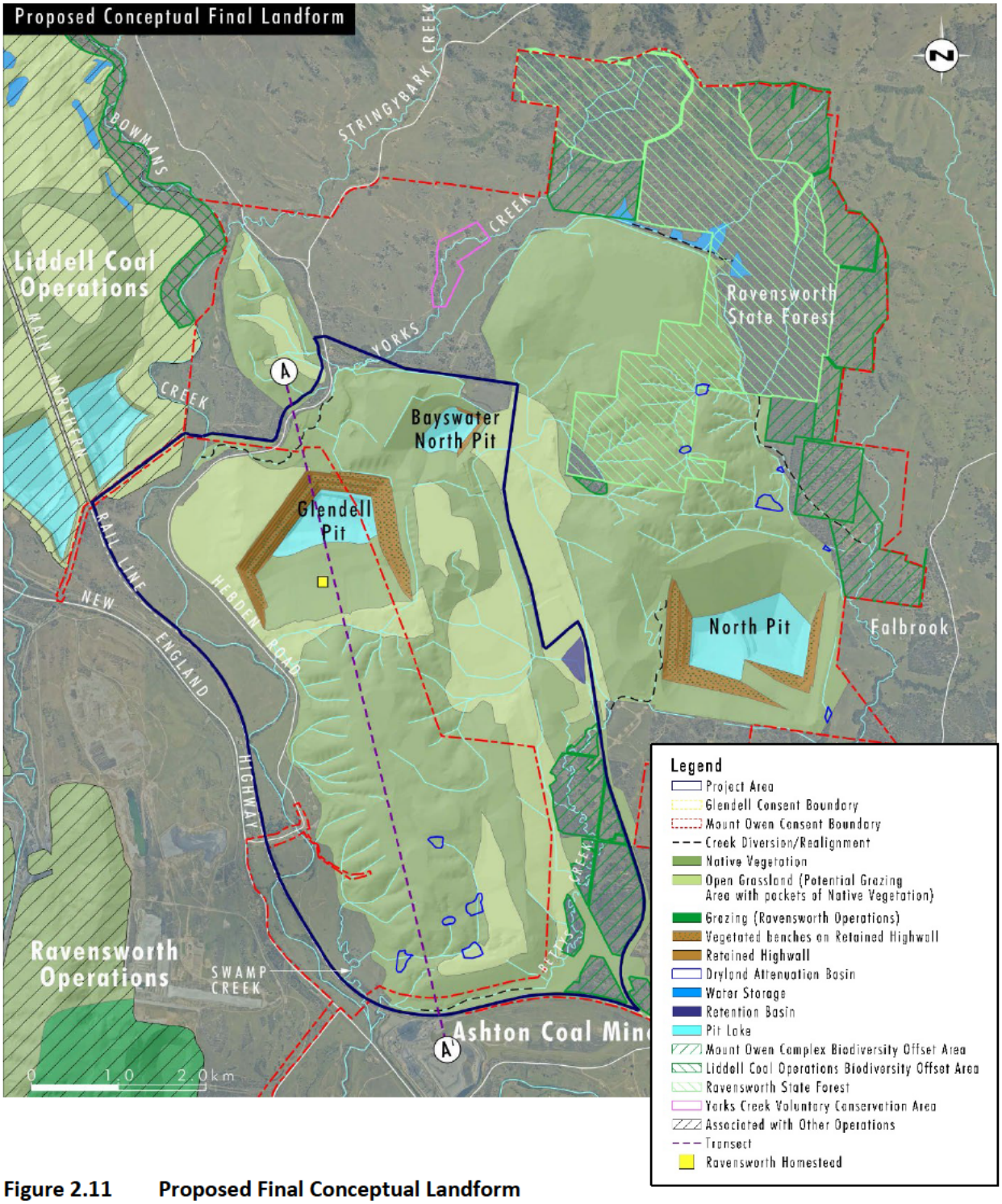


Figure 2.11 Proposed Final Conceptual Landform

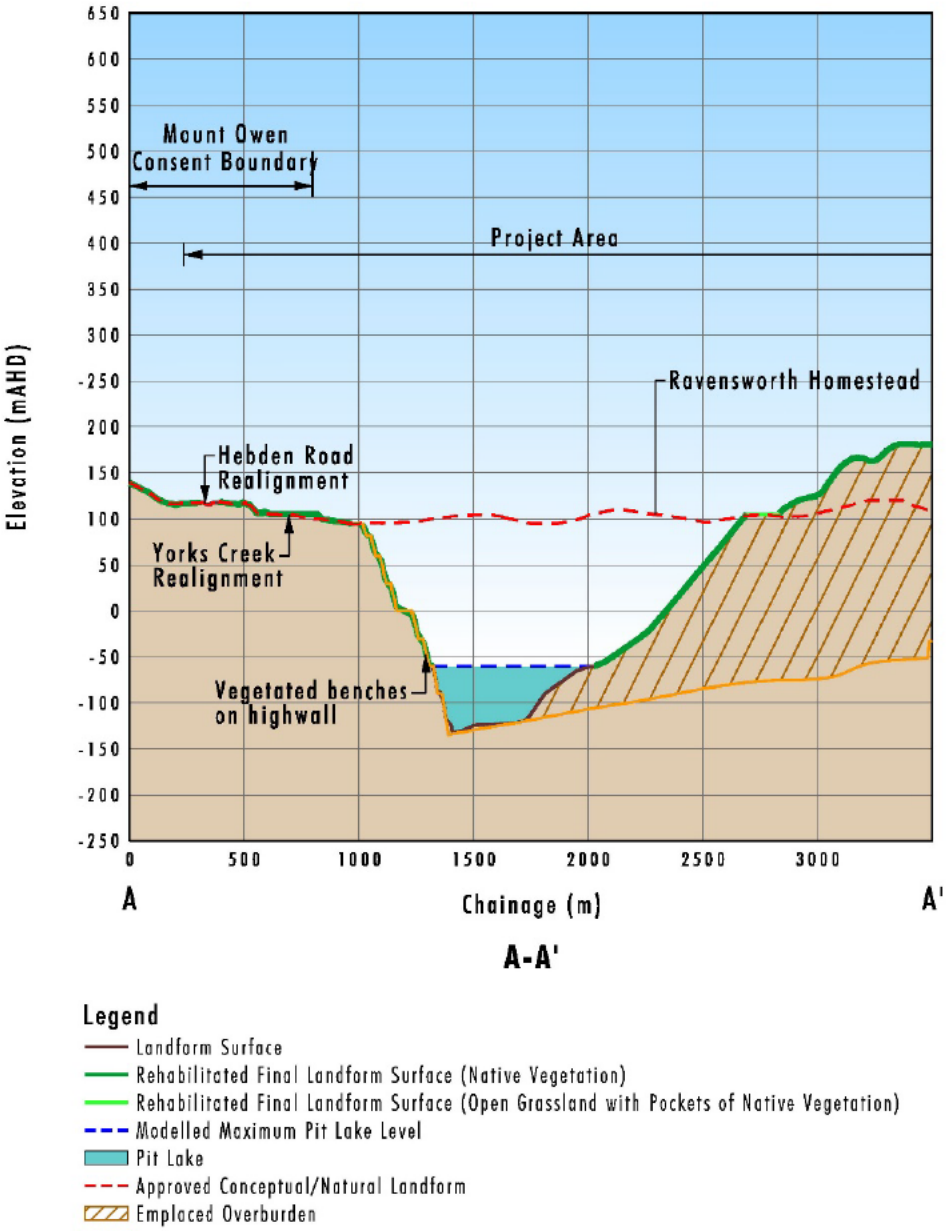


Figure 2.12 A-A Proposed Conceptual Final Landform

6) What process has been used to establish the Commonwealth emissions baseline, and what is the current emissions baseline for the existing Glendell operations?

The process used to establish the calculated emissions baseline is governed by the Commonwealth requirements of section 26A of the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015*.

Calculated baselines are set using an independently audited forecast of production and either the forecast emissions intensity or the government default emissions intensity. The baseline is calculated by multiplying forecast production by the emissions intensity of that production (tonnes of carbon dioxide equivalent - t CO2-e) per unit of production. Mt Owen Glendell uses a forecast emissions intensity because, in this circumstance, it is a more accurate reflection of greenhouse gas emissions than the government default.

Further information on the process can be found on the Commonwealth Government website at: http://www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Baselines/Calculated-baseline#How-is-a-calculated-baseline-set

The current Transitional Safeguard Baseline for the Mt Owen Glendell Complex is 286,172t CO_2-e. The Glendell mine does not have its own Safeguard Baseline. The emissions of both Mt Owen and Glendell are combined as a single Facility when reported under rules governing NGERs.

The current Transitional Safeguard Baseline will remain in force until 30 June 2023.

After 30 June 2023 the Transitional Safeguard Baseline will change to a Production Adjusted Baseline. Under a Production Adjusted Baseline the baseline will rise and fall in line with Run of Mine coal production.

If the Safeguard Baseline is exceeded in any given year, the Facility is required to surrender Australian Carbon Credit Units (ACCUs) at a rate of one ACCU for each tonne of CO_2-e above the Baseline.

ACCUs can be sourced from the Carbon Market Institute's Carbon Marketplace, or from the Federal government's Emissions Reduction Fund project register, or by establishing an Emissions Reduction Fund project to generate ACCUs.

7) What are the commercial considerations (including up front capital costs) for each of the mine design options and why are options that involve leaving Ravensworth Homestead in situ prohibitive? Please include a description of the capital costs of a shortened mine plan versus the longer (proposed) mine plan.

A separate response to this point has been provided by Glencore in a letter dated 23 March 2022.

8) What is the typical mine fleet replacement cycle?

Typically mine fleet equipment is replaced when it reaches "end of life". End of life is determined generally through cost benefit analysis that takes into account the cost of operating and maintaining the equipment (including any major overhaul requirements), the cost to replace the equipment (noting this equipment is expensive), as well as productivity considerations.

In general, depending on the number of hours each item of equipment is operated each year, new equipment could be scheduled for replacement with the following ranges:

- Trucks – 15 to 20 years
- Excavators – 12 to 15 years
- Ancillaries – 12 to 20 years.

Earlier replacement or later replacement may occur for specific equipment dependent on performance and running cost versus replacement cost.

New equipment is sourced from reputable Original Equipment Manufacturers (OEMs) in line with strict performance specifications. While in service, equipment is maintained based on a maintenance strategy generally in line with OEM recommendations to ensure the equipment maintains the safety, reliability and performance required by the mine operation.

9) What alternative options to truck haulage to transport ROM coal have been considered (such as the use of conveyors) to the Mount Owen CHPP in order to reduce emissions?

This issue has been addressed in the response to Question 4.

10) At the meeting, the Applicant described requested amendments to the recommended conditions. Please provide these requests and explanation in writing, directly responding to the Recommended Conditions provided by the Department to the Commission on 22 February 2022.

Glendell requested amendments to draft consent conditions (Recommended Conditions) via letter correspondence to the Department dated 17 February 2022. This request was specifically in reference to conditions A14, A15 relating to the Planning Agreement and condition B100 relating to road maintenance.

A separate amendment request was provided to the Department on 18 February 2022 in reference to condition B1 relating to noise for the Project.

This correspondence is provided as **Attachment A** and **Attachment B** and includes background information and reasoning for the requested amendments. A summary of the DPE recommended conditions and requested amendments to these conditions is provided below.

1. **Planning Agreement**

DPE Recommended Conditions

A14. Prior to relocating Hebden Road, or within 24 months of the date of the commencement of mining operations associated with the Glendell Pit Extension (whichever is sooner), the Applicant must enter into a PA with Council in accordance with Division 7.1 of Part 7 of the EP&A Act.

A15. If the Applicant and Council do not enter into a PA within the timeframe under condition A14, then within a further 3 months, the Applicant must make a Section 7.11 of the EP&A Act contribution to Council of $5.15 million as a one off payment. Upon making this payment condition A14 ceases to apply. The amount to be paid is to be adjusted at the time of the actual payment, in accordance with the provisions of Council's Singleton Community and Economic Development Fund, 2021, or its latest version.

