MACHEnergy

Mount Pleasant Operation

A JOINT VENTURE WITH JCDA Japan Coal Development Australia

Section 8

Evaluation and Conclusion

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8 EVALUATION AND CONCLUSION

This section provides a summary evaluation and conclusion for the Project EIS. Consistent with the requirement of the SEARs, this section provides strategic justification of the Project and reasons for why the Project should be approved.

As part of this justification, consideration has been given to:

- the suitability of the site (Section 8.1);
- Project design decisions, including feasible alternatives (Section 8.2);
- relevant planning considerations and policy objectives, including the principles of ESD (Section 8.3);
- key potential biophysical, economic and social impacts and benefits (Section 8.4); and
- the consequences of not carrying out the Project (Section 8.4.4).

8.1 SUITABILITY OF THE SITE

This sub-section describes the Project site with respect to key relevant aspects of suitability.

The remainder of Section 8 presents additional information that pertains to the general suitability of the Project within the NSW environmental assessment and approval regime, recognising that the Project site is effectively the existing site of the Mount Pleasant Operation.

The Project is a “brownfield” project that builds on and optimises the existing Mount Pleasant Operation. In particular, the Project would:

- continue and extend open cut mining wholly within the existing Mount Pleasant Operation MLs;
- provide augmentation of the existing Mount Pleasant Operation facilities including coal handling and processing, water storage, mine infrastructure, and Fines Emplacement Area;
- use the existing approved Mount Pleasant Operation rail infrastructure to its full capacity;
- continue to use the existing Mount Pleasant Operation access road as the primary site access point; and
- provide continuation and augmentation of supply for existing coal customers, including the Japanese electricity generators that are part-owners of the Project (through J.C.D. Australia Pty Ltd).

8.1.1 Existing Mining Leases

The objects of the NSW *Mining Act, 1992* are to encourage and facilitate the development of mineral resources in NSW (including coal), having regard to the need to encourage ESD.

The Project would involve the extraction of open cut coal resources primarily within ML 1645. ML 1645 was first granted to Coal & Allied in 2010. Open cut operations would also occur within MLs 1708, 1709, 1750, and 1808 where these adjoin or overlie ML 1645, with these five mining titles being conditioned as a “group”.

Extensive geological and geotechnical data is available within ML 1645 from multiple exploration campaigns, including from the existing Mount Pleasant Operation (Section 2.2). MACH can also refer to the operating experience of the adjoining Bengalla Mine, which targets many of the same coal seams.

The existing infrastructure of the Mount Pleasant Operation is largely located within existing MLs 1645, 1750 and 1709 and would continue to be used, augmented or expanded for the handling, processing and transportation of coal for the life of the Project.

Approved Mount Pleasant Operation infrastructure associated with the controlled water release dam (DW1) is also expected to be constructed by Bengalla Mining Company during the assessment of the Project. These facilities are within the existing mining tenements of the Bengalla Mine (e.g. ML 1728).

Bengalla Mine and the Mount Pleasant Operation have extensive agreements and processes in place to address interactions between the two mines, including management of mining tenement and EPL interactions (Section 1.2.1).

8.1.2 Existing Mine Infrastructure

Key existing infrastructure assets at the Mount Pleasant Operation include:

- Mount Pleasant Operation access road from Wybong Road and associated upgrades of Wybong Road;

- construction facilities, including construction offices, carparks and other associated services;
- MIA comprising administration, employee amenities, workshops, washdown bays, store, parking facilities and explosives storage;
- existing open cut operations and associated Eastern Out-of-Pit Emplacement, major haul road to the CHPP and go-line facilities;
- two CHPP modules and associated ROM coal and product coal stockpiles, coal reject facilities, coal reclaim and conveyor infrastructure;
- train load-out facility, rail spur and rail loop (existing Stage 1 in operation, with Stage 2 currently under construction);
- extensive electrical distribution infrastructure;
- Fines Emplacement Area and associated embankment, secondary flocculation plant, water transfer, and seepage collection system;
- MWD, and the associated Hunter River water supply infrastructure (existing Stage 1 in operation, with Stage 2 currently under construction); and
- general site water management infrastructure (including water storages, pumps and pipelines and a wastewater treatment facility).

