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RE: INFORMATION REQUEST - EPML00579213 EA AMENDMENT

Dear Jessica,

Peabody Energy Australia PCI (C&M Management) Pty Ltd (Peabody) submitted an amendment to Environmental Authority (EA) EPML00579213 to the administering authority on 16 February 2024. An Assessment Level Decision was made by the administering authority on 16 April 2024, which determined that the proposed amendment was considered a Major Amendment. A Request for Information (RFI) was received from the administering authority on 28 May 2024, with twenty-one information items requested to progress the decision process.

These items have been addressed in the report below and a copy of the RFI is provided in Appendix A.

Spatial data has been provided separately as part of this response.

Please feel free to contact me any time to discuss any of the below responses.

Yours sincerely,

Marianne Gibbons

Marianne Gibbons

Senior Manager – Environment & Approvals

Response to Information
Request for EPML00579213
EA Amendment

# <u>Peabody</u>

Peabody is a leading coal producer, providing essential products for the production of affordable, reliable energy and steel. Our commitment to sustainability underpins everything we do and shapes our strategy for the future.



#### TABLE OF CONTENTS

1.0 Introduction	5
2.0 Response to Information Request	7
Appendix A Information Request	51
Appendix B Surface Water	52
Appendix C Assessment	53
LIST OF FIGURES	
Figure 1 - Disturbance Area	14
Figure 2 - Matters of State Environmental Significance	16
Figure 3 - Matters of National Environmental Significance	17
Figure 4 - Residual MSES after removal of MNES duplication	18
Figure 5 - Regional Land Holdings	19
Figure 6 - Coppabella Historic and Future Planned Production	21
Figure 7 - Historical Mining Progress	38
Figure 8 - Coppabella Groundwater Levels and Contours	39
Figure 9 - SLR Potentiometric Surface and Groundwater Flow Direction - Permian Coal Aquifer	40
Figure 10 - Historic, and current predicted coal mining areas for the Life of Resource Mine Plan	41
Figure 11 - Transect Locations	42



#### ACRONYMS AND ABBREVIATIONS

Acronym/ Abbreviation	Definition
BBAC	Barada Barna Aboriginal Corporation
BOM	Bureau of Meteorology
CHMP	Cultural Heritage Management Plan
СНРР	Coal Handling and Preparation Plant
CMJV	Coppabella and Moorvale Joint Venture
CO <sub>2</sub>	Carbon dioxide
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEHP	Department of the Environment and Heritage Protection
DES	Department of Environment and Science
DESI	Department of Environment, Science and Innovation
DETSI	Department of Environment, Tourism, Science and Innovation
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development
EA	Environmental Authority
EP Act	Environmental Protection Act 1994
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPBC Act EO Policy	EPBC Act Environmental Offsets Policy 2012
EPP	Environmental Protection Policy
FTE	Full time equivalent
GDE	Groundwater-dependent ecosystem
GHG	Greenhouse gas
IESC	Independent Expert Scientific Committee
IPD	In-pit dump
IRC	Isaac Regional Council
LGA	Local government area
LOM	Life of mine
LOR	Life of Resource
the Mine	Coppabella Mine
ML	Mining lease
MNES	Matters of National Environmental Significance



Acronym/ Abbreviation	Definition
MR Act	Mineral Resources Act 1989
MSES	Matters of State Environmental Significance
Mtpa	Million tonnes per annum
NUMA	Non-use management area
OOPD	Out-of-pit dump
PAG Act	Petroleum and Gas (Production and Safety) Act 2004
PCI	Pulverised coal injection
PL	Petroleum lease
PMLU	Post mining land use
PRCP	Progressive Rehabilitation and Closure Plan
QLD	Queensland
RE	Regional Ecosystem
ROM	Run-of-mine
TEC	Threatened Ecological Communities
VM Act	Vegetation Management Act 1999
WMP	Weed Management Plan



#### 1.0 Introduction

The Coppabella Coal Mine (the Mine) is an open cut coal mining operation that produces pulverised coal injection (PCI) coal, a type of metallurgical coal for export. The Mine is located in Central Queensland (Qld), approximately 10 kilometres (km) north-east of Coppabella township and 30 km south-west of Nebo township, within the Isaac Regional Council (IRC) local government area (LGA). Peabody Energy Australia PCI (C&M Management) Pty Limited (Peabody) operates the Mine, which is owned by several joint venture partners that form the Coppabella and Moorvale Joint Venture (CMJV).

The Mine is located on mining leases (ML) 70161, ML 70163, ML 70164, ML 70236, and ML 70237 and petroleum lease (PL) 1015, granted by the State Government of Qld under the *Mineral Resources Act 1989* (MR Act) and the *Petroleum and Gas (Production and Safety) Act 2004*. Operations at the Mine are authorised by Environmental Authority (EA) EPML00579213, issued under the QLD *Environmental Protection Act 1994* (EP Act).

Operations at the Mine commenced in 1998, with the current workforce comprising over 480 Peabody employees and up to 700 personnel in total, including contractors. As a result, the Mine delivers significant economic and social benefits to the Central Queensland and state economies through job provision, partnerships with local vendors, local government rates, coal royalties and export revenue.

The Mine consists of four pits: Creek Pit, Johnson Pit, South Pit and East Pit. Mining operations primarily target the Macarthur Seam of the Rangal Coal Measures, as well as its constituent sub-seams, including the Phillips and Leichhardt Seams.

The Mine operations include in-pit dumps (IPD); out-of-pit spoil dumps (OOPD); a coal handling and preparation plant (CHPP); a coal reject co-disposal area; a raw water dam; a Run-of-Mine (ROM) coal stockpile area; and several small sediment and surface water containment dams generally located on creeks or gullies. Product coal is loaded via the Mine train load-out facility and transported to Dalrymple Bay Coal Terminal for export.

Coppabella produces a type of metallurgical coal called PCI. PCI is used in Blast Furnace steelmaking, a method of steel making favoured for its scalability and high product quality relative to other production routes.

Wood Mackenzie, a leading provider of data and analysis on energy, resources and metals markets, forecasts that global blast furnace steelmaking output will remain relatively stable between 2025 and 2050 (-0.4% CAGR). However, steel production is expected to shift away from China, traditionally reliant on its own domestic coal consumption, to other countries that depend more heavily on seaborne coal imports, including from Australia, due to limited local metallurgical coal reserves. As a result, seaborne metallurgical coal trade is projected to grow over the coming decades.

Coppabella PCI is highly valued by global steelmakers for its low volatile matter and high energy content, which enhance blast furnace efficiency and reduce reliance on more costly metallurgical coke. Coppabella's PCI has low sulphur and phosphorus levels making it particularly suitable for producing high-quality steels used in applications such as automotive manufacturing and complex construction. As a result, Coppabella PCI plays a significant role in supporting steelmaking across rapidly developing economies.

While the global steel industry is actively exploring technologies to decarbonize steelmaking, substitute fuels to replace PCI are not yet available at industrial scale and are far more costly, rendering commercial-scale, so-called 'green steel' production uneconomic for the foreseeable future. Alternatives also present challenges for steel quality and blast furnace productivity and face significant hurdles in developing cost-efficient, carbon-neutral supply chains. Wood Mackenzie projects that seaborne demand for PCI will grow at a compound annual growth rate (CAGR) of +0.9% between 2024 and 2050, with Coppabella coal well positioned to support this demand growth.



Peabody plans to continue mining at the Mine by extracting remaining coal reserves with open cut operations extending northwards towards the northern boundary of ML 70236. Two water courses originate northwest of the Mine and flow southeast, crossing the northern sections of ML 70164 and ML 70236. To support the continuation of mining to the northern lease boundary, an off-lease creek diversion is required, which will seek to be approved under separate legislation to the EP Act, so it is not part of this amendment to the Coppabella EA.

The Life of Resource (LOR) mine plan, which is the subject of this EA amendment application, has been prepared to align with the submission of the Coppabella Progressive Rehabilitation and Closure Plan (PRCP). It illustrates the rehabilitation outcomes and final landform resulting from mining the maximum resource within the existing MLs.

Peabody's objective is to optimise mining operations while achieving progressive reductions in greenhouse gas (GHG) emissions, consistent with Safeguard Mechanism obligations and Queensland's target of net zero by 2050. The Coppabella Mine exceeds the 100,000tpa GHG emission threshold of the Safeguard Mechanism and consequently is required to meet the Safeguard Mechanism emissions reduction targets against a production-adjusted baseline. The current emissions reduction target is 4.9% per annum until 2030, and 3.285% per annum thereafter. In line with these requirements and the mitigation hierarchy, Peabody is evaluating additional management practices to reduce GHG emissions.

Peabody is seeking an amendment to conditions C1 and C4 of Environmental Authority EPML00579213.

The proposed amendments seek to:

- modernise Table C1, by:
  - clarifying that residual void(s) without a proposed post-mining land use are included; and
  - specifying that low walls, end walls and highwalls form part of the Non-Use Management Area (NUMA).
- update Table C1 to amend projected surface areas so they align with current disturbance levels and the Life of Resource (LOR) Mine Plan; and
- update Table C3 to reflect the approved final landform, noting that the current version authorises four discrete final voids, which are no longer consistent with the proposed mine plan.

For completeness, Peabody has also submitted a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the continuation of mining near the northern boundary of ML70236 and the associated off-lease creek diversion that is required to facilitate mining to this extent of ML70236. Consideration of impacts on matters of national environmental significant (MNES) will form part of the EPBC referral.



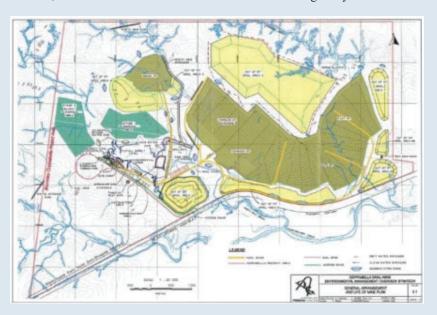
#### 2.0 Response to Information Request

#### **DETSI Information Request Item 1**

#### **DETSI Comment**

Section 7.9.2.1 of the EA amendment application supporting information document states "Peabody has determined that land use within ML70164, ML70161 and ML70237 is permitted without further Commonwealth Government and Queensland State Government approval".

Figure 2.1 – General Arrangement and Life of Mine Plan in the Environmental Management Overview Strategy (EMOS), June 2002, does not include disturbance to land in the Humbug Gully Creek area.



EMOS, Figure 2.1 - General Arrangement and Life of Mine Plan.

#### Information Request

Provide justification demonstrating why land use within ML70164, ML70161 and ML70237 has been determined to be permitted without further Commonwealth Government or Queensland State Government approval.

Clarify what documents are being relied upon to demonstrate a preapproved impact to the Humbug Gully area.

#### Peabody Response

The following response sets out the key issues relating to the approved disturbance and activities at the Coppabella Mine. The points below capture the critical aspects of the historic approvals.

The statement in the EA supporting document is incorrect in its reference to ML 70237. The correct reference is ML 70163, and the response below has been prepared on that basis.



#### State approval

On 30 January 1998, the then Queensland Mining Warden recommended to the Minister the approval of the Coppabella Coal Project. Consequently, ML 70161 and ML 70163 were granted on 14 May 1998; and ML 70164 on 13 August 1998.

The approval for the three MLs relied on the 1998 'EMOS: Environmental Management Overview Strategy Coppabella Coal Project MLA 70161, MLA 70163 and MLA 70164' (1998 EMOS). The EMOS was prepared in accordance with the then provisions of the Mineral Resources Act 1989 in support of the grant of the first three Coppabella MLs and satisfied the assessment requirements at the time of approval.

The EMOS documents were not intended to define the extent of the operation - the surface area of the MLs were assessed for clearing on the entire MLs and approved under the EA (no disturbance limits were conditioned in the EA). As per the Mining Warden's recommendation, the size and shape of the mining leases was appropriate for the proposed mining and related purposes.

ML70236 was assessed under the 2000 EMOS (February and December), which identified and contemplated the resources to the limit of the mining leases, including the Humbug Gully area.

When the Land and Resources Tribunal Queensland recommended that the mining lease be granted, it accepted that "the whole of the surface area [of Mining Lease 70236] is required for mining activities" and stated: "the area applied for on ML 70236 totalling 581.8ha is accepted as the surface area is required for mining activities, including associated infrastructure and haul roads, and that that was determined having regard to the area of mineralisation and availability of the resource within the application area. The diagrammatic mine plans which were produced by Mr Wood are consistent with the appropriateness of the size and shape sought. I am satisfied that this criterion has been established."

Peabody considers no further approvals are required from the Queensland Government as the entire surface area was approved for disturbance (is determined to be permitted).

#### Commonwealth approval

Upon review of the 1998 EMOS, the Commonwealth Government on 31 May 1998, gave a Determination and Direction that no environmental impact statement or public environment report was required under the now repealed Environment Protection (Impact of Proposals) Act 1974 (EPIP Act). The Commonwealth Determination considered the relevant impacts of Northern (Stage 2) and Southern (Stage 1) Replacement channels.

The EPBC Act commenced on 16 July 2000, repealing and replacing the EPIP Act.

The EPBC Act, along with the Environmental Reform (Consequential Provisions) Act 1999 (CP Act), included transitional arrangements that, amongst other things, provided that an Action did not require referral and approval (under the EPBC Act) if:

- the Commonwealth had determined that an environmental impact statement or a public environment report in relation to the proposed action was not required; or
- it had received all necessary environmental approvals under State laws before 16 July 2000.

Peabody relies on the Commonwealth Government determination of 31 May 1998, and the grant of ML70161, ML70163 and ML70164 to satisfy the EPBC Act transitional arrangement exemptions.

Further, with respect to the grant of ML 70161, ML 70163 and ML 70164, Peabody maintains that they are a 'special environmental authorisation' for the purposes of section 43A of the EPBC Act, as at all relevant times the Mineral Resources Act 1989 (Qld) had an object 'to encourage environmental responsibility in prospecting, exploring and mining'.



ML 70236 was granted following the assessment of both the February and December 2000 EMOS. As per Figure 2 of the February 2000 EMOS and Figure 7 of the December 2000 EMOS, the assessment considered impacts including vegetation clearing and open-cut mining up to the southern boundary of the Humbug Gully within ML70236.

Both the Northern and Southern Replacement Channels are on MLs that were granted under the Mineral Resources Act 1989 (Qld) (MRA) in May and August of 1998 (ML 70161, ML 70163 and ML 70164). The MRA has at all material times had an objective 'to encourage environmental responsibility in prospecting, exploring and mining'.

The Queensland Government determined in 1998 that the Thirty Mile Creek north and south arms were not a watercourse for the purposes of the now repealed Queensland Water Resources Act 1989. Consequently, approvals were not required for those water diversions.

Peabody has determined that the proposed works within, and to the north of Humbug Gully on ML 70236:

- were not considered for potential impacts on MNES in either the February 2000 or December 2000 EMOS; and
- are likely to result in a significant impact on MNES.

On this basis, Peabody has referred the proposed action for consideration under the EPBC Act.



The EA amendment application supporting information document and technical appendices have provided limited information about the area of land that will be disturbed by the proposed amendment.

The EA amendment application supporting information document provides Figure 1 – *Proposed disturbance*, which depicts the domains of disturbance.

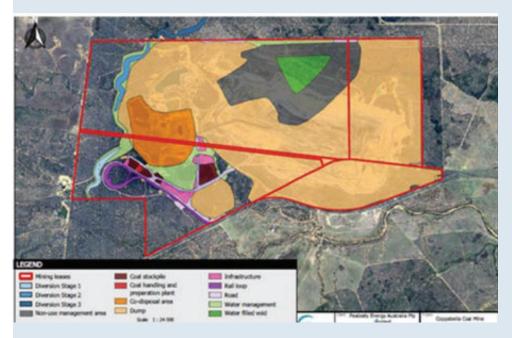


Figure 1 – Proposed disturbance (as part of original EA application)

However, according to Table C1 – Final land use and rehabilitation approval schedule in the current EA, the total authorised disturbance footprint is 2,390 ha. The projective surface area (ha) for undisturbed land is 1,753 ha, which is approximately 42 % of the total area. The proposed disturbance depicted in Figure 1 appears to be of a larger area than authorised in the EA.

## **Peabody**

### Disturbance type Projective surface area (ha)

Elevated landform (overburden) - upper slopes	700
- lower slopes	840
Access tracks and haul roads	250
Elevated landform (co- disposal) - upper surface	150
- slopes	70
Residual Voids	80
Rail loop	30
CHPP General Area	150
Water Management Structures	120
Undisturbed	1,753
Total	4,143

Table C1 – Final land use and rehabilitation approval schedule (EPML00579213)

#### Information Request

Provide the area (ha) of all proposed land disturbance associated with the amendment (on all the mining leases to which EPML00579213 relates) including:

- The proposed residual void.
- The Humbug Gully Creek diversion and associated water management landforms.
- Land which will be disturbed by using as waste rock dump.
- Total area of disturbance proposed.
- Undisturbed area.

Provide an updated disturbance map for the EA.



#### Peabody Response

An updated disturbance map and spatial data has been prepared to reflect the proposed land disturbance associated with the amendment and is provided as part of this response.

The areas of disturbance have been classified as follows:

- Proposed residual void;
- Low wall and High wall including offset associated with residual void;
- Northern and Southern Replacement Channels;
- Waste Rock Dumps Disturbance, and
- Total Disturbance Proposed.

It should be noted that Table C1 in the current EA presents surface areas as 'projective'. The only condition referencing this table is Condition C1, as shown below:

Land	
Condition Number	Condition
C1	Rehabilitation landform criteria
	All areas significantly disturbed by mining activities must be progressively rehabilitated to the final land description as defined in <b>Table C1 - Final land use</b> and rehabilitation approval schedule.



The full Table C1 from the current EPML00579213 EA is provided below:

Table C1 - Final land use and rehabilitation approval schedule

Disturbance type	Projective surface area (ha)	Post-mine land description	Post mine land suitability classification
Elevated landform (overburden) - upper slopes	700	Establish a landform and revegetate with native species with input from Aboriginal people, the objective being to develop a conservation area useful to Aboriginal people.	Class 4
- lower slopes	840	Establish pasture species to control erosion initially and thereafter develop a self-sustaining native ecosystem.	Class 5
- access tracks and haul roads	250	Establish a landform and revegetate with native species with input from Aboriginal people, the objective being to develop a conservation area useful to Aboriginal people.	
Elevated landform (co- disposal) - upper surface	150	Establish a landform and revegetate with native species with input from Aboriginal people, the objective being to develop a conservation area useful to Aboriginal people.	
- slopes	70	Establish pasture species to control erosion initially and thereafter develop a self-sustaining native ecosystem.	Class 5
Residual Voids	80	Water filled voids complementary to the post-mine land use of the surround land.	Class 5
Rail Loop	30	Establish a landform and revegetate with native species with input from Aboriginal people, the objective being to develop a conservation area useful to Aboriginal people.	Class 4
CHPP General Area	150	Establish a landform and revegetate with native species with input from Aboriginal people. the objective being to develop a conservation area useful to Aboriginal people.	Class 4
Water Management Structures	120	Establish a landform and revegetate with native species with input from Aboriginal people, the objective being to develop a conservation area useful to Aboriginal people.	Class 4
Undisturbed	1753		
Total	4143		

The disturbance areas shown in the Table are incomplete; for example, they do not include high walls and low walls surrounding the 'water filled voids'. Additionally, the total area listed in the table exceeds the current combined area of the Mining Leases by approximately 400ha. This is because ML70161 was originally much larger, extending to the Peak Downs Highway across its width, and its size was never reduced in the Table.



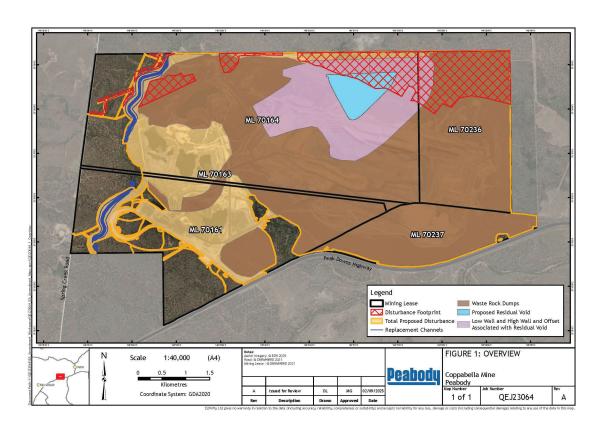


Figure 1 - Disturbance Area



Spatial data was not provided to support the amendment application. Spatial data is required for the department's assessment of the application Information Request.

Provide spatial files (for all MLs associated with EPML00579213) including:

- All domains of disturbance
- The total disturbance footprint
- Impact areas for each MSES
- Impact areas for each MNES

#### Peabody Response

Spatial data for all domains of disturbance, including the total disturbance footprint, have been provided as part of the submission package. Impact areas affecting undisturbed Matters of State Environmental Significance (MSES) and MNES are also included as part of this submission.

The publicly available MSES Protected Wildlife habitat and Essential Habitat layers do not include details of the associated threatened species within the spatial data. For this assessment, threatened species linked to Statemapped Essential Habitat and Protected Wildlife Habitat were inferred using the Vegetation Management Property Report provided by the Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD). Threatened species identified within mapped Essential Habitat include the koala (Phascolarctos cinereus), greater glider (central and southern) (Petauroides volans), squatter pigeon (southern) (Geophaps scripta scripta) and ornamental snake (Denisonia maculata). For areas of mapped Protected Wildlife Habitat containing threatened and Special Least Concern species, these were assumed to be associated with the short-beaked echidna (Tachyglossus aculeatus).

In accordance with the Queensland Environmental Offsets Policy Significant Residual Impact Guideline (Department of Environment and Heritage Protection (DEHP) 2014), MSES Regulated Vegetation prescribed REs containing essential habitat have been assessed as Protected Wildlife Habitat.

Due to the segmentation of proposed disturbance areas limiting the determination of cumulative impacts, where a MSES has been identified, a significant residual impact has been assumed.



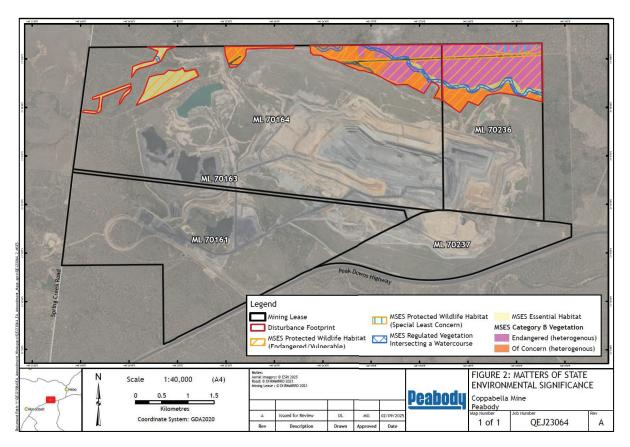


Figure 2 - Matters of State Environmental Significance

The Table below outlines the total potential MSES impact areas within ML 70164 and ML 70236, which are also illustrated in Figure 2 above.

MSES	ML 70164	ML 70236
Prescribed REs comprising Endangered or Of Concern (ha)*	50.03	19.26
Prescribed REs within the defined distance of a watercourse (ha)	11.48	11.49
Essential habitat (ha)	182.14	181.17
Protected Wildlife Habitat - Endangered/Vulnerable (ha)	172.06	181.17
Protected Wildlife Habitat - Special Least Concern (ha)	-	15.16
*comprising heterogenous polygons (calculated based on State assigned RE percentages)		



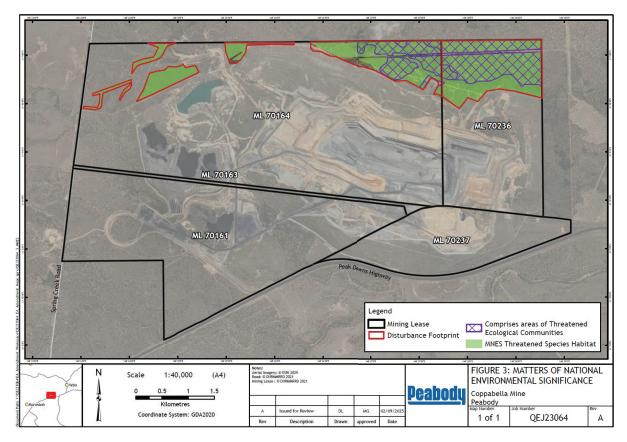


Figure 3 - Matters of National Environmental Significance

The Table below shows the total potential impact areas of MNES on ML 70164 and ML 70236 and these are also shown on the Figure 3 above.

MNES	ML 70164	ML 70236
MNES Threatened Species (ha)	182.14	181.17
MNES Threatened Ecological Communities		
(Brigalow TEC - area of RE 11.4.9*)	2.27	0.09
*comprising heterogenous polygons (calculated based on State assigned RE percentages)		



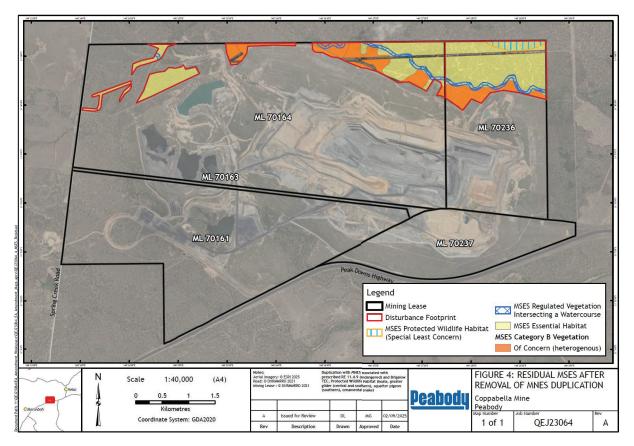


Figure 4 - Residual MSES after removal of MNES duplication

The Table below shows the total potential residual MSES within ML 70164 and ML 70236 and these are also shown on the Figure 4 above.

MSES (residual after removal of duplicated values)	ML 70164	ML 70236
Prescribed REs comprising Of Concern (ha)*	18.46	10.03
Prescribed REs within the defined distance of a watercourse (ha)	11.48	11.49
Essential habitat (ha)	182.14	181.17
Protected Wildlife Habitat - Special Least Concern (ha)	-	15.16
*comprising heterogenous polygons (calculated based on State assigned RE percentages)		

Peabody proposes to address MSES offset obligations for impacts on ML70236 and ML70164 through either land-based offsets or financial offsets, as agreed with the State. To assess the potential for land-based offsets, Peabody has undertaken an offset acquittal assessment. This assessment confirmed that the required offsets can be fully met using Peabody-owned land, with available habitat significantly exceeding the offset requirements should land-based offsets be pursued.

From a Commonwealth perspective, and as outlined above, Peabody is assessing potential offset properties within its existing land portfolio to identify suitable areas for acquitting impacts associated with the EPBC Act referred Action. A third party has been engaged to prepare an Offset Strategy and Offset Area Management Plan(s) consistent with DCCEEW requirements. The final location and extent of offsets will be confirmed



following detailed Project design and once the precise nature of impacts are known. These offsets will be managed through appropriate management plans and monitored against performance criteria to ensure compliance with the Commonwealth Environmental Offsets Policy.

The Peabody properties under consideration for offset suitability are shown in the Figure 5 below:

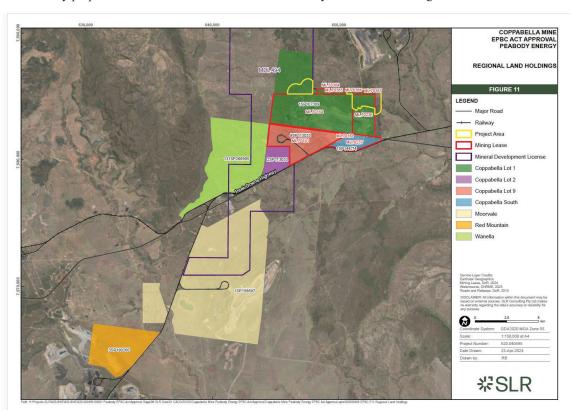


Figure 5 - Regional Land Holdings



#### Information Request

It is unclear if the proposed amendment will result in an increase in annual tonnage and production.

Section 5.1.1.3 of the EA amendment application supporting information document states "Stage 3 diversion works will have the following benefits:

•enables mining of economic resource beyond the current Humbug Gully, with ~33.4 Mt (ROM) at 10:1 ratio at an estimated yield of 75 % which provides opportunity for improved outcomes from current mining"

It is not clear whether the above statement refers to mining through Humbug Gully in ML70164, or the Johnson Extended Project in MLs 70384, 70385, 70386 and 70387.

#### Information Request

Provide details of the current annual extraction rate for Coppabella Coal Mine.

Provide details of any proposed increase of the current annual extraction rate from the proposed amendment.

•Clarify whether the anticipated ~33.4 Mt (ROM) will be from ML70164 and/or MLs associated with the Johnson Extended Project.

#### Peabody Response

Although this amendment does not propose any increase above historical annual production levels, the EA does not impose limits on annual production rates or total extraction volumes.

Historically, the Mine has produced between 3.0 and 5.8 MTPA (ROM). Current modelling for the PRC Plan assumes production within this range for several years, after which open-cut production is projected to decline to between 1.0 MTPA and 2.0 MTPA due to increasing waste ratios and the greater reliance on truck-and-shovel/excavator mining methods as the deposit becomes more complex.

Figure 6 illustrates historic, and currently anticipated production levels, including potential 'Life of Resource' ranges based on an average of 5.8 MTPA (ROM) (highest demonstrated annual production) and 2.5 MTPA (ROM) (the average of the current 'Life of Resource' plan).

For clarity, all coal quantities referenced in this amendment application relate exclusively to the Coppabella Mining Leases and do not include volumes from Mining Leases associated with the Johnson Extended Project.



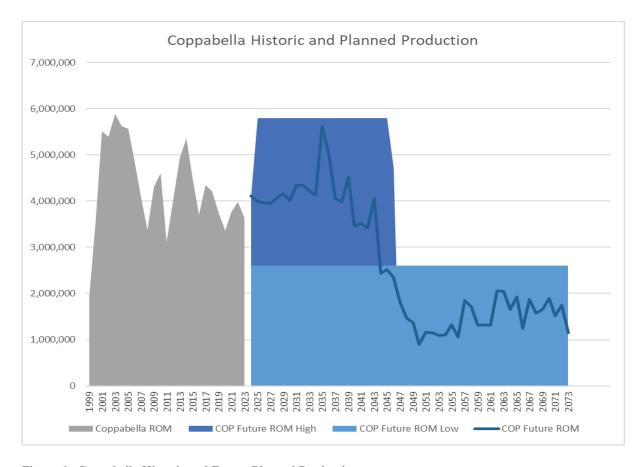


Figure 6 - Coppabella Historic and Future Planned Production



Figure 1 – Proposed disturbance depicts the overburden dump location as adjacent to the eastern mining lease boundaries on ML70236 and the southern mining lease boundary on ML70237, which is adjacent to the Peak Downs Highway. This could hinder future landform re-structuring, shaping or battering, rehabilitation and maintenance activities.

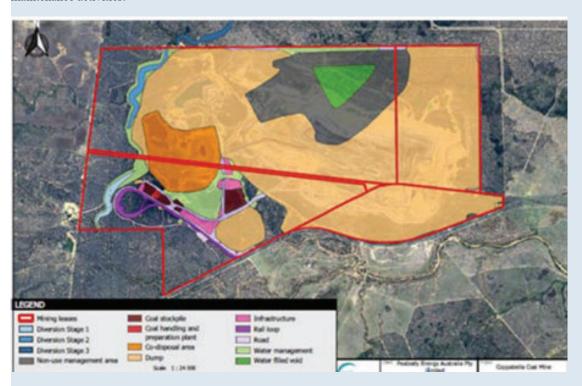


Figure 1 – Proposed disturbance (as part of original EA application)

#### Information Request

Explain why the overburden dump is adjacent to the mining lease boundaries in the map provided with the amendment application.

Provide the minimum distance that will be maintained between the overburden dump and mining lease boundaries.

#### Peabody Response

The waste dumps have been designed with appropriate setbacks to allow for future regrading activities and to accommodate access roads, water management features, fencing, firebreaks, and other necessary features. The image provided illustrates the maximum anticipated disturbance for rehabilitated waste rock emplacements and excavations, including allowances for minor infrastructure to support them. The footprint of the waste dumps has been minimised by constructing them at the maximum permissible height, which has required placing dump slopes in close proximity to the mining lease boundary. Much of the slope along the southern and eastern edges of the mining leases has already been established.