Alternate wording for Planning Agreement Conditions:

- *Within six months of the legal closure of the existing portion of Hebden Road associated with the Glendell Pit Extension, or other timeframe agreed by the Planning Secretary, the Applicant must enter into a PA with Council in accordance with Division 7.1 of Part 7 of the EP&A Act.*

- *If the Applicant and Council do not enter into a PA within the timeframe under condition A14, then within a further 3 months, the Applicant must make a Section 7.11 of the EP&A Act contribution to Council of $5.15 million as a one-off payment in satisfaction of all the Applicant's contributions for the Development. Upon making this payment condition A14 ceases to apply. The amount to be paid is to be adjusted at the time of the actual payment, in accordance with the provisions of Council's Singleton Community and Economic Development Fund, 2021, or its latest version.*

- *If there is any dispute between the Applicant and Council in regards to conditions A14 and A15 then either party may refer the matter to the Planning Secretary for resolution.*

The key issue the proposed condition seeks to address is that the timing of the payment of the contributions is contingent on the closure of the section of Hebden Road that will be impacted by the Project or resolution of an agreement between Glencore and Council on the terms of the closure. As explained in the 10 March 2022 meeting with the IPC, the Project is contingent on the closure of the road. Requiring an upfront payment of these contributions without having certainty that the road can be closed and the Project can proceed is unreasonable. As noted in the 17 February 2022 letter and communicated in the meeting with the IPC, the Project imposes no increased demand for services on Council other than road maintenance costs and the provision of a new and upgraded road at no cost to Singleton Council will further delay the need for road maintenance by Council for a significant length of Hebden Road. Accordingly, the delay in payment does not place Council at a financial disadvantage. Further, the quantum of the payment remains subject to adjustment in line with the terms of the *Singleton Community and Economic Development Fund, 2021*.

2. Road Maintenance

DPE Recommended Condition

B100. Unless road maintenance contributions are included in the PA under condition A14, then the Applicant must:

a) prepare a pre-dilapidation survey of Hebden Road (being the section of Hebden Road between the New England Highway and the Mount Owen Access Road Intersection), once the realigned road is commissioned;

b) prepare a post-dilapidation survey of Hebden Road every 5 years thereafter, or at intervals agreed to with the relevant roads authority, for the life of the development; and

c) following completion of a post-dilapidation survey prepared under condition b), where development - related damage is identified and rectification works are required, the Applicant is to notify the applicable roads authority of the required works and seek an independent costing associated with repairs. Upon acceptance of the independent costings and receipt of invoice from Council, the Applicant is to pay the amount required to undertake the repairs and Council is to complete the repairs to the satisfaction of the roads authority.

Alternate wording for Road Maintenance Condition:

- *The Applicant must:*
  - *prepare a pre-dilapidation survey of Hebden Road (being the section of Hebden Road between the New England Highway and the Mount Owen Access Road Intersection), prior to the commencement of any construction or decommissioning works;*
  - *prepare a post-dilapidation survey of Hebden Road within 1 month of the completion of construction or decommissioning works, or other timeframe agreed by the applicable roads authority, which includes an attribution of road maintenance works associated with other road users; and*

- *following completion of a post-dilapidation survey, where -construction or decommissioning related damage is identified and rectification works are required, the Applicant is to notify the applicable roads authority of the required works and seek an independent costing associated with repairs which are attributable to the Project. Upon acceptance of the independent costings and receipt of invoice from Council, the Applicant is to pay the amount required to undertake the repairs and Council is to complete the repairs.to the satisfaction of the applicable roads authority.*

- *If the construction and/or decommissioning of the development is to be staged, the obligations in this condition apply to each stage.*

As discussed in the 10 March 2022 meeting with the IPC, Glencore do not object to the Road Maintenance Contributions for damage caused by additional vehicle movements associated with construction and decommissioning activities. However, Glencore remain of the view that the broader Planning Agreement contributions cover the general road maintenance works due to usage associated with ordinary operations and there is no justification for additional contributions.

As noted in the 10 March 2022 meeting, Glencore also pay significant rates to Council associated with its land holdings and most of this incur rates at a higher rate than surrounding land due to being rated as mining land. It is noted that in 2021 Glencore paid approximately $1 million to Singleton Council for rates associated with Mount Owen Complex Land holdings.

3. Noise

DPE Recommended Condition:

*B1. The Applicant must ensure that the noise generated by the development does not exceed the criteria in **Table 1**.*

***Table 1:** Noise criteria dB(A)*

Noise Assessment Location[a]	Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$
Residences on Privately-Owned Land				
Areas 1, 2, 4, 5, 7 and 11	40	35	35	45
Area 8	40	40	38	47
Area 9	40	40	38	45
Area 10	40	38	37	45
Other privately-owned residences	40	35	35	45

[a]The Noise Assessment Locations referred to in **Table 1**, are shown in Appendix 3.

*Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (EPA, 2017). The noise enhancing meteorological conditions determined by monitoring at the meteorological station required under condition B36 and as defined in Part D of the NSW Noise Policy for Industry (EPA, 2017) apply to the noise criteria in **Table 1**.*

Proposed Revised Noise Condition:

*B1. The Applicant must ensure that the noise generated by the development does not exceed the criteria in **Table 1**.*

Table 1: *Noise criteria dB(A)*

Noise Assessment Location[a]	Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{AF\ MAx}$
Residences on Privately-Owned Land				
Areas 1, 2, 4, 5, 7 and 11	40	35	35	52
Area 8	40	40	38	52
Area 9	40	40	38	52
Area 10	40	38	37	52
Other privately-owned residences	40	35	35	52

[a]The Noise Assessment Locations referred to in **Table 1**, are shown in Appendix 3.

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (EPA, 2017). The noise enhancing meteorological conditions determined by monitoring at the meteorological station required under condition B36 and as defined in Part D of the NSW Noise Policy for Industry (EPA, 2017) apply to the noise criteria in ***Table 1****.*

The proposed approach to the setting short duration night-time noise limits at 52dB $L_{AF\ MAX}$ reflects the sleep disturbance screening criteria contained in the NSW Noise Policy for Industry (NPfI). The adoption of the sleep disturbance screening criteria as a night-time sleep disturbance performance criteria (Glencore's proposed drafting) is consistent with all recent approvals by the IPC for Projects which have been required to assess the project in accordance with the NPfI. The Glencore letter to DPIE dated 18 February 2022 contains further details regarding Glencore's preferred approach to this condition.

3.0 Response to Public Hearing Questions

Can the redacted report be provided to the Commissioners? What is harmful about the CiC information contained in the report?

Glencore have provided the report to the Commissioners in a separate response to the IPC, submitted on the 23 March 2022.

What are the GHG emissions per unit of energy delivered by this coal? Do you get greater energy per tonne of CO2 emitted by burning high quality coal?

Similar to the coal currently produced by the Mount Owen Complex, the Project will produce both thermal coal and semi-soft coking coal for use in power generation and steel making respectively. The coal is low moisture (around 9%) bituminous black coal with the following properties:

- Thermal coal
  - Average ash content less than 15% (as received (ar))
  - Average energy content greater than 6,200 kcal/kg (gross as received (gar))
- Semi-soft coking coal
  - Average ash content less than 9% (ar)
  - Average energy content greater than 6,800 kcal/kg (gar)

High calorific value coal is typically defined as being > 5700 kcal/kg and makes up less than half of thermal exports to the Asia Pacific Region. Indonesia is one of the largest thermal coal export producers in the Asia Pacific. Indonesia's coal production in 2020 was 545 Mt of which approximately 99% was thermal coal. This is significantly higher than Australia's coal production in 2020 (which was 468 Mt) of which approximately 62% was thermal (IEA 2021). Indonesian coal however is typically high moisture (around 30%) sub-bituminous coal with an energy content as low as 4,700 kcal/kg. Indonesian coal accounts for approximately 96% of global low calorific value coal (IEA, 2021).

Coal-fired power station technology is continuing to improve, particularly throughout Asia, with the carbon intensity (CO_2 generated per unit of power output) decreasing as power stations become more efficient, that is, extracting more energy from the coal that is combusted. In particular, High Energy Low Emission (HELE) plants throughout Asia are being designed specifically for use with high calorific value bituminous coals, which are produced in the Hunter Valley and includes coal produced at Glendell/Mount Owen Complex.

Figure 3.1 shows boiler energy versus t-CO_2 emissions generated per megawatt hour of power generated for different power station technologies and coal types. In short, the burning of high calorific bituminous coals, such as those produced at Glendell/Mount Owen Complex, requires around 5% less boiler energy input compared to sub-bituminous coals, such as those produced in Indonesia, which subsequently generates around 7% less t-CO_2 emissions per megawatt hour of power generated. This is because sub-bituminous coals have higher moisture levels and require more energy to evaporate the increased water content compared to bituminous coals (which inherently have a lower moisture content).

Hence more energy is lost, and more CO_2 is produced as extra sub-bituminous coal is needed to be burnt to evaporate the additional water.

Further, reductions in emissions are also achieved depending on the power station technology. Subcritical boilers are less efficient than Supercritical boilers, Ultra Supercritical boilers, and Integrated Gasified Combined Cycle (IGCC) HELE plants that burn bituminous coal (such as that produced at Glendell/Mount Owen Complex). The improvement in power plant efficiency from Subcritical boilers to HELE plants results in the generation of a further 8% less t-CO_2 emissions per megawatt hour of power generated for a given coal type as shown in **Figure 3.1**.

Overall, around 15% less CO_2 would be generated by switching from burning sub-bituminous coal in a Subcritical Boiler Power Station to burning bituminous Glendell/Mount Owen coal in an Ultra-Supercritical Boiler or IGCC Power Plant.

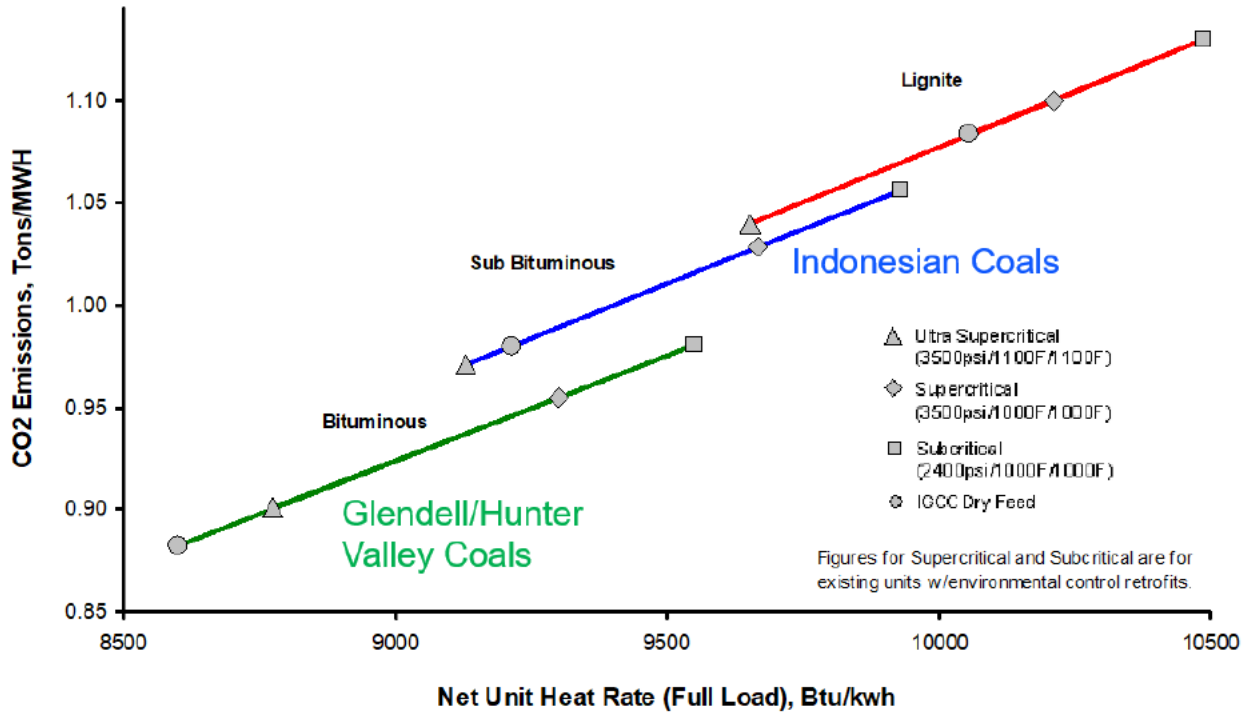


Figure 3.1 Boiler energy versus t-CO_2 emissions generated per megawatt hour for different power station technologies and coal types (Kellsall and Baruya, 2022)

What happens if the emissions baseline is exceeded?

This question has been addressed in response to Question 3 in **Section 2.0**.

Is Glencore considering any voluntary carbon offsets on top of the level proposed?

Glencore are not considering any additional voluntary carbon offsets as part of the Project. As mentioned in response to Question 6 above, if the Safeguard Baseline is exceeded in any given year, the Project will be required to surrender Australian Carbon Credit Units (ACCUs) at a rate of one ACCU for each tonne of CO_2-e above the Baseline.