The use and augmentation of the existing operating Mount Pleasant Operation infrastructure for the Project would result in significantly less land disturbance, and a lower initial capital cost, than would otherwise be required for a “greenfield” project.

8.1.3 Permissibility

Pursuant to clause 7 of the Mining SEPP, the Project is permissible with development consent under Part 4 of the EP&A Act (Section 5.2.2).

This EIS presents an assessment of the potential biophysical, economic and social impacts and benefits of the proposed continuation and extension of the existing Mount Pleasant Operation under the Project.

8.1.4 Consideration of the Compatibility of the Project with Relevant Land Uses

This sub-section provides consideration of the compatibility of the Project with existing and approved land uses in the vicinity of the Project, along with any likely preferred land uses. Further consideration of the public benefits of the proposed Project is provided in Sections 8.4 and 8.5.

Existing and approved land uses in the vicinity of the Project include:

- Dartbrook Mine (currently on care and maintenance) located to the immediate north of the Project, with surface facilities extending to the eastern side of the Hunter River and New England Highway;
- Bengalla Mine (operational to 2039 under current approvals) located to the immediate south of the Project, in the area bounded by Wybong Road to the north and the Muswellbrook–Ulan Rail Line to the south;
- exploration tenements that are located to the east and west of the Mount Pleasant Operation MLs, which are subject to approved mineral exploration activities by a number of parties, including Muswellbrook Coal Mine;
- agricultural land owned by MACH, which is subject to a number of uses including cattle grazing, dairying, turf farming, horse breeding and fodder cropping by local farmers;
- proximal private agricultural land that is largely subject to cattle grazing in the north and west, and a variety of more intensive land uses on the Hunter River floodplain to the east (including dairying and irrigated cropping);
- various rural residential properties on the Hunter River floodplain and located along the major infrastructure corridor of the New England Highway, plus more sparsely located rural properties to the north and west of the Mount Pleasant Operation;
- the Muswellbrook Race Club located to the east of the Hunter River between Bengalla Mine and Denman Road;
- the town of Muswellbrook and associated residential, commercial and industrial areas that are located on the eastern side of the Hunter River, and west of the Muswellbrook Coal Mine; and
- the village of Aberdeen, located in the Upper Hunter LGA to the north.

There are no viticulture enterprises within the immediate vicinity of the Project. With respect to equine industries, the most proximal horse stud is located on MACH-owned land to the east of the Mount Pleasant Operation and produces stock horses. Notwithstanding, a number of equine enterprises and some viticulture enterprises have previously objected to, or commented on, the development of the approved Mount Pleasant Operation.

Concerns have included potential visual effects viewed from the public road network, dynamic impacts, indirect impacts, or general concerns about the acceptability of predicted environmental impacts. Additional consideration is therefore also provided below of potential Project impacts on these key regional land uses.

Compatibility with Nearby Mines

MACH will continue to consult and work closely with Bengalla Mine and Dartbrook Mine regarding potential interactions between these operations and the Project, to maximise cooperation and efficiencies. Key potential interactions are anticipated to include:

- sharing excess mine water between the operations, such as extraction of excess water from the Dartbrook Mine underground goaf for beneficial re-use at the Mount Pleasant Operation (Sections 3.11 and 7.9);
- controlled release of water from the DW1 (or an alternative arrangement agreed between Bengalla Mine, MACH and the EPA) to manage excess water at the Mount Pleasant Operation in accordance with the HRSTS and EPL 20850 (Sections 3.11 and 7.9);
- continuing co-operation between Bengalla Mine and the Mount Pleasant Operation for tenement and EPL amendments to facilitate the approved activities of both operations in accordance with the Master Co-operation Agreement between the two mines;
- the assessment and management of cumulative impacts (Sections 1.2 and 7); and
- potential amenity impacts on Dartbrook-owned or Bengalla-owned rural residences (noting predicted noise and air quality levels would be broadly consistent with the approved Mount Pleasant Operation) (Section 7 and Appendices A and B).