The toe of the regraded waste dump profile is generally designed to accommodate an access road approximately 10 m from the Mining Lease boundary; however, in some areas, the existing reprofiled slope toe lies within 5 m of the lease boundary.



Figure 3 – MSES Vegetation, Appendix H, Desktop Assessment for Prescribed Environmental Matters at Coppabella Mine, submitted with the EA amendment application depicts MSES vegetation on ML70161 in the proposed location of the creek diversion and associated water management landforms. Figure 6 – Protected Wildlife Habitat and Figure 9 – Category B Remnant Vegetation within a Prescribed Distance of a Watercourse in the same document also depict MSES wildlife habitat and Category B Remnant Vegetation within a Prescribed Distance of a Watercourse on ML70161 and ML70164 in the proposed location of the creek diversion and associated water management landforms.

A description of impacts from the proposed amendment on the environmental values of land in the location of the Humbug Gully Creek diversion was not provided in the amendment application.



Figure 3 – MSES Vegetation

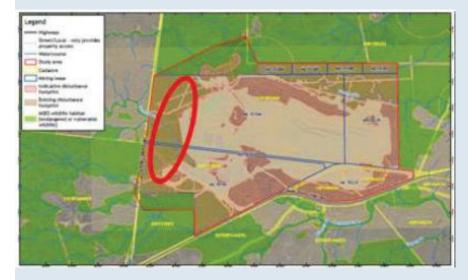


Figure 6 - Protected Wildlife Habitat



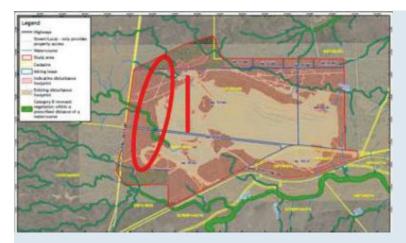


Figure 9 - Category B Remnant Vegetation within a Prescribed Distance of a Watercourse

#### Information Request

Provide details in regard to the relative risks and likely magnitude of impacts on environmental values in the location of the Humbug Gully Creek diversion.

#### Peabody Response

The Mine is traversed by several ephemeral creeks within the Isaac-Connors Sub-basin (Department of Environment and Science (DES), 2013) of the Fitzroy Basin. Thirty Mile Creek and its tributaries flow across ML 70161, ML 70163, and ML 70164 toward the south-east, discharging into Harrybrandt Creek approximately 2 km downstream of the Mine. Harrybrandt Creek subsequently flows into Bee Creek, which joins the Connors River in the Isaac River catchment, part of the Fitzroy River basin.

During the 1990s, Peabody constructed two diversions, the North Arm Diversion and Thirty Mile Creek Diversion (collectively, the 'existing diversions'), to manage surface water flows across the Mine. The North Arm Diversion extends approximately 3.8 km, commencing at the North Arm Levee located north of Creek Pit, incorporates four drop structures and a haul road crossing, and is in poor condition with significant instability risks should the drop structures fail. The Thirty Mile Creek Diversion is approximately 1.7 km long, contains two drop structures and a haul road crossing, and is generally unstable and lacking in vegetation.

To address these legacy issues, Peabody has initiated works to replace the existing diversions with modern fit-forpurpose designs, in accordance with the Detailed Design Report – Coppabella Diversions Design (Alluvium, 2023). The works include:

- Southern Replacement Channel construction of a 1.8 km diversion with 1:4 slopes from Thirty Mile
  Creek to Harrybrandt Creek. This channel will remove the need for ongoing remedial works to the
  existing diversion culverts and resolve stability issues.
- Northern Replacement Channel construction of a 2.3 km diversion with 1:4 slopes, along with upgrades to the Peak Downs Highway and rail culverts to accommodate anticipated higher flows. This channel addresses the legacy instability of the existing North Arm Diversion and improves water management for critical transport infrastructure.

The existing diversions are in the process of being replaced by the previously authorised North Arm to South Arm Diversion (Northern Replacement Channel) and South Arm Diversion (Southern Replacement Channel).



For clarity, the Northern and Southern Replacement Channels are subject to a separate Water License and are not part of this EA Amendment.

With respect to the proposed Humbug Gully Creek Diversion (which is off lease and not subject to this EA amendment), potential impacts on environmental values arising from its construction and operation are comprehensively addressed in Section 7.9.2.5 of the initially supplied Supporting Information Document (SGME 2024). The potential key risks identified include:

- direct impacts:
  - vegetation clearance and associated habitat removal;
  - habitat disturbance and degradation, including:
    - fragmentation and edge effects;
    - incursions by pest flora and fauna;
    - increased light, noise and dust levels;
    - fauna injury and / or mortality;
    - erosion, sedimentation and spills; and
    - increased risk of fire.
- indirect impacts:
  - hydrological impacts to ecosystems from watercourse diversion including:
    - changes in surface water and groundwater quality;
    - erosion and sedimentation; and
    - groundwater drawdown.

For the likely impacts outlined above, Peabody has referred the Action to the Commonwealth in accordance with the 'Significant Residual Impact Guidelines'.



Location of residual void

Appendix G – Coppabella Mine Continuation Project – Secondary Study Area – Terrestrial Ecology, 19 January 2024 submitted with the EA amendment application lists the following disturbance of key matters in the proposed location of the residual void:

•MNES - Threatened ecological communities

47.07ha - RE 11.5.16 (Endangered) (Brigalow TEC)

•MSES – Regulated vegetation

47.27ha - Category B ESA (Endangered RE 11.5.16)

11.25ha - RE within defined distance of a watercourse (Endangered) 119.10 ha - Essential habitat

•MNES and MSES – habitat for threatened species

133.96 ha - Fork-tailed swift (Apus pacificus)

76.45 ha – Greater glider (south and central) (Calyptorhynchus lathami)

76.45 ha – Koala (Phascolarctos cinereus)

59.60 ha – Ornamental snake (Denisonia maculata)

129.66 ha – Short beaked echidna (Tachyglossus aculeatus)

65.49 ha – Squatter pigeon (southern) (Geophaps scripta scripta)

133.96 ha – White-throated needletail (Hirundapus caudacutus)

The glossy black cockatoo (northern) (Calyptorhynchus lathami erebus) is also considered likely to occur within the proposed location for the residual void, with 119.10 ha considered preferred habitat for the species.

In addition, the above report describes the area of the proposed residual void as largely supporting remnant Eucalypt and Acacia woodlands that are connected to expansive tracts of similar vegetation communities to the north, east and west. Accordingly, the area of the proposed residual void has a role in supporting biodiversity values at both local and regional scales. Areas of watercourse will be directly impacted and artificially modified. Vegetation along these watercourses and drainage features provide connectivity between areas of preferred habitat. Vegetation clearing in the location of the proposed residual void is likely to fragment habitat and result in the loss of connectivity values associated with this riparian corridor.

There will be cumulative impacts on essential habitat through the loss of vegetation from clearing the adjacent ML70236 to allow for the overburden dump (these impacts are being assessed through an EPBC referral).

Activities associated with the EA amendment will result in a significant residual impact on prescribed environmental matters, both directly and indirectly. However, the amendment application supporting information document references the Environmental Management Overview Strategy (EMOS) 2002 for a description of the environmental values of land which states that there are no Category A or Category B environmentally sensitive areas in close proximity to the mine.

Location of Humbug Gully diversion



The area of prescribed matters impacted from the Humbug Gully Creek diversion is unclear. Impacts to prescribed environmental matters from the proposed amendment must be considered for all mining leases associated with EPML00579213.

#### Information Request

Location of residual void

Provide additional details of avoidance and mitigation measures that may reduce the significant residual impact.

Where impacts are unable to be avoided or suitably mitigated, provide details of an environmental offset approach to counterbalance the significant residual impact of the prescribed activity on the prescribed environmental matters. This must include an assessment of the availability of the necessary offset requirements.

Location of Humbug Gully diversion

Provide details of potential impacts to prescribed environmental matters from the Humbug Gully Creek diversion.

#### Peabody Response

The extent of the final void has been minimised through practical mine planning; however, due to the depth of the resource, a residual surface footprint will remain following completion of mining. As outlined in Item 11, the extent of the NUMA associated with the final void has been reduced to the greatest extent reasonably practicable.

The location of the final void is predominantly located within a previously disturbed OOPD. For clarification the secondary study area extends to the northern extent boundary of ML 70164 which is proposed for future disturbance and is discussed below. The total MSES and overlapping MNES impacts are tabulated in DETSI response Item 3.

The Mine has in place a suite of environmental management and monitoring plans, including:

- CM-TSE-MNP-0009 COP Water Management Plan (Peabody, September 2024)
- CM-TSE-MNP-0011 Erosion and Sediment Control Plan (Peabody, December 2024)
- TARP for Pre-rain event erosion and sediment control inspections (Peabody, 2019)
- TARP for Post-rain event erosion and sediment control inspections (Peabody, 2019)
- Receiving Environment Monitoring Program (REMP) Design Document (GAUGE, April 2022)
- Cultural Heritage Management Plan (May, 2010)
- Air Quality Management Plan (ERM, April 2023), and
- CM-TSE-MAN-0001 CMJV Rehabilitation Manual (Peabody, April 2025)

These plans will be reviewed and updated as required. Prior to commencement of any works resulting in direct impacts to regulated vegetation, additional management and mitigation measures, including supplementary management plans, will be developed and implemented.

#### Vegetation clearing and habitat removal

During construction and operations, the following measures will be adopted to minimise impacts:



- Limit clearing to the minimum area required and clearly demarcate on construction plans areas that
  must not be cleared or damaged. In this regard the proposed construction works (and disturbance
  footprint) will be set out and demarcated with pegs at a maximum of 50m intervals along the limit of
  clearing.
- Placement of temporary infrastructure is to be located outside of remnant vegetation, with areas previously cleared/degraded (non-remnant) to be prioritised.
- Boundaries of areas to be cleared, and those not to be cleared are to be clearly defined during clearing
  activities and clearly communicated to all necessary construction personnel. Where necessary, signage,
  flagging and/or barricade fencing may be used to demarcate areas not to be cleared.
- Threatened Species Management Plans will be developed prior to the commencement of construction to comply with Commonwealth and Queensland legislation and promote conservation outcomes for:
  - o Koala (Phascolarctos cinereus);
  - o Greater glider (central and southern) (Petauroides volans); and
  - o Ornamental snake (Denisonia maculata).
- The Threatened Species Management Plan should include species-specific mitigation measures and controls to minimise and mitigate long term impacts on these species.
- Pre-clearance fauna surveys are to be undertaken by a suitably experienced and qualified ecologist to identify fauna at direct risk from clearing activities.
- A suitably experienced and qualified fauna spotter/catcher will be present during the clearing of any structures that may serve as habitat or refugia for animals.
- Prior to removal, all hollow-bearing trees approved for removal are to be thoroughly checked for fauna
  presence prior to felling. If fauna presence is confirmed, it is recommended that trees be left overnight
  to allow for self-dispersal.
- Hollow-bearing trees providing shelter for native fauna should be felled slowly (in sections), so as to minimise the risk of injury to fauna.
- Fauna captured during clearing will be treated for injuries and transferred to suitable habitat elsewhere within or adjacent to the works.
- In the event a koala is identified within areas to be cleared, the individual is to be left to vacate the area
  on its own accord.
- Vegetation clearing should be carried out sequentially over the life of the clearing actions to allow fauna species the opportunity to disperse away from clearing areas.
- Directional clearing towards retained vegetation would be undertaken where practical to enable the
  movement of fauna into retained vegetation.
- During construction works, work areas and excavations (trenches) are to be checked for fauna that may have become trapped.
- Fauna exclusion fencing will be erected around open trenches and pits >1 m depth to minimise the risk of injury to fauna.
- If trenches remain open after daily site works have been completed, fauna ramps would be put in place.

#### Habitat disturbance and degradation

Impacts associated with fragmentation and edge effects will be managed through existing management plans (updated) and the development of a Weed and Pest Management Plan.

The existing CMJV Weed and Pest Management Plan will be revised and will be further developed to help minimise/mitigate impacts of pest species on native flora and fauna.



This plan will include measures to manage/control weed and pest animal species within the impacted areas and surrounds during construction and operational phases, as detailed below.

- Weeds or soil removed as a result of construction activities are to be appropriately disposed of or stored separately to minimise potential spread and proliferation of weed species.
- Prior to vegetation clearing activities, a pre-clearance survey will be undertaken to identify and map
  infestations of biosecurity matter to minimise the spread during clearing works and operational phase.
- Waste management, including suitable disposal of waste food, to minimise occurrences of pest fauna.
- All vehicles, equipment and materials (e.g. landfill, soil etc) brought to site are to be certified free of biosecurity matter and carry weed hygiene certification.
- Rehabilitation monitoring to identify environmental weeds within rehabilitation areas.
- Biosecurity monitoring to identify and assess the risk of weed and pest occurrences within the Mine and adjacent mine areas.
- Control measures for target biosecurity species and other weed and pest species identified within the Mine and adjacent mine areas.

#### Increased light, noise and dust levels

- To mitigate the potential impacts of light, noise and dust during construction and operational phases, the following management measures will be applied:
  - o Where artificial lighting is required, directional lighting should be implemented;
  - o Implementation of a Dust Management Plan; and
  - Regular maintenance of machinery and mobile plants should be undertaken to minimise unnecessary noise.

#### Fauna injury and/or mortality

- To mitigate potential impacts to fauna, including MNES species, the following management measures will be implemented during construction and operational phases:
  - Vehicles are to remain on designated access tracks and adhere to site rules relating to speed limits;
  - o Speed limits are to be clearly signposted to minimise potential fauna strike;
  - Removal of roadkill should be undertaken to minimise the risk of attracting other fauna to the road corridor;
  - o Contingencies and procedures for the treatment of injured fauna;
  - Where installation of wire fencing is required to exclude personnel or vehicular traffic, consideration should be given to movement of fauna around and/or through such fencing; and
  - Barbed wire should not be used on the top strand of wire fences unless necessary for security.
- The above measures will also be included in Threatened Species Management Plans.

#### Increased risk of fire

- Potential impacts from bushfire risk will be mitigated through the following measures:
  - o Managing vegetation within the MLs to maintain safe fuel loads and firebreaks;
  - Any chemicals used should be handled and disposed of in accordance with the relevant Material Safety Data Sheets;
  - Establishing and maintaining access tracks to be used by Queensland Fire and Rescue Service for emergency purposes; and



 Implementing an Emergency Response Procedure for fires prepared in consultation with emergency services.

#### Changes in hydrology

Further hydrologic assessment and modelling will be undertaken to characterise indirect impacts on terrestrial GDEs and associated MNES fauna habitat.

A Groundwater Dependent Ecosystem Monitoring and Management Plan will be developed, incorporating annual monitoring of groundwater quality and potential drawdown to identify trends and changes over time in terrestrial GDEs, vegetation and habitat, within the predicted drawdown extent and downstream.

#### Monitoring

Monitoring will continue during construction, operation and, where necessary, post closure, to assess Project impacts on MNES and gauge the efficacy of proposed impacts mitigation measures. Monitoring will focus on the quality and condition of vegetation and MNES fauna habitat adjacent to mining activities as well as vegetation communities located downstream. Monitoring methods, frequency of monitoring, and criteria for assessing the success (or otherwise) of impact mitigation measures will be detailed in the following management plans proposed for the Project: Weed and Pest Management Plan, Threatened Species Management Plan (for threatened fauna), and Groundwater Dependent Ecosystem Monitoring and Management Plan.

For clarity, the off-lease Creek Diversion referenced in Appendix G, is off-lease and is addressed separately under the EPBC Referral. It is therefore outside the scope of this application for amendment.



The EA amendment application and supporting documents provided limited information on potential impacts to aquatic species from the proposed Humbug Gully Creek diversion.

Appendix F – Coppabella Mine Project - MNES terrestrial ecology report, 13 February 2024, states "only terrestrial GDEs are included in the report and aquatic and subterranean GDEs were assessed as part of the aquatic ecology assessment".

Appendix B of the above document – Likelihood of Occurrence Assessment also states "aquatic species including Elseya albagula and Rheodytes leukops are considered in the aquatic ecology report".

The proposed diversion will redirect water away from an extended area of riparian vegetation downstream of the diversion which acts as both connectivity and a significant foraging resource for a diversity of fauna including threatened species.

Appendix F – MNES Terrestrial Ecology Report, 13 February 2024, recommends that further investigation will be required to assess and estimate this hydrological impact.

#### Information Request

Provide the aquatic ecology report.

Clarify when further investigations to assess the hydrological impact of the diversion on downstream vegetation and fauna will be undertaken.

#### Peabody Response

Attached at Appendix A is the Aquatic Ecological Assessment Report (ESP 2024), which provides a preliminary assessment based on a desktop review and brief site inspection.

A more detailed aquatic ecology field survey is scheduled to be undertaken as part of the EPBC Referral process, with results expected in 2026. This survey will include further investigations to assess the hydrological impacts of the diversion on downstream vegetation and fauna.



GDE mapping provided in Appendix H, Desktop Assessment for Prescribed Environmental Matters at Coppabella Mine, shows there are no terrestrial GDEs in the area of the proposed residual void or the proposed area of the diversion, however, the proposed diversion of surface flows on Humbug Gully Creek may have a downstream influence on surface flow volumes to the east, where fringing riparian habitats are identified as high potential Terrestrial GDEs and supporting habitat for MNES and MSES threatened fauna.

Appendix F, MNES Terrestrial Ecology Report recommends further detailed assessment of impacts to groundwater and associated Terrestrial GDEs, particularly along Humbug Gully and associated floodplains, will be required to adequately assess impacts on Terrestrial GDEs and associated habitat for MNES fauna species (in particular greater glider and koala).

Section 6.1.2.3 of Appendix F, MNES Terrestrial Ecology Report, also states that effective management/mitigation of Project impacts on terrestrial GDEs and associated MNES will require development of a Groundwater Dependent Ecosystem Monitoring and Management Plan, including annual monitoring of groundwater quality and potential drawdown to identify trends and changes over time in terrestrial GDEs, vegetation and habitat, within the predicted drawdown extent and downstream of the Project.

#### Information Request

Provide the groundwater dependant ecosystem assessment submitted under the EPBC Act.

Clarify whether a groundwater dependant ecosystem monitoring and management plan is being developed.

Explain how impacts to GDEs will be monitored.

#### Peabody Response

Attached at Appendix A is the Aquatic Ecological Assessment Report (ESP 2024), which provides a preliminary assessment based on a desktop review and brief site inspection.

If, as anticipated, the EPBC Referral process determines that monitoring of Groundwater Dependent Ecosystems (GDEs) is required, a GDE Monitoring and Management Plan will be prepared, as outlined in Item 7. This plan will establish the framework for monitoring potential impacts on GDEs and outline the measures to be implemented to manage and mitigate any identified risks.



Section 7.5.1 of the EA amendment application supporting information document states that "the mine is located on land with a Native Title claim determination", however, Section 4.3 of the document states the extent to which the NUMA is consistent with the outcome of community consultation is "consultation has been undertaken with affected landholders (such as underlying and adjoining land holders, and holders of land necessary for access to land to which the proposed amendment relates)".

The EA amendment application has not provided any details regarding consultation with the Native Title holders or a Cultural Heritage Management Plan (CHMP) or Memorandum of Understanding (MOU) that is in place. Considering that input from Aboriginal people is specifically mentioned in Table C1 – Final land use and rehabilitation approval schedule of the current EA, and that the amendment proposes to change the post-mining land use of the residual voids to a non-use management area (NUMA), consultation with the Native Title holders is necessary to ensure impacts to cultural and spiritual values are considered.

#### Information Request

Clarify whether a consultation process has been completed or planned to inform the Native Title holders of:

- the proposed relocation of the residual void and the proposed diversion of Humbug Gully
- the proposed change of post-mining land use for the residual void from "water filled voids complementary to the post-mine land use of the surrounding land" to a NUMA
- the proposed size of the NUMA.

If consultation has occurred, provide details of the consultation.

#### Peabody Response

Peabody maintains a range of communication and consultation mechanisms to engage with stakeholders and share information about the Mine's operations and proposed activities. These include:

- site open days;
- direct phone calls and meetings with landholders;
- regular meetings with Traditional Owners;
- meetings with Isaac Regional Council;
- updates via the Peabody Energy website https://www.peabodyenergy.com; and
- periodic community newsletters.

A Complaint Response process is also in place to ensure that all community concerns are recorded and appropriately addressed.

#### Indigenous Engagement

Peabody maintains regular engagement with the Barada Barna Aboriginal Corporation (BBAC) through twice-yearly Cultural Heritage (CH) Committee meetings. Recent engagements include a meeting at the Bidgerley Cultural Centre near Mackay in March 2024, and meetings in Brisbane in November 24, and March 2025. In addition, a Welcome to Country and Smoking Ceremony was conducted at the Mine on 23 July 2025 to celebrate NAIDOC week.

These meetings are intended to strengthen Peabody's relationship with the BBAC, deliver operational and cultural heritage updates, present details of the PRCP and the final landforms, and provide a forum to discuss employment, training, and other opportunities of interest to the BBAC.



In addition to CH meetings, Peabody regularly engages with the BBAC regarding employment and procurement opportunities at the Mine. Current initiatives include:

- rollout of BBAC Cultural Awareness Training to site staff;
- direct contracting opportunities (e.g. earthworks, rehabilitation, topsoil stripping); and
- indirect employment pathways via major site contractors (e.g. Compass Group at Terowrie Camp).



Table C1 – Residual Void Design, and Table C3 – Final land use and rehabilitation approval schedule of the current EA have been interpreted to mean that 80 ha is the total maximum surface area of water in the residual voids. Other parts of the void (high wall, low wall, end wall etc) have not been listed separately in the table. If the low wall is under 25 % (4H:1V) it could readily support a PMLU.

#### Information Request

Provide justification as to why the low wall cannot sustain a PMLU. It is considered best practice that low walls are rehabilitated, and proposed as a PMLU where possible.

•Clarify how measuring and monitoring the surface area of the pit lake water would be undertaken to stay within the interpreted requirement of 80 ha during operations and post mine closure.

#### Peabody Response

The low wall areas identified as NUMA are those where slopes into the final void are anticipated to be up to 33 %, which exceeds the 25 % typically considered practical to support a Post-Mining Land Use (PMLU). The steeper slopes have been deliberately designed to minimise the contributing catchment area into the final void, thereby maximizing runoff to the receiving environment post-closure

To ensure long-term stability and to achieve the requirement of maintaining a final pit lake surface area below 80 ha, the majority of these slopes will be established with vegetation. While the immediate post-closure management of these slopes is expected to be significant due to the slope geometry and material characteristics, once vegetation is successfully established, it may be possible to progressively transition substantial portions of these areas from NUMA to PMLU.

The measurement and monitoring of the pit lake surface area will be undertaken as follows:

- A detailed topographic survey of the final landform, following regrading, will be used to establish a standing water level–surface area relationship for the final void.
- Once this relationship is defined, the only parameter requiring regular monitoring will be the water level.
   This can be measured using a range of methods, such as water level loggers, manual dip measurements, or survey-based monitoring points.
- As the final water level may take several decades to stabilise, ongoing post-closure monitoring data will
  be used to calibrate pit water balance models. This will provide assurance that the long-term water surface
  area will remain below the 80 ha threshold.

This approach ensures that both slope stability and compliance with the interpreted 80 ha constraint can be reliably demonstrated and managed over time.



# Summary of the differences between the 2 void scenarios.

The EA amendment application supporting information document states that "where applicable, low walls will be rehabilitated by profiling, applying topsoil, ripping and seeding" and discusses two (2) scenarios for void modelling for predicted long-term water levels, volumes and surface area that differ in the assumptions around the establishment of vegetation within the final void (s).

		•	Void Scenario 1	•	Void Scenario 2
•	Volume (GL)	•	43.9	•	15.9
•	Water Level (mAHD)	•	81	•	48.7
•	Elevation at the lowest point (mAHD)	•	6.5	•	6.5
•	Water surface area (ha)	•	98	•	65
•	Final Void (ha)	•	460	•	100
•	Rehabilitation area (ha)	•	0	•	360
•	Infiltration/seepage area (ha)	•	370	•	370
•	Average salinity 100 years post mining (µS/cm)	•	9,666	•	20,895

All proposed non-use management areas (NUMAs) should have a footprint as small as practicable to limit environmental risk and future liability. It is unclear why scenario 2 has not been considered as a potential final landform in the application supporting information document or appendices.



Section 6.0 of the application supporting information document states "The proposed catchment area reporting to the void (~460 ha) is not able to support a PMLU due to average slope constraints (1V:3H). However, upon closure these areas will be rehabilitated as detailed in Section 4.5 and managed to be complementary with surrounding land use". However, section 4.2 of the application supporting information document states "The NUMA is the area of the residual void(s) that is unable to support a PMLU and includes the pit lake, low wall, end wall, highwall and abandonment bund with appropriate offset".

The area of the NUMA and the area to be rehabilitated is unclear.

#### Information Request

Provide details of why void scenario 2 has not been considered in the application supporting documents, including the landform design report.

Provide justification to demonstrate why the low wall cannot sustain a PMLU and minimise the extent of the NUMA.

Clarify the area of the proposed NUMA that is the residual void.

#### Peabody Response

The final long term - standing water level has been modelled as part of the void water balance (SLR 2024). Both Scenario 1 and Scenario 2 were modelled to assess final void behavior. Scenario 1 was modelled without vegetation inside the NUMA and showed a slightly larger water filled void than Scenario 2. Scenario 2 was prepared to demonstrate that the vegetation/rehabilitation of much of the slopes surrounding the void are necessary to reduce the quantity of inflow. Scenario 2 demonstrates that the landform is supportive of the approved final void size of less than 80 ha, provided the majority of slopes associated with the void are rehabilitated.

The slopes above the final water level are expected to be up to 33% (1V:3H), which exceeds the 25% slope typically considered practical to support a PMLU such as cattle grazing. This is consistent with observations by DETSI. Rehabilitation and management measures for these areas are outlined in Section 4.5 of the Supporting Information Document (SGME, 2024), including:

- Reprofiling, topsoiling, ripping, and seeding of low walls where practicable.
- Installation of bunding and fencing around the void crest to manage safety and livestock access.

The steep slopes are designed to reduce the catchment area into the void, thereby maximising runoff to the receiving environment post-closure and maintaining the approved residual void size. These slopes will be stabilised and managed through revegetation. While the initial designation is NUMA, once vegetation is established, substantial areas may be transitioned to PMLU, consistent with approaches implemented at the Moorvale Mine.

The area of the NUMA includes the residual void itself, which has been modelled to remain below 80 ha water surface area in accordance with the EA condition. The majority of the surrounding low wall slopes will also be designated NUMA until rehabilitation is demonstrated to support a transition to PMLU.



Section 5.2.2.2 discusses pre-mining groundwater levels.

Elsewhere in the report it appears to indicate that groundwater levels in about 2009 could be considered to represent pre-mining groundwater levels in some parts of the mine.

There is, however, no historical mine plan presented. Section 5.5.2 states: CCM has been in operation since 1998 and mining has progressed in a general east to west direction with successive strips mined towards the North-Northeast. However, beyond that there is little information with which to assess the timing of likely historical groundwater impacts. This sort of information is required to support assessments of which groundwater levels represent pre-mining groundwater levels. Details of future mining should also be provided to provide an understanding of likely future impacts of mining.

# Information Request

Provide a mine plan of historical mining at Coppabella to support the assessment of pre-mining groundwater levels.

Provide a mine plan of future mining at Coppabella to support the understanding of future mining impacts on groundwater levels.

#### Peabody Response

Historical mining progress at Coppabella, including extraction of the basal coal seam, is shown in Figure 7



**Figure 7 - Historical Mining Progress** 



The original assessment of pre-mining groundwater levels is documented in the 2010 report prepared by Australian Groundwater & Environmental Consultants Pty Ltd (AGE). Figure 4 from that report presents groundwater elevation contours overlaid on an aerial photograph of the mine at that time, providing a reference to pre-mining conditions and are shown in this response as Figure 8.

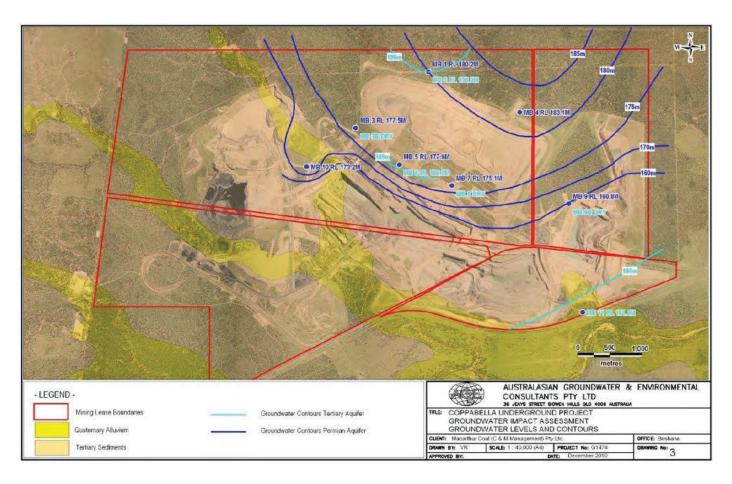


Figure 8 - Coppabella Groundwater Levels and Contours

# **Peabody**

More recent groundwater modelling undertaken by SLR has updated this assessment, with outputs presented in Figure 9.

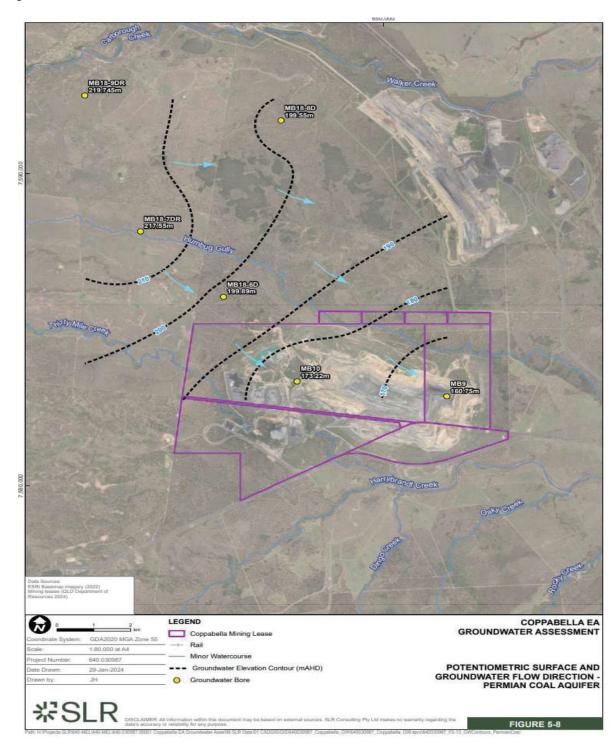


Figure 9 - SLR Potentiometric Surface and Groundwater Flow Direction - Permian Coal Aquifer



To illustrate the relationship between past and future mining, Figure 10 shows both historical mining areas and the current predicted coal extraction areas consistent with the LOR.

Together, these figures provide the basis for assessing pre-mining groundwater conditions as well as the anticipated impacts of future mining on groundwater levels which will be utilised in further groundwater modelling to be done for the project as part of the development of the PRCP and as anticipated through the EPBC Act assessment process.

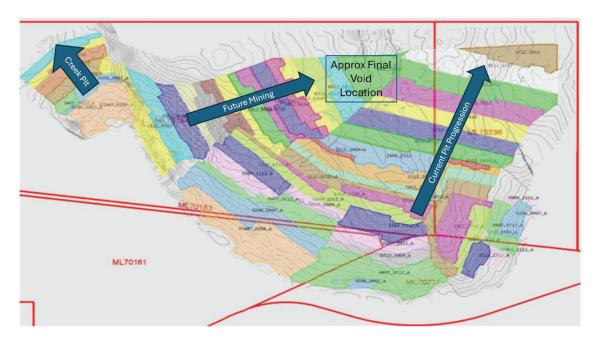


Figure 10 - Historic, and current predicted coal mining areas for the Life of Resource Mine Plan



It is difficult to reconcile some of the differences between these figures, perhaps because of the alignment of the sections.

There is no map showing the locations of these sections, which needs to be addressed.