Clarification on whether estimated fugitive emissions include post mining emissions from coal seams

Post-mining fugitive emissions are not directly required to be calculated under the NGERS calculation methods however the Method 2 assessment methodology does require inclusion of gas modelled as being present in the 20 metres below the pit floor. There is no specific requirements or methodologies for calculating emissions from exposed seams in pit walls.

As noted in the response to Question 3 in **Section 2.0**, the potential release of methane from seams in exposed faces of the pit shell will depend on a range of factors including the amount of gas within the seams to start with, micro fracturing around those seams as a result of mining, the effects of pore groundwater pressure and levels, and retarding effects of spoil and water against the exposed faces within the pit shell. As noted in the response to Question 3 in **Section 2.0**, the sealing of coal seams in open cut coal mines for the purposes of preventing fugitive emissions has not been fully studied to date and, from a theoretical perspective, is considered unlikely to be effective.

It is noted that concerns regarding fugitive emissions from exposed coal seams was also raised as an issue in the assessment of the Mangoola Coal Continued Operations Project by the IPC. For this recent Project Approval (SSD 8642), this issue was addressed by the inclusion of a specific rehabilitation objective for the final landform to 'Minimise post mining emissions from exposed coal seams' (refer to Condition B85 of SSD 8642). This is considered to represent a practical approach to addressing this issue with further work undertaken over the life of the Project to identify reasonable and feasible measures to minimising such emissions.

In relation to Graeme Cheetham's submission, please clarify dust impacts at his residence in Middle Falbrook due to terrain and proposed increased dump height due to the Glendell Pit Extension

Existing overburden emplacement at Glendell Mine located to the east of the existing approved Glendell Pit is currently permitted to approximately 160 mAHD under the existing Glendell Consent. The proposed Glendell Pit Extension will be generally developed to approximately 185 mAHD, with selected areas emplaced to approximately 200 mAHD, a height increase ranging from 25 metres to 40 metres from existing conditions.

The Air Quality Impact Assessment (AQIA) completed for the Project is based on the use of an air dispersion model, to predict concentrations of substances emitted to the air due to the proposed mining activities. The dispersion modelling accounted for meteorological conditions, land use and terrain information.

Meteorological conditions are important for determining the direction and rate at which emissions from a source will disperse. **Figure 3.2**shows the annual wind patterns for each year from 2012 to 2018. It can be seen from these windroses that the most common winds in the area are from the south-southeast, southeast, northwest and north-northwest aligned to seasonal variance. This pattern of winds is common for many parts of the Hunter Valley and reflects the northwest-southeast alignment of the valley.

Intensity and receiver location relative to prevailing wind conditions play a significant role in dust impacts. In regard to the Cheetham property, the peak impacts are predicted in Year 13 of the Project when the production rate is at its highest and operations have moved to the north, rather than Year 6 when emplacement will be at its highest and located closest to the Cheetham property. The primary reason for the increase in Year 13 relative to Year 6 (and earlier years) is that the emission generating activities have moved to the north which places the Cheetham property closer to the prevailing northwest/southeast wind alignment (refer to **Figure 3.3**).

Similar to other properties in the Middle Falbrook area, the Cheetham Property is in the prevailing northwest/southeast wind alignment relative to the Mount Owen Complex but is not located on this alignment relative to the mining operations to the south and therefore does not receive higher emissions from other nearby mines (Rix's Creek North and South, and Integra Open Cut). In this way, this area is to be contrasted to locations which are in the prevailing wind alignment for operations on two sides such as Camberwell or along Glennies Creek. This difference in the location and wind alignment relative to the mining operations, reduces the level of predicted cumulative impacts at the Cheetham Property and other areas to the east of the Mount Owen Complex and on that basis plays a larger role in cumulative impacts than terrain features such as height of overburden emplacement.

Due to the distance from the active areas of the Project to the Middle Falbrook area where the Cheetham property is located (more than 6 kilometres), the increase in annual average PM10 emissions relative to the Project not occurring remain small (approximately 0.5 µg/m^3 in Year 1 to 1.3 µg/m^3 in Year 13). Cumulative PM10 and PM2.5 levels at the Cheetham property are not predicted to exceed the relevant criteria set out in the recommended DPIE draft conditions (that is the annual average National Environment Protection Measures (NEPM)), in any year of the Project.

Glencore currently undertake real time monitoring in a location between the Mount Owen Complex and the Middle Fallbrook area. This monitoring is located on the ridgeline to the west of the Cheetham Property (approximately 3 kilometres from Mount Owen North Pit which is the closest area of active workings at the Mount Owen Complex). Glencore use this monitoring to manage operations at the Mount Owen Complex to avoid exceedances of relevant air quality criteria further to the east (including the Cheetham property). Glencore will maintain this real time management practice for the Project.

Glencore have been actively engaged with the Cheethams and other residents in the Middle Fallbrook area regarding air quality issues and these have been considered in the Air Quality and Greenhouse Gas Management Plan reviewed by the EPA and approved by the Department. To date, monitoring undertaken by Glencore for the Mount Owen Complex indicates that air quality in the Middle Fallbrook area is consistent with previous impact predictions and is below relevant impact criteria. Glencore will continue to liaise with the Cheethams and other residents within the Middle Falbrook area regarding air quality management for the Mount Owen Complex and are committed to managing impacts to avoid exceedances of relevant air quality criteria associated with its operations.

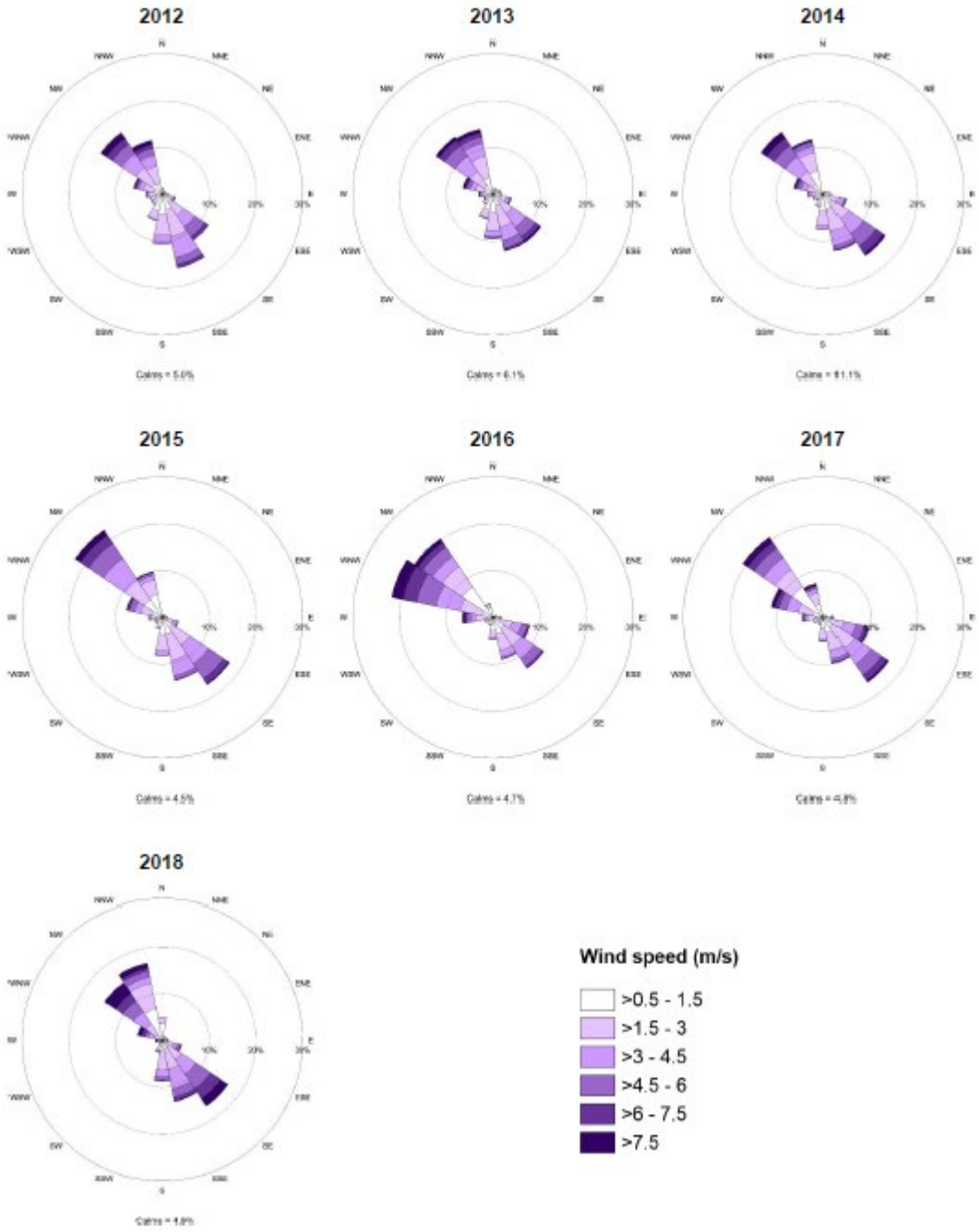


Figure 3.2 Annual wind roses for data collected at the Glendell Met meteorological station

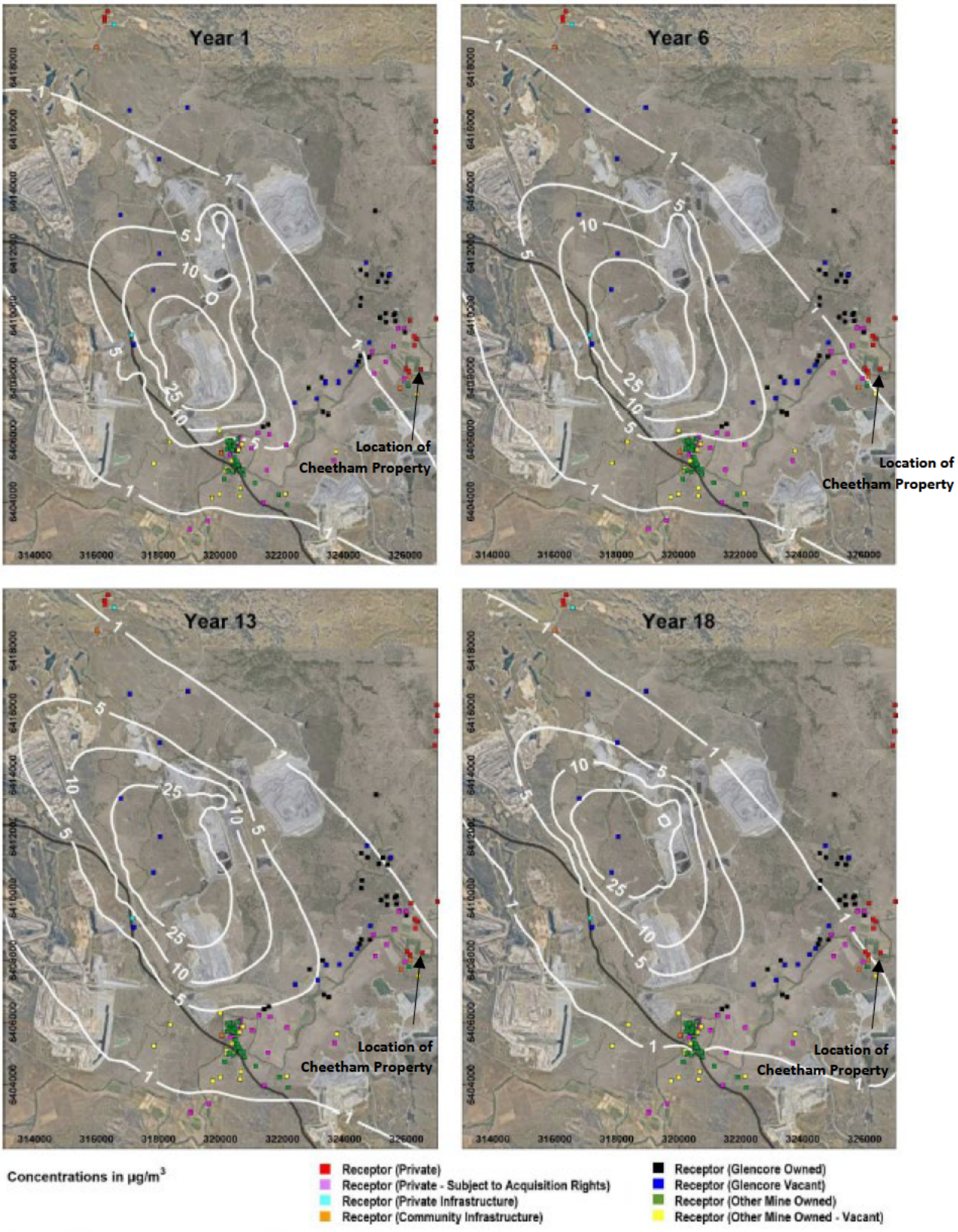


Figure 29 Predicted annual average PM_{10} concentrations due to the Project only

Figure 3.3 Predicted annual average PM10 concentrations due to the Project only (extracted from Appendix 13 of the EIS)

Examples of buildings which have been moved using the intact move methodology

Examples of buildings which have been relocated using an intact move methodology were provided as part of the Environmental Impact Statement (EIS) - refer to Attachment A of Mammoth Mover's Methodology for the Relocation of the Ravensworth Homestead Complex (14 October 2019) provided in sub-Appendix H of Appendix 23g.