Based on the above and the engagement outcomes to date (Section 6):

- there is not anticipated to be any material incompatibility between the Project and existing and approved mining land uses in the vicinity of the Project;
- there may be some potential benefits and efficiencies for Dartbrook Mine or Bengalla Mine and MACH associated with the Project proceeding (e.g. sharing of water or water management facilities between the operations); and
- MACH would continue to work closely with the Bengalla Mine on the various interactions associated with the two mines having a number of operational activities within the other mine's land holdings.

In addition, MACH would continue to cooperate and consult with Muswellbrook Coal and other mining companies that may conduct exploration activities on MACH-owned land.

Proximal Agricultural Land

A range of agricultural enterprises are located on private land in the vicinity of the Mount Pleasant Operation and the Project.

MACH has approached the design of the Project and its relationship with nearby agricultural enterprises with the following aims:

- being open to the feedback of nearby agricultural enterprises on the existing impacts of the Mount Pleasant Operation;
- facilitating ongoing agricultural production on available MACH-owned lands and the productive use of MACH water resources that are not presently required for mining; and
- incorporating staging in the Project design to reduce potential incremental Mount Pleasant Operation impacts on nearby residences, including proximal agricultural enterprises (Section 8.2.1).

Table 8-1 presents a summary of the key assessment outcomes related to adjacent agricultural enterprises.

MACH would continue to facilitate the productive use of MACH-owned agricultural land outside of Project active mining areas through leasing arrangements (e.g. to local farmers) over the life of the Project.

Table 8-1
Summary of Key Assessment Outcomes for Nearby Agricultural Enterprises

Potential Impact	Summary of Assessment Outcome
Potential impacts to infrastructure used by nearby agricultural enterprises	
Increased traffic levels on surrounding road network.	The Project would continue to use the existing site access to the Mount Pleasant Operation. Heavy vehicle deliveries would be required to continue using Bengalla Road and Wybong Road and would be prohibited from use of the Kayuga Bridge over the Hunter River. Any employee travel on Kayuga Road would be primarily limited to employees residing locally (e.g. in Aberdeen and Scone). The Road Transport Assessment (Appendix J) concludes that the existing road network can satisfactorily accommodate the forecast traffic demands resulting from the Project without any specific additional road upgrade requirements.
Changes in the surrounding road network.	The approved Mount Pleasant Operation is already required to construct the Northern Link Road to compensate for the planned closure of Castlerock Road. MACH would not close Wybong Road or construct the currently approved Western Link Road as a component of the Project. The proposed Project realignment of the Northern Link Road would have no material impact on travel time on the surrounding road network, and has been designed to optimise efficiency.
Access to agricultural support services and infrastructure.	The Project would not have any material incremental impact on agricultural support services or infrastructure, as MACH would continue to make its agricultural properties that are not required for mining available for ongoing productive agricultural use by local farmers. MACH further contributes to local demand for agricultural and rural services through Mount Pleasant Operation on-site weed and pest management activities, on-site and off-site fencing, rehabilitation works, maintenance activities and management of its major biodiversity offset properties in the broader region.
Potential impacts to agricultural resources used by nearby agricultural enterprises	
Availability and/or quality of water available to agricultural enterprises.	The Project would not have any material impacts on water resources used by nearby agricultural enterprises (water extraction would continue from the regulated Hunter River and other sources in accordance with applicable water access licences) (Sections 7.8 and 7.9 and Appendices C and D).
Increased biosecurity risks (weeds, plants and animals).	MACH would continue to implement weed and pest animal management programs to reduce biosecurity risks to off-site areas. Where vehicles and mechanical equipment have operated off-road, these would be washed down to minimise seed transport off-site (Section 7.10).
Potential impacts affecting amenity	
Construction noise, operational noise and dust emissions.	Noise and air quality contributions from the Project on adjoining agricultural properties would be broadly consistent with the currently approved Mount Pleasant Operation, with local and temporal changes in emission levels occurring as the open cut activities initially progress north, and then westwards over the life of the Project. Wilkinson Murray and TAS concluded that MACH's proposed staging of the expansion of Project ROM coal production would be effective in minimising potential noise and air quality impacts to the majority of receivers in the vicinity of the Mount Pleasant Operation (Sections 7.3 to 7.7 and Appendices A and B).
Blasting and blast vibration.	The Project would comply with applicable overpressure and blast vibration criteria at nearby private residences with the application of blast management measures, including minimising blast MIC (Section 7.6 and Appendix A).
Odour.	Any spontaneous combustion that may occur over the life of the Project would be managed in accordance with the Mount Pleasant Operation Spontaneous Combustion Management Plan (Section 7.7 and Appendix B).
Visual and landscape changes.	The landforms and activities of the existing approved Mount Pleasant Operation are visible from surrounding agricultural properties, from the public road network and west-facing areas of Muswellbrook (Appendix M). The lights of the Mount Pleasant Operation are also visible at night (i.e. a combination of direct and indirect lighting effects). The Project expansion in elevation and scale of the integrated waste rock emplacement landform and associated activities (including lighting) would alter the visual impacts of the approved Mount Pleasant Operation from nearby rural properties. There would be moderate cumulative impacts due to the extension of duration of the mine operations that would be evident in the local and sub-regional area (Section 7.16 and Appendix M). These impacts would be mitigated through progressive rehabilitation.