In Figure 7-1 the current topography appears to be about 40 m above the top of MB5.

In Figure 7-2 the current topography appears to be below the bottom of MB5.

Additionally in Figure 7-2 the current topography appears to be down to the coal seam in the area south of MB5, but this existing deep cut area will not be part of the final void or backfilled. These items are confusing to interpret.

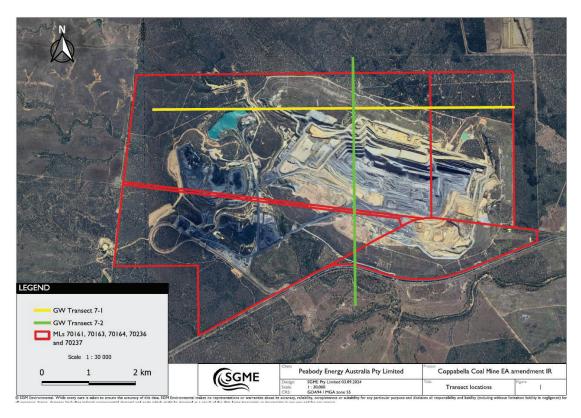
Whilst it is accepted that these are conceptual models, some of these basic issues should be addressed.

# Information Request

Provide a map to show the location of the cross sections. Review the validity of the information provided in Figure 7-1 and 7-2.

#### Peabody Response

A map showing the locations of the cross sections in Figures 7-1 and 7-2 (SLR 2024a) has been produced (Figure 11) and is shown below:



**Figure 11 - Transect Locations** 



The West-East transect (Figure 7-1) intersects the overburden stockpile located to the north of the current void. This is reflected in the profile peaks of approximately 290 m AHD at around 4000 m from the western transect origin. The South-North transect (Figure 7-2) intersects the current void, which is evidenced in the profile depression of approximately 60 m AHD at around 3000 m from the southern transect origin. The review confirms that the profiles depicted in Figures 7-1 and 7-2 accurately represent the existing landform and mining features. The reason for the difference in topography in Figure 7-1 is because the current topography being an OOPD is above the location of MB55 at the time of installation. The reason for the difference in Figure 7-2 is that the current topography being in the pit shell is below the level of the base of MB-5 at the time of installation.



An analytical groundwater model (Marinelli and Niccoli (2000)) to predict inflows to the final void and the extent of impacts (distance from residual void but not drawdown levels) to groundwater has been provided. The model has been used to represent two geologic units (Permian interburden and Permian coal seams).

The modelling does not:

- •include the linkages between the two Permian units or with the overlying Tertiary Sediments.
- •incorporate the impacts of historical and future mining (except for the single void represented at Coppabella).
- •represent the impacts of the Johnson Extended Project underground mine and the long term changes to the strata that the bord and pillar mining creates.
- •incorporate the impacts of the partial backfilling of voids with spoil.
- •provide predictions of the level of drawdown in the various geologic units during and post mining.

The model is unable to predict long term groundwater levels as a numerical groundwater model would, therefore the long-term void water level predicted by the surface water model has been compared with pre mining groundwater levels. As the analytical model is also unable to model the impacts of spoil (backfill) on groundwater inflow to the residual void, it has been included in the surface water model as infiltration/ seepage. However, limited detail is provided for the characteristics assumed for the spoil and the contribution of water predicted from the spoil to the residual void.

There has been a significant change to the configuration of the residual void/s and therefore potential localised impacts since the AGE 2010 numerical groundwater model was developed.

There is also no allowance for the Johnson Extended project underground mine in the AGE 2010 model.

#### Information Request

Provide a numerical groundwater model to adequately understand the impacts of the mining and residual void on groundwater levels in these various geologic units and the contributions of the various geologic units to the residual void

#### Peabody Response

At present, there is insufficient data available to develop a robust numerical groundwater model. Additional groundwater bores are required to provide the necessary hydrogeological data. The process of drilling these bores, collecting baseline data, and subsequently developing and calibrating a numerical groundwater model will extend beyond the timeframe available to meet the current EA amendment information request.

Rather than requesting a further extension of time for the EA amendment information request response, it is proposed that the numerical groundwater model be developed and submitted as part of the PRC Plan information request process. This will allow sufficient time for data acquisition, monitoring, and model development to ensure a scientifically robust assessment of groundwater impacts and the contributions of the various geologic units to the residual void.



In this figure water levels are plotted for selected Tertiary Sediments and Permian monitoring bores.

It is noted that some individual measurements (outliers) appear to be between 2 and 6m different to the majority of the measurements for that particular bore. This appears to be the case for monitoring bores MB1, MB2 and MB4. Is it possible that these different measurements are manual measurements that are not aligning with logger data.

If that is the case, there may be some issues with some of the data presented.

# Information Request

Review the water level measurements presented in Figure 5-7 and provide comment on the outliers for monitoring bores MB1, MB2 and MB4.

#### Peabody Response

Water level measurements presented in Figure 5-7 have been reviewed by SLR (2024). Analysis of the dataset indicates that the outliers recorded for monitoring bores MB1, MB2, and MB4 are most likely attributable to sampling or field measurement errors and should be excluded from any overall trend analysis.

However, these outliers constitute a very small percentage of the total observations. Elimination of the outliers leaves sufficient valid data points to establish a robust and reliable trend indicating a gradual decline in water levels in the relevant bore.



#### This section states:

It is considered that the Tertiary aquifer has been dewatered during current mining activity. The groundwater model developed by AGE (2010) confirmed this showing groundwater levels as depressurised. The inflow component from the Tertiary aquifer is minimal and ignored.

It is noted in Figure 5-7 that the measured groundwater levels in Tertiary monitoring bore MB2 appear to be about 190 to 191 m AHD, up to about 2022. This compares with a bottom of screens in the bore at 184.7 m. This represents a depth of water of about 6.3 m in this bore.

It is also noted that MB11, a Tertiary monitoring bore, is said to be dry at 181.75 m AHD (Table 5-1) when the base of the screen is said to be at 173.4 m AHD. It would appear that this bore may have been blocked. Based on the groundwater level stored on the groundwater database the water level in 2009 when drilled was about 180.8 m AHD. The depth of water at that time in this bore was about 7.4 m.

There is therefore evidence that there is some water in the deeper Tertiary bores.

Whilst there may have been some reduction in water levels in some Tertiary bores close to the pits (although not particularly evident in Figure 5-7 for MB2) it is likely these will at least partially recover post mining and play a role in understanding post mining groundwater impacts.

It is also important to include the Tertiary Sediments aquifer in any modelling to understand the impacts of mining and post mining on that aquifer and any receptors that may rely on that aquifer.

#### Information Request

In updated groundwater modelling include an assessment of impacts to all geologic units potentially impacted by mining and post mining activities.

#### Peabody Response

This requirement will be addressed as part of Item 15 through the development of a numerical groundwater model. The model will include an assessment of potential impacts to all geologic units that may be affected by mining and post-mining activities, ensuring a comprehensive understanding of groundwater behaviour across the project area.



It appears that the overlay for the void and the infiltration catchment to the void, does not line up with the existing pits on the imagery in the background.

#### Information Request

Review the location and extent of the void and infiltration catchment on Figure 4-5.

#### Peabody Response

The location and extent of the void is discussed in the SLR Report. The final location of the void is outlined in the Coppabella Landform Design Report, (Appendix A of the original application) the extent of the mine has been determined based on a high price case, which reflects Coal Resources with reasonable prospects for economic extraction. The mine plan sequence (shown in the Figure below) illustrates the current pit progressing northwards to the lease boundary. Backfilling will be undertaken using waste sourced from the area to the south-east of the existing Creek Pit. This process will ultimately result in the formation of the final void, as depicted in the landform design.



In this section Figure 4-7 provides Inflow vs Pit Lake (i.e. Final Void) Water Levels.

However, the text under Figure 4-7 states:

Generally, the rate at which water is expected to seep from the voids reduces over time as the groundwater levels recover.

It is assumed that this sentence is an error given the assessment does not appear to predict seepage of water from the void to groundwater.

#### Information Request

Review the wording in section 4.5 in relation to the reducing seepage of water from the voids over time as groundwater levels recover.

# Peabody Response

Peabody acknowledges that the sentence was in error and has requested an update to the report. Accordingly, please refer to the revised wording in Section 4.5 of the updated report, provided in Appendix B, which clarifies that the void will function as a groundwater sink to varying degrees, rather than as a sump as previously indicated.



#### This section states:

The model is based on a single assumed inflow water level relationship which was derived utilising an analytical method. No iteration between the groundwater analysis and results of this assessment have been undertaken.

It is noted that there is no discussion as to how this has potentially impacted the prediction of both void water level and groundwater levels.

#### Information Request

Provide discussion as to how the process of assumed groundwater inflow and the lack of an iteration process between the groundwater assessment and the surface water assessment has impacted the predictions of void water levels and groundwater levels.

# Peabody Response

This matter is addressed under Item 19. An updated numerical groundwater model is currently being developed and will supersede the SLR (2024) report. The forthcoming assessment will provide a refined analysis of groundwater inflows and surface water interactions, including an evaluation of the extent to which the final void may act as a long-term groundwater sink.



The EA amendment application supporting document and technical appendices do not consider greenhouse gas emissions. Section 7.6 – Air of the application supporting document only considers particulate emissions from operations including haulage on unsealed roads, mining, conveyors, infrequent blasting and wind action on stockpiles prior to revegetation.

Section 226A of the Environmental Protection Act 1994 includes the requirement for amendment applications to provide an assessment of the likely impact of each relevant activity on environmental values, including details of any emissions or releases likely to be generated by each relevant activity, and the management practices proposed to be implemented to prevent or minimise emissions and adverse impacts.

Refer to the Guideline - Greenhouse gas emissions ESR/2024/6819 version 1.00, 15 May 2024 <a href="https://www.desi.qld.gov.au/policies?a=272936:policy\_registry/era-glgreenhouse-gas-emissions.pdf">https://www.desi.qld.gov.au/policies?a=272936:policy\_registry/era-glgreenhouse-gas-emissions.pdf</a>

#### Information Request

Identify the GHG emissions likely to be generated through the life of the project, in particular the emissions as a result of the amendment.

Determine the emission category of the project, with respect to the amendment being sought.

Identify all proposed management practices proposed to be implemented to prevent or minimise adverse impacts, with respect to the amendment being sought.

Identify if a GHG abatement plan will be required to accompany the application to identify continuous commitments to achieve progressive GHG mitigation and management throughout the life of the project, with respect to the amendment being sought.

Describe the risk and likely magnitude of impacts to environmental values resulting from the project's GHG emissions, with respect to the amendment being sought.

#### Peabody Response

To address this information request, Peabody has engaged Katestone to prepare the Coppabella Mine Greenhouse Gas Assessment and Decarbonisation Plan. A copy of the report is provided in Appendix C.



Appendix A



# **Environmental Protection Act 1994**

# Information request

This information request is issued by the administering authority under section 140 of the Environmental Protection Act 1994 to request further information needed to assess an amendment application for a site-specific environmental authority.

To: Peabody Coppabella Pty Ltd Level 14, 31 Duncan Street Fortitude Valley, QLD 4006 By email transmission only

ATTN: Marianne Gibbons, Brad Cartwright

Email:MGibbons@peabodyenergy.com,BCartwright@peabodyenergy.com

Our reference: EPML00579213

# Further information is required to assess an amendment application for environmental authority

# 1. Application details

The amendment application for a site-specific environmental authority was received by the administering authority on 16 February 2024.

The application reference number is: A-EA-AMD-100600739

Land description: ML70161, ML70163, ML70164, ML70236 ML70237, PL1015.

#### 2. Information request

The administering authority has considered the abovementioned application and is writing to inform you that further information is required to assess the application (an information request).

The information requested is provided in **Appendix A – Information requested.** 



#### 3. Actions

The abovementioned application will lapse unless you respond by giving the administering authority -

- (a) all of the information requested; or
- (b) part of the information requested together with a written notice asking the authority to proceed with the assessment of the application; or
- (c) a written notice
  - i. stating that you do not intend to supply any of the information requested; and
  - ii. asking the administering authority to proceed with the assessment of the application.

A response to the information requested must be provided by **28 November 2024** (the information response period). If you wish to extend the information response period, a request to extend the period must be made at least 10 business days before the last day of the information response period.

The response to this information request or a request to extend the information response period can be submitted to the administering authority by email to CRMining@des.qld.gov.au.

If the information provided in response to this information request is still not adequate for the administering authority to make a decision, your application may be refused as a result of section 176 of the *Environmental Protection Act 1994*, where the administering authority must have regard to any response given for an information request.

#### 4. Human rights

A human rights assessment was carried out in relation to this decision and it was determined that no human rights are engaged by the decision.

#### 5. Review and appeal rights

You may apply to the administering authority for a review of this decision within 10 business days after receiving this notice. Information about your review rights is attached to this notice or search 'DESI Internal review and appeals' at business.qld.gov.au. This information is guidance only and you may have other legal rights and obligations.

If you require more information, please contact Saranne Giudice on the telephone number listed below.



Alisha Stewart
Department of Environment, Science and Innovation
Delegate of the administering authority
Environmental Protection Act 1994

**Enquiries:** 

Business Centre Coal PO Box 3028, Emerald QLD 4720

Phone: (07) 4987 9320

Email: CRMining@des.qld.gov.au

Requested Action/s	- Provide justification demonstrating why land use within ML70164, ML70161 and ML70237 has been determined to be permitted without further Commonwealth Government approval Clarify what documents are being relied upon to demonstrate a preapproved impact to the Humbug Gully area.
DESI Comment	Section 7.9.2.1 of the EA amendment application supporting information document states "Feabody has determined that land use within ML70164, ML70164 and ML70237 is permitted without further Commonwealth Government and Queensland State Government approvar."  Figure 2.1 – General Arrangement and Life of Mine Plan in the Environmental Management Overview Strategy (EMOS), June 2002, does not include disturbance to land in the Humbug Gully Creek area.  The figure 2.1 – General Arrangement and Life of Mine Plan.  EMOS, Figure 2.1 - General Arrangement and Life of Mine Plan.
Matter of Interest	Land use approval
No.	₹

Disturbance footprint

The EA amendment application supporting information document and technical appendices have provided limited information about the area of land that will be disturbed by the proposed amendment.

The EA amendment application supporting information document provides Figure 1 – *Proposed disturbance*, which depicts the domains of disturbance.

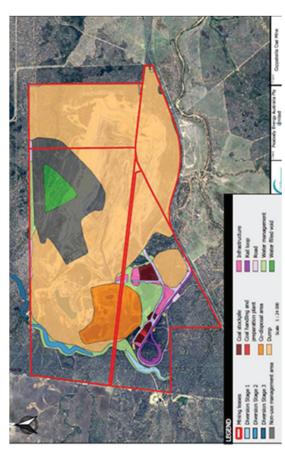


Figure 1 – Proposed disturbance

However, according to Table C1 – *Final land use and rehabilitation approval schedule* in the current EA, the total authorised disturbance footprint is 2,390ha. The projective surface area (ha) for undisturbed land is 1,753ha, which is approximately 42% of the total area. The proposed disturbance depicted in Figure 1 appears to be of a larger area than authorised in the EA.

Table C1 - Final land use and rehabilitation approval schedule

Projective surface area	(ha)
Disturbance type	

- Provide the area (ha) of all proposed land disturbance associated with the amendment (on all the mining leases to which EPML00579213 relates) including:
  - The proposed residual void.
- The Humbug Gully Creek diversion and associated water management landforms.
- Land which will be disturbed by using as waste rock dump.
- Total area of disturbance proposed.
- Undisturbed area.
- Provide an updated disturbance map for the EA.

o Impact areas for each MNES	ge - Provide details of the current annual extraction rate for Coppabella Coal Mine Provide details of any proposed increase of the current annual extraction rate from the proposed amendment.  ly in amendment.  Clarify whether the anticipated ~33.4Mt (ROM) will be from ML70164 and/or ML associated with the	of the
	It is unclear if the proposed amendment will result in an increase in annual tonnage and production.  Section 5.1.1.3 of the EA amendment application supporting information document states "Stage 3 diversion works will have the following benefits:  • enables mining of economic resource beyond the current Humbug Gully, with ~33.4Mt (ROM) at 10:1 ratio at an estimated yield of 75 % which provides opportunity for improved outcomes from current mining"  It is not clear whether the above statement refers to mining through Humbug Gully in ML70164, or the Johnson Extended Project in MLs 70384, 70385, 70386 and 70387.	Figure 1 – <i>Proposed disturbance</i> , depicts the overburden dump location as adjacent to the eastern mining lease boundaries on ML70236 and the southern mining lease boundary on ML70237 which is adjacent to the Peak Downs Highway. This could hinder future landform re-structuring, shaping or battering, rehabilitation and maintenance activities.    Proposed disturbance   Figure 1 – proposed disturbance   Proposed
	ROM	Overburden dump
	4.	ശ്

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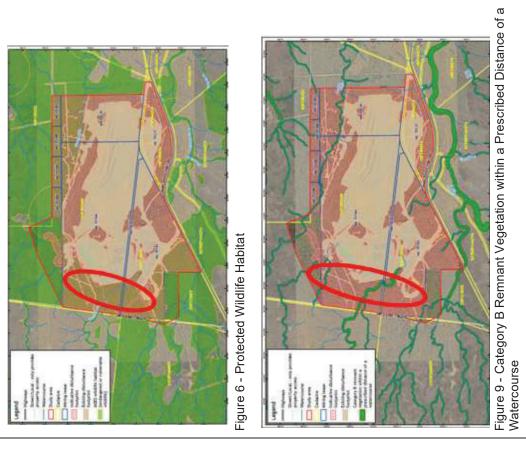
Figure 3 – *MSES Vegetation*, Appendix H, Desktop Assessment for Prescribed Environmental Matters at Coppabella Mine, submitted with the EA amendment application depicts MSES vegetation on ML70161 in the proposed location of the creek diversion and associated water management landforms. Figure 6 – *Protected Wildlife Habitat* and Figure 9 – *Category B Remnant Vegetation within a Prescribed Distance of a Watercourse* in the same document also depict MSES wildlife habitat and Category B Remnant Vegetation within a Prescribed Distance of a Watercourse on ML70161 and ML70164 in the proposed location of the creek diversion and associated water management landforms.

Provide details in regard to the relative risks and likely magnitude of impacts on environmental values in the location of the Humbug Gully Creek diversion.

A description of impacts from the proposed amendment on the environmental values of land in the location of the Humbug Gully Creek diversion was not provided in the amendment application.



Figure 3 – MSES Vegetation



Page 8 of 20 • ESR/2016/3447 • Version 4.01 • Last reviewed: 06 FEB 2024

7.	Impacts to	Location of residual void	Location of residual void
	presdibed environmental matters	Appendix G – Coppabella Mine Continuation Project – Secondary Study Area – Terrestrial Ecology, 19 January 2024 submitted with the EA amendment application lists the following disturbance of key matters in the proposed location of the residual void:	- Provide additional details of avoidance and mitigation measures that may reduce the significant residual
		• MNES – Threatened ecological communities 47.07ha - RE 11.5.16 (Endangered) (Brigalow TEC)	impact Where impacts are unable to be avoided or suitably
		<ul> <li>MSES – Regulated vegetation</li> <li>47.27ha - Category B ESA (Endangered RE 11.5.16)</li> <li>11.25ha - RE within defined distance of a watercourse (Endangered) 119.10ha - Essential habitat</li> </ul>	mitigated, provide details of an environmental offset approach to counterbalance the significant residual impact of the prescribed activity on
		MNES and MSES – habitat for threatened species     133.96ha - Fork-tailed swift (Apus pacificus)     76.45ha – Greater glider (south and central) (Calyptorhynchus lathami)     76.45ha – Koala (Phascolarctos cinereus)	the prescribed environmental matters. This must include an assessment of the availability of the necessary offset
		29.00na – Ornamental shake ( <i>Demsonia maculata</i> ) 129.66ha – Short beaked echidna ( <i>Tachyglossus aculeatus</i> ) 65.49ha – Squatter pigeon (southern) ( <i>Geophaps scripta scripta</i> ) 133.96ha – White-throated needletail ( <i>Hirundapus caudacutus</i> ) The glossy black cockatoo (northern) ( <i>Calyptorhynchus lathami erebus</i> ) is also considered likely to occur within the proposed location for the residual void, with	Location of Humbug Gully diversion  - Provide details of potential
		In addition, the above report describes the area of the proposed residual void as largely supporting remnant Eucalypt and Acacia woodlands that are connected to expansive tracts of similar vegetation communities to the north, east and west. Accordingly, the area of the proposed residual void has a role in supporting biodiversity values at both local and regional scales. Areas of watercourse will be directly impacted and artificially modified. Vegetation along these watercourses and drainage features provide connectivity between areas of preferred habitat. Vegetation clearing in the location of the proposed residual void is likely to fragment habitat and result in the loss of connectivity values associated with this riparian corridor.	impacts to prescribed environmental matters from the Humbug Gully Creek diversion.

			- Provide the aquatic ecology report.	- Clarify when further investigations to assess the hydrological impact of the diversion on downstream vegetation and fauna will be undertaken.	
There will be cumulative impacts on essential habitat through the loss of vegetation from clearing the adjacent ML70236 to allow for the overburden dump (these impacts are being assessed through an EPBC referral).  Activities associated with the EA amendment will result in a significant residual impact on prescribed environmental matters, both directly and indirectly. However, the amendment application supporting information document references the Environmental Management Overview Strategy (EMOS) 2002 for a description of the environmental values of land which states that there are no Category A or Category B environmentally sensitive areas in close proximity to the mine.	Location of Humbug Gully diversion The area of prescribed matters impacted from the Humbug Gully Creek diversion is unclear.	Impacts to prescribed environmental matters from the proposed amendment must be considered for all mining leases associated with EPML00579213.	The EA amendment application and supporting documents provided limited information on potential impacts to aquatic species from the proposed Humbug Gully Creek diversion.	Appendix F – Coppabella Mine Project - MNES terrestrial ecology report, 13 February 2024, states "only terrestrial GDEs are included in the report and aquatic and subterranean GDEs were assessed as part of the aquatic ecology assessment". Appendix B of the above document – Likelihood of Occurrence Assessment also states "aquatic species including Elseya albagula and Rheodytes leukops are considered in the aquatic ecology report".	The proposed diversion will redirect water away from an extended area of riparian vegetation downstream of the diversion which acts as both connectivity and a significant foraging resource for a diversity of fauna including threatened species. Appendix F – MNES Terrestrial Ecology Report, 13 February 2024, recommends that further investigation will be required to assess and estimate this hydrological impact.
			Aquatic ecology		
			<u></u>		

9 9 C	ularly plan is being developed. assess - Explain how impacts to GDEs will be monitored.	ociated oring , , of the	- Clarify whether a consultation process has been completed or planned to inform the Native Title holders of:    O	0 o
GDE mapping provided in Appendix H, Desktop Assessment for Prescribed Environmental Matters at Coppabella Mine, shows there are no terrestrial GDEs in the area of the proposed residual void or the proposed area of the diversion, however, the proposed diversion of surface flows on Humbug Gully Creek may have a downstream influence on surface flow volumes to the east, where fringing riparian habitats are identified as high potential Terrestrial GDEs and supporting habitat for MNES and MSES threatened fauna.	assessment of impacts to groundwater and associated. I errestrial GDEs, particularly along Humbug Gully and associated floodplains, will be required to adequately assess impacts on Terrestrial GDEs and associated habitat for MNES fauna species (in particular greater glider and koala).	Section 6.1.2.3 of Appendix F, MNES Terrestrial Ecology Report, also states that effective management/mitigation of Project impacts on terrestrial GDEs and associated MNES will require development of a Groundwater Dependent Ecosystem Monitoring and Management Plan, including annual monitoring of groundwater quality and potential drawdown to identify trends and changes over time in terrestrial GDEs, vegetation and habitat, within the predicted drawdown extent and downstream of the Project.	Section 7.5.1 of the EA amendment application supporting information document states that "the mine is located on land with a Native Title claim determination", however, Section 4.3 of the document states the extent to which the NUMA is consistent with the outcome of community consultation is "consultation has been undertaken with affected landholders (such as underlying and adjoining land holders, and holders of land necessary for access to land to which the proposed amendment relates)".	The EA amendment application has not provided any details regarding consultation with the Native Title holders or a Cultural Heritage Management Plan (CHMP) or Memorandum of Understanding (MOU) that is in place.  Considering that input from Aboriginal people is specifically mentioned in Table C1 – Final land use and rehabilitation approval schedule of the current EA, and that the amendment proposes to change the post-mining land use of the residual voids to a
Ground water dependant ecosystems			Consultation Consultation	
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voids complementary to the post-mine land use of the surrounding land" to a NUMA	- Provide justification as to why the low wall cannot sustain a PMLU. It is considered best practice that low walls are rehabilitated, and proposed as a PMLU where possible.  - Clarify how measuring and monitoring the surface area of the pit lake water would be undertaken to stay within the interpreted requirement of 80ha during operations and post mine closure.
non-use management area (NUMA), consultation with the Native Title holders is necessary to ensure impacts to cultural and spiritual values are considered.	Table C1 – Residual Void Design, and Table C3 – Final land use and rehabilitation approval schedule of the current EA have been interpreted to mean that 80ha is the total maximum surface area of <b>water</b> in the residual voids. Other parts of the void (high wall, low wall, end wall etc) have not been listed separately in the table. If the low wall is under 25% (4H:1V) it could readily support a PMLU.
	Final Residual Void
	<del></del>

Table C1 - Final land use and rehabilitation approval schedule

Establish a landform and revegetate with native species with input from Aborignal people, the objective being to develop a conservation area useful to Aborignal people.  Establish pasture species to control erosion initially and thereafter develop a self-sustaining native ecosystem.  Establish a landform and revegetate with native species with input from Aborignal people, the objective being to develop a conservation area useful to Aborignal people.  Establish a landform and revegetate with native especies with input from Aborignal people, the objective being to develop a conservation area useful to Aborignal people.  Establish a landform and revegetate with native and thereafter develop a self-sustaining and see of the surround land.  Establish a landform and revegetate with native species with input from Aborignal people.  Establish a landform and revegetate with native species with input from Aborignal people.  Establish a landform and revegetate with native species with input from Aborignal people.  Establish a landform and revegetate with native species with input from Aborignal people.  Establish a landform and revegetate with native species with input from Aborignal people.  Establish a landform and revegetate with native species with input from Aborignal people.	Suitability	Class 4	Class 5	Class 4	Class 4	Class 5	Class 5	Class 4	Class 4	Class 4				Void maximum surface area (ha)	20	30	20	10
			ontrol erosion initially self-sustaining	egetate with native Aborginal people,the a conservation area	egetate with native Aboriginal people,the a conservation area	ontrol erosion initially self-sustaining	tary to the post-mine	egetate with native Aboriginal people, a conservation area	egetate with native Aboriginal people. o a conservation area	egetate with native Aboriginal people, p a conservation area				Void wall – low Vo	Between 1V:3H – 1V:4H	Between 1V:3H – 1V:4H	Between 1V:3H – 1V:4H	Between 1V:3H – 1V:4H
	Post-mine land de	Establish a landform and rev species with input from A subjective being to develop isserti to Aboriginal becople.	stablish pasture species to co and thereafter develop a native ecosystem.	Establish a landform and reverses with input from A objective being to develop a seful to Aboriginal people.	Establish a landform and rev species with input from A objective being to develop a useful to Aboriginal people.	stablish pasture species to co and thereafter develop a native ecosystem.	Vater filled voids complement and use of the surround land.	Establish a landform and rev species with input from A the objective being to develop useful to Aboriginal people.	Establish a landform and rev species with input from A species with input from A specially be objective being to develop useful to Aboriginal people.	Establish a landform and rev species with input from # the objective being to develop useful to Aboriginal people.				Void wall - competent rock slope highwall (%)	10V:1H	10V:1H	10V:1H	10V:1H
	Projective surface area										1753	4143	void design	Void wall				
ce type		Elevated landform (overburden)	- lower slopes	- access tracks and haul roads	Elevated landform (co- disposal) - upper surface	sadols -	Residual Voids	Rail Loop	CHPP General Area	Water Management Structures	Undisturbed	Total	Table C3 - Residual void design	Void Identification	Creek Pit	Johnson Pit	South Pit	East Pit

The application proposes one (1) residual void with a maximum surface area of water of 80ha, however when the domains of low wall, end wall, high wall, abandonment bund (and bund offset) are included in addition to the water surface area of 80ha, the proposed residual void will be 460ha.

The application supporting information document references the Water Management Plan (WMP) version 5 (deemed a LOD on 19 April 2022 as part of the transitional PRCP process) – which states that "the 'projective surface area' assigned for 'Residual Voids' in EA Table C1, includes approximately 80ha, which comprises the pit lake surface area of the voids (rather than the cross-sectional area at the top of the voids and the areas of low walls, end walls and high walls)".

The application does not provide information on how the surface area of the water would be measured and monitored for compliance with the EA during operations and post-closure.

The document further states that "Given the area and location of the Residual Voids and other landforms noted in the EMOS, it is clear that there was no intention to rehabilitate the high walls or low walls below OGL. The projected area for these features at the end of the mine life is provided in Table 10-3. These further disturbance areas are not inconsistent with EA Table C1. The high walls and low walls are dealt with elsewhere in the EA".

Table 10-3: Below Original Ground Level Disturbance Categories Omitted from EA

Below OGL Disturbance Categories Omitted from EA Table C1	Approximate Projected Disturbance (ha)
ligh wall Areas (inclusive of end walls)	158
V:3H Internal Slopes below OGL to Water level	228
TOTAL	386

However, page 47 of the EMOS states that "the approximate area for residual voids that will be rehabilitated is 80ha". The WMP also states that these residual voids will have a purpose of water use for the area - water filled voids complementary to the post-mining land use of the surrounding land.

The location of the residual voids and other landforms are substantially different from what is proposed in the amendment application. The WMP describes that at the cessation of mining there will be three voids containing water; Johnson Pit (previously

in om a a an		1	Provide justification to	demonstrate why the low wall	minimise the extent of the	NOIMA.	<ul> <li>Clarify the area of the proposed NUMA that is the residual void.</li> </ul>		
Pit. Therefore, the references EA. scribes surface water runoff from allowed to run into the pit vithe final highwall, to be orks. The document describes sion drain around the northern	e would be measured and of water surface area would be vould be placed as the site map nd eastern mining lease	on document states that "where applying topsoil, ripping and odelling for predicted long-term he assumptions around the	cenarios.	Void Scenario 2	15.9	48.7	6.5	65	100
Pit West and Creek rs in Table C3 of the many part, de orth of the void as being and form design of the void establishment wo be to develop a diversity.	er area of the pit lake ted authorised 80ha or re diversion drains want to the northern ar	ant application supporting informations will be rehabilitated by profiling, usses two (2) scenarios for void momes and surface area that differ in tegetation within the final void (s).	differences between the 2 void scenarios.	Void Scenario 1	43.9	81	6.5	86	460
South Pit and East Pit), Johnson Pit West and Creek Pit. Therefore, the references in the WMP differ from the identifiers in Table C3 of the EA.  Residual Void structures  Appendix A, Coppabella Landform Design Report, describes surface water runoff from the off-lease catchment to the north of the void as being allowed to run into the pit via a drop structure integrated into the landform design of the final highwall, to be constructed as part of the final void establishment works. The document describes an alternative to this structure may be to develop a diversion drain around the northern and eastern lease boundaries.	It is unclear how the surface water area of the pit lake would be measured and monitored to ensure the interpreted authorised 80ha of water surface area would be compliant. It is also unclear where diversion drains would be placed as the site map shows overburden dumps adjacent to the northern and eastern mining lease boundaries.	The EA amendment application supporting information document states that "where applicable, low walls will be rehabilitated by profiling, applying topsoil, ripping and seeding" and discusses two (2) scenarios for void modelling for predicted long-term water levels, volumes and surface area that differ in the assumptions around the establishment of vegetation within the final void (s).	Summary of the differences be		Volume (GL)	Water Level (mAHD)	Elevation at the lowest point (mAHD)	Water surface area (ha)	Final Void (ha)
		NUMA 8				1		1	•
		15.							