Further details of intact building moves are also provided in Appendix 6 of the Glendell Continued Operations Project Response to Submissions Part B (August 2020) report and provided as **Attachment C** to this document.

4.0 References

Clean Energy Regulator 2021: Estimating emissions and energy from coal mining guideline, July 2021

International Energy Agency (IEA) 2021 Coal 21, Analysis and forecast to 2024 https://iea.blob.core.windows.net/assets/f1d724d4-a753-4336-9f6e-64679fa23bbf/Coal2021.pdf

Kellsall, G. and Baruya, P., January 2022, The Role of Low Emission Coal Technologies in a Net Zero Asian Future, International Centre for Sustainable Carbon

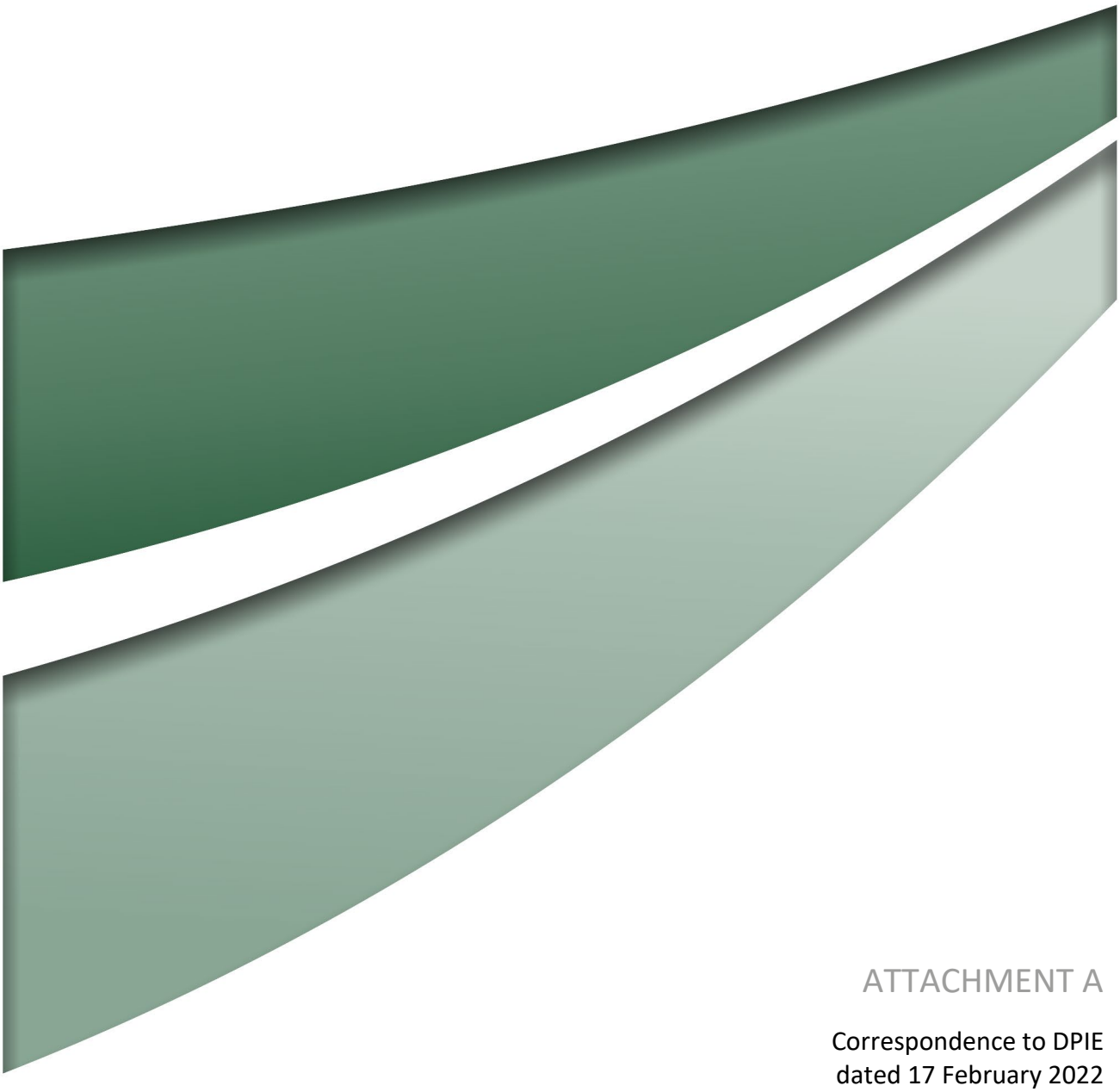
Umwelt 2019a Glendell Continued Operations Project Environmental Impact Statement

Umwelt 2019b Glendell Continued Operations Project Greenhouse Gas and Energy Assessment (Appendix 28 in Glendell Continued Operations Project Environmental Impact Statement (Umwelt 2019a)

Umwelt 2020a Glendell Continued Operations Project Greenhouse Gas and Energy Assessment

Umwelt 2020b Glendell Continued Operations Project Response to Submissions Report A

Umwelt 2021 Glendell Continued Operations Project Response to Minecraft Report



ATTACHMENT A

Correspondence to DPIE
dated 17 February 2022

MGO
MT OWEN / GLENDELL

GLENCORE

17 February 2022

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

Dear Joe,

Glendell Continued Operations Project (GCOP) – Draft Conditions of Consent

We refer to the draft consent conditions for the Glendell Continued Operations Project (GCOP) and specifically conditions A14, A15 relating to the Planning Agreement, and condition B100 relating to Road Maintenance (as set out below).

A14. Prior to relocating Hebden Road, or within 24 months of the date of the commencement of mining operations associated with the Glendell Pit Extension (whichever is sooner), the Applicant must enter into a PA with Council in accordance with Division 7.1 of Part 7 of the EP&A Act.

A15. If the Applicant and Council do not enter into a PA within the timeframe under condition A14, then within a further 3 months, the Applicant must make a Section 7.11 of the EP&A Act contribution to Council of $5.15 million as a one off payment. Upon making this payment condition A14 ceases to apply. The amount to be paid is to be adjusted at the time of the actual payment, in accordance with the provisions of Council's Singleton Community and Economic Development Fund, 2021, or its latest version.

B100. Unless road maintenance contributions are included in the PA under condition A14, then the Applicant must:

a) prepare a pre-dilapidation survey of Hebden Road (being the section of Hebden Road between the New England Highway and the Mount Owen Access Road Intersection), once the realigned road is commissioned;

b) prepare a post-dilapidation survey of Hebden Road every 5 years thereafter, or at intervals agreed to with the relevant roads authority, for the life of the development; and

c) following completion of a post-dilapidation survey prepared under condition b), where development -related damage is identified and rectification works are required, the Applicant is to notify the applicable roads authority of the required works and seek an independent costing associated with repairs. Upon acceptance of the independent costings and receipt of invoice from Council, the Applicant is to pay the amount required to undertake the repairs and Council is to complete the repairs.

to the satisfaction of the roads authority.

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Mt Owen Pty Limited ABN 83 003 827 361

For the reasons set out in this letter, we are unable to accept these conditions in their current form. While we appreciate DPIE may elect to include these conditions as currently drafted in its referral of the GCOP to the Independent Planning Commission (IPC), we propose to submit our alternative drafting of these conditions and justification to the IPC for its consideration.

Background

A key requirement of the GCOP is the realignment of a section of Hebden Road to enable progression of the Glendell Pit Extension to the north. There are two components to this realignment:

1. the construction of a new section of Hebden Road at Glendell's cost which will then be transferred to Singleton Council;
2. formal closure of the existing alignment of Hebden Road under Part 4 of the *Roads Act 1993* (NSW) by Singleton Council as the roads authority and the transfer of that closed portion of road to Glendell.

Without these two components, the mining approved by the Project cannot proceed.

Importantly, the old section of road will be used during the high impact construction phase of the GCOP and prior to the opening of the new section of road. Consequently, this will avoid the need for repair of any construction damage to the section of road being closed. Ongoing operations as part of the GCOP will not significantly contribute to dilapidation impacts beyond the fair wear and tear associated with normal road use by employees and suppliers.

Unlike a section 138 Roads Act approval, a decision by Council to close a road under Part 4 of the Roads Act is not an approval, pursuant to the *Environmental Planning and Assessment Act 1979* (NSW), that must be consistent with a State Significant Development approval and is entirely at the discretion of Council. In practice, this gives Council, as the roads authority, a veto right over any road closure.

Glendell has had numerous discussions with Singleton Council regarding the financial arrangements around this road closure and transfer processes however, agreement as to the closure of the road has not yet been reached. We are aware of significant delays for other projects in relation to this matter, both across NSW and in the Singleton LGA. We note that without reaching agreed terms with Singleton Council regarding the closure of Hebden Road the GCOP cannot be commenced.

Requested Planning Agreement Condition Amendments

Given the issues identified above, Glendell is strongly of the view that the Planning Agreement terms (and subsequent payment of the contribution) must be linked to the closure of Hebden Road. Without this there is nothing preventing Council from collecting the Planning Agreement contributions but delaying or preventing the Project by withholding the formal closure of the road. For this reason, the Planning Agreement terms proposed by Glendell cover all aspects of the closure of Hebden Road, the transfer of the closed road to Glendell, the ongoing maintenance of Hebden Road and GCOP generally.

Below is our alternate wording for conditions A14 and A15, which links payment of the contribution to the formal closure of the road. This condition does not fetter the discretion of Council in terms of its responsibilities under the Roads Act however, it does create an incentive for Council to exercise such discretion in a timely manner that is consistent with any decision to approve the GCOP. We also request that a condition be added to provide a resolution pathway should agreement not be reached with Singleton Council.

Alternate wording for Planning Agreement Conditions:

- *Within six months of the legal closure of the existing portion of Hebden Road associated with the Glendell Pit Extension, or other timeframe agreed by the Planning Secretary, the Applicant must enter into a PA with Council in accordance with Division 7.1 of Part 7 of the EP&A Act.*
- *If the Applicant and Council do not enter into a PA within the timeframe under condition A14, then within a further 3 months, the Applicant must make a Section 7.11 of the EP&A Act contribution to Council of $5.15 million as a one-off payment in satisfaction of all the Applicant's contributions for the Development. Upon making this payment condition A14 ceases to apply. The amount to be paid is to be adjusted at the time of the actual payment, in accordance with the provisions of Council's Singleton Community and Economic Development Fund, 2021, or its latest version.*
- *If there is any dispute between the Applicant and Council in regards to conditions A14 and A15 then either party may refer the matter to the Planning Secretary for resolution.*

Glendell notes that, other than potential road maintenance costs, the GCOP itself will place no additional demand on Council services and as such the quantum of the Planning Agreement offer made by Glendell to Singleton Council significantly exceeds the anticipated additional maintenance costs.

Requested Road Maintenance Condition Amendments

As currently drafted, the proposed road maintenance condition provides an opportunity for Singleton Council to capture additional value from the GCOP on top of the proposed Planning Agreement contribution. Glendell strongly believe that any contribution in relation to road maintenance for the relocated section of Hebden Road should form part of the Planning Agreement contribution, which is in keeping with the original intent of developer contributions (whether imposed under a Contributions Plan or a Planning Agreement) to ensure that Councils can recoup additional capital and maintenance costs they may incur from the developer of the project that gives rise to those increased costs.