Proximal Rural Residences

As well as being located proximal to existing agricultural land uses and the approved Mount Pleasant Operation, many rural residences in the vicinity of the Project (Plate 8-1) are also located proximal to other major non-residential land uses, including (Figure 1-5):

- To the north and north-east, some residences are located proximal to the approved Dartbrook Mine.
- To the north-east and east, many residences are located proximal to the major transport corridors of the New England Highway and Main Northern Railway.
- In the south-east and south-west many residences are located proximal to the approved Bengalla Mine, with some residences also located adjacent to the major transport corridor of the Muswellbrook–Ulan Rail Line.
- Rural residences in the south-east and to the south of the Muswellbrook–Ulan Rail Line are also proximal to the approved Mt Arthur Coal Mine.

Of relevance to potential impacts at these residences, the Project would involve:

- the continuation and staged expansion of existing mining activities, with Project noise and air quality contributions broadly consistent with the currently approved Mount Pleasant Operation;
- expansion in the elevation and scale of the integrated waste rock emplacement landform and associated construction activities (including night-lighting); and
- Project incremental increases in average and peak train movements on the approved Mount Pleasant Operation rail spur and Muswellbrook–Ulan Rail Line.

Any potential incompatibility that may arise as a result of the Project would largely be related to potential impacts on the amenity of these residences. Table 8-2 presents a summary of the key assessment outcomes.

There would not be any material incompatibility between the Project and existing rural residential land uses, given that the assessment outcomes are similar to the approved Mount Pleasant Operation, and key Project management measures would comply with relevant Government policy (e.g. the VLAMP).

Muswellbrook Race Club

The Muswellbrook Race Club is proximal to the existing Bengalla Mine, Mt Arthur Coal Mine and is located approximately 2.5 km to the south-southeast of the Mount Pleasant Operation. The Race Club is also located in close proximity to the Muswellbrook–Ulan Rail Line and the approved Mount Pleasant Operation Mod 4 (Stage 2) rail infrastructure (i.e. rail spur).

The construction of the approved Mod 4 (Stage 2) rail infrastructure will occur in 2020/21/22. The Mount Pleasant Operation open cut is also currently at its closest proximity to the Race Club, with mining activities currently centred in the south-east of ML 1645 (Figure 1-3).

The Race Club also has existing views of the more proximal components of the Bengalla Mine and Mt Arthur Coal Mine landforms. Over the life of the Project, the focus of Mount Pleasant Operation mining activities would progressively move north and west, away from the Race Club.

Compliance with all applicable noise and air quality criteria is predicted at the Muswellbrook Race Club (Sections 7.3 and 7.7 and Appendices A and B).

There would not be any material additional incompatibility between the Project and the Muswellbrook Race Club, given that Project impacts would be similar to the approved Mount Pleasant Operation. Existing impacts would be ameliorated with progressive rehabilitation and as the Mount Pleasant Operation moves west.

Town of Muswellbrook

The town of Muswellbrook is located to the east of the Hunter River on the New England Highway, and at the junction of the Muswellbrook–Ulan Rail Line and the Main Northern Railway, approximately 3 km from the Mount Pleasant Operation (Figure 1-2).