						- Provide a mine plan of historical mining at Coppabella to support the	assessment of pre-mining groundwater levels Provide a mine plan of future mining at Connahalla to	support the understanding of future mining impacts on	groundwater levels.
			mall as rio 2 ng	e to e to nation		009 f the	east to	f likely	els. ikely
360	370	20,895	use management areas (NUMAs) should have a footprint as small and environmental risk and future liability. It is unclear why scenario 2 sidered as a potential final landform in the application supporting nent or appendices.	document states "The propable to support a PMLU du cosure these areas will be to be complementary with pplication supporting informal void(s) that is unable to nd wall, highwall and	d is unclear.	rels. undwater levels in about 20 vater levels in some parts o	no historical mine plan presented. Section 5.5.2 states: operation since 1998 and mining has progressed in a general east to successive string mined towards the North-Northeast	hich to assess the timing on is required to support	ore-mining groundwater levoovide an understanding of l
0	370	9,666	ent areas (NUMAs) s I risk and future liabil tential final landform ices.	oporting information of coid (~460 ha) is not fold (~460 ha) is not fold waver, upon class and managed; section 4.2 of the and he area of the residule pit lake, low wall, eviate offset".	UMA and the area to be rehabilitated is unclear.	ning groundwater leves to indicate that gro	no historical mine plan presented. Section 5.5.2 states operation since 1998 and mining has progressed in a concressive strips mined towards the North-Northeast	tle information with w This sort of informatic	ter levels represent p so be provided to pr
Rehabilitation area (ha)	Infiltration/seepage area (ha)	Average salinity 100 years post mining (µS/cm)	All proposed non-use management areas (NUMAs) should have a footprint as small as practicable to limit environmental risk and future liability. It is unclear why scenario 2 has not been considered as a potential final landform in the application supporting information document or appendices.	Section 6.0 of the application supporting information document states "The proposed catchment area reporting to the void (~460 ha) is not able to support a PMLU due to average slope constraints (1V:3H). However, upon closure these areas will be rehabilitated as detailed in Section 4.5 and managed to be complementary with surrounding land use". However, section 4.2 of the application supporting information document states "The NUMA is the area of the residual void(s) that is unable to support a PMLU and includes the pit lake, low wall, end wall, highwall and abandonment bund with appropriate offset".	The area of the NUMA and the a	Section 5.2.2.2 discusses pre-mining groundwater levels.  Elsewhere in the report it appears to indicate that groundwater levels in about 2009 could be considered to represent pre-mining groundwater levels in some parts of the	mine. There is however, no historical m CCM has been in operation since	However, beyond that there is little information with which to assess the timing of likely historical groundwater impacts. This sort of information is required to support	assessments of which groundwater levels represent pre-mining groundwater levels. Details of future mining should also be provided to provide an understanding of likely future impacts of mining.
						Groundwater Modelling	Appendix C, Groundwater Final Void Assessment Report Section	5.2.2.2 Recharge and Discharge	
						13.			

14.	Groundwater Modelling	It is difficult to reconcile some of the differences between these figures, perhaps because of the alignment of the sections.  There is no map showing the locations of these sections, which needs to be	Provide a map to show the location of the cross sections.  Review the validity of the information of the cross sections.	
	Groundwater Final Void Assessment	In Figure 7-1 the current topography appears to be about 40 m above the top of MB5. In Figure 7-2 the current topography appears to be below the bottom of MB5.	7-1 and 7-2.	
	Report, Section7.5 Conceptual Model	Additionally in Figure 7-2 the current topography appears to be down to the coal seam in the area south of MB5, but this existing deep cut area will not be part of the final void		
	and Key	or backfilled. These items are confusing to interpret.		
	Considerations of the Project, Figures 7-1 and 7-2	Whilst it is accepted that these are conceptual models, some of these basic issues should be addressed.		
15.	Groundwater	An analytical groundwater model (Marinelli and Niccoli (2000)) to predict inflows to the	- Provide a numerical	_
	Modelling	final void and the extent of impacts (distance from residual void but not drawdown	groundwater model to	
		levels) to groundwater has been provided. The model has been used to represent two	adequately understand the impacts of the mining and	
		georgic dring (1 ching) interpart of and 1 ching) coal scans).  The modelling does not:	residual void on groundwater	
		<ul> <li>include the linkages between the two Permian units or with the overlying Tertiary</li> </ul>	levels in these various	
		Sediments.	geologic units and the	
		<ul> <li>incorporate the impacts of historical and future mining (except for the single void represented at Connabella)</li> </ul>	contributions of the various deologic units to the residual	
		represent the impacts of the Johnson Extended Project undergrand mine and the	Void	
			3	
		<ul> <li>incorporate the impacts of the partial backfilling of voids with spoil.</li> </ul>		
		<ul> <li>provide predictions of the level of drawdown in the various geologic units during</li> </ul>		
		and post mining.		
		The model is unable to predictionly term groundwater levels as a numerical aroundwater model would therefore the long-term void water level predicted by the		
		surface water model has been compared with pre mining groundwater levels.		
		As the analytical model is also unable to model the impacts of spoil (backfill) on		
		groundwater inflow to the residual void, it has been included in the surface water model		
		as infiltration/ seepage. However, limited detail is provided for the characteristics		
		assumed for the spoil and the contribution of water predicted from the spoil to the		
		There has been a significant change to the configuration of the residual void/s and		
		therefore potential localised impacts since the AGE 2010 numerical groundwater model		
		was developed.		

		There is also no allowance for the Johnson Extended project underground mine in the AGE 2010 model.	
16.	Appendix C, Groundwater Final Void Assessment Report, Section 5.2.1.1 Groundwater Distribution and Flow Figure 5-7	In this figure water levels are plotted for selected Tertiary Sediments and Permian monitoring bores.  It is noted that some individual measurements (outliers) appear to be between 2 and 6m different to the majority of the measurements for that particular bore. This appears to be the case for monitoring bores MB1, MB2 and MB4. Is it possible that these different measurements are manual measurements that are not aligning with logger data.  If that is the case, there may be some issues with some of the data presented.	Review the water level measurements presented in Figure 5-7 and provide comment on the outliers for monitoring bores MB1, MB2 and MB4.
77.	Appendix C, Groundwater Final Void Assessment Report, Section 8.1.2 Model Design	This section states:  It is considered that the Tertiary aquifer has been dewatered during current mining activity. The groundwater model developed by AGE (2010) confirmed this showing groundwater levels as depressurised. The inflow component from the Tertiary aquifer is minimal and ignored.  It is noted in Figure 5-7 that the measured groundwater levels in Tertiary monitoring bore MB2 appear to be about 190 to 191 m AHD, up to about 2022. This compares with a bottom of screens in the bore at 184.7 m. This represents a depth of water of about 6.3 m in this bore.  It is also noted that MB11, a Tertiary monitoring bore, is said to be dry at 181.75 m AHD (Table 5-1) when the base of the screen is said to be at 173.4 m AHD. It would appear that this bore may have been blocked. Based on the groundwater level stored on the groundwater database the water level in 2009 when drilled was about 180.8 m AHD. The depth of water at that time in this bore was about 7.4 m.  There is therefore evidence that there is some water in the deeper Tertiary bores. Whilst there may have been some reduction in water levels in some Tertiary bores close to the pits (although not particularly evident in Figure 5-7 for MB2) it is likely these will at least partially recover post mining and play a role in understanding post mining groundwater impacts.  It is also important to include the Tertiary Sediments aquifer in any modelling to understand the impacts of mining and post mining on that aquifer and any receptors that may rely on that aquifer.	In updated groundwater modelling include an assessment of impacts to all geologic units potentially impacted by mining and post mining activities.

- Review the location and extent of the void and infiltration catchment on Figure 4-5.	- Review the wording in section 4.5 in relation to the reducing seepage of water from the voids over time as groundwater levels recover.	- Provide discussion as to how the process of assumed groundwater inflow and the lack of an iteration process between the groundwater assessment and the surface water assessment has impacted the predictions of void water levels and groundwater levels.	<ul> <li>Identify the GHG emissions likely to be generated through the life of the project, in particular the emissions as a result of the amendment.</li> <li>Determine the emission category of the project, with respect to the amendment being sought.</li> <li>Identify all proposed management practices</li> </ul>
It appears that the overlay for the void and the infiltration catchment to the void, does not line up with the existing pits on the imagery in the background.	In this section Figure 4-7 provides Inflow vs Pit Lake (i.e. Final Void) Water Levels. However, the text under Figure 4-7 states:  Generally, the rate at which water is expected to seep from the voids reduces over time as the groundwater levels recover.  It is assumed that this sentence is an error given the assessment does not appear to predict seepage of water from the void to groundwater.	This section states:  The model is based on a single assumed inflow water level relationship which was derived utilising an analytical method. No iteration between the groundwater analysis and results of this assessment have been undertaken.  It is noted that there is no discussion as to how this has potentially impacted the prediction of both void water level and groundwater levels.	The EA amendment application supporting document and technical appendices do not consider greenhouse gas emissions. Section 7.6 – Air of the application supporting document only considers particulate emissions from operations including haulage on unsealed roads, mining, conveyors, infrequent blasting and wind action on stockpiles prior to revegetation.  Section 226A of the Environmental Protection Act 1994 includes the requirement for amendment applications to provide an assessment of the likely impact of each relevant activity on environmental values, including details onf any emissions or releases likely to be generated by each relevant activity, and the management practices proposed to be implemented to prevent or minimise emissions and adverse impacts.
Appendix D, Surface Water Final Void Assessment report, Section 4.3 Catchment Areas, Figure 4-5	Appendix D, Surface Water Final Void Assessment report, Section 4.5 Groundwater Interaction, Figure 4-7	Appendix D, Surface Water Final Void Assessment report, Section 5.5 Limitations of the Assessment	Greenhouse gas (GHG) emissions
<del>8</del>	19.	20.	21.



# Appendix B



# 浆SLR

# Coppabella Coal Mine – Environmental Authority Amendment

# **Surface Water Final Void Assessment Report**

# **Peabody Energy**

Level 14, 31 Duncan St, Fortitude Valley, Queensland 4006

Prepared by:

#### **SLR Consulting Australia**

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SLR Project No.: 640.030987.00001

13 August 2025

Revision: 4.0

#### **Revision Record**

Revision	Date	Prepared By	Checked By	Authorised By
V1.0	6 February 2024	Samantha Sam	Nadja Kunz	Fiona Stark
V2.0	12 February 2024	Samantha Sam	Fiona Stark	Fiona Stark
V3.0	13 February 2024	Samantha Sam	Fiona Stark	Fiona Stark
V4.0	13 August 2025 (addressing an Information request for the EA amendment)	Ines Epari	Fiona Stark	Fiona Stark

# **Basis of Report**

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care, and diligence, taking account of the timescale and resources allocated to it by agreement with Peabody Energy (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.



# **Table of Contents**

Bas	sis of Report	ii
1.0	Introduction	1
1.1	Scope of Work	1
1.2	Relevant Legislation	1
1.2.	1 EPA Guideline Considerations	1
1.3	Site Information	2
1.4	Document Structure	4
2.0	Project Data	5
2.1	Available Data	5
2.2	Final Landform	5
3.0	Flood Risk Assessment	7
4.0	Water Balance Modelling	10
4.1	Methodology	10
4.1.	1 Conceptual Model	10
4.1.2	2 Key Statistics	11
4.1.3	3 Simulation Period	11
4.2	Climate	11
4.2.	1 Rainfall	11
4.2.2	2 Probabilistic Rainfall Generation	12
4.2.3	3 Evaporation Rates	14
4.3	Catchment Areas	14
4.4	Runoff Modelling	17
4.5	Groundwater Interaction	18
4.6	Storage	18
4.6.	1 Void	18
4.7	Water Quality	19
5.0	Results	21
5.1	Residual Water Body – Volume and Water Levels	21
5.1.	1 Scenario 1	21
5.1.2	2 Scenario 2	22
5.2	Water Quality	23
5.3	Sensitivity Analysis	25
5.3.	1 AWBM	25
5.3.2	2 Groundwater	25



5.3.3	3 Climate Change	25
5.4	WBM Risk Assessment	26
5.5	Limitations of the Assessment	26
6.0	Conclusion	28
7.0	References	29
Tal	bles in Text	
Tabl	le 2-1: Final Void Details	5
Tabl	le 4-1: Rainfall Gauge Data	12
Tabl	le 4-2: Adopted Evaporation Rates	14
	le 4-3: Summary of Land use within the Void and its surrounding catchment	
Tabl	le 4-4: Adopted AWBM Parameters	17
	le 5-1: Simulated water levels and water volumes in residual voids (Percentile Resu	ılts)
Tabl	le 5-2: Simulated Size and Permanence of the Final Void (median results)	
Tabl	le 5-3: Simulated Long-Term Median Salinity of the Final Void	25
	le 5-4: Residual Void Risk Assessment Summary	
Fig	gures in Text	
Figu	re 1-1:Project Location	3
Figu	re 2-1:Void Location in Relation to the Proposed Rehabilitated Area	6
Figu	re 3-1:Stream Order Final Void	8
Figu	re 3-2:PMF Harrybrandt Creek (Neilly, 2019)	9
Figu	re 4-1:Conceptual Model of Typical Residual Void	11
Figu	re 4-2:Comparison of Rainfall Records – Daily Average	12
Figu	re 4-3:Stochastic and Historical Data Comparison - Annual Rainfall	13
Figu	ıre 4-4:Probabilistic and Historical Data Comparison – Daily Maximum Rainfall	14
Figu	re 4-5:Catchment Reporting to the Void	16
Figu	re 4-6:Australian Water Balance Model Schematic	17
Figu	re 4-7:Inflow vs Pit Lake (i.e. Final Void) Water Levels	18
Figu	re 4-8:Stage Storage Curve for the Final Void	19
Figu	re 5-1:Scenario 1 - Residual Voids Simulated Volumes (Percentile Results)	22
Figu	re 5-2:Scenario 1 - Simulated Water Levels of the Final Void (Percentile Results)	22
Figu	re 5-3:Scenario 2 - Residual Voids Simulated Volumes (Percentile Results)	23
Figu	re 5-4:Scenario 2 - Simulated Water Levels of the Final Void (Percentile Results)	23



Figure 5-5:Scenario 1 - Simulated EC of the Final Void (median results)	24
Figure 5-6:Scenario 2 – Simulated EC of the Final Void (median results)	24



#### 1.0 Introduction

#### 1.1 Scope of Work

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Peabody Energy Australia Pty Ltd (Peabody) to support the preparation of the Coppabella Mine (the 'Project') Environmental Authority Amendment (EA Amendment). Peabody is seeking an amendment to their current EA EPML00579213 to nominate the final void as a non-use management area (NUMA) which includes:

- a change to the final landform and residual void location (Figure 2-1). There are currently four pits, and these pits are proposed to be merged to form a single pit void;
- nominate the final void as a non-use management area (NUMA) prior to submission of the PRC plan.

#### 1.2 Relevant Legislation

This assessment was undertaken in accordance with the following guidelines and documentation:

- Environmental Protection Act 1994;
- Environmental Protection Regulation 2019;

#### 1.2.1 EPA Guideline Considerations

As defined by section 111A of the EP Act 1994, land is in a stable condition if:

- the land is safe and structurally stable;
- there is no environmental harm being caused by anything on or in the land; and
- the land can sustain a Post Mining Land Use (PMLU).

If a void is proposed to be situated wholly or partially in a floodplain the void must be rehabilitated to a safe and stable landform that is able to sustain an approved PMLU that does not cause environmental harm (a stable condition).

Therefore, the intent of the surface water assessment is to:

- 1 Predict the long-term water levels of the final landform. This information can be used to assess the impact on the final landform stability and understand if there are sufficient resources to maintain or support the final land use;
- 2 Preliminary floodplain assessment to determine the flood risk; and
- 3 Assess whether the stored water is of appropriate quality to support the identified PMLU.

This is further outlined in Sections 3.6.1 and 3.6.3 of the PRCP Guideline which requires "detailing of the long-term water management requirements and void hydrology addressing the long-term water balance and water level in the voids, stratification, connections to groundwater resources and potential for overflow."

In a manner that is consistent with the requirements of Section 3.6.1 and 3.6.3, a final void water balance model was developed on the proposed final landform which incorporates all projected inflows, outflows, and recharge rates to model the long-term water balance and water quality of the void.



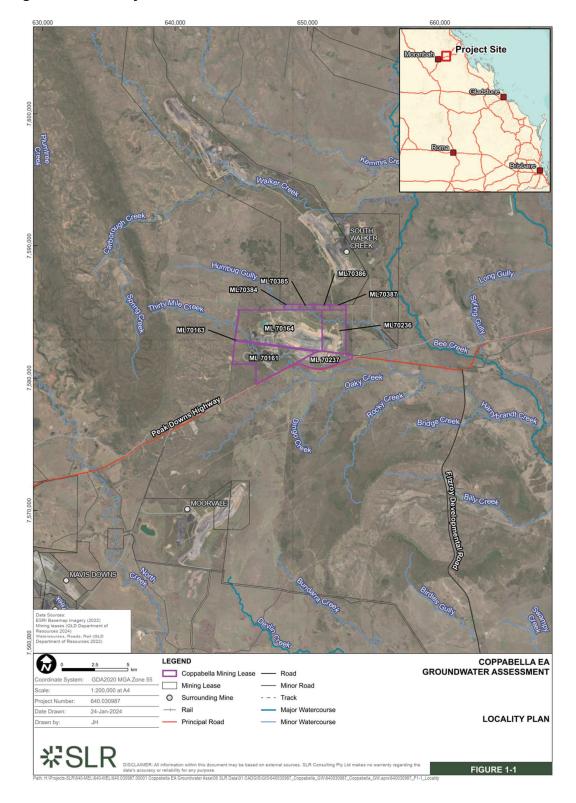
#### 1.3 Site Information

Coppabella Mine is an open cut coal mine located approximately 31 kilometres southwest of Nebo and 10 km east of the town of Coppabella in Queensland. The project is approved under Environmental Authority (EA) EPML00579213 (effective 13 April 2022) and mining leases ML70161, ML70163, ML70164, ML70236, ML70237, and PL1015. The project originally commenced in July 1998 with mining commencing in 2002. Currently, the mine lease at the Coppabella Mine expires in 2040.

The project location is shown below in Figure 1-1.



Figure 1-1: Locality Plan





#### 1.4 **Document Structure**

The structure of this report is set out as follows:

- **Section 1** Introduction, Relevant Legislation and Site Information
- Section 2 Project Data;
- Section 3 Water Balance Model Development;
- Section 4 Results;
- **Section 5** Summary of the Study and Conclusions.

Details of each component of the assessment are provided below.



#### **Project Data** 2.0

#### 2.1 Available Data

The following data sources for the assessment were provided by Coppabella Coal Mine:

- Final Void Study (Hatch 2016):
- Coppabella Water Balance (Jacobs, 2020); and
- LiDAR data dated Sept 2023.

A final void study was completed in 2016, using a different final landform with three voids. This landform differs from the current final void design which only retains one void at the time of closure. Hydrological water balance parameters were adopted from the previously calibrated final void model (Hatch, 2016) and operations water balance model (Jacobs, 2020).

Figure 4-8 shows stage-storage-surface area curves for the final void, which were derived from the final landform provided by Peabody. These curves were used to estimate the wetted surface area for each daily timestep simulated in the model based on the volume of water predicted to be contained within the void at each given time.

Additional data was obtained from publicly available sources for use in the development of the WBM. The data utilised in the assessment is as follows:

- Historical Rainfall and Evaporation data from Scientific Information for Landowners (SILO) database (Queensland Government, 2023).
- Ewater CRC Stochastic Climate Library (Ewater CRC 2018).

#### 2.2 **Final Landform**

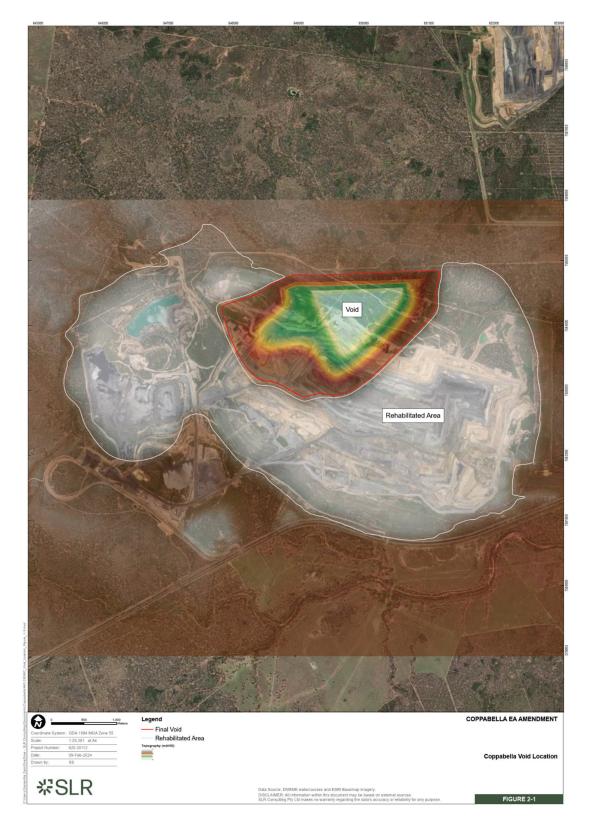
Currently, the Coppabella mine has four open cut pits, an out-of-pit, and in-pit spoil dump, stockpiles, a coal handling process plant (CHPP), and co-disposal with one final void expected to remain as a residual depression capable of storing water i.e., a pit lake. The arrangement of this final void in relation to the proposed rehabilitated area is summarized in Figure 2-1, with the details of the proposed final void outlined in Table 2-1.

Table 2-1: Final Void Details

Void	Pit Lake Storage Capacity (GL)	Final void Area (ha)	Overflow Level (m AHD)	Catchment Area (ha)	Base Level (m AHD)
Coppabella Void	402.9	460	220	460	6.5



Figure 2-1: Void Location in Relation to the Proposed Rehabilitated Area.





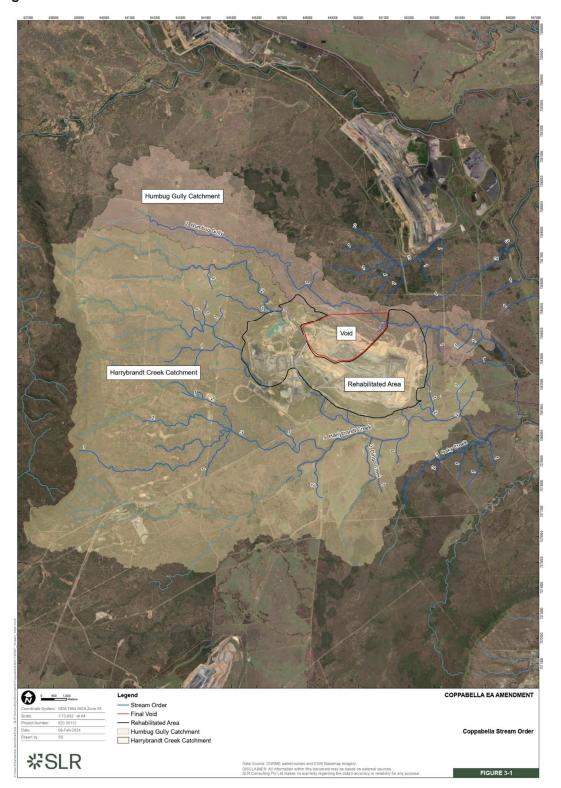
#### 3.0 Flood Risk Assessment

The project area is comprised of two catchments, Humbug Gully and Harrybrandt Creek Catchments as seen in **Figure 3-1**.

Section 3.4 of the PRCP guidelines requires that NUMA voids be located outside the premining condition 0.1% AEP flood extent for relevant watercourses (i.e. watercourses with Strahler Stream Order 4 or greater). Preliminary review of available watercourse data indicates that the only stream order higher than 4 is the Harrybrandt Creek with stream order 5, **Figure 3-1**.



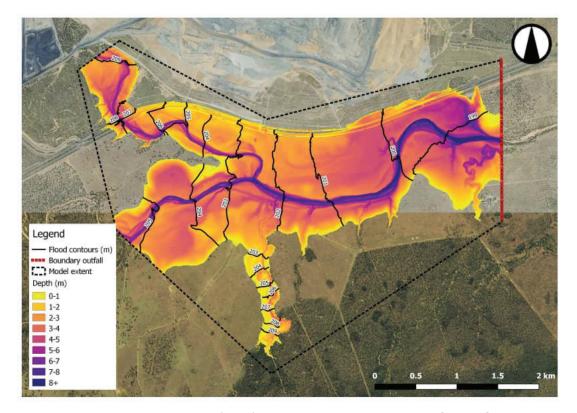
Figure 3-1: Stream Order Final Void





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Figure 3-2: PMF Harrybrandt Creek (Neilly, 2019)



The Probable Maximum Flood (PMF) Model, previously developed for the Coppabella Mine current pit by the Neilly Group in 2019, includes a hydrologic model and a hydraulic model. This model did not analyse the final landform design. According to that model, both the Humbug Gully and the Harrybrandt Creeks are unlikely to experience flood ingress during a PMF event. However, the North and South Arms of the Thirty Mile Creek are susceptible to significant inundation events. The modelled PMF flow in the Harrybrandt Creek is seen in **Figure 3-2** which will reach a maximum elevation of 209 m AHD which is lower than the crest of the void (220 mAHD). Consequently, flooding at this creek will have no discernible impact on the void. Further modelling should be completed in the PRCP for more detailed assessments.

Modelling of the pre-mining landform is not required for the purposes of this EA amendment, and a desktop review detailing the above is sufficient to support the consideration of the revised final landform void.



## 4.0 Water Balance Modelling

A Water Balance Model (WBM) was developed using the GoldSim software package (version 14.0) to determine the long-term water level and water quality of the residual void following the closure of Coppabella Mine. GoldSim is a software program developed by the GoldSim Technology Group which can analyse complex time-dependent systems and is capable of analysing stochastic systems resulting in probabilistic outcome ranges.

The model simulates daily changes in the volumes of stored water in response to inflows (rainfall, groundwater) and outflows (evaporation and controlled releases/overflows). The WBM was run at a daily time step over a 100-year simulation period and assessed under 500 varying climate sequences, allowing the model to predict long-term water levels, water quality, and the risk of overflow from the void. The model only considers salinity; however, it is representative of potential trends that might be expected for other water quality constituents (e.g. if salinity is accumulating, this is probably the case for other water quality components as well).

#### 4.1 Methodology

#### 4.1.1 Conceptual Model

A conceptual cross section of a typical residual void is provided in Figure 4-1.

As the groundwater levels recover, the saturated level in the backfill material will rise until a quasi-equilibrium is reached between the water level in the void and local groundwater levels.

The diagram shows the varying sources of water which may contribute to the void water body. These include:

- Direct rainfall on the waterbody (once established);
- Runoff from pit walls;
- Runoff from the rehabilitated catchment draining towards the void;
- Runoff from any natural catchment draining towards the void; and
- Groundwater inflow while the water levels in the void and spoils are lower than the surrounding water table.

Potential water losses from the void include:

- Evaporation, if an open water surface has established;
- If the water level in the void exceeds that of the surrounding water table, water can seep out from the void to the surrounding aquifer systems;
- Overtopping or spilling if the accumulated volume exceeds the storage capacity.

The assumed groundwater flows into the pit for this study were based on the analytical groundwater model produced by SLR, as described in the SLR Groundwater Report (SLR, 2024). Assumed interactions between surface-groundwater are further described in that report.



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indirect catchment direct catchment **RCH EVT** RCH EVT Processes Simulated in Water Balance Model Net Rainfall Runoff Recharge to Spoil Direct Rainfall Evap D SPOIL **VOID WATER BODY** Surrounding Natural Geology B -Groundwater flow from Groundwater Inflow Groundwater **Natural Geology to Spoil** via Natural Geology Inflow via Spoil

Figure 4-1: Conceptual Model of Typical Residual Void

#### 4.1.2 Key Statistics

A key component of the WBM is the variability of climatic conditions. The WBM is simulated with a range of rainfall conditions, statistically equivalent to the historic records, to allow for the calculation of percentiles of key model outputs. These percentiles represent the results range due to the variability in the climate. These percentiles can be interpreted as the chance of the statistic being exceeded. The results of the WBM focus on the 5<sup>th</sup> (very dry), 50<sup>th</sup> (median), and 95<sup>th</sup> percentile (very wet) conditions.

#### 4.1.3 Simulation Period

The final void WBM was simulated for two different time periods. Water levels within the voids and the water quality component of the model were predicted over a 100-year period (2040 – 2140) under 500 varying climatic sequences. This allowed assessment of long-term water levels, quality, and probable risk of overflow for each void.

#### 4.2 Climate

#### 4.2.1 Rainfall

Historical rainfall data was sourced for the site from the Scientific Information for Land Owners (SILO) database. The SILO database is hosted by the Queensland Department of Environment and Science (DES) developed in collaboration with the Bureau of Meteorology (BoM). SILO provides a continuous daily time series of data at either recording stations or grid points across Australia. The data consists of observational records with missing data interpolated from surrounding gauges. The grid consists entirely of interpolated estimates based on a 0.05° × 0.05° grid. The gridded data point for SILO data was selected from 1889 to present due to its correlations with nearby gauges and the length and quality of the gauged record. The centroid of the SILO grid selected was -21.85, 148.45 (Latitude/Longitude) based on the site location placed in Google Earth.

The Bureau of Meteorology (BoM) operates rainfall and evaporation gauges for several locations in the vicinity of the Project Site. A comparison was undertaken between the SILO gridded data and BoM historical rainfall records in the surrounding area, as listed in **Table** 



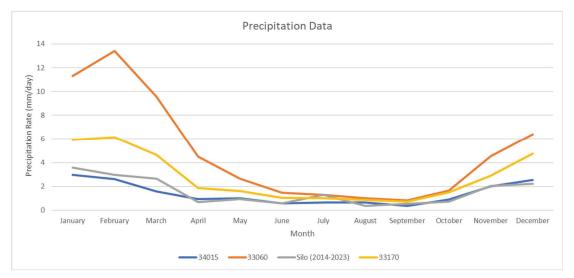
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**4-1** to determine the climate at the Site. The average daily rainfall rates for these stations are indicated in **Figure 4-2**. Annual precipitation ranges from 230mm to 1,316mm with a median rate of 577mm/year and a standard deviation of 212mm (Hatch, 2016).

Table 4-1: Rainfall Gauge Data

Gauge Number	BoM Name	Period	Elevation (mAHD)	Location (Latitude/ Longitude)	Distance & Direction from Site
33170	Mystery Park	1972-Open	40	-21.36, 149.37	114 km southwest
33060	Pleystowe Sugar Mill	1913-Open	27	-21.14, 149.04	126 km southwest
34015	Wentworth	1963-Open	225	-22.07, 147.72	70 km northeast

Figure 4-2: Comparison of Rainfall Records - Daily Average



Examining the water stream gauged data in **Figure 4-2**, it is evident that the SILO data closely relates to the Wentworth station (34015), deviating from where the other stations experience more rain. The proximity of the Wentworth station to the site and its similarity in elevation logically explains the close relationship between its values and those of SILO. The higher rates of precipitation in the Mystery Park station can be due to its location between the Glencoe State Forest and the Ocean which can geographically provide orographic condensation creating a rain shadow over that gauge area, this makes it less appropriate to use as a stream representation for the site. Since the SILO values are closely related to the closest and more representative stream gauge, it is concluded that the SILO data seems appropriate to be used to generate the probabilistic rainfall dataset.

#### 4.2.2 Probabilistic Rainfall Generation

Probabilistic climate data for the WBM was used to predict the rainfall at the site using the retrieved SILO rainfall data and the Stochastic Climate Library program (eWater CRC).

The purpose of probabilistic rainfall generation is to develop a wide range of climate sequences based on the recorded rainfall data of the area. These sequences have the same statistical characteristics of the historical data set for a range of parameters, including mean, variance, skew, and number of wet days or dry days. Each sequence has an order in which the rainfall has occurred. For example, one sequence may have wetter years at the start of



the sequence, whereas another sequence may have wetter years towards the end of the sequence. Some sequences may be wetter or drier than others in order to account for the variability of the climate which may occur after the Mine is rehabilitated. The probabilistic rainfall data replicates the seasonality of the rainfall data. This climate data does not reflect changes in the climate over the years, but rather variable future climates based on historical data.

From the SILO data (1923 to present), probabilistic rainfall data was produced for 500 replicates of 100-year rainfall data (50,000 years of probabilistic data). This allows a wide range of climatic conditions to be simulated, and the mean and median of the assessment are then summarized. The assessment also yields percentiles which are interpreted as a percentage exceedance probability (i.e., the risk of an event occurring).