We propose the below alternate wording for condition B100:

Alternate wording for Road Maintenance Condition:

- *The Applicant must:*
  - *prepare a pre-dilapidation survey of Hebden Road (being the section of Hebden Road between the New England Highway and the Mount Owen Access Road Intersection), prior to the commencement of any construction or decommissioning works;*
  - *prepare a post-dilapidation survey of Hebden Road within 1 month of the completion of construction or decommissioning works, or other timeframe agreed by the applicable roads authority, which includes an attribution of road maintenance works associated with other road users; and*
  - *following completion of a post-dilapidation survey, where -construction or decommissioning related damage is identified and rectification works are required, the Applicant is to notify the applicable roads authority of the required works and seek an independent costing associated with repairs which are attributable to the Project. Upon acceptance of the independent costings and receipt of invoice from Council, the Applicant is to pay the amount required to undertake the repairs and Council is to complete the repairs.*

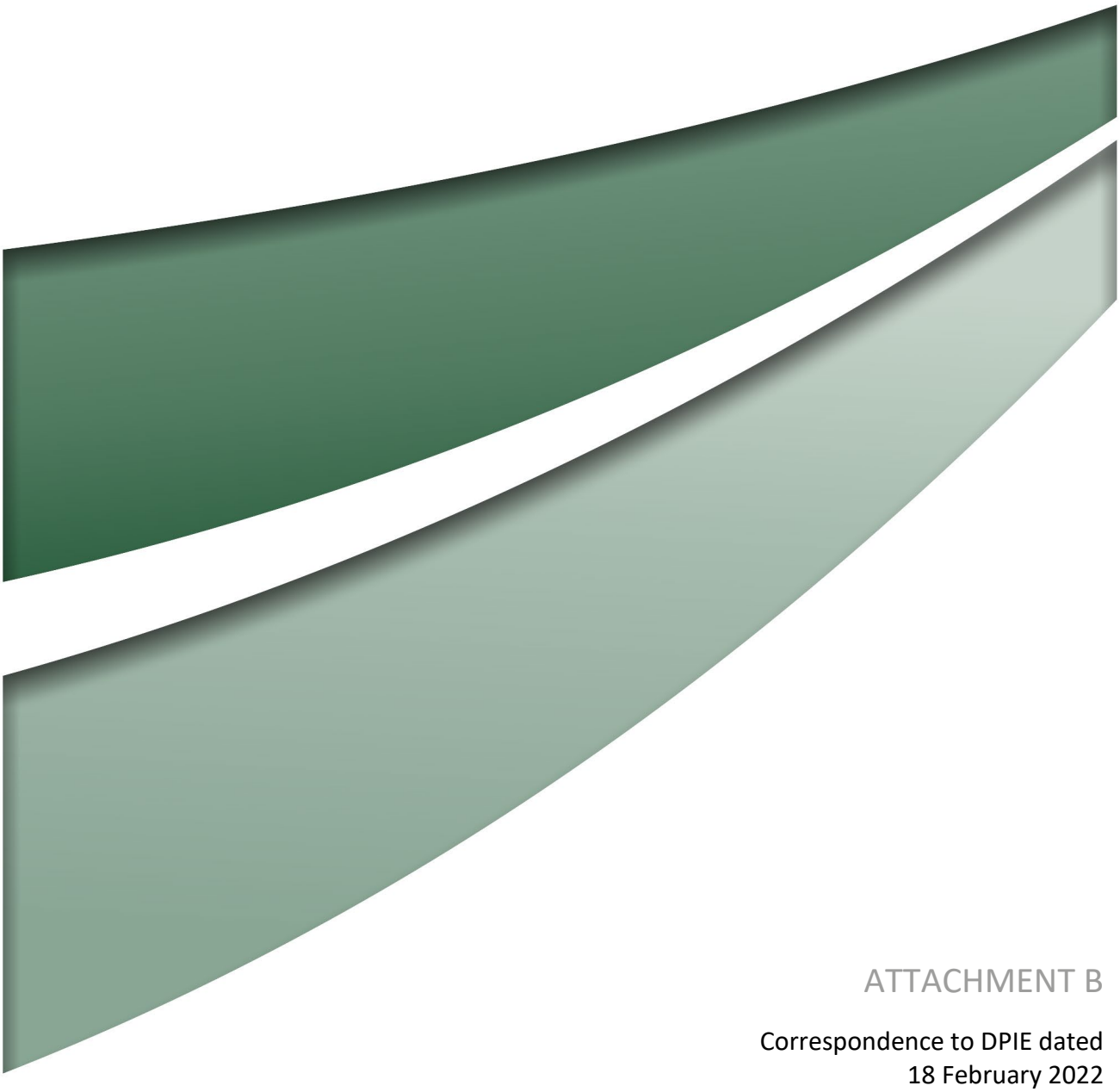
  to the satisfaction of the applicable roads authority.
- *If the construction and/or decommissioning of the development is to be staged, the obligations in this condition apply to each stage.*

- *If there is a dispute about the scope of any remedial works or the implementation of the works, then either party may refer the matter to the Planning Secretary for resolution.*

Should you require any further information or clarification on the above then please do not hesitate to contact the undersigned.

Yours sincerely,

Shane Scott
Coal Assets Australia, GLENCORE
M: [redacted]
E: [redacted]



ATTACHMENT B

Correspondence to DPIE dated
18 February 2022

18 February 2022

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

Dear Joe,

Glendell Continued Operations Project (GCOP) – Draft Conditions of Consent (Noise)

We refer to the Sleep Disturbance Criteria set out in the draft noise condition B1 for the Project.

The proposed 45dB (and/or 47dB) as a $L_{A1\,(1\,min)}$ criteria for the Project in the draft noise condition B1 is inconsistent with the 52dB $L_{AF\,max}$ Sleep Disturbance Screening Criteria/Noise Goal as set out in the *Noise Policy for Industry* (NPfI).

This inconsistency with the NPfI will cause material compliance and operational issues for the Project, particularly in the early years. While we appreciate DPIE (on advice from the EPA) may elect to include its proposed noise limits in its recommended conditions for referral of the GCOP to the Independent Planning Commission (IPC), we propose to submit our alternative drafting of these conditions and justification contained in this letter to the IPC for its consideration, which incorporates specialist input from Umwelt Australia Pty Ltd (Umwelt) on the technical aspects.

As required by the SEARs, the Noise Impact Assessment (NIA) for the Project has been prepared in accordance with the NPfI. Consistent with the NPfI, the relevant impact criteria against which the Project has been assessed is set out in Table D.1 of Appendix D in the NIA. In the draft conditions provided in their letter of 10 June 2020, the EPA provided the following:

> ***Noise limits:***
>
> *L1) Unless otherwise further restricted or otherwise stipulated by a condition of this Development Approval or any in-force environment protection licence, operational noise generated at the premises must not exceed the project specific noise goals defined in Table D.1 in Appendix D of the Noise Impact Assessment titled "Glendell Continued Operations Project Noise Impact Assessment" dated November 2019 by Umwelt Environmental and Social Consultants, excluding the construction noise goals.*

The proposed draft development consent noise conditions for the Project are inconsistent with this statement from the EPA. The proposed $L_{Aeq\ 15\ min}$ criteria is consistent with the criteria specified in Table D.1 in the NIA. However, the proposed criteria of 45 dB and 47 dB $L_{A1\,(1\,min)}$ differs from the Sleep Disturbance Noise Goal in Table D.1 which is 52dB $L_{AF\,max}$. The 52dB $L_{AF\,max}$ is also the criteria set out in Table 7.12 of the EIS and Table 3.8 of the NIA.

While not explicitly stated in correspondence from DPIE or the EPA, we understand that the EPA's and DPIE's position for applying sleep disturbance criteria to the Project's draft consent conditions is linked to the existing criteria in the current Glendell EPL (EPL 12840). However, it must be noted that the Project is a new SSD Project (SSD-9349) and not a modification of an existing approved project. The currently proposed noise limit criteria is a 'mix and match' of the Industrial Noise Policy (INP) and NPfI policy approach whereby the $L_{Aeq\ 15\ min}$ criteria has been set by reference to the NPfI and the short-term noise criteria is based on the old INP.

While Table 7.20 of the EIS and 7.1 of the NIA does identify a $L_{A1\ (1\ min)}$ monitoring criteria of 45 dB $L_{A1\ (1\ min)}$ at representative monitoring locations, these relate to representative monitoring locations only and do not specify limit criteria for specific residences.

At the time the EIS was finalised, the noise levels specified in Table 7.20 were appropriate for the setting of *monitoring criteria* under the Mount Owen Complex Noise Management Plan given the integrated nature of the Mount Owen Complex and the continued application of a 45dB $L_{A1\ (1\ min)}$ under the Mount Owen Consent at some receivers[1]. However, this monitoring criteria cannot not be used to represent the appropriateness of setting the noise limits under the new SSD-9349. This is particularly the case given the NIA modelling indicates that the proposed lower criteria in the draft development consent noise conditions is predicted to be unachievable.

Additionally, as is discussed further below, these lower monitoring criteria have now been increased to 52dB $L_{A1\ (1\ min)}$ in a recent Mount Owen EPL variation, issued by the EPA (see **Table 2** below). The approach to managing the difference in compliance criteria between the Mount Owen Operations and the Project is discussed further below.

Consideration of existing 'in-force' EPL noise limits to the setting of conditions

The transitional arrangements for the Noise Policy for Industry (2017) (Implementation Arrangements) provide the principles for applying the NPfI in circumstances where the INP may previously have been applicable. The Project is a new SSD with a significant ramping up of maximum production (4.5Mtpa to 10Mtpa) and necessitates an increased elevation in the in-pit emplacement area, both of which have significant implications for noise management. The relevant provisions of the Implementation Arrangements are extracted below (emphasis added):

1. *The NSW Industrial Noise Policy (2000) is withdrawn and is replaced by the Noise Policy for Industry (2017) except as described in points 2, 3 and 8 below.*

2. ***The Noise Policy for Industry (2017) will take effect immediately upon its release and should be referenced in relevant Secretary's Environmental Assessment Requirements (SEARs) for new industrial development issued after the policy release date.*** *Where SEARs were issued before the release of the new policy, and have not been modified, the assessment requirements referenced in the SEARs will apply for a period*

[1] The Adopted Noise Monitoring Criteria specified in Table 7.1 of the NIA and Table 7.20 of the EIS do not necessarily reflect a non-compliance with consent criteria. As identified in the text discussing Table 7.20 (**emphasis added)**: *If the adopted noise criteria at the compliance noise monitoring location are exceeded, it will be considered that the noise criteria at any of the residences in the defined receiver area* ***may*** *also have been exceeded.*

of two (2) years from the date of issue of the SEARs consistent with the provisions in the Environmental Planning and Assessment Regulation 2000, Schedule 2, Part 2, 3 (7).

…

4. **The Noise Policy for Industry (2017) will be used to assess and develop requirements for existing industrial developments/activities under the circumstances and through the processes described in points 5 and 6 below.**

5. **Modification to a planning approval:**

   a. *where the planning authority requires a noise impact assessment to support the modification; or,*

   b. where a significant change to existing plant, equipment or processes is proposed.

6. Environment protection licence review/variation:

   a. *where the existing environment protection licence does not include noise requirements and the regulation of noise is warranted (for example, due to complaints or changing land uses) through a pollution reduction program; or,*

   b. *where there is a change in the activity, or to existing plant, equipment or processes that may require a noise assessment.*

   NOTE: Where an application is made to vary requirements using the new policy, the NSW Environment Protection Authority (EPA) will take into account existing commitments and requirements, and performance against those requirements, as evidence of the ability of the proponent/licensee to implement reasonable and feasible measures to mitigate noise. That is, where a licence holder meets current noise limits or can do so, this will be considered evidence that practical measures can be implemented to mitigate pollution for the purposes of s.45(d) of the Protection of the Environment Operations Act 1997 when the EPA makes a licensing decision.

7. ***Where application of the policy is triggered through the above circumstances and processes the policy is to be applied in full. The Noise Policy for Industry (2017) is designed to be used in its entirety and 'cherry picking' or 'mix and match' between the NSW Industrial Noise Policy (2000) and Noise Policy for Industry (2017) will not be accepted.***

…

As highlighted above, the Implementation Arrangements clearly identify that the NPfI applies to the Project (including arguably the modification of the Mount Owen Consent) due to it being required by the SEARs. Furthermore, the proposed approach in the current draft consent conditioning is wholly inconsistent with the directions in paragraph 7 of the Implementation Arrangements which state that 'cherry picking' and 'mix and match' of criteria between the INP and the NPfI is unacceptable.

As the SEARs for the Project require the NIA to be undertaken in accordance with the NPfI (consistent with paragraph 2 of the Implementation Arrangements), the NPfI is to be applied "in-full" and the continued application of the INP to the Project assessment is not consistent with the above paragraph 7.