The Mount Pleasant Operation open cut is currently at its closest proximity to Muswellbrook, with mining activities centred in the south-east of ML 1645 (Figure 1-3). Over the life of the Project, the focus of mining activities would progressively move north and west, increasing separation from Muswellbrook (Section 3.3). Coincident with the western progression of mining, the integrated waste rock emplacement would increase in elevation, acting to screen potential views and provide an increasing barrier to potential air quality and noise emissions.

Table 8-2
Summary of Key Assessment Outcomes for Nearby Rural Residences

Potential Impact	Summary of Assessment Outcome
Potential amenity impacts to rural residences	
Construction noise, operational noise and dust emissions.	Noise and air quality contributions from the Project at rural residences would be broadly consistent with the currently approved Mount Pleasant Operation, with local and temporal changes in emission levels occurring as the open cut initially progresses north, and then westwards over the life of the Project. Wilkinson Murray and TAS concluded that MACH's proposed staging of the expansion of Project ROM coal production would be effective in minimising potential noise and air quality impacts at the majority of receivers in the vicinity of the Mount Pleasant Operation (Sections 7.3 to 7.7 and Appendices A and B). Consistent with the approved Mount Pleasant Operation, a number of proximal rural residences would continue to experience moderate noise exceedances of the Project-specific noise trigger levels (i.e. exceedances of 3 dBA to 5 dBA). These landholders would be afforded mitigation measures at their property upon request, such as mechanical ventilation/comfort condition systems to enable windows to be closed. Consistent with the approved Mount Pleasant Operation, a number of the most proximal rural residences are predicted to experience air quality emissions above applicable cumulative criteria, or would be subject to noise affectation (i.e. exceedances of the Project-specific noise trigger levels greater than 5 dBA). These landholders would be afforded acquisition rights under the Project Development Consent, and therefore be acquired by MACH upon request. These landholders would also be afforded mitigation measures at their property upon request, such as mechanical ventilation/comfort condition systems to enable windows to be closed.
Rail noise.	The Project would operate the approved Mod 4 rail spur over an extended period, and average and peak rail movements on the rail spur and the Muswellbrook–Ulan Rail Line would reflect Project coal production rates. Maximum daily rail departures would rise from nine to 10 trains per day at peak Project production. The Project would comply with relevant rail noise criteria (in the RING) on the Project rail spur, with the exception of the two nearest private residences, which are predicted to experience negligible rail noise exceedances (Section 7.4 and Appendix A).
Blasting and blast vibration.	The Project would comply with applicable overpressure and blast vibration criteria at nearby private residences with the application of blast management measures, including minimising the MIC of applicable blasts (Section 7.6 and Appendix A).
Odour.	Any spontaneous combustion that may occur over the life of the Project would be managed in accordance with the Mount Pleasant Operation Spontaneous Combustion Management Plan (Section 7.7 and Appendix B).
Visual and landscape changes.	The landforms and activities of the existing approved Mount Pleasant Operation are visible from surrounding rural residences. The lights of the Mount Pleasant Operation are also visible at night (i.e. a combination of direct and indirect lighting effects). The Project expansion in elevation and scale of the integrated waste rock emplacement landform and associated activities (including lighting) would alter the visual impacts of the approved Mount Pleasant Operation from nearby rural residences. There would be moderate cumulative visual impacts due to the extension of duration of the Mount Pleasant Operation under the Project that would be evident in the local and sub-regional area (Section 7.16 and Appendix M). These impacts would be mitigated through progressive rehabilitation.

Plate 8-1 Rural Residence with Bengalla Mine and Mount Pleasant Operation in the Background

It is acknowledged that some residents of Muswellbrook are currently experiencing a range of cumulative impacts associated with the proximity of local mines to the town.

MACH has primarily recorded complaints regarding noise, blasting and dust and lighting emissions, with complaints peaking in late 2019, during the drought and associated regional bushfires (Section 7).

Based on the assessment undertaken by Wilkinson Murray (Appendix A) applicable noise limits in the town of Muswellbrook would be 1 dBA to 3 dBA lower at night under the Project than is currently the case for the approved Mount Pleasant Operation. Applicable air quality and blasting criteria would be unchanged.

With the implementation of adopted Project noise, blasting and air quality management measures, the Mount Pleasant Operation is predicted to comply with applicable noise, air quality and blasting criteria in the residential zones of Muswellbrook for all modelled Project scenarios (Sections 7.3 to 7.7 and Appendices A and B).