The comparison shows a good correlation for typical rainfall conditions through most of the records, i.e. 99th percentile **Figure 4-3**. The probabilistic data representing extreme events (<5%) includes the representation of outlier years similar to those in the historical record but at a lower frequency. Since the purpose of this assessment is to develop an understanding of the long-term residual void water levels and qualities, which are primarily driven by averages and partially by seasonal or multi-year variances rather than outlier years, the probabilistic representative dataset can be considered appropriate for the analysis. Annual rainfall depths equivalent to and exceeding the wettest year on record (996.2 mm in 2010) are represented in the probabilistic dataset (the wettest simulated rainfall is 1114.3 mm) and thus any spills predicted results from a single outlier wet year (such as that historically recorded or even greater) will be observed in the modelling results. Similarly, dry years are adequately represented, the driest on record being 146 mm in 1982 (the driest simulated is 97.07 mm). These values are considered the ultimate extremes, however, the probability of exceedance comparison indicated in **Figure 4-4** confirms the adequacy of exceeding annual depths.

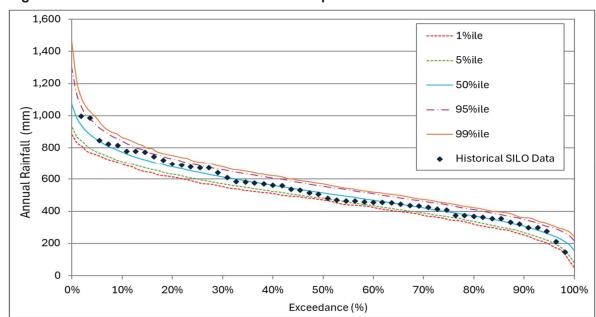


Figure 4-3: Stochastic and Historical Data Comparison - Annual Rainfall



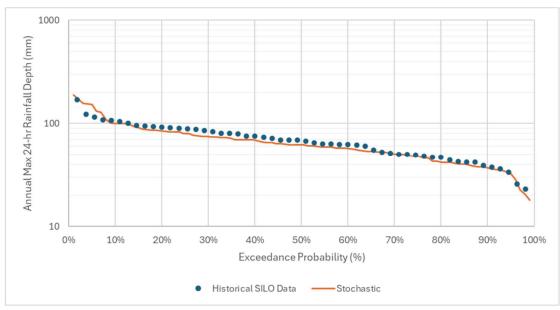


Figure 4-4: Probabilistic and Historical Data Comparison – Daily Maximum Rainfall

#### 4.2.3 Evaporation Rates

Morton Lake evaporation data sets taken from SILO were used to determine evaporation rates on-site (Morton, 1983). The Morton wet surface dataset will be used to determine void evaporation rates. These rates were also compared to the available Morton's shallow lake evaporation rates, which are approximately 10% more than the Potential Evaporation with a 0.8 pan factor. The adopted lower evaporation rates are conservative with regard to the estimated excess water volumes requiring management in the long term. According to the SILO Data, evaporation data from 1889 to the present year indicates a median evaporation rate of 1,822 mm per year.

Probabilistic evaporation data was not adopted for the modelling due to poor correlation to historical statistics when evaporation data was included in the probabilistic data generation. This is likely due to the limited daily evaporation record and infilling of the evaporation data set with monthly records which skews the generated data set. As a result, the monthly average data was adopted based on long-term values. **Table 4-2** shows the adopted evaporation rates.

Table 4-2: Adopted Evaporation Rates

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential Evaporation (mm/day)	5.8	5.2	4.9	4.0	3.0	2.5	2.7	3.4	4.6	5.6	6.1	6.2

#### 4.3 Catchment Areas

Water accumulating in the voids will come from the following sources:

- 1. Direct rainfall on the surface of the void;
- 2. Runoff from the void walls and the surrounding catchment (rehabilitated and natural surfaces);
- 3. Rainfall infiltrating the backfilled material, saturating the spoils, and seeping into the void; and



#### 4. Groundwater ingress from the surrounding aquifers.

For sources 1 through 3 listed above, the relevant catchment areas were determined as detailed below:

Direct rainfall: A stage-area relationship for each void was determined based on the proposed final landform digital elevation model (DEM). From this relationship, a wetted surface area was calculated for each timestep simulated in the model based on the volume of water in storage. These stage-area relationships are provided in Figure 4-8.

Runoff: The natural catchment configurations for the residual voids at the Mine were determined based on the final landform contours provided by Peabody. The final landform covers two catchment areas, Humbug Gully, north of the void, and Harrybrant Creek catchment, south of the void (as outlined in Section 3.0). Peabody instructed SLR to assume that runoff from the Humbug Gully Catchment will not report into the final void.

The residual void catchment consists primarily of rehabilitated spoil dumps, with an elevated stable landform assumed to be constructed around the perimeter to prevent external catchment and flood ingress into the voids. The void catchment, as visualized in Figure 4-5, was used to determine surface inflows to the void. It is assumed that the void is fully bunded and all fully rehabilitated surface areas above the crest of the void are diverted away from the void.

Infiltration/Seepage: A portion of the rainfall landing on the rehabilitated areas overlaying the backfilled material in the pits will seep through the covered soils and into the spoils. As the spoil material becomes saturated, it is expected that the excess water will seep along the original pit floor and fill the lowest-lying spoils progressively until the invert level of the remaining void is reached, at which time the excess water will seep into the void. The approximate catchment areas associated with this infiltration water source would equal the original excavated pit footprint minus the wetted surface in the void (if a water body has already been established). The catchment area for seepage and infiltration differs from that of the surface runoff as the baseflow component of the catchment can't be diverted through surface bunding.

The landuse and catchment areas have been based on the currently available pit outlines, LIDAR imagery, surface contours, and the proposed final landform of the site. The adopted catchment areas for each land use are summarised in Table 4-3.

Two scenarios were considered to model the final water levels, volume, and surface area. The first scenario assumes the entire catchment inside the void (up to the crest) has a land use of mine pit. The second scenario assumes a rehabilitation land use for the area unlikely to be wetted by the final void lake.

Table 4-3: Summary of Land use within the Void and its surrounding catchment

Landuse	Scenario 1 Catchment Area (ha)	Scenario 2 Catchment Area (ha)
Final Void	460	100
Rehabilitation area	0	360
Infiltration/seepage area	370	370



Figure 4-5: Catchment Reporting to the Void





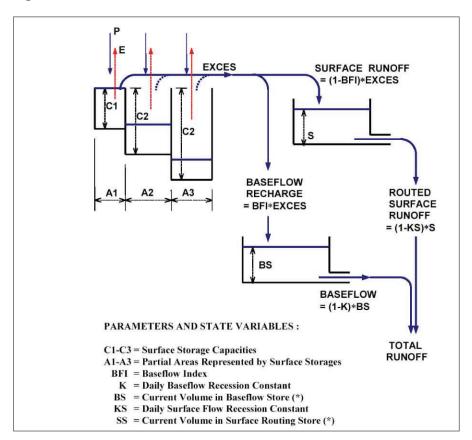
#### 4.4 **Runoff Modelling**

The WBM utilises the Australian Water Balance Model (AWBM) rainfall runoff module to calculate the rainfall and runoff inflows from the catchment.

The rainfall is converted to runoff using the Australian Water Balance Model (AWBM), illustrated in **Figure 4-6.** This runoff can be split into two forms:

- 1. Surface runoff which travels overland to the destination; or
- 2. Sub-surface which travels through the ground to reach the destination.

Figure 4-6: Australian Water Balance Model Schematic



The AWBM parameters were adopted from the previously calibrated GoldSim model (Jacobs, 2020 and WRM, 2022), and are consistent with the 2016 Final Void model produced by Hatch, no further validation of these by SLR was undertaken. All models were reviewed for this assessment. A summary of the AWBM parameters used for each catchment type is presented in Table 4-4.

**Table 4-4: Adopted AWBM Parameters** 

Parameter	Abbreviation	Void	Rehabilitated		
Small storage capacity (mm)	C1	0.5	25		
Medium storage capacity (mm)	C2	20	140		
Large storage capacity (mm)	C3	NA	200		



SLR Ref No.: 640.030987.00001-WBM-R01v4.0 20250813.docx

Parameter	Abbreviation	Void	Rehabilitated
Small partial area portion	A1	0.1	0.1
Medium partial area portion	A2	0.9	0.45
Large partial area portion	A3	0	0.54
Baseflow Index	BFI	0.25	0.25
Baseflow recession	Кь	0	0.3
Daily streamflow recession	Ks	0	0

#### 4.5 Groundwater Interaction

Groundwater inflows and outflows to/from the voids were adopted from the analytical groundwater model developed alongside this study (SLR, 2024). The 2016 Final Void Study by Hatch noted no net groundwater inflow verified from site validations. The existing groundwater level is 180m AHD with the pit lake likely expected to act as a groundwater sink (Hatch, 2016; Jacobs, 2020).

The flux rate applied in the WBM was dependent on the water level within the void. This relationship is illustrated in **Figure 4-7**. Baseflow to the pit was included in the AWBM surface water model.

180 160 Pit Lake Water Level (mAHD) 140 120 100 80 60 40 100 200 0 50 150 250 300 350 400 450 500 Inflow (m3/day)

Figure 4-7: Inflow vs Pit Lake (i.e. Final Void) Water Levels

Generally, the rate at which groundwater is expected to flow into the voids reduces over time as the groundwater levels recover and the gradient towards the void water levels reduces. The WBM predicts a final water level elevation in the void of below 100 mAHD, which would result in the void acting as a full groundwater sink.

#### 4.6 Storage

#### 4.6.1 Void

The stage-storage and surface area relationship curves were derived from the final landform contours provided by Peabody. Residual void maximum depth is 214 m with the lowest depth at 6 m AHD and a crest at 220 m AHD. Residual void staged storage area relationships for the void is shown in **Figure 4-8**.



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500 450 400 400 350 350 (ha) 300 (GL) 300 Surface Area 250 250 200 200 150 150 100 100 50 50 90 100 110 120 130 140 150 160 170 180 190 200 210 220 20 30 40 50 80 Elevation (mAHD) Cumulative Volume (ML) Surface Area (ha)

Figure 4-8: Stage Storage Curve for the Final Void

#### 4.7 Water Quality

The WBM was developed to include a high-level salt balance to track both the quantity and quality of water on site. The salt balance tracks the water quality or salinity (total dissolved solids (TDS) in mg/L) for the inflows into the voids and subsequent effects from evaporation and releases on the storage water quality. This also includes salinity modelling to represent the general salt estimated within the final voids.

Each land use type was allocated a specific Electrical Conductivity (EC) (in  $\mu$ s/cm) value which is then applied to the runoff for each land use type that reports to the void. In addition to runoff, the groundwater inflow to the voids also contributes to TDS levels. This net groundwater inflow was taken from the SLR Groundwater Study (SLR, 2024) analytical model; the rates are conservative. The salt loading parameters for this project were adopted from the existing operational WBM for Peabody (Jacobs, 2020; WRM, 2022) and the groundwater concentration was taken from the Hatch 2016 Final Void Report.

Adopted water quality (salinity) parameters were taken from the Peabody WBM (Jacobs, 2020) and the Hatch Final Void Study (Hatch, 2016) and reference to the salinity findings of the SLR Groundwater Report (SLR, 2024), as summarized below.

In cases where there were differences between the water quality parameters from the Jacobs (2020) SLR (2024) or Hatch (2016) studies, the higher salinity values were adopted as a more conservative estimate.

#### Runoff:

- Pit: 1,500 μS/cm (Jacobs, 2020)
- Infiltration/Seepage via spoils: 700 μS/cm (Jacobs, 2020)
- Groundwater: 14,000 μS/cm (Hatch, 2016, SLR 2024).

The reported TDS concentrations in the voids were limited to 357,000 mg/L (532,800 µS/cm), as this is the solubility limit of salt in water. Importantly it is noted that while reported concentrations were limited, the mass of salt in the model is preserved.

The ANZECC & ARMCANZ (2000) Water Quality Guidelines for livestock drinking water quality recommends up to 5,000 mg/L TDS for beef cattle. The Guideline suggests that animals may experience an initial reluctance to drink or there may be some scouring, with



such salinity levels but should adapt without loss of production. The current EA (EPML00579213) stipulates a stock water storage containment limit of 5,970 µS/cm.

To evaluate the salinity modelling outcomes, three risk categories have been defined:

- Low = EC < 5,970 μS/cm (complies with current EA stock water release limits)</li>
- Medium = EC > 5,000 and < 18,000  $\mu$ S/cm (complies with fauna habitat requirements)
- High = EC > 18,000  $\mu$ S/cm (Not expected to support fauna habitat or cattle drinking)

For the purposes of this assessment, EC has been used as an indicator element to show the projected rate of concentration of an element over the modelled period. Although all critical analytes have not been assessed within this report, the approach provides an indication of the rate of concentration which could apply to other contaminants of concern based on the range of modelled scenarios.



#### 5.0 Results

#### 5.1 Residual Water Body – Volume and Water Levels

The system response was simulated daily over a period of 100 years and with 500 different sequences of rainfall, to estimate the probable range of results when considering water volumes within the residual voids.

Table 5-1: Simulated water levels and water volumes in residual voids (Percentile Results)

Residual Void	Water level (mAHD)		V	Total void storage capacity below spill level (GL)			
	5%	50%	95%	5%	50%	95%	level (OL)
Final Void (Scenario 1)	88.9	94.9	101.2	51.1	58.9	68.3	402.9
Final Void (Scenario 2)	41.1	48.7	55.5	11.2	15.9	20.8	402.9

Table 5-2: Simulated Size and Permanence of the Final Void (median results)

Landform	Volume (GL)	Water Level (mAHD)	Elevation at the Lowest Point (mAHD)	Water Surface Area (ha)	
Void Scenario 1	43.9	81	6.5	98	
Void Scenario 2	15.9	48.7	6.5	65	

#### 5.1.1 Scenario 1

The simulated 5<sup>th</sup> percentile, median, and 95<sup>th</sup> percentile water levels and water volumes in each of the water-storing residual voids after 100 years are provided in **Table 5-1** with the daily median volumes and surface water level over this period graphed in **Figure 5-1** and **Figure 5-2**, respectively.

The void is expected to store 43.9 GL or more of water under median conditions. It is predicted to reach its steady state water levels after around 100 years following the final landform shaping and rehabilitation. The simulated median depth, volume and permanency of the void is provided in **Table 5-2**.



SLR Ref No.: 640.030987.00001-WBM-R01v4.0\_20250813.docx

Figure 5-1: Scenario 1 - Residual Voids Simulated Volumes (Percentile Results)

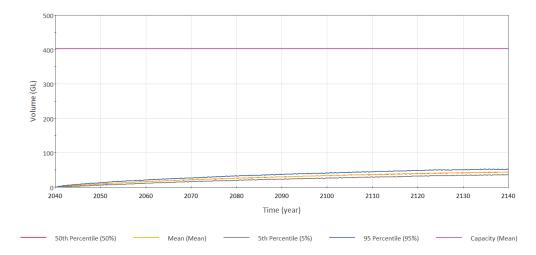
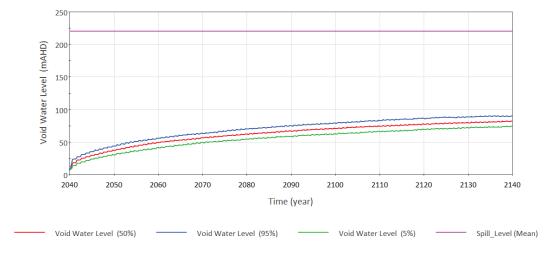


Figure 5-2: Scenario 1 - Simulated Water Levels of the Final Void (Percentile Results)



#### 5.1.2 Scenario 2

The simulated 5<sup>th</sup> percentile, median, and 95<sup>th</sup> percentile water levels and water volumes in each of the water-storing residual voids after 100 years are provided in **Table 5-1** with the daily median volumes and surface water level over this period graphed in **Figure 5-3 and Figure 5-4**, respectively.

The void is expected to store 15.9 GL or more of water under median conditions. It is predicted to reach its steady state water levels after around 100 years following the final landform shaping and rehabilitation. The simulated median depth, volume and permanency of the void is provided in **Table 5-2**.



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Figure 5-3: Scenario 2 - Residual Voids Simulated Volumes (Percentile Results)

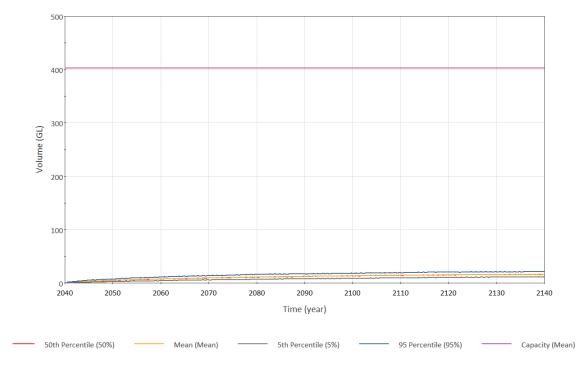
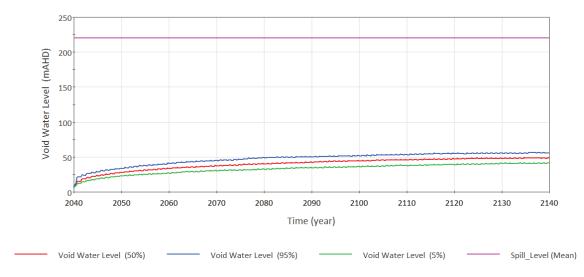


Figure 5-4: Scenario 2 - Simulated Water Levels of the Final Void (Percentile Results)



The analysis indicates that the water surface area of the final void lake would be between 98 and 65 ha, depending on the establishment of vegetation within the final void. It is therefore considered that the proposed final landform design will be able to meet the current EA conditions, Table C1, with the residual void having a surface area ~80ha.

### 5.2 Water Quality

The results of the residual void salinity modelling for the permanent void are provided in **Figure 5-5**, **Figure 5-6**, and **Table 5-3**. After 100 years post-mine closure, the pit exhibits



moderate salinity. The graphed data indicates an ongoing upward trend that has not yet stabilised over 100 years.

Since evaporation is the predominant outflow mechanism, salt will stay within the void. The salinity levels within the void are expected to persist in an upward trajectory, eventually reaching a hyper saline state with the void in the future.

The sensitivity analysis in **Section 4.8.2** reveals changes in evaporation rates will significantly impact the EC of the void. Therefore, conservative rates were used for the evaporation.

Figure 5-5: Scenario 1 - Simulated EC of the Final Void (median results)

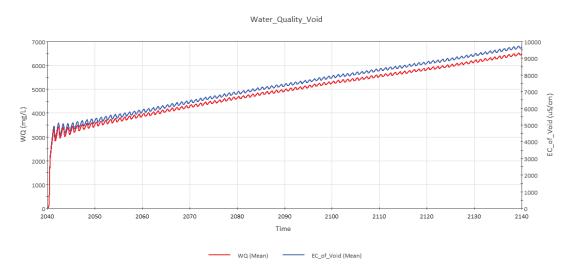
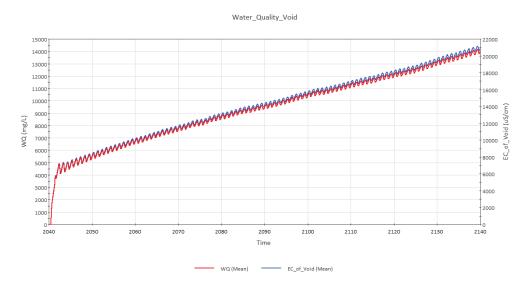


Figure 5-6: Scenario 2 – Simulated EC of the Final Void (median results)





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SLR Project No.: 640.030987.00001 SLR Ref No.: 640.030987.00001-WBM-R01-

Table 5-3: Simulated Long-Term Median Salinity of the Final Void

Residual Void	100 years post mining		
	TDS (mg/l)	EC (μS/cm)	
Void (Scenario 1)	6,476	9,666	
Void (Scenario 2)	14,000	20,895	

#### 5.3 Sensitivity Analysis

#### 5.3.1 AWBM

Climate data was reviewed in the sensitivity analysis to determine the effects of the calibrated parameters in the WBM. A 20% increase and decrease were applied to the AWBM to analyse the sensitivity of the climate model to the water level of the void.

In running this sensitivity analysis, the final water level in the void differs to the model scenario by <5 m over the period of 100 years. In both scenarios, water level continues to be a groundwater sink and stays relatively consistent within the 5 m difference therefore showing the suitability of the parameters in the hydrological model.

Since the groundwater inflows are based on an analytical model, a sensitivity analysis was performed on the water quality. The analysis indicates large effects of the evaporation rates on the water quality of the void since groundwater outflow and overflow are minimal to none. Increases and decreases in the evaporation rates show large changes in the long-term EC of the final void. Therefore, conservative estimates of the EC will be used for the evaporation component of the water quality section within the WBM.

#### 5.3.2 Groundwater

A sensitivity assessment was undertaken of the assumed groundwater-surface water inflow relationship and was found to change the final void water surface levels and volumes by 3% and 7% respectively. Importantly it did not change the key findings of the assessment that the void would reach equilibrium and remain a sink with significant freeboard maintained within the void. The salinity of the void would continue to increase with time due to the effects of evaporation, eventually reaching hypersaline conditions.

The assumed groundwater quality was consistent with findings from the Groundwater Report (SLR, 2024) which indicated ranges of  $(13,000-15,000~\mu\text{S/cm})$  and is therefore considered appropriately conservative.

#### 5.3.3 Climate Change

According to the Climate Futures Exploration Tool, the climate at the project site in 2090 under the climate scenario RCP 8.5, predicts the area to have approximately 10% increase in annual evaporation and an annual rainfall decrease of 5% (Climate Change in Australia, 2021). These climate change estimates were included in the WBM and confirm the void is still well within the capacity of the void under 100 m AHD and continues a groundwater sink.

The increase in evaporation rates also affects the final void water quality. The effects of the climate change scenario result in higher final salinity levels.



#### 5.4 WBM Risk Assessment

A summary of the residual void risk assessment is provided in **Table 5-4**. The expected size, permanency, overtopping probability, and long-term water quality of the void have been considered when allocating an overall risk rating for the two scenarios.

Table 5-4: Residual Void Risk Assessment Summary

Residual Void	Size and Permanence of Waterbody (100 Years)	Overtopping Risk	Water Quality	Surface Water Risk
Scenario 1	Average volume: 43.9 GL Final water level Surface area: 98 ha	None	Slow rising trend, expected to reach 9,666 µS/cm after 100 years, and is trending up. Will eventually reach hypersaline	Medium: Large-sized waterbody, moderately saline in the long-term
Scenario 2	Average volume: 15.9 GL Final water level Surface area: 65 ha	None	Slow rising trend, expected to reach 20,895 µS/cm after 100 years, and is trending up. Will reach hyper- salinity	Medium: Medium sized waterbody, high salinity in the long-term.

#### 5.5 **Limitations of the Assessment**

The accuracy of the assessment is reliant on the accuracy of the utilised data, as detailed in Section 2. SLR has assumed all source data to be fit for purpose and sufficiently accurate for the purpose of this assessment. Except where noted, no verification of the accuracy of the information has been carried out. In the event that some of the information which was relied upon for this assessment is found to be inaccurate, then some or all of the findings may change.

Several assumptions have been made to inform the development of the WBM. The modelling and sensitivity assessment provides guidance regarding the likely importance of these assumptions and parameters on the model results. However, the passage of time and additional further studies may refine these assumptions leading to improvements in model accuracy and changes to the conclusions drawn in this report.

Although the analyses undertaken, as detailed in this report, were done so with the appropriate care and professionalism, this report shall only be used for the purposes intended. The analyses detailed in this report were undertaken solely for the purpose of addressing the requirements for the final void WBM for Coppabella Mine in accordance with the relevant documentation as detailed in **Section 1.2**.

This report should be read in full, and no excerpts are to be taken as representative of the findings. This report has been prepared on behalf of Peabody and SLR accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

This assessment was completed alongside a groundwater assessment (SLR, 2024) and utilises data from the groundwater assessment. This report is therefore also subject to the limitations of this groundwater assessment (SLR, 2024). While the model represents key processes that influence the expected water level and water quality within each void, there remains both uncertainty and unknowns in the model and its parameterisation. In particular, the following is noted:



13 August 2025

SLR Project No.: 640.030987.00001 SLR Ref No.: 640.030987.00001-WBM-R01v4.0 20250813.docx

 The model is based on a single assumed inflow water level relationship which was derived utilising an analytical method. No iteration between the groundwater analysis and results of this assessment have been undertaken.

- While the AWBM rainfall runoff assumptions are based on calibration undertaken by others (Hatch, 2016, Jacobs, 2020), these have not been validated for a closure scenario. Assumptions around the porosity/void space associated with the backfill material may impact the time to saturation of this material which could reduce or lengthen the time it takes for the surface residual void to start sustaining a permanent waterbody.
- There is very little research done on estimating evaporation from void waterbodies. Studies have been conducted attempting to increase the confidence in the estimations and have generated mixed results, particularly for voids with smaller depths, volumes, and surface areas when the localised effects of the final landform topography are unknown. Lower evaporation rates have been adopted to be more conservative with regards to the estimated excess water volumes requiring management in the long term. Higher evaporation rates have been reviewed for climate scenarios to analyse void water quality and void salinity.
- Due to the chemical processes transpiring within the waterbody, a portion of the
  dissolved salts will likely precipitate and accumulate on the void floor. Some of these
  salts may readily re-dissolve in the water during wetter periods, however a portion is
  expected to remain insoluble. Thus, any predicted future water quality is deemed
  conservative.
- Based on the above it is considered likely that the water storage volume identified in this report will be conservative and the actual volumes of water accumulating within each void are expected to be less.

The model limitations discussed above, in combination with the groundwater model limitations, as detailed in the Groundwater Modelling Report (SLR, 2024), could result in changes to the conclusions drawn in this report.



#### Conclusion 6.0

Once the final landform is completed, one residual void will remain capable of capturing and storing runoff water as well as infiltrating groundwater. The void is deemed a groundwater sink. Surface water will also be contained in the void and not flow through and out via surface pathways. The void has been modelled, considering long-term climate, catchments, runoff generation, and groundwater interaction.

Two scenarios have been modelled to predict the long-term water levels, volumes and surface area. The scenarios differ in the assumption around the establishment of vegetation within the final void. The analysis indicates that the proposed single residual void is able to be constructed to have a final lake water surface level with a surface area ~80 ha, which is within the current EA condition, Table C1. In all scenarios there is no risk of overtopping of the residual void.

The void has been allocated a medium-risk rating with regard to the surface water impacts. It is considered a large permanent water body with medium salinity levels and the capacity to become hypersaline in the long-term future due to evaporation as the only water loss. Limited stratification is expected to occur, given the dry climate. Long term predictions in water quality indicate the final void salinity is trending upward and the void is expected to eventually become hypersaline but remain a groundwater sink.

A NUMA is proposed for this void due to its medium risk profile where rehabilitating the land would pose a greater environmental risk than not rehabilitating the land.

Section 3.4 of the PRCP guidelines require that NUMA voids be located outside the premining condition 0.1% AEP flood extent for relevant watercourses (i.e. watercourses with Strahler Stream Order 4 or greater).

A preliminary review of available watercourse data indicates that the only stream order higher than 4 within the project area is the Harrybrandt Creek, which lies outside of the void catchment. Therefore, it is anticipated that modelling of the pre-mining landform was not deemed to be required for the purposes of this EA amendment, and a desktop review detailing the above is sufficient to support the proposed PMLU for the final landform void.

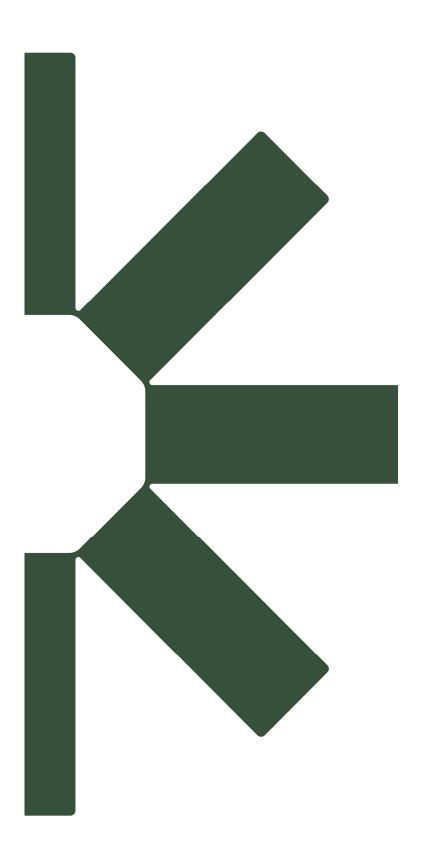
Several assumptions regarding the hydrology and groundwater interactions of the site have been made while developing the current understanding and the model. It is recommended that ongoing monitoring of the water levels and water quality be maintained, and the assessment revisited at least every 5 years to improve confidence in the long-term forecasting.



#### 7.0 References

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WRM, 2022	Coppabella Coal Mine, Water Balance Model Report. June 2022.		