We understand that the justification for the proposed 'mix and match' approach to condition limits relates to the note to paragraph 6 and the requirement for both the Mount Owen EPL and the Glendell EPL to be varied as a result of the Project and associated modification to the Mount Owen Consent. However, the circumstances covered by paragraph 6 are designed to prevent existing industrial premises from seeking a potential increase in approved impacts from existing operations simply due to the NPfI setting higher day time and sleep disturbance criteria.

The consideration of whether an existing operation approved under an EPL can meet the existing criteria is only relevant where there is no material change to the proposed operations. In the case of the Project, the proposed extension of mining operations covered by SSD-9349 are not caught by paragraph 6 as it is a significant extension of mining operations which includes material changes to the existing operations that have implications for noise impacts (as is demonstrated in the modelling). The Project is a new SSD project, materially different to what is approved under the currently 'in-force' Glendell EPL and therefore must be considered against the NPfI in full. Accordingly, paragraph 6 has no application to the assessment of noise impacts and the setting of criteria for SSD -9349 and the Note is irrelevant.

We further note that even if the Note to paragraph 6 was relevant, a mix and match approach between assessment criteria would still not be permitted. As the SEARs prescribe the application of the NPfI to the Project, the criteria set under the consent for the SSD application (if approved) should be consistent with the PNTL criteria and the 52 dB $L_{A\ Max}$ sleep disturbance noise goal set out in Table D.1 (as per the EPA letter of 10 June 2020) and the criteria under the current Glendell EPL is irrelevant.

As the broader Project includes a modification to the Mount Owen Consent (SSD-5850), the application of the INP and NPfI to the modification of the Mount Owen Consent requires separate consideration. In this regard, the note in the EPA letter of 10 June 2020 to an in-force EPL and existing consent conditions does have relevance to the conditions under the modified Mount Owen Consent SSD-5850. Despite this modification forming part of the 'Project' and the assessment of these changes being subject to the SEARs, the Project does not propose material changes to operations at the Mount Owen from a noise perspective other than bringing the haulage route for ROM coal to the CHPP entirely within the Project consent (it was previously managed under the Mount Owen Consent). Given the lack of any material change to the noise impacts from the Mount Owen operations as a result of the Project, we accept that an approach consistent with EPL conditions is appropriate for the modification to the Mount Owen consent. In this regard, the Note in Paragraph 6 is relevant to guide the conditioning the modification of the Mount Owen consent but not the Project.

Worst case impacts not necessarily modelled

One of the stated reasons for setting conditions on the Project lower than the PNTLs (or sleep disturbance screening criteria) is that this represents noise levels which are achievable by the operations. While this is correct in terms of representing the worst case noise levels for the scenarios and meteorological conditions *modelled* it unlikely (particularly in the case of sleep disturbance) to represent worst case impacts as not all meteorological conditions were (or are required to be)

modelled. There are two principal reasons why the modelled predictions may not represent worst case operating impacts:

- The first is that the NPfI only requires the modelling of prevailing conditions determined in accordance with Fact Sheet D of the NPfI. These are conditions which must occur for more than 30% of the time during any day, evening or night period. Conditions which occur below 30% threshold are not required to be modelled and these can include conditions which would result in higher noise impacts than those required to be assessed. The assessment in Tables F.2 indicates that, without active management, there is potential for $L_{Aeq\ 15\ min}$ noise criteria to be exceeded under different operating scenarios.

- The second is that the published $L_{AF\ max}$ predictions represent the modelled impacts for a *representative* modified operational scenario that could be implemented under adverse conditions should monitoring of either noise impacts or meteorological conditions indicate a change to operations is required to meet criteria.

  Unlike many industrial developments, mining operations do not have static noise sources, either in terms of the location of machinery or the noise emitted by that machinery. Due to this dynamic nature of mining operations, the modelling only represents a snapshot of mining. In reality, actual operating conditions (and therefore noise impacts) will vary significantly over the life of the project and even in the representative stages modelled. As detailed in section 7.0 of the NIA, the Project will operate a noise management system which includes a proactive noise management system based on forecast meteorological conditions for the coming day and also a reactive noise management system based on real time noise monitoring to alert operations to conditions which may be approaching noise criteria and enables mine management to adjust operation to reduce potential noise impacts based on the nature of meteorological conditions that are driving the increased noise level observed. This means that, whilst the operations are very carefully monitored and managed, at times there still may be short periods of higher peak noise levels, whilst the operation responds to real-time noise monitoring by adjusting operations to a particular, unanticipated weather condition or un-planned operating circumstance.

Glencore has committed to managing operations for the Project to remain below the PNTLs and sleep disturbance screening criteria and this commitment was based on the assumption that noise criteria would be set at the relevant PNTLs for each area and the NPfI noise screening criteria.

Noise compliance monitoring at the Mount Owen Complex

The differing noise limit conditions under the two consents (the Project and Mount Owen) has monitoring implications for the combined complex. It is noted that this already occurs in relation to existing operations. Table 7.20 in the EIS identified '*monitoring criteria'* for the Project to be included in the noise management procedures. On 23 September 2021, the EPA issued a variation to Mount Owen EPL (EPL 4460) to, among other things, update the Night time LA1(1 Min) limits at two monitoring points (but not receiver locations) to reflect noise modelling predictions in the Mount Owen Continued Operations Project Noise Impact Assessment. The Mount Owen Noise Management Plan has recently been updated to reflect these changes.

Table 1 provides recommended noise monitoring locations and criteria for the Project based on the full application of the NPfI to the Project (SSD-9349). **Table 2** provides an updated table of proposed

monitoring which reflects the recently updated Mount Owen EPL and the subsequently updated Noise Management Plan monitoring locations.

Table 1 Proposed Compliance Noise Monitoring Locations for SSD-9349

	EPA 12840 (Glendell)	EPL 4460 (Mt Owen)			Day/Evening/ Night $L_{Aeq\ 15\ min}$	Night $L_{AF\ max}$
N3	-	33 (NMG 2)	23	Areas 4 North and 4 South - all private residences	40/35/35	52
N8	8	-	145	Residences 145, 144a	40/38/37	52
N9	9	-	150	Residences 150, 152	40/40/38	52
N10	10	-	143	Residences 143, 154, 155, 156	40/40/38	52
N11	11	37 * (NMG 3)	127a	Residences 111, 127a, 127b, 127c, 127d, 146, 147, 148	40/40/38	52
N17	-	39 (NMG 4)	134	Area 11- all private residences	40/35/35	52

Note: * Supplementary monitoring locations only monitored if elevated noise levels are detected Primary monitoring locations.

Table 2 Compliance Noise Monitoring Locations for SSD-5850

Monitoring location				**Mount Owen SSD-5850**	
				Day/Evening/ Night $L_{Aeq\ 15\ min}$	Night $L_{A1\ 1min}$
N1	31	42	NMG 1	35/35/35	45
N3	33	23	NMG 2	45/45/42	49
N15*	44	10		37/37/37	45
N4	34	127a	NMG 3	42/42/42	52
N11*	37			39/39/35	45
N17	39	134	NMG 4	35/35/35	45

Note: * Supplementary monitoring locations only monitored if elevated noise levels are detected Primary monitoring locations.

It is emphasised that Table 1 and Table 2 above relate to noise *monitoring* criteria only, noting for example in Table 2, two monitoring locations (N3 and N4) are adjacent to mine owned land but are

important in the triggering of investigations and assessment of compliance within the noise management groups. These criteria are used to inform investigations of potential non-compliances with the residence specific criteria.

Recent Precedents

We note that this approach of adopting 52dB $L_{AF\ max}$ as a sleep disturbance noise limit criteria for new projects and extensions of existing new projects is entirely consistent with recent approvals granted by the IPC, in particular the Maxwell Underground Coal Project (SSD-9526) and the Mangoola Coal Continued Operations Project (SSD-8642). For these Projects, the adoption of a 52dB for the night time sleep disturbance criteria at all residences is consistent with NPfI sleep disturbance screening criteria other than the use of $L_{A1\ (1\ min)}$ in the Mangoola consent as opposed to $L_{AF\ max}$. The split application of INP and NPfI to discrete aspects of a project is also consistent with the conditions imposed on the 2019 modification of the Ulan Continued Operations Consent (08_0184) approved by the IPC, which applied the NPfI to the setting of conditions related to a new and discrete aspect of that modification (a ventilation fan) while retaining the INP derived noise criteria for other operations which remain unchanged. For these projects, the 52dB criteria were provided for nominated receivers as well as the default 'all other receivers' with all predictions being below the 52dB screening criteria. Given the above precedents, it is not clear why a different approach is now adopted for setting of conditions for the Glendell Continued Operations Project.

In our discussions, DPIE have referred to the draft conditions for the Mount Pleasant Optimisation Project as a relevant precedent for this Project. We understand from a review of EPA submissions on the Mount Pleasant Optimisation Project that the EPA have recommended $L_{A1\ (1\ min)}$ criteria of 45dB for that consent (if approved) despite that project also being assessed under the NPfI. Notably, those draft conditions are also subject to the $L_{A1\ (1\ min)}$ criteria not applying to properties with acquisition or mitigation rights. We are unable to comment on the appropriateness of these conditions to that project other than to note that this approach would also appear to be inconsistent with the NPfI and Implementation Arrangements for similar reasons to those discussed earlier. In this regard, these proposed conditions should not be viewed as an appropriate precedent for SSD-9349.

Appropriateness of 52dB $L_{AF\ max}$ as a night time sleep disturbance criteria

There is potentially some concern among stakeholders that an increase in noise criteria from 45 dB $L_{A1\ (1\ min)}$ to 52 dB $L_{A\ Max)}$ may result in increased impacts to sleep disturbance. However, the short-term impact criteria set for sleep disturbance is specifically designed to avoid potential impacts on sleep disturbance from projects. The processes of updating the NPfI from the INP specifically considered the appropriate management of potential impacts to sleep disturbance. The policy justification for the increase in sleep disturbance assessment criteria from the INP to the NPfI is clearly explained in the 2015 EPA Draft Industrial Noise Guideline Technical Background Paper (Technical Background Paper) that supported the consultation processes on the draft NPfI. Section 4.7 of the Technical Background Paper includes detailed discussion on both the assessment of sleep disturbance impacts under the INP and the proposed justification for the approach now adopted under the NPfI. The key justification for the proposed approach is set out below:

> *The* [World Health World Health Organization (WHO). Night Noise Guidelines for Europe (WHO, NNG-2009)] *recommends a yearly average* $L_{night,outside}$ *of 40 dB(A). However, this criterion has been specifically derived in relation to long-term exposure to noise and the relationship with health effects. The WHO criteria are not intended for use as criteria for assessment of the*

impacts of a specific project and must be used with caution. The criteria represent a health-based threshold based on the lowest observed adverse effect level (LOAEL), a very conservative health end point.

The WHO, NNG also indicates that L_{Amax} 42 dB inside a bedroom aligns with the LOAEL as this level is identified as the levels that may cause awakenings from sleep. Based on the conservative assumption of a 10 dB(A) noise reduction across a façade with a partially open window, this results in an external level of L_{Amax} 52 dB. The current practice of deriving screening level sleep disturbance assessment criteria on the basis of background plus 15 dB can lead to screening criteria as low as L_{Amax} 45 dB(A), which is well below the LOAEL recommended by WHO. Therefore, it is proposed to raise the base screening level criteria for the maximum noise level descriptor to L_{Amax} 52 dB(A) to align with the WHO, NNG. Like all trigger levels in the draft ING, this should not be construed as the level at which unacceptable impacts occur, but rather the level at which feasible and reasonable mitigation measures need to be considered as part of a detailed assessment. It has therefore been proposed in the draft ING to adopt the following screening level assessment criteria approach and trigger levels. Where the subject development can satisfy the following two noise level event trigger levels for the night-time period, no additional assessment or evaluation of sleep disturbance is required:

1. *a night-time project noise trigger level of $L_{Aeq,15minutes}$ 40 dB(A)*
2. *a maximum noise level screening criteria of L_{Amax} 52 dB(A) when assessed or predicted at 1 metre from the façade of a residence containing a window.*

Where the night-time noise levels are predicted to exceed one or both of the maximum event noise trigger levels above, a detailed analysis should be undertaken

These NPfI Sleep Disturbance Screening Criteria has been established having regard to internationally recognised standards which are specifically designed to avoid potential sleep disturbance effects.