In addition, no exceedances of applicable blasting, noise or air quality criteria are predicted at any public buildings, commercial facilities, or industrial facilities in the town (Sections 7.3 to 7.7 and Appendices A and B).

Elevated areas with a western outlook in Muswellbrook currently have extensive views of the Mount Pleasant Operation mine landforms, and particularly the Eastern Out-of-Pit Emplacement (Section 7.16). MACH is applying rapid bulk shaping, topsoiling and initial rehabilitation as emplaced waste rock material becomes available. Progressive rehabilitation is undertaken to achieve three key objectives:

- to reduce the extent of raw emplaced waste rock lifts that have high visual contrast to surrounding unmined land;
- to reduce potential fugitive dust generation sources and minimise erosion with the rapid establishment of initial revegetation; and
- to rapidly improve visual integration of the emplacement landform with the unmined landscape.

MACH has staged the Project increases in ROM coal production to minimise potential amenity impacts on nearby rural residences and the town of Muswellbrook. With the adoption of the Project management measures there would not be any additional incompatibility between the Project and the town of Muswellbrook, and existing visual impacts would be further ameliorated with MACH's continuation of progressive rehabilitation.

Village of Aberdeen

Aberdeen is located directly to the north of the Dartbrook Mine, some 5 km from the Project.

With the implementation of adopted Project noise, blasting and air quality management measures, the Mount Pleasant Operation is predicted to comply with applicable noise, air quality and blasting criteria in the residential zones of Aberdeen for all modelled Project scenarios (Sections 7.3 to 7.7 and Appendices A and B). In addition, no exceedances of applicable blasting, noise or air quality criteria are predicted at any public buildings, commercial facilities, or industrial facilities in the village of Aberdeen (Sections 7.3 to 7.7 and Appendices A and B).

Aberdeen is not current experiencing material visual impacts from the approved Mount Pleasant Operation, as some intervening topography largely screens views while the mine is in the south-east. However, the approved Mount Pleasant Operation was predicted to have high visual impacts at elevated viewpoints in Aberdeen, and high/moderate impacts are expected for the Project (Section 7.16 and Appendix M). These impacts would be mitigated through progressive rehabilitation.

With the adoption of the Project management measures there would not be any material incompatibility between the Project and the village of Aberdeen.

Compatibility with Equine Enterprises and Viticulture in the Region

No equine or viticulture enterprises have been identified in the EIS assessments that would experience material adverse direct impacts as a result of the Project that are not already occurring with the approved Mount Pleasant Operation. The nearest equine enterprise is a horse stud that is located on land that MACH owns, and produces stock horses.

Section 7 of this EIS assesses the predicted incremental (direct and indirect), and potential cumulative environmental impacts of the Project, and discusses the acceptability of these impacts in the context of applicable guidance documents, and regulatory requirements.

Table 8-3 presents a further discussion of the potential Project visual impacts from the public road network, dynamic impacts and concerns/fears or perceptions about predicted environmental impacts.

Compatibility with Likely Preferred Land Uses in the Vicinity of the Project

In considering likely preferred land uses and land use trends, it is noted that the Project area is identified in the *Hunter Regional Plan 2036* (NSW Government, 2016a) as a coal production title, and in the *Upper Hunter Strategic Regional Land Use Plan* (NSW Government, 2012a) as existing mining title, which is defined as "a mineable coal resource has been proven and Government mining approval granted". Therefore, open cut mining in ML 1645 is considered a likely preferred land use.

This is further supported by the draft *Muswellbrook Local Strategic Planning Statement 2020-2040* (MSC, 2020a) that identifies planning principles and actions to assist in implementing the Regional Plan and meet the objectives of the Community Strategic Plan. The Mount Pleasant Operation is included in the Statement as part of the 'Coal Mines and Agribusiness' mapped zone for the 2020-2040 period addressed by the statement.