## Appendix C



# Coppabella Mine Greenhouse Gas Assessment and Decarbonisation Plan

Prepared for:

**Peabody Energy** 

September 2025

## **Final**

#### Prepared by:

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#### **Contents**

Executiv	ve summary			V
1.	Introductio	n		1
2.	Regulatory	/ Environm	ent	4
	2.1	Internat	ional Agreements	4
		2.1.1	Paris Agreement	4
	2.2	Legislati	on and Regulation	4
		2.2.1	Climate Change Act 2022 (Cwlth)	4
		2.2.2	Climate Change (Consequential Amendments) Act 2022 (Cwlth)	1
		2.2.3	National Greenhouse and Energy Reporting Act 2007 (Cwlth)	
		2.2.4	National Greenhouse and Energy Reporting	
		2.2.5	(Measurement) Determination 2008 (Cwlth)	
			(Cwlth)	
		2.2.6	Clean Economy Jobs Act 2024 (Qld)	
		2.2.7	Environmental Protection Act 1994 (Qld)	
	2.3		nd Guidelines	
		2.3.1	DETSI Guideline Greenhouse gas emissions	5
		2.3.2	Corporate Value Chain (Scope 3) Accounting and Reporting Standard	6
3.	Method			7
	3.1	Scenario	OS	7
	3.2		, Scope 2, and Scope 3 emissions	
	3.3		is assessment boundary	
	3.4		activities that cause GHG emissions	
		3.4.1	Fugitive emissions resulting from the extraction of coal	
	3.5		I for calculation of GHG emissions	
	0.0	3.5.1	Emissions from construction and operation	
		3.5.2	Emissions from vegetation clearance	
		3.5.3	Emissions from coal distribution	
		3.5.4	Emissions from upstream processing of purchased diesel	
		3.5.5	Emissions from downstream waste	
		3.5.6	Emissions from end use of coal	
	3.6		ons and assumptions	
4.	Results		713 G113 G33011P110113	
	4.1		ry of Emissions for Scenario 1 and Scenario 2 for LOM	
	4.2		and 2 emissions	
	1.2	4.2.1	Fugitive methane emissions	
	4.3		B emissions	
	4.0	4.3.1	End use of coal	
	4.4		nission category for the Project	
5.			n	
0.	5.1		tion	
	5.2		ly Energy Corporate GHG strategy	
	5.3		nd Objectives	
	5.4		ed GHG emissions and emissions intensity of production	
	5.5	-	ce Point	
	5.6		Emissions	
	5.7		ement Controls to Reduce GHG Emissions	
		5.7.1 5.7.2		
			Reduce	
		5.7.3 5.7.4	Substitute Offset	
		5./.4	O113G1	4

	5.8 Mitigating Scope 3 emissions	34
	5.9 Monitoring, Evaluation, and Reporting	34
	5.10 Advancing technologies and opportunities	34
	5.11 Assessment of proposed GHG mitigation measures	35
6.	Risks and likely magnitude of impacts on environmental values	36
	6.1 Impacts of GHG emissions on environmental values	36
	6.2 Contribution to Queensland's Emissions Reduction and Renewable Energy	_
7.	Summary	
8.	References	
Appendix A	End users of Project coal and level of decarbonisation commitments	
Appendix A	Ena oseis of Project coal and level of decarbonisation commitments	42
Tables		
Table 1	Sections of GHG Assessment addressing the GHG Guideline	3
Table 2	Project activities that cause GHG emissions	8
Table 3	Summary of energy content and emissions factors for Scope 1 and Scope 2 assessment	9
Table 4	Summary of emissions factors for Scope 3 components of the Project	10
Table 5	Mapping of Broad Vegetation Groups to FullCAM Vegetation Types and Areas Cleared	10
Table 6	Coal Distribution by destination, distance, and attributable percentage of product coal	12
Table 7	Summary of GHG Emissions associated with the Project	14
Table 8	Scenario 1 - Scope 1 and 2 GHG emissions for the LOM of the Project	
Table 9	Scenario 1 - GHG emissions by category and project year for the LOM of the Project	
Table 10	Scenario 2 - Scope 1 and 2 GHG emissions for the LOM of the Project	
Table 11	Scenario 2 - GHG emissions by category and project year for the LOM of the Project	
Table 12	Scenario 1 - Scope 3 Inventory for LOM	
Table 13	Scenario 2 - Scope 3 Inventory for LOM.	
Table 14	Reference point sources and quantities of Scope 1 and Scope 2 GHG emissions by activit and abated case for LOM	
Table 15	Key result areas and management controls for the project by GHG abatement hierarchy.	
Table 16	Project Contribution to Queensland's emissions and renewable energy targets	
Table A1	Summary ranking of destination country by quantity (%) of coal sold by the Project	42
Table A2	Nationally determined contributions (NDC) by end user countries	
Figures		
Figure 1	Mapping of Broad Vegetation Groups	11
Figure 2	Scenario 1 - fugitive methane emissions († CO2-e) and ROM coal (†) by project year	
Figure 3	Scenario 2 - fugitive methane emissions († CO <sub>2</sub> -e) and ROM coal (†) by project year	21
Figure 4:	Scenario 1 Unabated Scope 1 emissions († CO2-e)	29
Figure 5:	Scenario 2 Unabated Scope 1 emissions († CO2-e)	29
Figure 6	Scenario 1: Abated Scope 1 emissions († CO <sub>2</sub> -e)	32
Figure 7	Scenario 2: Abated Scope 1 emissions († CO2-e)	32

### Glossary

	D. C. W.
Term	Definition
	degrees
°C	degrees Celsius
С	carbon
GJ	gigajoule
ha	hectares
kg	kilograms
kL	kilolitres
km	kilometres
m	metres
m <sup>2</sup>	square metres
m <sup>3</sup>	cubic metres
Mt	million tonnes
Mt CO <sub>2</sub> -e	million tonnes of carbon dioxide equivalent
t .	tonnes
t c	tonnes of carbon
t CO <sub>2</sub> -e	tonnes of carbon dioxide equivalent
Nomenclature	Definition
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> -e	carbon dioxide equivalents
N <sub>2</sub> O	nitrous oxide
SF <sub>6</sub>	sulfur hexafluoride
Abbreviation	Definition
ACCU	Australian Carbon Credit Units
CC Act	Climate Change Act 2022
CCCA Act	Climate Change (Consequential Amendments) Act 2022
CEJ Act	Clean Economy Jobs Act 2024
CER	Clean Energy Regulator
CFI	Carbon Farming Initiative
CSG	Coal seam gas
DBCT	Dalrymple Bay Coal Terminal
DCCEEW	Department of Climate Change, Energy, Environment and Water
DESI	Department of Environment, Science and Innovation
DETSI	Department of Environment, Tourism, Science and Innovation
EA	Environmental Authority
EF	Emission factor
EI	Emissions intensity
EP Act	Environmental Protection Act 1994
FullCAM	Full Carbon Accounting Model
GHG	Greenhouse gases
GHG Guideline	Guideline Greenhouse gas emissions ESR/2024/6819
GWP	Global warming potential
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land use, land use change and forestry
LGA LOM	Local government area  Life of Mine
ML	Mining lease
NDC NEM	Nationally Determined Contribution
NEM	National Electricity Market

4 September 2025

Term	Definition
NGER	National Greenhouse and Energy Reporting
NGER Act	National Greenhouse and Energy Reporting Act 2007
NGER Determination	National Greenhouse and Energy Reporting (Measurement) Determination 2008
PBOGS	Petroleum based oils and greases
PCI	Pulverised coal injection
PL	Petroleum Lease
PPA	Power purchase agreement
QLD	Queensland
ROM	Run-of-mine
Safeguard Mechanism	Safeguard Mechanism (Crediting) Amendment Act 2023
Scope 3 Standard	Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard
SF6	Sulphur hexafluoride
SMC	Safeguard Mechanism Credits
UNFCCC	United Nations Framework Convention on Climate Change

#### **EXECUTIVE SUMMARY**

Katestone Environmental Pty Ltd (Katestone) was commissioned by Peabody Energy Australia PCI Pty Ltd (Peabody) to conduct a greenhouse gas (GHG) Assessment for the Coppabella Coal Mine (the Mine) as part of its application to amend conditions C1 and C4 of Environmental Authority (EA) EPML00579213. This EA authorises Peabody to operate the Coppabella Coal Mine (the Mine) on mining leases (ML)70161, ML70163, ML70164, ML70236, and ML70237, and petroleum lease (PL)1015, and was issued under the *Mineral Resources Act 1989* (Qld).

The Department of Environment, Tourism, Science, and Innovation (DETSI) has requested that Peabody:

- Identify the GHG emissions likely to be generated through the life of the project, in particular the emissions as a result of the amendment
- Determine the emission category of the project, with respect to the amendment being sought
- Identify all proposed management practices proposed to be implemented to prevent or minimise adverse impacts, with respect to the amendment being sought
- Identify if a GHG abatement plan will be required to accompany the application to identify continuous commitments to achieve progressive GHG mitigation and management throughout the life of the project, with respect to the amendment being sought
- Describe the risk and likely magnitude of impacts to environmental values resulting from the project's emissions, with respect to the amendment being sought.

The amendments to EA EPML00579213 sought by Peabody are to:

- Modernise Table C1, by:
  - o clarifying that residual void(s) without a proposed post-mining land use are included; and
  - specifying that low walls, end walls and highwalls form part of the Non-Use Management Area (NUMA).
- Update Table C1 to correct projected surface areas so they align with current disturbance levels and the Life of Resource Plan; and
- update Table C3 to reflect the approved final landform, noting that the current version authorises four
  discrete final voids, which are no longer consistent with the proposed mine plan. The Mine is an open
  cut operation that produces pulverised coal injection (PCI) coal for export. The rate of coal production
  per annum is limited by the available resource and economic decisions.

The assessment of two operational scenarios are presented:

- Scenario One (1) Maximum production over eighteen (18) years
- Scenario Two (2)

   Attenuated production over forty-five (45) years

The Mine is a Safeguard facility for the purposes of the Safeguard Mechanism. The Mine's baseline emission intensity (EI) is 0.06041 tonnes of carbon dioxide equivalent (t  $CO_2$ -e) / run of mine tonnes (t ROM) and it is required to reduce its production-adjusted baseline emissions by 4.9% per annum to 2030 and thereafter by 3.285% per annum to 2050.

The assessment shows:

Scenario 1

- o The total LOM emissions are estimated to be 253,206,584 (t CO<sub>2</sub>-e). Of this total:
  - Scope 1 emissions contribute 6,595,291 t CO<sub>2</sub>-e
  - Scope 2 emissions contribute 966,279 t CO<sub>2</sub>-e
  - Scope 3 emissions contribute 245,645,014 t CO<sub>2</sub>-e.
- Scenario 2
  - o The total LOM emissions are estimated to be 265,071,493 t CO₂-e. Of this total:
    - Scope 1 emissions contribute 6,919,529 t CO2-e
    - Scope 2 emissions contribute 1,015,919 t CO2-e
    - Scope 3 contributes 257,136,045 t CO<sub>2</sub>-e.
- Diesel and fugitive methane are the largest contributor to total LOM Scope 1 emissions for both scenarios at:
  - o 3,166,370 t CO<sub>2</sub>-e and 3,268,136 t CO<sub>2</sub>-e, respectively for Scenario 1
  - o 3,329,033 t CO<sub>2</sub>-e and 3,424,025 t CO<sub>2</sub>-e, respectively for Scenario 2
- Electricity for Scope 2 contributes 966,279 t CO<sub>2</sub>-e for Scenario 1 and 1,015,919 t CO<sub>2</sub>-e for Scenario 2.
- Production and transmission of diesel and shipping of coal to the Dalrymple Bay Coal Terminal (DBCT)
  are the largest contributor to Scope 3 emissions in Australia. Combustion of the coal in client countries
  is largest contributor to offshore Scope 3 emissions. These countries are all signatories to the Paris
  Agreement and are responsible for reducing or offsetting their emissions.

Peabody's decarbonisation objective is to meet the Safeguard Mechanism reduction requirements for the Mine against its published baseline. Decarbonisation action categorised by the GHG Guideline hierarchy are:

#### Reduce

- Mobile and stationary plant emissions are reduced from the base case through:
  - Optimisation of mine layout and operations
  - Optimisation of vehicles and processes for energy efficiency
  - Replacement of diesel with premium diesel where economically feasible
- Fugitive methane emissions are assessed and abated following Peabody's emission reduction framework, with actions contingent on each stage's outcome:
  - 1) A pre drainage pilot well to be drilled in 2026 which flares coal seam gas (CSG) to assess permeability and gas drainage attributes
  - 2) Expanded pre-drainage and flaring targeting up to 50% of in situ gas, subject to pilot results
  - 3) Development of practicable gas utilisation strategies once gas volumes, quality, and well field production potential are confirmed, with options including:
    - Onsite power generation
    - Diesel substitution (dual fuelled machinery)
    - Gas sales

#### Substitute

- Emissions due to electricity usage will be minimised through:
  - Purchase of renewably generated electricity, where cost effective
  - Onsite renewable electricity generation or through electricity generation by combusting drained CSG, where technically and economically feasible
  - Energy efficiency measures

#### Offset

- Residual emissions against the Safeguard Mechanism production-adjusted baseline are offset through:
  - Purchase of Australian Carbon Credit Units (ACCU) generated in Queensland where feasible and cost-effective
  - Identification of best rehabilitation and post mining land use (PMLU) options to increase carbon stock in soil and vegetation
  - Conversion of cleared vegetation to biochar where practicable, with application to rehabilitated and managed land within the ML
- Staff are engaged in energy efficiency and emissions reduction
- Carbon farming, including biochar production, agrivoltaics, and agroforestry are assessed and applied
  if feasible on agricultural land owned or managed by Peabody
- New technologies and processes are evaluated for cost-effective emissions reduction.

The Project's Scope 3 emissions within Australia will be mitigated through the reduction in diesel procurement and consequent transport and through the purchase or generation of renewable electricity.

Peabody commits to a process of continuous improvement informed by engaged staff, monitoring, evaluation, and research. Peabody will report on its emissions and emissions reduction targets through the annual NGER and Safeguard Mechanism process and through its annual sustainability report.

Peabody will help the Queensland Government achieve the state's targets for renewable energy generation and emissions reduction by purchasing renewable electricity where practicable, enabling production of renewable energy on land owned or managed by Peabody where economically feasible, participating in carbon sequestration activities on land owned or managed by Peabody where practicable, purchasing ACCU produced in Queensland where practicable, and being an active participant in progressive Safeguard Mechanism emissions reductions.

#### 1. INTRODUCTION

Katestone Environmental Pty Ltd (Katestone) was commissioned by Peabody Energy (Peabody) to conduct a greenhouse gas (GHG) Assessment for the Coppabella Coal Mine (the Mine) as part of its application to amend conditions C1 and C4 of Environmental Authority EPML00579213. The Department of Environment, Tourism, Science, and Innovation (DETSI) has requested that Peabody:

- Identify the GHG emissions likely to be generated through the life of the project, in particular the emissions as a result of the amendment
- · Determine the emission category of the project, with respect to the amendment being sought
- Identify all proposed management practices proposed to be implemented to prevent or minimise adverse impacts, with respect to the amendment being sought
- Identify if a GHG abatement plan will be required to accompany the application to identify continuous commitments to achieve progressive GHG mitigation and management throughout the life of the project, with respect to the amendment being sought
- Describe the risk and likely magnitude of impacts to environmental values resulting from the project's emissions, with respect to the amendment being sought.

The Coppabella Coal Mine (the Mine) is an open cut coal mining operation that produces pulverised coal injection (PCI) coal for export. The Mine is located in Central Queensland (Qld), approximately 10 kilometres (km) northeast of Coppabella and about 31 km south-west of Nebo, within the Isaac Regional Council (IRC) local government area (LGA). Peabody Energy Australia PCI (C&M Management) Pty Limited (Peabody) operate the Mine, which is owned by several joint venture partners that form the Coppabella and Moorvale Joint Venture (CMJV).

The Mine is located on mining leases (ML) 70161, ML 70163, ML 70164, ML 70236, and ML 70237 and petroleum lease (PL) 1015, granted by the State Government of Qld under the *Mineral Resources Act 1989* (MR\_Act) and the *Petroleum and Gas (Production and Safety) Act 2004*. Operations at the Mine are authorised by Environmental Authority (EA) EPML00579213, issued under the QLD *Environmental Protection Act 1994* (EP Act).

Mining at the Mine commenced in 1998, with the current workforce comprising over 480 Peabody employees and up to 700 personnel in total, including contractors. The Mine consists of four pits: Creek Pit, Johnson Pit, South Pit and East Pit. Mining operations primarily target the Macarthur Seam of the Rangal Coal Measures, as well as its constituent sub-seams, including the Phillips and Leichhardt Seams.

The Mine operations include in-pit dumps (IPD); out-of-pit spoil dumps (OOPD); a coal handling and preparation plant (CHPP); a coal reject co-disposal area; a raw water dam; a Run-of-Mine (ROM) coal stockpile area; and several small sediment and surface water containment dams generally located on creeks or gullies. Product coal is loaded via the Mine train load-out facility and transported to Dalrymple Bay Coal Terminal for export.

Peabody plans to continue mining at the Mine by extracting remaining coal reserves with open cut operations extending northwards towards the northern boundary of ML 70236. Humbug Gully, a tributary of Harrybrandt Creek, originates northwest of the Mine and flows southeast, crossing the northern sections of ML 70164 and ML 70236. In order to support the continuation of mining to the northern lease boundary, an off-lease creek diversion is required which will seek to be approved under separate legislation to the EP Act so is not part of this amendment to the Coppabella EA.

Peabody's objective is to optimise mining operations while achieving progressive reductions in greenhouse gas (GHG) emissions, consistent with Safeguard Mechanism obligations and Queensland's target of net zero by 2050. The Coppabella Mine exceeds the 100,000 tpa GHG emission threshold of the Safeguard Mechanism and is required to meet the Safeguard Mechanism emissions reduction targets against a production-adjusted baseline. The current emissions reduction target is a 4.9% per annum until 2030, and 3.285% per annum thereafter. In line



with these requirements and the mitigation hierarchy, Peabody is evaluating additional management practices to further reduce GHG emissions.

The amendments to EA EPML00579213 sought by Peabody are to:

- modernise Table C1, by:
  - o clarifying that residual void(s) without a proposed post-mining land use are included; and
  - specifying that low walls, end walls and highwalls form part of the Non-Use Management Area
     (NUMA)
- update Table C1 to amend projected surface areas so they align with current disturbance levels and the Life of Resource (LOR) Plan; and
- update Table C3 to reflect the approved final landform, noting that the current version authorises four discrete final voids, which are no longer consistent with the proposed mine plan

The GHG Assessment considers two operational scenarios where the total proposed resource extraction is the same and is limited by the resource availability, as currently approved. Scenario 1 consists of maximum production over eighteen (18) years and Scenario 2 consists of attenuated production over forty-five (45) years.

The assessment follows the Guideline Greenhouse gas emissions ESR/2024/6819 (GHG Guideline) (Table 1).

Table 1 Sections of GHG Assessment addressing the GHG Guideline

Red	Requirement Section					
a.	Project	details	Section 1			
b.	Emissi	ons projections and commencing abatement measures:	Section 4.2			
	i.	Emission inventory and estimates as developed in Section 3.1 of the	Section 4.3			
		GHG Guideline	Section 5.7			
	ii.	Management practices proposed to be implemented at commencement to reduce GHG emissions as per section 3.3 of the GHG Guideline				
c.	GHG er	nissions reference point:	Section 5.5			
	i.	Outline the level of emissions against which ongoing reduction of GHG emissions will be assessed throughout the life of the project (reference point) (based on projected GHG emissions prior to implementation of the GHG abatement plan)				
	ii.	Provide justification for the reference points proposed				
d.	Emissi	on reduction targets:	Section 5.7			
	i.	Identify interim Scope 1 and Scope 2 GHG emission reduction targets to be applied throughout the life of the project				
	ii.	Identify long-term overall Scope 1 and Scope 2 GHG emission reduction targets.				
	iii.	Provide justification for the emission reduction trajectory and targets proposed and how they support the Queensland Government's GHG emission reduction targets				
e.		mission reduction program (as detailed in section 3.3 and lix A (Part B) of the GHG guideline), including:	Section 5.7			
	i.	Implementation details including timeframes for implementation and				
	ii.	estimated reduction of emissions expected  Risk assessment details including cost, practicality, effectiveness,				
	iii.	and risks of each measure  Justification for each measure including a comparison of each				
		proposed measure with relevant best practice environmental management standards				
	iv.	Estimates of emissions expected to be abated by each measure				
	٧.	Any ongoing monitoring proposed to be undertaken to ensure the success of emission reduction measures				
f.	Advanc	ing technologies and opportunities:	Section 5.10			
	i.	Include provisions for regularly reviewing new technologies to identify opportunities to further reduce emissions and energy efficiency				
g.	Monito	ring and auditing program	Section 5.9			
h.	Reporti	ng:	Section 5.9			
	i.	A program for periodic public reporting on progress towards the GHG emission reduction targets outlined in the GHG abatement plan, including details about how public reporting will be undertaken				

#### 2. REGULATORY ENVIRONMENT

#### 2.1 International Agreements

#### 2.1.1 Paris Agreement

The Australian Government signed the legally binding Paris Agreement (UNFCCC 2016) to take actions to keep global warming to 'well below' 2°C and strive to limit warming to 1.5°C. The current Australian target (Nationally Determined Contribution) is to reduce emissions by 43% below 2005 levels by 2030, including land use, land use change, and forestry (LULUCF) and using Global Warming Potential (GWP) values from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5). The intention is to have net zero GHG emissions by 2050.

The Australian Government is currently considering the setting of the 2035 emissions reduction target as required by the agreement.

#### 2.2 Legislation and Regulation

#### 2.2.1 Climate Change Act 2022 (Cwlth)

The *Climate Change Act 2022* (CC Act) provides the legislative framework to implement Australia's net-zero commitments and codifies Australia's 2030 and 2050 net GHG emissions reductions targets under the Paris Agreement. The legislated targets are to reduce net GHG emissions to 43% below 2005 levels by 2030, and to reduce net GHG emissions to zero by 2050.

The CC Act establishes the 2030 GHG emissions reduction target as a national point target and an emissions budget. The CC Act does not impose obligations directly on companies, but it does signal sector-based reforms to achieve the GHG emissions reduction targets.

#### 2.2.2 Climate Change (Consequential Amendments) Act 2022 (Cwlth)

The Climate Change (Consequential Amendments) Act 2022 (CCCA Act) embeds the GHG emissions reduction targets into fourteen Commonwealth acts, including the Clean Energy Regulator Act 2011, Infrastructure Australia Act 2008, National Greenhouse and Energy Reporting Act 2007, and the Renewable Energy (Electricity) Act 2000.

#### 2.2.3 National Greenhouse and Energy Reporting Act 2007 (Cwlth)

The National Greenhouse and Energy Reporting Act 2007 (NGER Act) established a national framework for corporations to report GHG emissions and energy consumption.

Registration and emissions reporting under the National Greenhouse and Energy Reporting (NGER) scheme are mandatory for corporations or facilities that have energy production, energy use, or GHG emissions that exceed 50,000 tonnes carbon dioxide equivalent (tCO<sub>2</sub>-e) or 25,000 tCO<sub>2</sub>-e, respectively, per year. These entities are required to report on their Scope 1 and Scope 2 emissions. Scope 3 emissions are not included in NGER reporting due to the potential for double counting.

# 2.2.4 National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Cwlth)

The National Greenhouse and Energy Reporting (Measurement) Determination 2008 (NGER Determination) provides methods, criteria, and measurement standards for calculating greenhouse gas emissions and energy data under the NGER Act. It covers Scope 1 and Scope 2 emissions and energy production and consumption.

#### 2.2.5 Safeguard Mechanism (Crediting) Amendment Act 2023 (Cwlth)

The Safeguard Mechanism (Crediting) Amendment Act 2023 (Cwlth) (Safeguard Mechanism) provides a framework for Australia's largest emitters to measure, report and manage their emissions and is administered through the NGER scheme. It does this by requiring large facilities, whose net emissions exceed the Safeguard threshold of 100,000 tCO<sub>2</sub>-e per year, to keep their emissions at or below an emissions baseline determined by the Safeguard Mechanism under the Clean Energy Regulator (CER). The CER is the government body responsible for accelerating carbon abatement for Australia through the administration of the National Greenhouse and Energy Reporting scheme, Renewable Energy Target, and the Emissions Reduction Fund.

#### 2.2.6 Clean Economy Jobs Act 2024 (Qld)

The purpose of the *Clean Economy Jobs Act 2024* (CEJ Act) is to reduce GHG emissions in Queensland by legislating emissions reduction targets. The CEJ Act sets a target of net zero emissions by 2050, with an interim emissions reduction target of 75% below 2005 emissions by 2035. The initial target of a reduction by 30% of 2005 levels by 2030 has already been achieved. Queensland's emissions in 2005 were 197.3 mega tonnes of carbon dioxide equivalents (MtCO<sub>2</sub>-e) meaning that annual emissions will need to be reduced to 49.3 MTCO<sub>2</sub>-e or below by 2035.

#### 2.2.7 Environmental Protection Act 1994 (Qld)

The *Environmental Protection Act 1994* (EP Act) seeks to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The EP Act does not explicitly regulate the emission of GHG. However:

- Regarding air emissions, a contaminant can be a gas (11(a))
- GHG emissions may constitute an environmental harm (14(1)(2)), i.e., "... any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value ..." "whether the harm is a direct or indirect result of the activity; or whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors".

#### 2.3 Policy and Guidelines

#### 2.3.1 DETSI Guideline Greenhouse gas emissions

The DETSI *Guideline Greenhouse gas emissions ESR/2024/6819* (GHG Guideline) describes requirements under the EP Act and provides information about how to meet these requirements in relation to GHG emissions for new and amended environmental authority (EA) applications.

The GHG Guideline sets out the minimum expectations for GHG emissions information to be provided with applications and supports rigorous, defensible, and transparent decision making in relation to these emissions. The required information includes:

- An inventory of expected GHG emissions resulting from the Project including the stage at which the emissions will occur and a breakdown by source
- An estimate of projected Scope 1 and Scope 2 CO<sub>2</sub>-e emissions over the life of the project, including an unabated and abated emissions scenario
- An estimate of annual Scope 3 emissions and total Scope 3 emissions over the life of the Project
- A description of the method used for estimating GHG emissions
- A GHG abatement (decarbonisation) plan in alignment with recommendations made in Appendix A of the GHG Guideline
- A description of risks and the likely magnitude of impacts on environmental values resulting from the Project, including qualitatively describing the impacts of climate change on environmental values and the likely magnitude of such impacts based on the relative scale of the Project's net GHG emissions.

The GHG Guideline identifies expected GHG emission rates for activities as:

- Low emitters if expected annual GHG emissions are less than 25,000 t CO<sub>2</sub>-e.
- Medium to high emitters if expected annual GHG emissions are 25,000 t CO<sub>2</sub>-e or more at any time during the life of the project.

#### 2.3.2 Corporate Value Chain (Scope 3) Accounting and Reporting Standard

The Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (Scope 3 Standard) (GHG Protocol, 2011) is the only internationally accepted method for Scope 3 emissions accounting and is applied here.

Scope 3 emissions refer to all indirect emissions occurring in the value chain of a reporting company, including upstream and downstream emissions, that are not included in the reporting company's Scope 1 and 2 inventory. Examples of Scope 3 emissions include emissions resulting from the production and transport of purchased goods, processing and use of sold products, and purchased services such as fuel-intensive activities or transportation.

Scope 3 emissions may be 'double-counted', when two companies account for the same emissions – this is recognised as a beneficial scenario because each company may have different and mutually exclusive opportunities to influence the sources of emissions. While a reporting company has no direct control over its Scope 3 emissions, it may exert influence over its Scope 3 inventory through strategic partnerships, policy-setting, and procurement decisions.

#### 3. METHOD

#### 3.1 Scenarios

Two operational scenarios are considered in this assessment:

- Scenario 1 Maximum production over eighteen (18) years
- Scenario 2 Attenuated production over forty-five (45) years

#### 3.2 Scope 1, Scope 2, and Scope 3 emissions

GHG emissions are classified into three Scopes for monitoring, reporting, and management purposes. In Australia, these are defined in the NGER Act as:

- Scope 1. GHG emissions released to the atmosphere as a direct result of an activity or series of activities
  that are controlled by a company, and which are reported at a facility level. This would include emissions
  from combustion of diesel during construction or operation of the Project. These direct emissions are
  reported annually if the emissions exceed a legislated threshold (section 2.2.3).
- Scope 2. GHG emissions released to the atmosphere because of the generation of electricity that has been purchased by a company for use at a facility such as the Project. These are considered indirect emissions and are reported annually if the facility exceeds a legislated threshold (section 2.2.3).
- Scope 3. GHG emissions released to the atmosphere upstream or downstream in an organisation's supply
  or value chain. These indirect emissions are not reported under the NGER Act as they are another
  company or organisation's Scope 1 or Scope 2 emissions (section 2.3.2). This assessment only considers
  the Scope 3 emissions from the combustion of coal and the production and transportation of diesel.

The purpose of monitoring and reporting GHG emissions is threefold:

- Allow Queensland and Australian governments to determine an annual inventory of GHG emissions against international agreements and legislated emissions reduction targets.
- Allow a company or organisation to manage or offset its Scope 1 and Scope 2 emissions to meet corporate
  or regulatory targets.
- Allow a company or organisation to influence Scope 3 emissions reduction through procurement or supply decisions.

#### 3.3 Emissions assessment boundary

The GHG emissions assessment boundary includes:

- Operational activities of the Mine under the operational control of Peabody (Scope 1 and 2)
- Production and transportation of diesel used by the Mine (Scope 3)
- Road/rail transport and shipping of coal product resulting from the Mine (Scope 3)
- End use of coal product resulting from the Project (Scope 3)
- Transport and offsite processing of waste (Scope 3)

#### 3.4 Project activities that cause GHG emissions

Project activities that will lead to GHG emissions are presented in Table 2. These are differentiated by their scope and the Project phase in which they occur.

Table 2 Project activities that cause GHG emissions

Phase	Scope 1 and 2	Scope 3
Operation	Diesel combustion by stationary mine plant	Diesel combustion for transport of materials and products
	Diesel for explosives	Upstream fuel extraction and processing
	Diesel combustion for generation of electricity	Workforce commute including road and air travel
	Fugitive emissions from mining of coal	Handling of project waste
	Combustion of fugitive methane	End use of sold product coal
	through flaring (where applicable)  Electricity usage for conveyors, the coal processing plant, amenities, etc  Vegetation clearing	Electricity usage for transport of materials and products
Decommissioning	Diesel combustion for rehabilitation activities	Upstream fuel extraction and processing
	Electricity usage	

#### 3.4.1 Fugitive emissions resulting from the extraction of coal

Fugitive GHG emissions resulting from the extraction of coal have been calculated using Method 1 as per Subdivision 3.2.3.2, Subsection 3.20 of the NGER Determination. Method 1 is:

$$E_j = Q \times EF_j,$$

Where:

 $E_j$  is the fugitive emissions of methane (j) that result from the extraction of coal from the mine during the year measured in CO<sub>2</sub>-e tonnes

Q is the quantity of ROM coal extracted from the mine during the year, measured in tonnes (t)

 $EF_j$  is the emissions factor for methane (*j*), measured in CO<sub>2</sub>-e tonnes per tonne of ROM coal extracted from the mine (the default  $EF_j$  for a mine in Queensland is 0.031).

Peabody will begin estimating fugitive emissions with Method 2 soon as required by the NGER Determination for Safeguards facilities. Peabody is in the process of characterising the gas domains for the Coppabella Mine for this purpose.

#### 3.5 Method for calculation of GHG emissions

#### 3.5.1 Emissions from construction and operation

Projected annual Scope 1, Scope 2, and Scope 3 GHG emissions for the Project during construction and operation are calculated from projected activity data provided by Peabody by applying the methods, fuel consumption and emissions factors described in the following resources:

- NGER Determination
- The National Greenhouse Accounts Factors (to date)
- The Greenhouse Gas Protocol (WRI/WBCSD, 2004)

Method 1, as outlined in the NGER Determination for the relevant calculations, is used to calculate Scope 1 and Scope 2 emissions (t  $CO_2$ -e) calculations. The method is:

$$\frac{\mathbf{Q} \times \mathbf{ECF} \times \mathbf{EF}}{\mathbf{1000}},$$

where Q is the quantity of the emission source (e.g., with units kilolitres, kL), ECF is the energy content factor of the emission source (e.g., with units GJ/kL) (Table 3), EF is the emission factor that describes the total amount of equivalent carbon dioxide emissions associated with the emission source (i.e., with units kg CO<sub>2</sub>-e/GJ) (Table 3), and the 1000 returns the correct units for the emissions (Table 3).

Table 3 Summary of energy content and emissions factors for Scope 1 and Scope 2 assessment

Factorion	Energy	Units	Emission factor		
Emission source	content		Scope 1	Scope 2	Units
Diesel (transport) 1	38.6	GJ/kL	70.4	-	kg CO <sub>2</sub> -e/GJ
Diesel (stationary) 1	38.6	GJ/kL	70.2	-	kg CO <sub>2</sub> -e/GJ
Land Clearing - Eucalyptus woodlands	-	-	40.2	-	t C / ha
Land Clearing - Acacia shrublands	-	-	37.3		t C / ha
Land Clearing - Acacia Forest and woodlands	-	-	37.5		t C / ha
Electricity usage	-	-	-	0.67	kg CO <sub>2</sub> -e/kWh

<sup>&</sup>lt;sup>1</sup> (DCCEEW, 2025)

<sup>&</sup>lt;sup>2</sup> Full Carbon Accounting Model (FullCAM) (Richards, 2001)

Table 4 Summary of emissions factors for Scope 3 components of the Project

Emission source	Energy Content	Unit	Scope 3 emission factor	Units
Diesel <sup>1</sup>	38.6	GJ/kL	17.3	kgCO <sub>2</sub> -e/GJ
Electricity Usage <sup>1</sup>	-	-	0.1	kg CO2-e/kWh
Bulk Carrier Shipping Average <sup>2</sup>	-	-	0.00353	t.km t CO <sub>2</sub> -e
Coking Coal <sup>1</sup>	30	GJ/t	92.0	kg CO <sub>2</sub> -e/GJ
Municipal solid waste 1	-	-	1.6	t CO <sub>2</sub> -e/t
Commercial and industrial waste <sup>1</sup>	-	-	1.3	t CO2-e/t
1 DOOFFW 2025			1	1

<sup>&</sup>lt;sup>1</sup> DCCEEW, 2025

#### 3.5.2 Emissions from vegetation clearance

The Full Carbon Accounting Model (FullCAM) (Richards, 2001) is used to assess the carbon stock (tonnes carbon per hectare (t C / ha)) of vegetation within the proposed areas for land clearing resulting from the Project. FullCAM estimates the carbon stock change in ecosystems at a grid scale of 25 m x 25 m including:

- above and belowground biomass
- standing and decomposing debris
- soil carbon resulting from land use and management activities.

The carbon stock is multiplied by an emissions factor to give the t CO<sub>2</sub>-e that would be emitted if all the carbon was converted to carbon dioxide at a single point in time.

The vegetation to be cleared was identified by Queensland Remnant 2021 broad vegetation groups (BVG) as predominately 16a, 16c, 17a, 24a, 25a and non-remnant (DETSI, 2024). Areas identified as non-remnant were assumed to consist of no carbon stock. The area of the BVGs to be cleared and the resulting matched FullCAM vegetation types are identified in Table 5 and presented in Figure 1. The BVG data includes the relative contribution of each BVG where multiple BVGs exist.