Summary

In conclusion, Glencore is seeking a consistent application of the relevant NSW Government Policy in relation to sleep disturbance criteria. The adoption of the 52 dB $L_{A\ Max)}$ sleep disturbance noise limit set out in Table D.1 in the NIA as the noise criteria for the Project (as originally identified in the 10 June 2020 EPA letter) is consistent with both the NPfI and recent approvals granted by the IPC and also aligns with relevant international guidance. The below proposed revised draft development noise condition B1 and B2 reflects this approach:

Noise Criteria

B1 The Applicant must ensure that the noise generated by the development does not exceed the criteria in ***Table 1***.

Table 1: *Noise criteria dB(A)*

Noise Assessment Location[a]	***Day*** $L_{Aeq\ (15\ min)}$	***Evening*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{A\ Max}$
Residences on Privately-Owned Land				
Areas 1, 2, 4, 5, 7 and 11	40	35	35	52

Area 8	40	40	38	52
Area 9	40	40	38	52
Area 10	40	38	37	52
Other privately-owned residences	40	35	35	52

[a] *The Noise Assessment Locations referred to in Table 1, are shown in Appendix 3.*

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the *NSW Noise Policy for Industry* (EPA, 2017). The noise enhancing meteorological conditions determined by monitoring at the meteorological station required under condition B36 and as defined in Part D of the *NSW Noise Policy for Industry* (EPA, 2017) apply to the noise criteria in Table 1.

B2 The noise criteria in ***Table 1*** do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

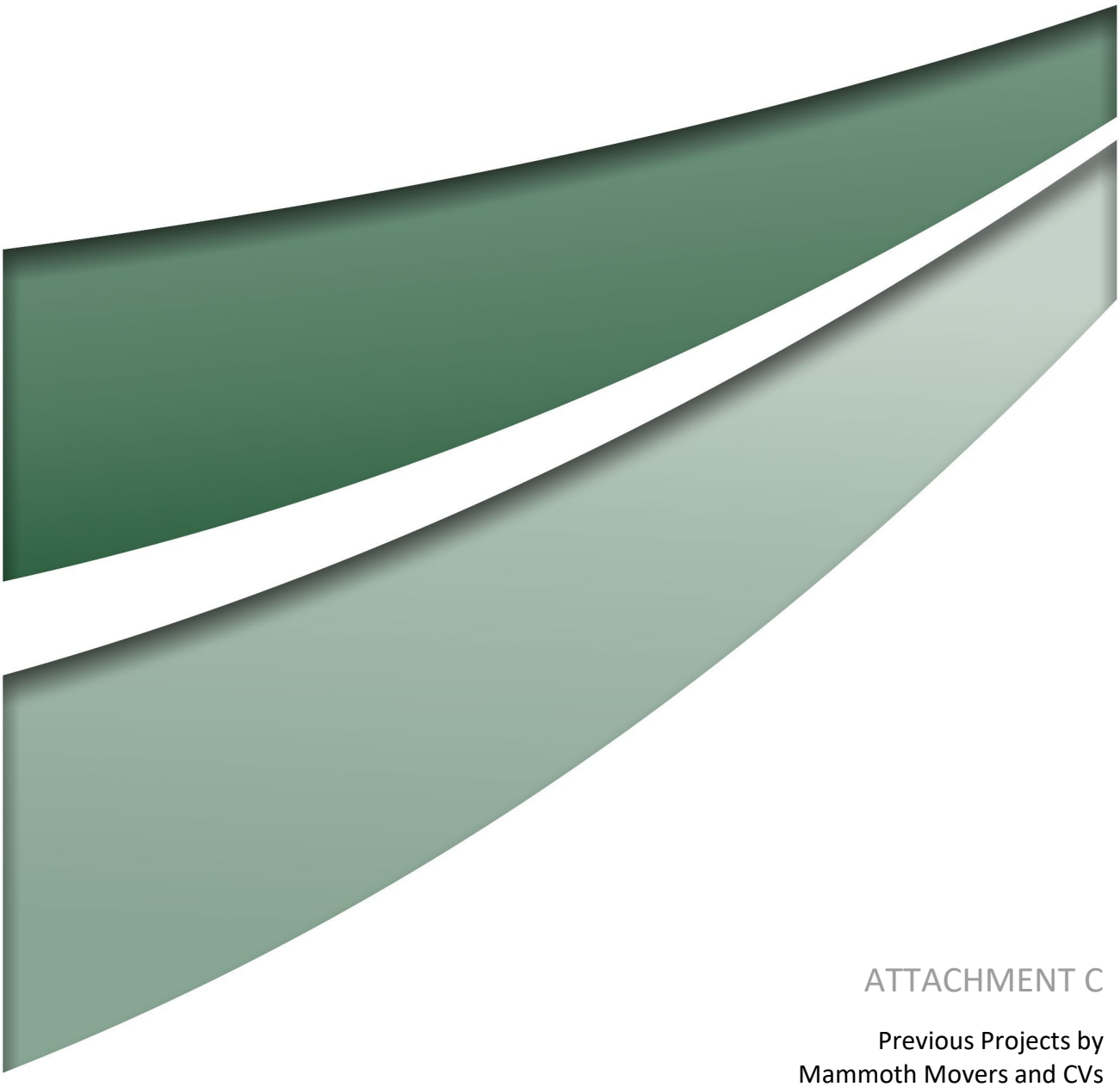
For the reasons set out in this letter, Glencore requests that the DPIE revises its recommended draft noise conditions for the Project consistent with the its NIA, EIS and the noise limit criteria set out in the NPfI.

Should you require any further information or clarification on the above then please do not hesitate to contact the undersigned.

Yours sincerely,

[redacted]

Shane Scott
Coal Assets Australia, GLENCORE
M: [redacted]
E: [redacted]



ATTACHMENT C

Previous Projects by
Mammoth Movers and CVs

Example Past Projects

Mammoth Movers

Project No.	Project Name/title	Location	Photo of move	Photo in final position	Heritage listed	Year Built	Year Relocated	Why Relocated	Building construction (e.g. stone or brick)	No. of storeys	Approx weight of building (tonnes)	Building dimensions (Length x width) (m)	Approximate distance moved (m)	Total time for the relocation component	Details/complications/challenges and mitigation strategies
1	King of Prussia Inn	Pennsylvania, USA			Yes	1719	2000	Road expansion	Constructed of locally available stone and a weak mortar of lime, sand and clay	3	670 tonne	15 m x 10 m	730 m	2 days	This project presented several challenges The walls were quite thick, varied in thickness 610 to 760 mm, with the vast majority of the weight of the structure around the perimeter. There was no uniformity in the size and shape of the stone. Mortar offered virtually no adhesion. One massive fireplace was on one end wall with a smaller cooking flue on the other end. The lower members of the open beam roof system no longer offered any real resistance to wall spreading. The route the building had to travel was fairly narrow, curb lined paved roads. Three 90 degree turns were also part of the route. Extensive bracing and tension cables were used to secure the walls inside and out to prevent movement. Steel cables were wrapped around the entire structure and tensioned in order to put the walls into compression. In order to create a uniform line of separation and support, the wall was gradually de-constructed with drills, saws and small chipping hammers, creating pockets first for primary steel support, then secondary support. As the openings were formed, temporary pads with grout packing were installed and shored in place to create the uniform line of support. Once all the steel framework was installed the initial lift was gradually executed, stopping often to add additional support where needed. As soon as all of the structure was supported, jacking pressures were recorded and calculations were made to create a long, narrow dolly foot print consisting of 21 dollies on heavy transfer beams, in order to negotiate the narrow route. All of the hard turns required stopping, physically resetting each dolly to perform a hub turn, completing the turn and then resetting the dollies. Concern for the road surfaces required timber mats to cover the entire travel path, leapfrogging them along the route. The building was set on a CMU (besser block) wall with poured cells. Some of the original stone was used to fill in the area between the new wall and the bottom of the uneven building wall. This became the reveal line on the building when final grading was done.
2	Jeremiah Clemens House	Alabama, USA			Yes	1835	2004	Downtown expansion	Locally made brick and fine brown clay for mortar	2	515 tonne	18 m x 14 m	800 m	3 days	The original building consisted of two buildings sharing a common roof with a passageway between the two. In the 1860's the roof was removed, the walls were heightened and the sides enclosed, creating a single two story structure. The building's foundation consisted of trenches dug in the clay soil and filled with rock rubble. The walls were extremely fragile, literally bricks stacked up. The building had suffered substantial damage from roof leaks which resulted in degradation of many of the bricks. Two large fireplaces were set along the centreline of the building on internal brick walls. These fire place flues also became access points for water damage. The connections between the old and new walls were separating in several locations. Before excavation under the building could begin, heavy angle irons were placed on the corners with cushioned material underneath. Seven cable strands were wrapped around the building, incorporating brace timbers in between and tensioned using turn buckles in order to stabilize the very weak walls. Both fireplace flues were braced up from the roof. Because of the fragile condition of the building, the process of loading the building onto the support steel was done progressively using a combination of steel beams and banding to create a support structure. External and internal beams and steel banding were installed ahead of the crosser openings being made. These beams provided additional support of the walls between the cross beams. As each opening was completed a cross beam was installed and pre-tensioned between the cross steel and main beams, becoming part of the support of the building. Once support steel was installed, the building was then jacked up and 17 dollies were installed. The move required one hard turn where dollies were reset to make the turn and
3	Horticultural Building	Ontario, Canada			Yes	1914	2012	Horticultural park	Brick	1	1540 tonne	55 m x 37 m	152 m	3 days	The plan was to move the building east to the far side of the park and place on a two story underground parking garage. The park boundaries narrowed travelling east which resulted in the need for the north 12 m of the building to be cut off and demolished. The remaining structure was 55 m long and had a 2000 sqm footprint. The building has two distinct components; a flat roofed two story entrance hall made of brick and concrete and a gable roofed exhibition hall noted for the column free open design. The exhibition hall has riveted steel trusses and steel columns embedded in a two course brick wall. Inspection of the structure determined that additional load had been placed on the roof trusses over the years and the steel columns and the brick walls were completely independent of each other, yet both shared support of the roof system. This condition created concerns regarding the stability of the roof system. Since this move would be sideways with a slight fall to the south, there were lateral integrity concerns. An intricate design of steel trusses was installed inside the hall on top of the internal main beams, in lieu of conventional crossbeams, because of the great span wall to wall. These trusses were attached to the steel columns at two points. Lateral bracing was installed truss to truss and additional members installed to reinforce the roof system. The side walls were supported on ladder beams between inner and outer main beams. Once the steel support system was in place the building was jacked up and transfer beams and dollies were installed. A total of 48 dollies supported a 1540 tonne load. Because of the great variation in weight in this building, three different weight values were used for each of the three zones. Before the building could be moved over the completed parking garage, a significant amount of shoring was installed to allow for the weight of the building to pass over the garage. To control the sideways movement of the building as it traveled to the new site, two power units were used to maintain proper alignment as the building was moving.
4	Oneida Stake Academy	Idaho, USA			No	1895	2003	High school expansion	Freestone with sand and lime mortar	2.5	1500 tonne	24 m x 18.5 m	5 blocks	4 days	The Academy is constructed with stone that was mined in a local mission with a double leaf wall and rubble fill in the wall cavity. The mortar was locally made from a lime and sand mixture. The lumber making up the floor systems and partitions was harvested and sawn by members of the church. Over time the walls and mortar had deteriorated, causing movement in the stone walls and one corner had actually cracked off. The interior floors represented the only diaphragms in the 2 ½ story structure. Over time the timbers in the floor system dried and shrank, allowing the walls to bulge outward. The transition line between the nicely hewn stone and the smaller rubble type stone and mortar foundation was actually well above the bottom of the timbered floor system. The following remedies were performed on the building to prepare the structure for relocation. Bands of wooden timbers were wrapped around the structure at the first and second floors. Holes were drilled through the timbers and walls with steel cables and turn buckles installed. Tensioning these cables brought the walls back into plumb. Cracks in the walls were filled with new mortar and a fluid grout was pumped into the wall cavity in selected locations to stabilise the base and rubble fill. The damaged corner and a few other spots were sprayed with gunite and fiber to strengthen those sections. Gunite was also shot onto the backside of the foundation wall. Because of a desire to keep the original floor system intact, a decision was made to establish a cut line on the foundation wall and the footings were cut off in sections and shoring jacks installed to temporarily support the building. Support steel was gradually installed as the cutting and footing removal proceeded. With everything installed, the building was jacked up and transfer beams and bracing steel was installed along with 41 dollies to carry the 1500 tonne load. Even with power dollies and air brakes, the move was challenging with multiple grade changes and side sloping roads.
5	Century and Gem theatre	Michigan, USA			Yes	1903 and 1927	1999	Baseball stadium development	Brick and stone	2 and 4	2450 tonne	32m x 30 m	563 m	4 days	The Gem theatre is a two level theatre built of brick. The theatre shares a common wall and lobby with an older structure called the Century Club theatre. Although the Gem theatre had experienced recent renovations and was structurally in very good shape, the Century theatre was in very poor shape. The Century, a basic rectangular structure with tall, massive brick and sandstone walls, had been mostly gutted for renovation and then abandoned. A failed roof system and the extreme Detroit winters had severely deteriorated the structure. Major work on the brick walls was the first step in this project. Mortar was cut out and new grout installed. Some sections were taken down and relaid. Major steel reinforcement on the interior walls was required. Engineers and architects designed a steel framework which became a permanent part of the structure, becoming wall and new floor supports. A framework of steel beams was placed under both buildings in order to lift them as one unit. The buildings were elevated approximately 2.7 m in order to install the transport equipment and roll out on grade. Seventy one dollies were installed on transfer beams in three zones to support the 2450 ton load. Even though the Century theatre made up less than a quarter of the total foot print of the structures it represented more than half the total weight. This forced 41 of the dollies to be placed in one corner of the move platform and caused the loads on these dollies to be much higher than the other dollies. Due to this situation, a heavy layer of fill dirt was spread on all the streets over which the buildings traveled. The move predated the general use of hydraulically powered dollies and 4 large excavators and 2 large bulldozers, along with 1000's of metres of cable and pulleys were used to move the building. At the midpoint of the move route a 90 degree turn had to be made. This was complicated by the fact that internal attachment points for the cables on both sides of the structure had to be continuously relocated to maintain a true radial force to turn the building. The densely packed dollies in the heavy area of the building had to be constantly reset as they would begin to engage each other in the confined area. Many large buildings surrounded the area, further complicating the process. For a short time this building was the heaviest structure to be moved on pneumatic tyres in the world.
6	Hornsby Signal Box	NSW, Australia			Yes	1928	2007	Rail expansion	Full brick, lime mortar	2	320 tonne	22 m x 8 m	130 m	1 day	The Signal Box relocation was the first relocation of a masonry building on pnuematic tyres in Australia and was a finalist in the Engineers Australia Awards for that year. The building construction offered a number of challenges with racks of equipment imparting point loads through individual columns into footing pads located within the floor plan of the building and a post construction unreinforced slab poured between the lines of equipment which all needed to be supported from above to enable the building to be excavated. A temporary trusswork of chains was installed within the building to transfer the equipment loads (and second storey slab weight) from the base of the rack columns to the external walls of the building prior to it being dug out. Excavation of the building required the identification and termination of over 100 power and communication cables into and out of the building with excavation limited to the two narrow ends of the building due to an operational trainline within 1 m of one side of the building and approximately 20 essential service fibre optic cables located on the opposite side and within 3 m of the building. Railway iron had been installed within the buildings concrete footings (both within the building footprint and under the perimeter walls) which presented a problem for their demolition. The move methodology was adjusted to enable the installation of the support steel in the restricted space between the underside of the ground floor slab and the top of the concrete footers with pockets being cut out in the footer for the main beams only. The relocation route, though short was tight with the building being moved past existing infrastructure with only millimetres to spare and all within an operating rail corridor (and not in a possession). The building was moved up a ramp and rotated into position using a hub turn at the new site as there was insufficient room to spot the building directly above the new foundation as due to adjacent infrastructure constraining the approach to the new site.
7	Armstrong House	Minneapolis, USA			Yes	1886	2001	Transit expansion	Brick and cut stone	4 plus basement	770 tonne	16.5 m x 20 m	800 m	9 days	The three story brick and stone double house has 2 large fireplaces. The height of building meant it had a high centre of gravity. This was of some concern because one section of the route had a 6.5% slope. Although the brick and stone were substantially weathered, the mortar was mostly intact. The preparation of the structure for lifting went smoothly. Upon lifting the structure, it was discovered that construction of the upper walls was completely different from the first story. The first story consisted of three courses of brick, while the next two stories were made up of two independent courses with a rubble filled void in between. This discovery delayed the relocation by a month. The internal plaster was removed from the walls, holes were drilled through the walls and threaded rods installed with plywood plates reinforced with lumber on each side. The walls were then compressed and tied to the opposing walls. Once the building was set down, the final remedy for the hollow walls was a grid of steel pins drilled and epoxied in place tying both courses together. The move of the Armstrong house was an extremely technical event. The building was loaded on 24 dollies. There were four compound turns along the route which took a day or more for each turn. The section with the 6.5% of slope required four pieces of equipment attached to cables and blocks to maintain holdback on the building. Numerous reconfigurations of the dolly system to keep them within operational tolerances were required.

MATTHEW MANIFOLD

B Eng (Hons)

PROFILE

- TELEPHONE MOBILE
- EMAIL

[redacted]

SUMMARY OF EXPERIENCE

Matthew has over twenty five years project management and mechanical engineering experience in high value projects working for global engineering firms on projects up to half a billion USD. Over the past 10 years Matthew has filled project management roles in parallel with his role in our structural moving business. Prior to this he worked as a system engineer on technical tender preparation, review and coordination; contract negotiation and claim management. In the early stages of his engineering career Matthew focused on design engineering and testing. He has significant interface management knowledge from his technical lead roles in various consortia in Australia and overseas.

Matthew has worked in Germany, Switzerland, USA and the Middle East (Qatar) and has spent as much time on site or in factories as he has in the office resulting in a practical approach to his roles and problem solving. He holds operator certificate of competency (CoC) for a diverse range of machinery and is competent in the German language.

Matthew is the majority share holder and Managing Director of Mammoth Movers; a company which specialises in the relocation of brick and stone buildings in one piece (including heritage buildings) utilising technology conceived and developed in USA. The company undertakes the turnkey relocation and re-establishment of masonry buildings on projects ranging from $25K to > $20million AUD and has been recognised as a finalist in the Engineers Australia engineering awards. Matthew has worked on and/or managed over 30 moving projects in Australia and overseas.

A selection of moves Matthew has worked on with Mammoth Movers or in conjunction with other structural moving companies

University Mansion – Greensboro – North Carolina

Private House – Hamptons – New York

Private House – Fort Pierce - Florida

Commercial Office building – Sacramento - Florida

Private House – Arcadia - Florida

Boat House – Palm Island – Florida

Signal box makes Mammoth Move

A HISTORIC signal box in Sydney's northern suburbs was relocated in one piece by specialist moving technology last month. The movement of the 320t brick and fibreboard structure was undertaken by Mammoth Movers as part of the NSW Government's extensive upgrade of Hornsby Railway Station.

Mammoth Movers spokesperson Matthew Manifold says the only solution until now would have been either to demolish the building or to undertake a time consuming and expensive heritage deconstruction and rebuild. "A building such as this would be very difficult to de-construct because the signalling machinery inside it is integral to the structure," he says. "By using Mammoth Movers, they were able to relocate the building and its contents in one piece, with no risk to the structural integrity of the building or the delicate and fragile machinery inside it."

The relocation of the solid masonry building was the first time such a move was completed in Australia.

The Hornsby Signal Box was moved approximately 150m. Mammoth Movers had spent several months preparing for the relocation which involved securing the structure for excavation and uplifting, preparation of the new site, and securing an access route. "While relocating prefabricated buildings is routine, the technology required to move solid masonry buildings has been used internationally for some time, but has not been used previously, in Australia," Manifold says.

The unique techniques employed by Mammoth Movers meant the only limit on size or weight of the structure being moved was site access and the availability of a suitable transport route. These techniques open up a range of cost-effective and time saving construction or relocation alternatives for building and construction, heritage, government, property developers and even home renovators.

(See page 14 for details on the Building Moving Process.)

Construction Contractor Nov 2007

Laveter House – Rosanna - Melbourne

LARRY CLINE

CONTACT

- TELEPHONE MOBILE [redacted]
- EMAIL [redacted]

SUMMARY OF EXPERIENCE

Larry Cline has over 45 years of experience in the structural moving industry. He has accomplished more than one hundred historical moves.

Larry specializes in moving structures that are especially challenging, due to their weight, dimensions, location and/or overall condition. Larry has assisted in numerous historical relocation projects throughout the United States and further afield. Some examples of these projects include:

- THE 250 YEAR OLD KING OF PRUSSIA INN, PENNSYLVANIA, USA, WITH EXPERT HOUSE MOVERS OF MARYLAND
- THE SALEM BAPTIST CHURCH, SALEM, MASSACHUSETTS, USA WITH EXPERT HOUSE MOVERS OF MARYLAND
- THE 170 YEAR OLD CLEMONS HOUSE, HUNTSVILLE, ALABAMA, USA WITH DON KENNEDY AND SONS HOUSE MOVERS
- THE 100 YEAR OLD BRICK OFFICE BUILDING, PORT HURON, MICHIGAN, USA, WITH DEITZ MOVING ENGINEERS
- THE KINGSTON-LANGFORD MANSION, FT. MYERS, FLORIDA, USA WITH FDSM
- THE HORNSBY SIGNAL BOX, SYDNEY, AUSTRALIA, WITH MAMMOTH MOVERS
- THE 100 YEAR OLD HORTICULTURE BUILDING, OTTOWA, CANADA, USA WITH CDS BUILDING MOVERS
- THE 100 YEAR OLD HELMSLY MANSION, MIAMI, FLORIDA, USA WITH BROWNIE AND SONS MOVING ENGINEERS

Historical moves typically require special care and attention to details, with many procedures required that are normally outside the scope of routine structure relocation. Larry is highly experienced in these procedures.

Some typical moves Larry has worked on in conjunction with other structural moving companies

The Kingston Langford Mansion

The Clemons House

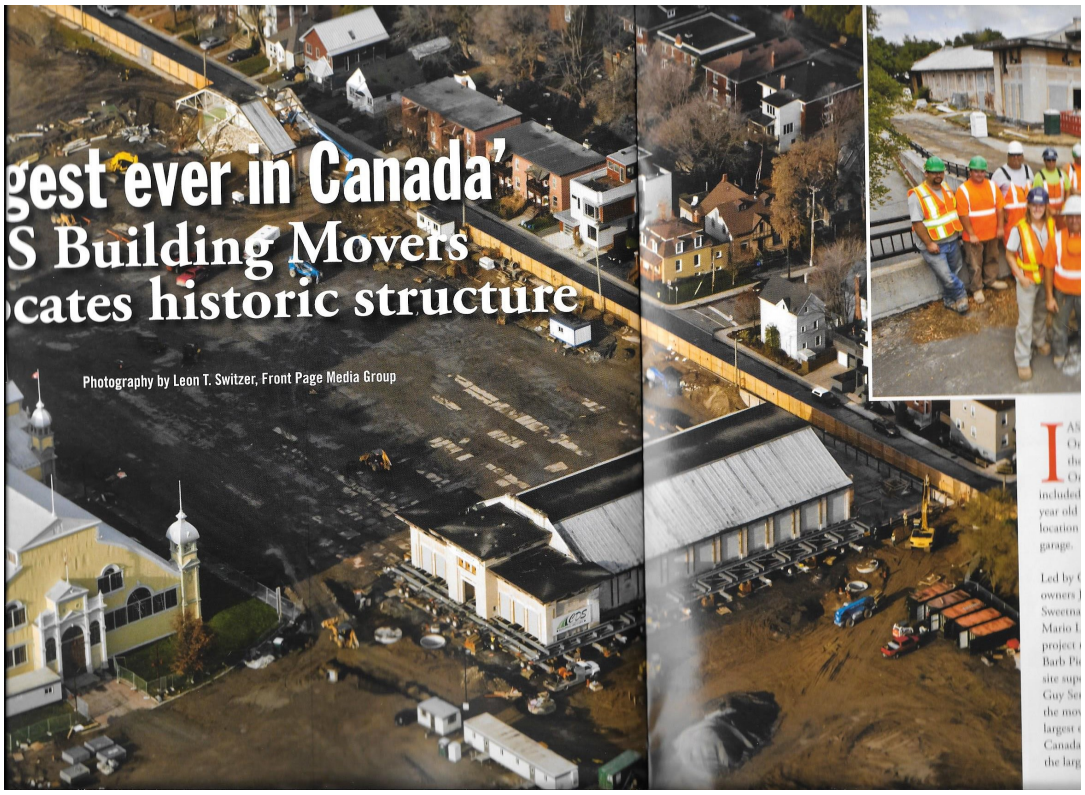
Czech Museum

King of Prussia Inn

Schifter Mansion – Martha's Vineyard

Catholic Convent

Horticulture Building



Salem Baptist Church

Helmsley Mansion

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