Table 5 Mapping of Broad Vegetation Groups to FullCAM Vegetation Types and Areas Cleared

Broad Vegetation Group	FullCam Vegetation Type	Area Cleared (ha)
16a - Eucalyptus camaldulensis (river red gum) or E. tereticornis (blue gum)	Eucalyptus woodlands	24.9
16c - Eucalyptus coolabah (coolibah) or E. microtheca or E. largiflorens (black box) or E. tereticornis (blue gum) woodlands.	Eucalyptus woodlands	25.5
17a - Eucalyptus populnea (poplar box) or E. brownii (Reid River box)) woodlands on alluvium, sand plains and footslopes	Eucalyptus woodlands	253.6

<sup>&</sup>lt;sup>2</sup> Department for Energy Security and Net Zero, 2025

24a - Acacia spp. low woodlands to tall shrublands on residuals.	Acacia shrublands	9.2
25a - Open forests to woodlands dominated by <i>Acacia harpophylla</i> (brigalow) sometimes with <i>Casuarina cristata</i> (belah) on heavy clay soils.	Acacia forest and woodlands	40.6
Non-remnant land	-	32.4
Total		386.4

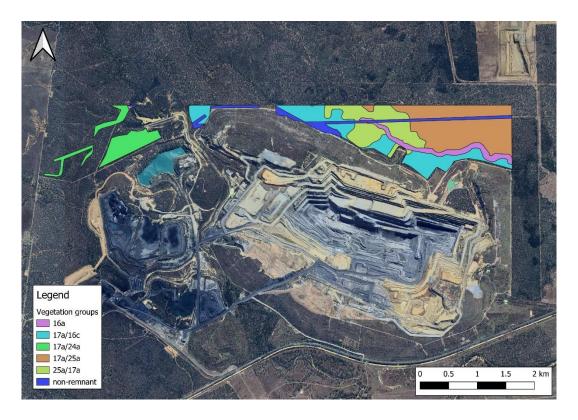


Figure 1 Mapping of Broad Vegetation Groups

Emissions were calculated by running FullCAM simulations of 100% clearing for each FullCAM vegetation type. FullCAM returns the total tonnes of carbon per hectare (t C / ha) for the vegetation type (Table 3). The t C values are converted to t  $CO_2$ -e by multiplying by the ratio of the molecular weight of carbon dioxide to that of carbon (44/12). The t  $CO_2$ -e is then multiplied by the vegetation type area (in hectares) cleared. Land clearing is assumed and modelled as occurring entirely in Year 1, with all pre-clearing carbon stock accounted as emitted in the same reporting year.

#### 3.5.3 Emissions from coal distribution

The Mine produces PCI coal, exporting to markets across Asia, India, Europe, and South America via the DBCT, south of Mackay.

The distribution of coal involves the transport of coal product to DBCT via electric trains and then shipping to international markets. The distribution of coal from receiving ports to the point of final use is not included in this assessment due to limited data availability and Peabody's limited influence over these emissions.

The total projected product coal for the LOM to be distributed is 91.31 Mt. Data on rail and shipping locations along with the respective tonnage of product coal transported to each destination was supplied by Peabody and applied in this assessment (Table 6).

Table 6 Coal Distribution by destination, distance, and attributable percentage of product coal

Transport type	Destination	Distance (km)	Percentage of product coal distributed
Rail	DBCT	145	100%
	Brazil	16,451	17%
	Europe	21,174	18%
	India	10,551	5%
Ship	Indonesia	5,558	2%
	Japan	7,402	40%
	Korea	7,539	4%
	Taiwan	6,284	14%

Emissions from rail freight were calculated using an industry average energy consumption of 0.02 kilowatt-hours per tonne- kilometre (kWh/t·km) (Ligternik, Smit, & Spreen, 2018). The total electricity due to rail freight was then multiplied by Queensland's electricity EF (Table 3).

Emissions resulting from shipping of coal used The Department of Energy Security and Net Zero's (2025) average bulk carrier emission factor (Table 4). The respective tonnage and of coal and distance per destination was multiplied by the EF.

#### 3.5.4 Emissions from upstream processing of purchased diesel

Diesel will be consumed throughout the project for fuelling vehicles and powering generators. Emissions factors in the National Greenhouse Accounts Factors (Table 4) for the upstream extraction and processing of diesel oil were applied to diesel consumption data provided by Peabody to evaluate total Scope 3 GHG emissions resulting from the production of diesel for the Project.

#### 3.5.5 Emissions from downstream waste

In assessing the emissions resulting from downstream waste, Peabody's waste sources were categorised as either:

- Municipal waste
- Commercial and industrial waste.

The total tonnage of each waste category was then multiplied the respective EF (Table 4). The downstream emissions of waste did not include transportation to the waste processing facility due to data unavailability and relative immateriality.

#### 3.5.6 Emissions from end use of coal

Emissions resulting from the end use (combustion) of coal were estimated using the emissions factors provided in the NGER Determination. Coking coal was conservatively assumed to be the coal to be combusted. It is assumed that all emissions during combustion of coal are emitted to the atmosphere without mitigation measures applied; the commitments of end users of coal to GHG abatement is discussed in Section 4.3.1.

The quantity of coal projected to be sold by country along with the percentage of total LOM coal is shown in Appendix A (Table A1). Specific end user companies are not disclosed in this report due to commercial sensitivity, however these may be supplied by Peabody upon request. Japan is the destination country expected to receive the highest quantity of coal (39.8%), followed by Europe (18.2%) and Brazil (16.7%). Publicly available data sources including but not limited to company websites, shipping inventories, and financial reports were searched to identify the category, coal use type and decarbonisation commitments for end use companies. Each end user category is categorised as a steel manufacturer.

The Nationally Determined Contributions (NDCs) for Paris Agreement commitments of end user countries are shown in Appendix A (Table A2).

#### 3.6 Limitations and assumptions

The assessment has been conducted using data provided by Peabody. Katestone makes no claim as to the accuracy of this data. Due to limitations of data, the following assumptions were applied:

- Only lubricating petroleum-based oils and greases (PBOGs) were included in this assessment as other PBOGs are reported as energy consumed in the NGER system
- Peabody's Scope 3 emissions do not include return trips of ships or trains
- Rail freight services are purchased by Peabody (Scope 3 category 4) shipping services are not purchased by Peabody (Scope 3 category 9)
- End use of coal assumes the Australian EF for coking coal for every country

#### 4. RESULTS

#### 4.1 Summary of Emissions for Scenario 1 and Scenario 2 for LOM

The GHG emissions associated with the Project for both development scenarios for Scope 1, Scope 2, and Scope 3 emissions over the life of mine (LOM) are presented in Table 7.

#### Scenario 1

The total GHG emissions for Scenario 1 are estimated to be 253.21 Mt CO<sub>2</sub>-e. Of this:

- LOM Scope 1 emissions are estimated at 6.60 Mt CO<sub>2</sub>-e, with an annual average of 0.37 Mt CO<sub>2</sub>-e.
- LOM Scope 2 emissions are estimated at 0.97 Mt CO<sub>2</sub>-e, with an annual average of 0.05 Mt CO<sub>2</sub>-e.
- LOM Scope 3 emissions are estimated at 1.18 Mt CO<sub>2</sub>-e within Australia and 244.47 Mt CO<sub>2</sub>-e outside Australia.

On an annual basis, emissions from Scenario 1 are expected to contribute approximately 0.11% to Australia's total annual GHG emissions<sup>1</sup> and approximately 0.03% to global GHG emissions<sup>2</sup>.

#### Scenario 2

The total GHG emissions for Scenario 2 are estimated to be 265.07 Mt CO<sub>2</sub>-e. Of this total:

- LOM Scope 1 emissions are estimated at 6.92 Mt CO<sub>2</sub>-e, with an annual average of 0.15 Mt CO<sub>2</sub>-e.
- LOM Scope 2 emissions are estimated at 1.02 Mt CO<sub>2</sub>-e, with an annual average of 0.02 Mt CO<sub>2</sub>-e.
- Scope 3 emissions are estimated at 1.38 Mt CO<sub>2</sub>-e within Australia and 255.75 Mt CO<sub>2</sub>-e outside Australia.

On an annual basis, emissions from Scenario 2 are likewise expected to contribute approximately 0.05% to Australia's total annual GHG emissions<sup>1</sup> and approximately 0.012% to global GHG emissions<sup>2</sup>.

Table 7 Summary of GHG Emissions associated with the Project

Category	Measure	Scenario 1 (Mt CO <sub>2</sub> -e)	Scenario 2 (Mt CO <sub>2</sub> -e)
Saana 4	Average annual emissions	0.37	0.15
Scope 1	Total emissions	6.60	6.92
Saana 2	Average annual emissions	0.05	0.02
Scope 2	Total emissions	0.97	1.02
	Average annual emissions (within Australia)	0.07	0.03
Saana 2	Average annual emissions (outside Australia)	13.90	5.68
Scope 3	Total emissions (within Australia only)	1.18	1.38
	Total emissions (outside Australia only)	244.47	255.75
Totals	Total GHG Emissions	253.21	265.07

<sup>&</sup>lt;sup>1</sup> 2022 Australian GHG emissions inventory available at <a href="https://ageis.climatechange.gov.au/">https://ageis.climatechange.gov.au/</a>

https://www.climatewatchdata.org/ghg-emissions?chartType=area&end\_year=2021&start\_year=1990

<sup>&</sup>lt;sup>2</sup> 2021 Global GHG emissions inventory available at

Category	Measure	Scenario 1 (Mt CO <sub>2</sub> -e)	Scenario 2 (Mt CO <sub>2</sub> -e)
	Average annual emissions (within Australia)	0.49	0.21
	Average annual emissions (within and outside Australia)	14.38	5.89
Contributions	Total average annual emissions (within Australia) as % of Australia current annual emissions	0.11%	0.05%
Contributions	Total average emissions (within and outside Australia) as % of Global current annual emissions	0.03%	0.012%

#### 4.2 Scope 1 and 2 emissions

A breakdown of Scope 1 and 2 emissions for the total LOM for Scenario 1 is provided in Table 8. A breakdown by year is provided in Table 9.

The assessment for Scenario 1 shows that combined Scope 1 and Scope 2 LOM emissions are estimated to be 7,561,571 t CO<sub>2</sub>-e:

- Fugitive methane emissions are expected to be the largest source, totalling 3,268,136 t CO<sub>2</sub>-e (43.22%),
- Diesel combustion for stationary plant, and transport vehicles is expected to contribute 3,153,888 t CO<sub>2</sub>-e (41.71%) and 12,482 t CO<sub>2</sub>-e (0.17%) respectively.
- Diesel used in explosives is estimated to result in 90,686 t CO<sub>2</sub>-e (1.20%)
- PBOGs and refrigerants contribute 17,917 t CO<sub>2</sub>-e (0.24%) and 99 t CO<sub>2</sub>-e (~0%) respectively.
- Land clearing is estimated to result in 52,083 t CO<sub>2</sub>-e (0.69%).
- Emissions from electricity purchased from the Queensland grid are estimated to result in 966,279 t CO<sub>2</sub>-e (12.78%).
- The maximum annual greenhouse gas emissions are estimated at 486,716 t CO<sub>2</sub>-e in project year 1 (with land clearing) and 462,756 t CO<sub>2</sub>-e in project year 11 (without land clearing) (Table 9).

The average annual emissions by project year are estimated at 420,087 t  $CO_2$ -e, with emissions remaining relatively steady between project years 2 and 14, between 462,756 t  $CO_2$ -e to 414,929 t  $CO_2$ -e. The emissions decrease in project years 15 to 17 and then in the last year are significantly lower at 185,881 t  $CO_2$ -e.

Table 8 Scenario 1 - Scope 1 and 2 GHG emissions for the LOM of the Project

		Proportion of				
Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total	Total	
		Scope 1				
Diesel (stationary)	3,140,409	4,493	8,985	3,153,888	41.71%	
Diesel (transport)	12,482	2	89	12,482	0.17%	
Diesel (explosives)	90,686	8	15	90,686	1.20%	
PBOGS	17,917			17,917	0.24%	
Refrigerants				99	0.00%	

Land clearing				52,083	0.69%					
Fugitive methane				3,268,136	43.22%					
Total Scope 1	3,261,494	4,502	9,089	6,595,291						
	Scope 2									
Electricity	966,279			966,279	12.78%					
Total Scope 2	966,279			966,279						
Total Scope 1 and Scope 2	4,227,773	4,502	9,089	7,561,571	100.00%					

Table 9 Scenario 1 - GHG emissions by category and project year for the LOM of the Project

			04			00	
Project			Scope 1 (t CO <sub>2</sub> -e)			Scope 2 (t CO <sub>2</sub> -e)	Total
Year	Diesel	Fugitive Methane	Land Clearing	PBOGS and SF6	Explosives	Electricity	(t CO <sub>2</sub> -e)
1	185,631	186,000	52,083	1,025	5,327	56,649	486,716
2	189,879	186,000		1,025	5,458	57,945	440,307
3	187,635	186,000		1,025	5,389	57,260	437,309
4	193,923	186,000		1,025	5,582	59,180	445,710
5	186,916	186,000		1,025	5,367	57,041	436,349
6	192,464	186,000		1,025	5,537	58,734	443,761
7	196,575	186,000		1,025	5,663	59,989	449,252
8	185,889	186,000		1,025	5,335	56,728	434,977
9	188,414	186,000		1,025	5,413	57,498	438,350
10	195,049	186,000		1,025	5,616	59,523	447,213
11	206,684	186,000		1,025	5,973	63,074	462,756
12	206,651	186,000		1,025	5,972	63,064	462,711
13	170,881	186,000		1,025	4,875	52,148	414,929
14	181,291	186,000		1,025	5,194	55,324	428,835
15	153,930	186,000		1,025	4,356	46,975	392,286
16	157,005	186,000		1,025	4,450	47,913	396,393
17	128,141	186,000		1,025	3,565	39,105	357,836
18	59,412	106,136		587	1,614	18,131	185,881
Total	3,166,370	3,268,136	52,083	18,016	90,686	966,279	7,561,571
Average	175,909	181,563	52,083	1,001	5,038	53,682	420,087
Maximum	206,684	186,000	52,083	1,025	5,973	63,074	486,716

A breakdown of Scope 1 and 2 emissions for the total LOM for Scenario 2 is provided in Table 10. A breakdown by year is provided in Table 11.

The assessment for Scenario 2 shows that combined Scope 1 and Scope 2 LOM emissions are estimated to be 7,935,448 t CO<sub>2</sub>-e:

- Fugitive methane emissions are expected to be the largest source, totalling 3,424,025 t CO<sub>2</sub>-e (43.15%).
- Diesel combustion for stationary plant and transport vehicles is expected to contribute 3,315,910 t CO<sub>2</sub>-e (41.79%) and 13,123 t CO<sub>2</sub>-e (0.17%), respectively.
- Diesel used in explosives is estimated to result in 95,368 t CO<sub>2</sub>-e (1.20%).
- PBOGs and refrigerants contribute 18,771 t CO<sub>2</sub>-e (0.24%) and 248 t CO<sub>2</sub>-e (~0%), respectively.
- Land clearing is estimated to result in 64,182 t CO<sub>2</sub>-e (0.66%).
- Emissions from electricity purchased from the Queensland grid are estimated at 1,015,919 t CO<sub>2</sub>-e (12.80%).
- The maximum annual greenhouse gas emissions are estimated at 323,738 t CO<sub>2</sub>-e in project year 11.

The average annual emissions by project year are estimated at 176,343 t  $CO_2$ -e, with emissions remaining relatively steady between project years 1 and 14, ranging from 323,738 t  $CO_2$ -e to 242,477 t  $CO_2$ -e. Emissions then steadily decrease between project years 15 and 45, with the final year estimated at 54,948 t  $CO_2$ -e.

Table 10 Scenario 2 - Scope 1 and 2 GHG emissions for the LOM of the Project

0		GHG emiss	ions (t CO <sub>2</sub> -e)		Proportion of	
Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total	Total	
		Scope 1				
Diesel (stationary)	3,301,739	4,724	9,447	3,315,910	41.79%	
Diesel (transport)	13,123	2	93	13,123	0.17%	
Diesel (explosives)	95,368	4	8	95,368	1.20%	
PBOGS	18,771			18,771	0.24%	
Refrigerants				248	0.00%	
Land clearing				52,083	0.66%	
Fugitive methane				3,424,025	43.15%	
Total Scope 1	3,429,002	4,729	9,548	6,919,529		
		Scope 2				
Electricity	1,015,919			1,015,919	12.80%	
Total Scope 2	1,015,919			1,015,919		
Total Scope 1 and Scope 2	4,444,921	4,729	9,548	7,935,448	100.00%	

Table 11 Scenario 2 - GHG emissions by category and project year for the LOM of the Project

Project		•	Scope 1 (t CO	2-e)		Scope 2 t CO <sub>2</sub> -e)	Total
Year	Diesel	Fugitive Methane	Land Clearing	PBOGS and SF6	Explosives	Electricity	(t CO <sub>2</sub> -e
1	101,850	129,028	52,083	713	2,870	31,082	317,626
2	99,301	124,337		687	2,802	30,304	257,431
3	104,191	134,805		745	2,931	31,796	274,468
4	100,932	134,764		744	2,831	30,801	270,073
5	105,271	131,248		725	2,971	32,126	272,341
6	100,658	127,934		707	2,836	30,718	262,853
7	105,546	174,192		960	2,896	32,209	315,804
8	100,991	156,074		861	2,792	30,819	291,537
9	94,893	125,646		694	2,664	28,958	252,855
10	113,918	123,528		683	3,251	34,764	276,144
11	137,056	140,155		774	3,928	41,825	323,738
12	110,974	107,109		593	3,193	33,866	255,735
13	99,639	108,986		603	2,842	30,407	242,477
14	115,357	106,321		588	3,329	35,203	260,798
15	119,451	125,612		694	3,417	36,453	285,626
16	92,496	75,467		419	2,688	28,227	199,297
17	97,923	77,938		433	2,850	29,883	209,026
18	92,296	73,118		406	2,686	28,166	196,673
19	97,292	56,146		313	2,873	29,691	186,314
20	97,303	45,559		255	2,894	29,694	175,704
21	96,255	42,225		237	2,868	29,374	170,960
22	87,173	27,623		157	2,618	26,602	144,174
23	62,620	35,882		202	1,849	19,110	119,663
24	61,151	35,490		200	1,805	18,661	117,308
25	60,907	33,821		191	1,801	18,587	115,306
26	54,346	34,340		194	1,599	16,585	107,064
27	57,653	40,955		230	1,687	17,594	118,119
28	50,704	32,768		185	1,490	15,473	100,621
29	51,081	57,300		320	1,454	15,588	125,744
30	49,564	53,000		296	1,416	15,126	119,402
31	54,988	40,674		229	1,606	16,781	114,278
32	49,175	41,143		231	1,427	15,007	106,984

Project		•	Scope 1 (t CC	) <sub>2</sub> -e)		Scope 2 t CO <sub>2</sub> -e)	Total (t CO <sub>2</sub> -e)	
Year	Diesel	Fugitive Methane	Land Clearing	PBOGS and SF6	Explosives	Electricity		
33	45,817	40,451		227	1,326	13,982	101,804	
34	41,756	63,864		356	1,156	12,743	119,874	
35	51,364	63,382		353	1,451	15,675	132,225	
36	46,401	51,376		287	1,322	14,160	113,547	
37	46,827	59,709		333	1,319	14,290	122,478	
38	42,228	38,612		217	1,219	12,887	95,164	
39	41,499	58,031		324	1,159	12,664	113,677	
40	39,115	48,656		272	1,104	11,937	101,084	
41	36,766	51,464		288	1,027	11,220	100,764	
42	33,208	58,666		327	904	10,134	103,239	
43	33,385	46,940		263	932	10,188	91,708	
44	33,265	54,163		302	914	10,151	98,796	
45	14,445	35,521		200	374	4,408	54,948	
Total	3,329,033	3,424,025	52,083	19,020	95,368	1,015,919	7,935,448	
Average	73,979	76,089	52,083	423	2,119	22,576	176,343	
Maximum	137,056	174,192	52,083	960	3,928	41,825	323,738	

#### 4.2.1 Fugitive methane emissions

Fugitive methane emissions resulting from the project are estimated to be:

- Scenario 1:
  - ⊙ 3,268,136 t CO₂-e for the LOM resulting from 105,423,758 t of ROM coal mined. Emissions are relatively steady throughout the project except the last year, project year 18 (Figure 2).
- Scenario 2:
  - $_{\odot}$  3,424,025 t CO<sub>2</sub>-e for the LOM resulting from 110,452,429 t of ROM coal mined, peaking in Project Years 1 14 (Figure 3).

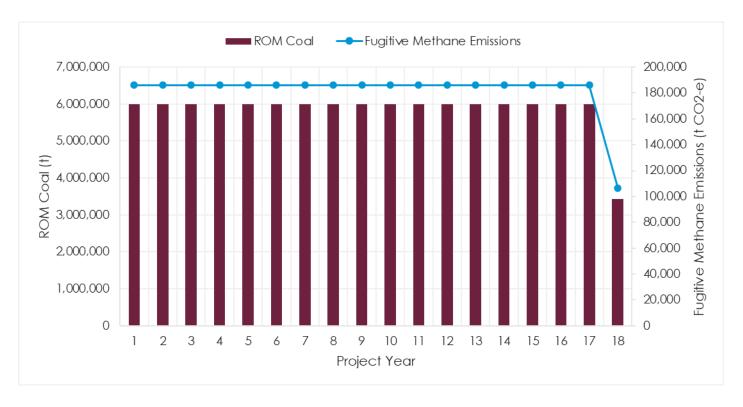


Figure 2 Scenario 1 - fugitive methane emissions (t CO2-e) and ROM coal (t) by project year

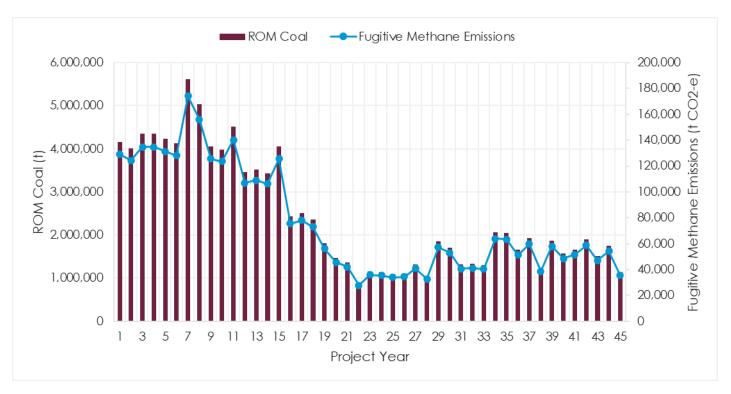


Figure 3 Scenario 2 - fugitive methane emissions (t CO<sub>2</sub>-e) and ROM coal (t) by project year

#### 4.3 Scope 3 emissions

The Scope 3 emissions inventory for the project are provided in Table 12 (Scenario 1) and Table 13 (Scenario 2). The total LOM Scope 3 emissions are estimated to be 245,645,014 t CO<sub>2</sub>-e in scenario 1 and 257,136,045 t CO<sub>2</sub>-e in scenario 2. For both scenarios, end use of sold products is the highest Scope 3 emission category for the LOM estimated to be 240,578,747 t CO<sub>2</sub>-e (97.9% of total) in scenario 1 and 252,085,922 t CO<sub>2</sub>-e (98.0% of total) in scenario 2. Downstream distribution Scope 3 emissions were estimated to be 4,056,720 t CO<sub>2</sub>-e (1.7% of total) in scenario 1 and 3,844,662 t CO<sub>2</sub>-e (1.5% of total) in Scenario 2. Fuel and energy-related Scope 3 emissions were 1,746,586 t CO<sub>2</sub>-e in scenario 1 and 2,003,105 t CO<sub>2</sub>-e in Scenario 2.

#### 4.3.1 End use of coal

The end use of sold product coal represents the most significant source of Scope 3 emissions for the Project. Combustion of coal overseas is projected to result in 240,578,747 t CO<sub>2</sub>-e in scenario 1 and 252,085,922 t CO<sub>2</sub>-e in Scenario 2. This value has been obtained using the default emission factor for coking coal (NGER Determination) and may change depending on the actual tonnage and types of coal consumed and the analytically derived energy content of the coal. No coal from the Mine will be combusted within Australia.

#### 4.4 GHG emission category for the Project

Maximum annual Scope 1 and 2 GHG emissions for the Project are estimated as 486,716 t CO<sub>2</sub>-e, occurring in project year 1 in Scenario 1 and 323,738 t CO<sub>2</sub>-e, occurring in project year 1 in Scenario 2. The Project is therefore considered a medium to high emitter under the GHG Guideline. The EA application for the Project is required to include a GHG abatement plan and a Scope 3 emissions inventory further to requirements for low emitter applications.

Table 12 Scenario 1 - Scope 3 Inventory for LOM

					GHG emissi	ions (t CO <sub>2</sub> -e)				
Project Year		ergy Related vities	Downstream	n Distribution	Use of Sol	ld Products	Waste generated in operations	Totals		
	Diesel	Electricity	Trains	Shipping	End Use Coal Aus	End Use Coal Overseas	Waste	Australia (excl. shipping)	International (incl. shipping)	Total
1	45,746	7,610	9,848	203,804	0	14,008,674	5,524	68,728	14,212,478	14,281,206
2	46,793	7,784	9,862	204,105	0	14,029,398	5,524	69,963	14,233,504	14,303,467
3	46,240	7,692	9,953	205,988	0	14,158,761	5,524	69,409	14,364,749	14,434,158
4	47,790	7,949	9,878	204,426	0	14,051,424	5,524	71,142	14,255,850	14,326,992
5	46,063	7,662	9,814	203,096	0	13,960,041	5,524	69,063	14,163,138	14,232,201
6	47,430	7,890	9,822	203,275	0	13,972,290	5,524	70,667	14,175,565	14,246,231
7	48,443	8,058	9,785	202,499	0	13,918,952	5,524	71,811	14,121,451	14,193,262
8	45,810	7,620	9,768	202,153	0	13,895,226	5,524	68,722	14,097,380	14,166,102
9	46,432	7,724	9,716	201,071	0	13,820,803	5,524	69,396	14,021,874	14,091,270
10	48,067	7,996	9,175	189,879	0	13,051,549	5,524	70,762	13,241,428	13,312,190
11	50,934	8,473	9,082	187,957	0	12,919,444	5,524	74,014	13,107,402	13,181,415
12	50,926	8,471	9,292	192,302	0	13,218,099	5,524	74,214	13,410,402	13,484,616
13	42,111	7,005	9,424	195,034	0	13,405,894	5,524	64,065	13,600,929	13,664,994
14	44,677	7,432	9,303	192,524	0	13,233,350	5,524	66,935	13,425,874	13,492,809
15	37,934	6,310	9,474	583,636	0	13,477,550	5,524	59,243	14,061,186	14,120,429
16	38,692	6,436	9,584	198,339	0	13,633,053	5,524	60,236	13,831,392	13,891,628
17	31,578	5,253	9,785	202,496	0	13,918,802	5,524	52,140	14,121,299	14,173,439
18	14,641	2,435	5,557	115,012	0	7,905,435	5,524	28,159	8,020,447	8,048,605
Total	780,307	129,799	169,123	3,887,598	0	240,578,747	99,440	1,178,669	244,466,345	245,645,014
Category Total	910	,106	4,05	6,720	240,5	78,747	88,391	1,178,669	244,466,345	245,645,014

Table 13 Scenario 2 - Scope 3 Inventory for LOM

	GHG emissions (t CO <sub>2</sub> -e)													
Project Year		nergy Related ivities	Downstrear	n Distribution	Use of Sold Products		Waste generated in operations	Totals						
	Diesel	Electricity	Trains	Shipping	End Use Coal Aus	End Use Coal Overseas	Waste	Australia (excl. shipping)	International (incl. shipping)	Total				
1	25,099	4,175	6,678	138,211	0	9,500,059	5,524	41,477	9,638,270	9,679,747				
2	24,471	4,071	6,531	135,168	0	9,290,932	5,524	40,598	9,426,100	9,466,698				
3	25,676	4,271	7,128	147,517	0	10,139,750	5,524	42,600	10,287,267	10,329,867				
4	24,873	4,137	7,197	148,941	0	10,237,610	5,524	41,732	10,386,551	10,428,283				
5	25,943	4,315	7,018	145,248	0	9,983,766	5,524	42,801	10,129,014	10,171,815				
6	24,806	4,126	6,856	141,897	0	9,753,428	5,524	41,313	9,895,324	9,936,637				
7	26,010	4,327	9,202	190,432	0	13,089,535	5,524	45,063	13,279,966	13,325,030				
8	24,888	4,140	8,240	170,529	0	11,721,503	5,524	42,792	11,892,033	11,934,825				
9	23,385	3,890	6,626	137,123	0	9,425,265	5,524	39,425	9,562,388	9,601,813				
10	28,073	4,670	6,529	135,124	0	9,287,851	5,524	44,797	9,422,975	9,467,772				
11	33,775	5,618	7,372	152,572	0	10,487,188	5,524	52,291	10,639,760	10,692,050				
12	27,348	4,549	5,610	116,094	0	7,979,873	5,524	43,031	8,095,968	8,138,999				
13	24,555	4,085	5,710	118,163	0	8,122,078	5,524	39,873	8,240,242	8,280,115				
14	28,428	4,729	5,552	114,909	0	7,898,353	5,524	44,234	8,013,261	8,057,495				
15	29,437	4,897	6,215	128,621	0	8,840,893	5,524	46,073	8,969,514	9,015,587				
16	22,794	3,792	3,614	74,789	0	5,140,673	5,524	35,724	5,215,462	5,251,186				
17	24,132	4,014	3,843	79,526	0	5,466,311	5,524	37,513	5,545,837	5,583,350				
18	22,745	3,783	3,587	74,233	0	5,102,468	5,524	35,640	5,176,701	5,212,341				
19	23,976	3,988	2,853	59,045	0	4,058,551	5,524	36,342	4,117,597	4,153,939				
20	23,979	3,989	2,285	47,279	0	3,249,741	5,524	35,777	3,297,020	3,332,796				

					GHG emission	ons (t CO <sub>2</sub> -e)				
Project Year		Fuel and Energy Related Activities		n Distribution	Use of Sold Products		Waste generated in operations	Totals		
	Diesel	Electricity	Trains	Shipping	End Use Coal Aus	End Use Coal Overseas	Waste	Australia (excl. shipping)	International (incl. shipping)	Total
21	23,721	3,946	2,063	42,703	0	2,935,238	5,524	35,254	2,977,941	3,013,195
22	21,483	3,573	1,362	28,193	0	1,937,889	5,524	31,943	1,966,082	1,998,025
23	15,432	2,567	1,798	37,200	0	2,556,968	5,524	25,321	2,594,168	2,619,488
24	15,070	2,507	1,787	36,981	0	2,541,914	5,524	24,888	2,578,895	2,603,783
25	15,010	2,497	1,713	35,452	0	2,436,820	5,524	24,744	2,472,272	2,497,015
26	13,393	2,228	1,748	36,170	0	2,486,164	5,524	22,893	2,522,334	2,545,226
27	14,208	2,363	2,068	42,798	0	2,941,795	5,524	24,164	2,984,593	3,008,757
28	12,495	2,079	1,681	34,789	0	2,391,287	5,524	21,779	2,426,076	2,447,855
29	12,588	2,094	2,883	59,661	0	4,100,849	5,524	23,090	4,160,510	4,183,600
30	12,214	2,032	2,641	54,655	0	3,756,752	5,524	22,412	3,811,407	3,833,818
31	13,551	2,254	2,017	41,749	0	2,869,683	5,524	23,347	2,911,432	2,934,779
32	12,119	2,016	2,062	42,673	0	2,933,159	5,524	21,721	2,975,832	2,997,552
33	11,291	1,878	2,056	42,553	0	2,924,891	5,524	20,750	2,967,444	2,988,194
34	10,290	1,712	3,232	66,886	0	4,597,444	5,524	20,758	4,664,330	4,685,088
35	12,658	2,106	3,237	66,984	0	4,604,232	5,524	23,525	4,671,216	4,694,741
36	11,435	1,902	2,630	54,424	0	3,740,864	5,524	21,491	3,795,288	3,816,779
37	11,540	1,920	3,081	63,761	0	4,382,651	5,524	22,065	4,446,412	4,468,476
38	10,407	1,731	1,994	41,261	0	2,836,089	5,524	19,656	2,877,350	2,897,005
39	10,227	1,701	2,998	62,053	0	4,265,247	5,524	20,451	4,327,299	4,347,750
40	9,639	1,603	2,527	52,301	0	3,594,996	5,524	19,294	3,647,297	3,666,592
41	9,060	1,507	2,700	55,870	0	3,840,248	5,524	18,792	3,896,118	3,914,909
42	8,184	1,361	3,098	64,113	0	4,406,859	5,524	18,167	4,470,972	4,489,139

	GHG emissions (t CO <sub>2</sub> -e)												
Project Year	Fuel and Energy Related Activities		Downstream Distribution		Use of Sold Products		Waste generated in operations	Totals					
	Diesel	Electricity	Trains	Shipping	End Use Coal Aus	End Use Coal Overseas	Waste	Australia (excl. shipping)	International (incl. shipping)	Total			
43	8,227	1,369	2,475	51,225	0	3,521,012	5,524	17,595	3,572,237	3,589,832			
44	8,198	1,364	2,813	58,208	0	4,000,991	5,524	17,898	4,059,199	4,077,097			
45	3,560	592	1,902	39,369	0	2,706,051	5,524	11,579	2,745,419	2,756,998			
Total	820,393	136,467	177,212	3,667,450	0	252,085,922	248,601	1,382,673	255,753,372	257,136,045			
Category Total	95	6,860	3,844,662		252,085,922		248,601	1,382,673	255,753,372	257,136,045			

#### 5. DECARBONISATION PLAN

#### 5.1 Introduction

This GHG Decarbonisation Plan addresses requirements of the GHG Guideline in line with Queensland's emission reduction targets, supporting Peabody in their application for the EA amendment (Table 1). Approval to mine has already been given (EPML00579213).

The Project is considered a medium to high emitter for the purposes of the GHG Guideline, with average Scope 1 GHG emissions of 0.37 Mt CO2-e per year (Scenario 1) and 0.15 t CO2-e per year (Scenario 2) (Table 7) and is therefore required to identify emissions mitigation and management practices and provide a GHG abatement plan.

The Mine is an existing facility under the Safeguard Mechanism.

## 5.2 Peabody Energy Corporate GHG strategy

Peabody has established an ambition of achieving net-zero emissions (Scope 1 and 2) by 2050 through setting measurable, near-term emission reduction goals. Peabody has set a near-term target to reduce their Scope 1 and 2 emissions by 20%, from a 2023 baseline, by 2030. The company is reducing emissions at its operations and developing opportunities to support their customers' climate commitments, including investment in advancing technology and the development of renewables. Further information related to emissions reductions, key projects, initiatives, and partnerships is reported annually in its sustainability report. Peabody's corporate GHG strategy seeks to balance the regulatory environment, customer expectations, and market segments in which they operate to drive outcomes that support their operations.

For Australian operations, Peabody is currently assessing future production volumes, opportunities to implement emission reduction technologies and initiatives that drive operational excellence, and meet the targets established under the Safeguard Mechanism to ensure these targets support long-term economic, social, and environmental sustainability.

# 5.3 Goals and Objectives

Peabody's primary objective for the Project is to meet the Commonwealth Safeguard Mechanism emissions reduction requirement to reduce emissions in line with Australia's emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050.

- Peabody's first supplementary objective is to reduce Project emissions from diesel use by at least 5% against the baseline for the LOM, from mine operation
- Peabody's second supplementary objective is to measure the methane quantity and composition in the Mine's respective coal seams and identify best practice mitigation options for implementation if practicable before mine operation

# 5.4 Projected GHG emissions and emissions intensity of production

The Project has three sources of direct (Scope 1) GHG emissions, i.e., diesel combustion, fugitive methane released from the excavated coal seams, and vegetation clearance. Only the emissions from diesel combustion and fugitive methane are considered under the Safeguard Mechanism's emission intensity of production calculations.

Diesel combustion excluding diesel used in explosives is projected to be 3,166,370 t CO<sub>2</sub>-e in Scenario 1 and 3,329,033 t CO<sub>2</sub>-e in Scenario 2 (Table 8, Table 10). Fugitive methane released from exposed coal seams is the largest source of GHG emissions across the LOM for both Scenarios 1 and 2 and is projected to be 3,268,136 kt CO<sub>2</sub>-e and 3,424,025 t CO<sub>2</sub>-e respectively, for the operational LOM based on the current NGER Determination default emission factor for open cut coal mines (Table 14).

There is one indirect (Scope 2) source of GHG emissions, i.e., the production of electricity purchased from the national electricity market (NEM). Electricity purchased from the NEM accounts for 966,279 kt CO<sub>2</sub>-e per annum in Scenario 1 and 1,015,919 kt CO<sub>2</sub>-e per annum in Scenario 2 based on the 2025 Queensland emissions factor (Table 8, Table 10). This emissions factor will reduce as more renewable generation comes online, and coal fired electricity generation reduces. Consequently, the LOM Scope 2 emissions will be less than projected under current expected electricity demand.

#### 5.5 Reference Point

The projected unabated Scope 1 emissions reference point of each Scenario 1 and Scenario 2 for the LOM is 6,595,291 t CO<sub>2</sub>-e and 6,919,529 t CO<sub>2</sub>-e respectively (Table 14). The current Coppabella mine's emission intensity is 0.06041 t CO<sub>2</sub>-e/t ROM. The current Australian industry average EI is 0.0653 t CO<sub>2</sub>-e/t ROM. The Scope 2 reference point of the Scenario 1 and Scenario 2 for the LOM is 966,279 t CO<sub>2</sub>-e and 1,015,919 kt CO<sub>2</sub>-e respectively.

As a Safeguard Mechanism facility (Figure 4, Figure 5), the legislated emissions reduction target (production-adjusted baseline) for the Project is a product of annual production (t ROM) multiplied by the emissions intensity value (t CO<sub>2</sub>-e/t ROM) multiplied by the annual emissions reduction contribution (i.e., 4.9% per annum to 2030 and 3.285% per annum from 2031) to reach net zero by 2050. Coppabella may be eligible for a different decline rate as it is a trade exposed industry and will need to apply to the CER for this.

The Project would need to purchase and surrender Australian Carbon Credit Units (ACCU) and/or Safeguard Mechanism Credits (SMC) if it is unable to reduce its net emissions below the production-adjusted baseline in any one year.

Table 14 Reference point sources and quantities of Scope 1 and Scope 2 GHG emissions by activity for LOM and abated case for LOM

Activity	Scenario 1 Maximum production		Scenario 2 Attenuated production	
	Base Case (kt CO <sub>2</sub> -e)	Abated Case (kt CO <sub>2</sub> -e)	Base Case (kt CO <sub>2</sub> -e)	Abated Case (kt CO <sub>2</sub> -e)
Diesel <sup>1</sup>	3,166,370	3,008,051	3,329,033	3,162,581
Fugitive Methane <sup>2</sup>	3,268,136	1,634,068	3,424,025	1,712,013
Land Clearing <sup>3</sup>	52,083	52,083	52,083	52,083
PBOGs and Refrigerants	18,016	18,016	19,020	19,020
Diesel used in Explosives	90,686	90,686	95,368	95,368
Purchased Electricity	966,279	966,279	1,015,919	1,015,919
Total Scope 1	6,595,291	4,802,904	6,919,529	5,041,065
Total Scope 1 + Scope 2	7,561,571	5,769,184	7,935,448	6,056,984

<sup>&</sup>lt;sup>1</sup> Refers to diesel consumed at fixed locations and includes onsite mobile plant not registered for road use, e.g., excavators and haul trucks, and stationary engines, e.g., generators

<sup>&</sup>lt;sup>2</sup> Peabody is in the process of measuring and determining the actual coal seam gas content as will be required for future NGER reporting

<sup>&</sup>lt;sup>3</sup> All land clearings are assumed to occur only in project year 1

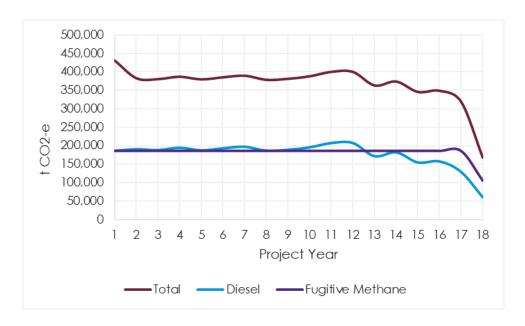


Figure 4: Scenario 1 Unabated Scope 1 emissions (t CO2-e)

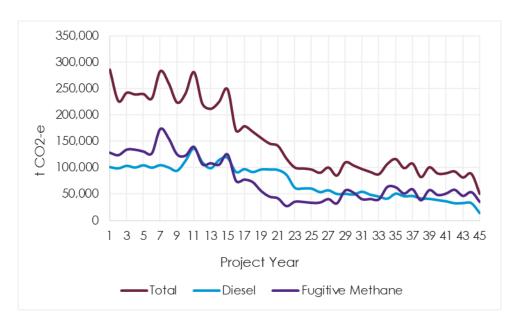


Figure 5: Scenario 2 Unabated Scope 1 emissions (t CO2-e)

### 5.6 Abated Emissions

Projected abated emissions achieved through the decarbonisation management controls (Table 15) to achieve the Project objectives (Section 5.3) are presented Figure 6 (Scenario 1) and Figure 7 (Scenario 2).

Table 15 Key result areas and management controls for the project by GHG abatement hierarchy

Priority	Key Result Area	Management Controls and Timing
Avoid	NA	NA
Reduce	KRA 1: Mobile and stationary plant emissions are reduced from the base case to support emissions reductions as required under the Safeguard Mechanism and Queensland's emission reduction targets Reductions will be realised through process optimisation and cost-effective abatement options.	Mine layout and run of mine will be optimised for diesel use efficiency through explicit planning and scheduling from Project Year 0
		Use of Premium Diesel in all transport and stationary plant will be reviewed before commencement and implemented where available and economically feasible
	·	Research and evaluation of dual fuel technologies in heavy diesel vehicles and implementation if economically feasible and if CSG reserves prove favourable
		Right sized machinery and load optimisation on commissioning to reduce fleet hours
		Right size coal handling plant conveyor motors on commissioning
	KRA 2: Quantify coal seam gas (CSG) reservoirs and identify	Develop accurate domain model of CSG (enabling Method 2 reporting)
	and apply most cost-effective abatement option for fugitive methane	Implement pre-drainage flaring, and/or pre-drainage capture and utilisation of CSG if feasible and cost effective, when project commences
Substitute	KRA 3: Emissions due to electricity usage are reduced where	Implement generation of onsite generation of electricity from CSG on Project commencement if practicable
	cost effective and technically possible	and economically feasible
		Purchase renewably generated electricity where cost effective for Project operation
		Implement onsite renewable electricity generation where a business case exists

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D25018-2 Peabody Energy - Coppabella Mine Greenhouse Gas Assessment and

Decarbonisation Ptan - Final

Priority	Key Result Area	Management Controls and Timing
Offset	KRA 4: Apply cost-effective options to offset balance of annual emissions (<30%) against production adjusted baseline after decarbonisation and abatement	Purchase ACCU produced in Queensland where available and cost effective, and surrender as required  Identify best management practices to increase the post mine land use carbon stock in soil and vegetation for application in progressive rehabilitation
		Convert cleared vegetation to biochar for application to land for carbon sequestration, if practicable

The precise GHG emissions abatement for each management control measure is unable to be projected at the time of publishing this Decarbonisation Plan, however the Project is subject to annual reporting and emissions reduction or offsetting as an existing facility under the Safeguard Mechanism. It is anticipated that CSG quantification will inform feasible abatement options that will be implemented on Project commencement, and which will significantly reduce the fugitive methane component of the Project's Scope 1 emissions.

Peabody will be required to purchase and surrender ACCUs in Project years where the Mine is a Safeguard Facility and is unable to meet the required emissions reduction against the production-adjusted baseline.

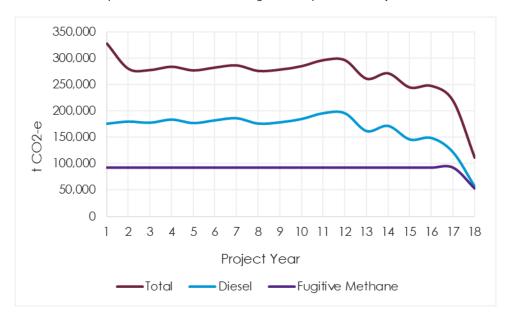


Figure 6 Scenario 1: Abated Scope 1 emissions (t CO<sub>2</sub>-e)

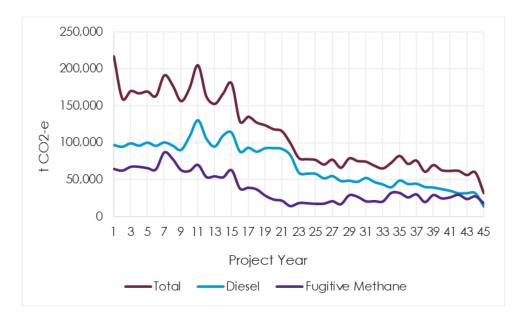


Figure 7 Scenario 2: Abated Scope 1 emissions (t CO<sub>2</sub>-e)

# 5.7 Management Controls to Reduce GHG Emissions

The following management controls will be applied for the Project by Peabody, where practicable and costeffective, to achieve the objectives and key result areas.

#### 5.7.1 Avoid

Peabody is unable to avoid GHG emissions in carrying out the activities associated with the Project.

#### 5.7.2 Reduce

Peabody's priority is to reduce Scope 1 emissions through diesel use efficiency on site and the economically valuable abatement of fugitive methane emissions.

Peabody is continually investigating and testing feasible options for emissions reduction through increased diesel use efficiency and electrical efficiency. The main areas of focus include investigating the business case of:

- Premium diesel (3.9% fuel burn benefit, reducing diesel consumption by 3.9%)
- Dual fuel technologies
- Onsite renewable electricity generation.

Implementation of these options will occur when the business case is met.

Peabody will further investigate the feasibility of other options for GHG emissions reductions including trolley assist systems, in-pit crushing and conveying, battery and tethered electric fleet, and battery trolley systems (Bao, 2024) and will implement these where feasible and commercially available.

Peabody have engaged a third-party contractor to develop gas content and gas composition profiles of targeted Project coal seams to support the development of an NGER Method 2 domain model for estimating fugitive emissions resulting from the extraction of coal. Development of this gas model will improve emissions estimations for the Project and inform fugitive methane abatement opportunities during mining activities. The potential fugitive methane emissions intensity will likely be higher than the default NGER Method 1 emission factor, based on proportions of the mine seams containing high in situ gas content. This will be confirmed prior to commencement of Project operation and paradoxically provides greater opportunities for economically valuable abatement practices, e.g. capture and use on site for dual-fuelling or for export and electricity generation.

Peabody have established an emission reduction framework to evaluate options with actions contingent on each stage's outcome:

- A pre drainage pilot well to be drilled in 2026 which flares CSG to assess permeability and gas drainage attributes
- 2. Expanded pre-drainage and flaring targeting up to 50% of in situ gas, subject to pilot results
- 3. Develop gas utilisation strategies once gas volumes, quality, and well field production potential are confirmed, with options including:
  - Onsite power generation.
  - Diesel substitution (dual fuelled machinery)
  - Gas sales

#### 5.7.3 Substitute

Peabody will evaluate the cost-effectiveness of engaging in a Power Purchase Agreement (PPA) with a supplier of renewably generated electricity, for use by the Coppabella mine. Cost-effectiveness may be reduced if Peabody is able to generate some or all of its electricity needs from CSG. However, a PPA for renewably generated electricity would both support investment in renewably generated electricity in Queensland, helping to meet Queensland targets for renewable energy, and provide for significantly reduced Scope 2 emissions for the mine. Purchasing (or producing) renewably generated electricity will incur zero (0) GHG emissions for that proportion of electricity purchased or produced.

#### 5.7.4 Offset

The Project will be required to purchase and surrender ACCU if and when it is unable to meet Safeguard Mechanism emission reduction requirements. Peabody is committed to implementing all feasible and cost-effective decarbonisation options before seeking to offset residual emissions with ACCUs. Peabody will seek to ensure that the offset requirements are <30% of emissions reductions through its decarbonisation activities and will purchase ACCUs that are produced in Queensland where they are available and cost-effective.

Peabody will also consider all options to maximise carbon sequestration as part of its post mining land use and rehabilitation strategy. This will include appropriate vegetation selection for revegetation and the conversion of vegetation cleared for mining into biochar, where practicable, which will be applied to land as non-labile carbon. Biochar application will also improve water holding and nutrient retention capacity, and soil biome habitat, in the soil.

There may be other PMLU options for offsetting emissions that Peabody will identify and evaluate as the Project progresses.

# 5.8 Mitigating Scope 3 emissions

The significant majority Scope 3 emissions will be due to the combustion of the product coal in Peabody's client countries. These countries are signatories to the Paris Agreement and are responsible for reducing their own GHG emissions and becoming net zero by their specified timeframes.

Peabody will investigate the business case and implement where appropriate, targeted policy interventions to mitigate emissions associated with their supply chain. This may include:

- · Voluntary provision of consumer's GHG and decarbonisation disclosures
- Collaboration on low carbon consumer end users including steel manufacturers, research groups and industry organisations.

Within Australia, Peabody will regularly review options to reduce GHG emissions across its supply and value chain such as distribution of coal product via low emission transportation providers. It is noted, Peabody already contracts a rail freight provider which is seeking to have 25% of their electricity consumption to be from renewable sources.

# 5.9 Monitoring, Evaluation, and Reporting

Peabody will monitor and record all energy use and production within the facility boundary consistent with NGER requirements and methods. This data and the methods for monitoring will be available and subject to periodic internal validation and independent audit.

The Coppabella Mine is subject to the Safeguard Mechanism and Peabody will be required to demonstrate year-on-year proportional reduction in emissions relative to its production-adjusted baseline when its emissions are above the threshold (Figure 4, Figure 5, Figure 6 and Figure 7).

Peabody will report its progress in emissions reduction and minimisation of Safeguard Mechanism liabilities to the Board and will also report its progress in annual emissions reduction in the Sustainability section of its website.

Progress against the objectives (section 3.3) and key result areas (Table 4) will be periodically audited and reviewed.

# 5.10 Advancing technologies and opportunities

Peabody will annually review the technological and commercial readiness of options that may result in improved efficiency in the operation of the Project.



Peabody is committed to a process of continuous improvement to meet its decarbonisation goal and objective. It will scope for new technologies and processes that may be implemented cost-effectively to improve efficiency and reduce GHG emissions. Peabody will also continue to support the Australian Coal Industry Research Program (ACARP) in research to develop best practice environmental management measures.

Feasibility assessments will be conducted for options that meet technology readiness level (TRL) of 6 or above and a commercial readiness level (CRL) of 5 or above, and recommendations for investment will be made to the appropriate level of management.

# 5.11 Assessment of proposed GHG mitigation measures

Decarbonisation of the mining sector is a rapidly changing space, driven in large part by the Safeguard Mechanism requirements. Expected best practice is planning, designing, constructing, and operating mine sites for the efficient use of diesel (Crittenden *et al.* 2016). Electrification of plant and equipment is emerging as best practice however there are still limitations in market availability and cost-competitiveness against traditional diesel options.

Peabody is continually investigating a range of improved diesel-use efficiency and electrification options, and these will be implemented where feasible for the Project.

Peabody is in the process of defining and quantifying the gas domains at the Project site so that the most practicable fugitive methane mitigation options can be identified and implemented. Economically valuable options for capture and use of CSG with a high methane content are currently being rolled out across the Bowen and Galilee Basins.

Practicable and economically feasible emission reduction, abatement, or offsetting options will be implemented when the business case is met. Each option will have the effectiveness monitored and reported (section 5.9).

# 6. RISKS AND LIKELY MAGNITUDE OF IMPACTS ON ENVIRONMENTAL VALUES

## 6.1 Impacts of GHG emissions on environmental values

The increasing concentration of greenhouse gases in the atmosphere, primarily due to the combustion of fossil fuels and deforestation, is leading to the warming of oceans, land, and atmosphere. This warming increases the heat energy available in the climate system leading to changed weather patterns including more frequent and intense extreme weather events. Australia is required to provide the UNFCCC with National Inventory Reports annually, biennial reports every 2 years, and National Communications every 4 years. These reports include details on total and sectoral GHG emissions, progress against reduction targets, and mitigation actions.

The Project is located in the Mackay, Isaac, and Whitsunday region within Queensland. Key climate risks for this region include (Department of Energy and Climate, 2024):

- increased frequency of hot days (>35 °C) and very hot days (>40 °C)
- increased likelihood of bushfire weather
- increased likelihood of short duration high intensity rainfall
- increased pan evaporation rates
- · increased frequency and severity of drought
- less frequent but more intense tropical cyclones
- warmer and more acidic ocean
- rising sea levels and more frequent coastal and open ocean extreme events.

Consequently, there is a need to reduce emissions at a state, national, and global level.

Peabody recognises that the Project will contribute to Queensland's, Australia's, and global GHG emissions while recognising that coal still forms a critical part of the electricity generation sector and steel production sector in Asia and will continue decarbonisation efforts while providing an energy source to the global market.

# 6.2 Contribution to Queensland's Emissions Reduction and Renewable Energy Targets

Queensland has committed to three emissions reduction and three renewable energy targets in legislation. The targets are:

- i. 30% reduction in GHG emissions on 2005 levels by 2030
- ii. 75% reduction in GHG emissions on 2005 levels by 2035
- iii. A net zero emissions economy will be achieved by 2050
- iv. 50% of energy will be provided by renewable energy sources by 2030
- v. 70% of energy will be provided by renewable energy sources by 2032
- vi. 80% of energy will be provided by renewable energy sources by 2035

The Queensland Government has flagged that these targets will be amended and are likely to be reduced.

The state, national, and global carbon budgets for the 2025 - 2050 trajectory towards net zero are 1.67977 Gt  $CO_2$ -e, 7.24862 Gt  $CO_2$ -e, and 531 t  $CO_2$ -e, respectively.

For state and national contributions, only emissions that occur within Australia across the LOM are included. The respective unabated state and national contributions for Scenario 1 are estimated as 0.52 % and 0.12% respectively. For Scenario 2, the respective contributions are estimated as 0.55% and 0.13%.

The global contribution includes unabated LOM emissions occurring both within and outside Australia. The estimated contributions for Scenario 1 and Scenario 2 is estimated at 0.048% and 0.050% respectively.

 Table 16
 Project Contribution to Queensland's emissions and renewable energy targets

Queensland Targets	Project Contribution	
75% on 2005 levels by 2035	Progressive emissions reduction as per Safeguard Mechanism requirements	
	This will also contribute to meeting the 2030 target of 30% on 2005 levels	
50% renewable energy by 2030 Peabody will evaluate onsite renewable generation and purchasing of renewable electrons.		
Zero net emissions economy by 2050	Progressive reduction in production-adjusted baseline emissions under Safeguard Mechanism	
	Potential purchases of renewable electricity through a PPA, or onsite electricity generation	

### 7. SUMMARY

Katestone Environmental Pty Ltd (Katestone) was commissioned by Peabody Energy Australia PCI Pty Ltd (Peabody) to conduct a greenhouse gas (GHG) Assessment for the Coppabella Coal Mine (the Mine) as part of its application to amend conditions C1 and C4 of Environmental Authority EPML00579213. This EA authorises Peabody to operate the Coppabella Coal Mine (the Mine) on mining leases (ML)70161, ML70163, ML70164, ML70236, and ML70237, and petroleum lease (PL)1015, and was issued under the *Mineral Resources Act 1989* (Qld).

The Department of Environment, Tourism, Science, and Innovation (DETSI) has requested that Peabody:

- Identify the GHG emissions likely to be generated through the life of the project, in particular the emissions as a result of the amendment
- Determine the emission category of the project, with respect to the amendment being sought
- Identify all proposed management practices proposed to be implemented to prevent or minimise adverse impacts, with respect to the amendment being sought
- Identify if a GHG abatement plan will be required to accompany the application to identify continuous commitments to achieve progressive GHG mitigation and management throughout the life of the project, with respect to the amendment being sought
- Describe the risk and likely magnitude of impacts to environmental values resulting from the project's emissions, with respect to the amendment being sought.

The amendments to EA EPML00579213 sought by Peabody are to:

- Modernise Table C1, by:
  - o clarifying that residual void(s) without a proposed post-mining land use are included; and
  - specifying that low walls, end walls and highwalls form part of the Non-Use Management Area (NUMA).
- Update Table C1 to correct projected surface areas so they align with current disturbance levels and the Life of Mine (LOM) Plan; and
- Revise Table C3 to reflect the approved final landform, noting that it currently authorises four discrete final voids that are no longer consistent.

The Mine is an open cut operation that produces pulverised coal injection (PCI) coal for export. The rate of coal production per annum is limited by the available resource and economic decisions.

The assessment of two operational scenarios are presented:

- Scenario One (1) Maximum production over eighteen (18) years
- Scenario Two (2)- Attenuated production over forty-five (45) years

The Mine is a Safeguard facility for the purposes of the Safeguard Mechanism. Its baseline emission intensity (EI) is 0.06041 tonnes of carbon dioxide equivalent (t  $CO_2$ -e) / run of mine tonnes (t ROM) and it is required to reduce its production-adjusted baseline emissions by 4.9% per annum to 2030 and thereafter by 3.285% per annum to 2050.

The assessment shows:

- Scenario 1
  - The total LOM emissions are estimated to be 253,206,584 (t CO<sub>2</sub>-e). Of this total:

- Scope 1 emissions contribute 6,595,291 t CO<sub>2</sub>-e
- Scope 2 emissions contribute 966,279 t CO<sub>2</sub>-e
- Scope 3 emissions contribute 245,645,014 t CO<sub>2</sub>-e.

#### Scenario 2

- o The total LOM emissions are estimated to be 265,071,493 t CO<sub>2</sub>-e. Of this total:
  - Scope 1 emissions contribute 6,919,529 t CO2-e
  - Scope 2 emissions contribute 1,015,919 t CO2-e
  - Scope 3 contributes 257,136,045 t CO<sub>2</sub>-e.
- Diesel and fugitive methane are the largest contributor to total LOM Scope 1 emissions for both scenarios at:
  - o 3,166,370 t CO<sub>2</sub>-e and 3,268,136 t CO<sub>2</sub>-e, respectively for Scenario 1
  - o 3,329,033 t CO<sub>2</sub>-e and 3,424,025 t CO<sub>2</sub>-e, respectively for Scenario 2
- Electricity for Scope 2 contributes 966,279 t CO<sub>2</sub>-e for Scenario 1 and 1,015,919 t CO<sub>2</sub>-e for Scenario 2.
- Production and transmission of diesel and shipping of coal to the Dalrymple Bay Coal Terminal (DBCT)
  are the largest contributor to Scope 3 emissions in Australia. Combustion of the coal in client countries is
  largest contributor to offshore Scope 3 emissions. These countries are all signatories to the Paris
  Agreement and are responsible for reducing or offsetting their emissions.

Peabody's decarbonisation objective is to meet the Safeguard Mechanism reduction requirements for the Mine against its published baseline. Decarbonisation action categorised by the GHG Guideline hierarchy are:

#### Reduce

- Mobile and stationary plant emissions are reduced from the base case through:
- Optimisation of mine layout and operations
- Optimisation of vehicles and processes for energy efficiency
- Replacement with premium diesel where economically feasible
- Fugitive emissions are abated via Peabody's emission reduction framework with actions contingent on each stage's outcome:
  - 1) A pre drainage pilot well to be drilled in 2026 which flares coal seam gas (CSG) to assess permeability and gas drainage attributes
  - 2) Expanded pre-drainage and flaring targeting up to 50% of in situ gas, subject to pilot results
  - 3) Develop practicable gas utilisation strategies once gas volumes, quality, and well field production potential are confirmed, with options including:
    - Onsite power generation
    - Diesel substitution (dual fuelled machinery)
    - Gas sales.

#### Substitute

• Emissions due to electricity usage will be minimised through:

- Purchase of renewably generated electricity where cost effective
- Onsite renewable electricity generation or generation of electricity from combustion of CSG, where technically and economically feasible
- Energy efficiency measures

#### Offset

- Residual emissions against the Safeguard Mechanism production-adjusted baseline are offset through:
  - Purchase of Australian Carbon Credit Units (ACCU) generated in Queensland where feasible and cost-effective
  - Identification of best rehabilitation and post mining land use (PMLU) options to increase carbon stock in soil and vegetation
  - Conversion of cleared vegetation to biochar where practicable, with application to rehabilitated and managed land within the ML
- Staff are engaged in energy efficiency and emissions reduction
- Carbon farming, including biochar production, agrivoltaics, and agroforestry are assessed and applied if feasible on agricultural land owned or managed by Peabody
- New technologies and processes are evaluated for cost-effective emissions reduction.

The Project's Scope 3 emissions within Australia will be mitigated through the reduction in diesel procurement and through the purchase or generation of renewable electricity.

Peabody commits to a process of continuous improvement informed by engaged staff, monitoring, evaluation, and research. Peabody will report on its emissions and emissions reduction targets through the annual NGER and Safeguard Mechanism process and through its annual sustainability report.

Peabody will help the Queensland Government achieve the state's targets for renewable energy generation and emissions reduction by purchasing renewable electricity, enabling production of renewable energy on land owned or managed by Peabody where economically feasible, participating in carbon sequestration activities on land owned or managed by Peabody where practicable, purchasing ACCU produced in Queensland where practicable, and being an active participant in progressive Safeguard Mechanism emissions reductions.

# 8. REFERENCES

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# APPENDIX A END USERS OF PROJECT COAL AND LEVEL OF DECARBONISATION COMMITMENTS

Table A1 Summary ranking of destination country by quantity (%) of coal sold by the Project

Destination Country	Quantity of coal (t)	% of LOM coal
Brazil	15,272,804	16.73%
Europe	16,597,275	18.18%
India	4,304,530	4.71%
Indonesia	1,986,706	2.18%
Japan	36,381,557	39.85%
Korea	4,097,582	4.49%
Taiwan	12,665,252	13.87%
Total	91,305,705	100.00%

Table A2 Nationally determined contributions (NDC) by end user countries

Destination Country	Paris signatory (Y/N)	Nationally Determined Contribution
Indonesia	Y	Long term strategy defines pathways to low emission development to 2050  a) new and renewable energy at least 23% in 2025 and at least 31% in 2050  b) oil should be less than 25% in 2025 and less than 20% in 2050  c) coal should be minimum 30% in 2025 and minimum 25% in 2050  d) gas should be minimum 22% in 2025 and minimum 24% in 2050
Japan	Y	GHG emission reduction target of 46% by FY2030 from FY2013 levels, with a goal of net-zero by 2050. Reduction strategies across all sectors (Energy industries, Manufacturing industries and Construction, Transport, Commercial/Institutional, Residential, Agriculture/Forestry/Fishing, and Other).
India	Y	Emissions intensity of GDP to be reduced by 45% by 2030 from 2005 levels. 50% of installed power capacity to come from non-fossil sources by 2030. Additional carbon sink of 2.5-3 billion tonnes CO <sub>2</sub> equivalent via afforestation. Seeks international support for technology transfer and financing. Net zero by 2070.
Korea	Y	Emissions reduction target of 40% from 2018 levels by 2030 and net zero by 2050. Plans to phase down coal-fired power, transition aged coal plants to LNG, increase solar and wind capacity, and use electric furnaces in steelmaking.
Taiwan	N	Non-signatory. Targets 23-25% emissions reduction from 2005 levels by 2030 and net zero by 2050. Energy transition focuses on renewables, nuclear phase-out, and reducing coal use. Solar PV to expand by 2GW annually before 2030; offshore wind by 1.5GW annually. No new coal-fired power plants since 2020.

Destination Country	Paris signatory (Y/N)	Nationally Determined Contribution
Brazil	Y	Targets a 43% reduction by 2030 and 59-67% by 2035, relative to 2005 levels. Net zero by 2050.
Europe	Y	Reduce net GHG by 55% below 1990 levels by 2030. Net zero by 2050