Having regard to historic, current and approved uses of the land, land zoning, land use zone objectives, land use trends, strategic planning documents and economic circumstances (discussed further in Sections 3, 4 and 5, and Attachments 6 and 7), other likely preferred land uses in the vicinity of the Project include:

- the existing and approved land uses:
  - open cut and underground mining;
  - agriculture, agribusiness and agritourism;
  - rural dwellings; and
  - the town of Muswellbrook on the eastern side of the Hunter River.
- future use of Mount Pleasant Operation mine infrastructure;
- industrial and/or employment land development in areas surrounding major mine developments, including complementary renewable energy developments; and
- additional agricultural, agribusiness and agritourism opportunities.

The compatibility of the Project with existing and approved land uses is considered in the sub-sections above. Based on land use trends, it is likely that these existing and approved uses are preferred uses of land in the vicinity of the Mount Pleasant Operation, and are unlikely to be significantly impacted by the Project. Notwithstanding, consideration of other likely preferred land uses is provided in the sub-sections below.

Future Use of Mount Pleasant Operation Infrastructure

MACH will continue to investigate opportunities for the continued beneficial use of the Mount Pleasant Operation infrastructure and Project final void before the cessation of the Project. This may include seeking approval to develop additional coal resources to the west of the Project open cut extent in ML 1645, and engagement with any holders of adjoining exploration tenements or MLs in the vicinity of the Project (subject to separate assessments and approvals).

The Project would not negatively impact on the potential for future resource extraction and the continued use of the Mount Pleasant Operation current and augmented infrastructure. The extraction of additional coal beyond the life of this Project would be subject to the rigorous assessment and consultation processes outlined in relevant State and Commonwealth legislation at that time.

Future Development of Mined Lands

The draft *Muswellbrook Local Strategic Planning Statement 2020-2040* (MSC, 2020a) planning principles include:

> - *Council will support rehabilitation of coal mining and power station land to achieve land uses identified in closure plans and rehabilitation plans, to provide opportunities for agricultural/horticultural production, bio-diversity habitat, agribusiness, food processing, industrial, tourism, recreation and enhancement of scenic landscape values (existing and desired) of the Shire.*

It is not expected the Project would be incompatible with this planning principle.

Table 8-3
Summary of Key Assessment Outcomes for Regional Equine and Viticulture Enterprises

Potential Impact	Summary of Assessment Outcome
Potential indirect, flow-on or perceptual impacts on equine and viticulture enterprises	
Visual and landscape changes.	In the sub-regional and regional context, the expansion in scale and elevation of the integrated waste rock emplacement landform associated with the Project is considered to be consistent with extensive existing mining landscapes within the region (Section 7.16 and Appendix M). The relinquishment of some previously approved disturbance areas would balance the Additional Disturbance Area required for the Project (Section 7.16 and Appendix M). There are a number of horse studs (i.e. Abbey Thoroughbreds, Balmoral Park Thoroughbred Studs and Edinglassie Stud) that have high or moderate visual impacts from the approved Mount Pleasant Operation, in the context of these businesses also having views of other mining operations (e.g. Bengalla Mine and Mt Arthur Coal Mine). The visual impacts of the Project on these horse studs would continue to be high to moderate/low and would reduce in the long term (Section 7.16 and Appendix M). There would be no views of the Project from Monarch, Coolmore and Godolphin Woodlands, Kelvinside, Segenhoe and Yarraman Park Studs and therefore there would be no visual impacts at these more remote locations (Section 7.16 and Appendix M). It is expected that the potential diffuse light effects of the Project would extend further north in comparison to the existing levels, creating more localised lighting visual impacts. However, the nature of the diffuse light effects would be consistent with the approved effects of the approved Mount Pleasant Operation and the existing effects of other developments in the vicinity of the Project (e.g. Bengalla Mine and Mt Arthur Coal Mine) (Section 7.16 and Appendix M).
Dynamic impacts, perception of impacts as a result of preferences, associations and memories.	Personal perceptions would be affected by preferences, associations and memories derived from reading, hearing and/or seeing information on previous, existing and proposed activities and stakeholder interactions. Perceptions vary between individuals and can, therefore, be difficult to assess (Appendix M). DP&E (2017) relevantly states: *When considering perceptions of adverse impacts on amenity, an evaluation must be made of the reasonableness of those perceptions. This evaluation involves 'the identification of evidence that can be objectively assessed to ascertain whether it supports a factual finding of an adverse effect on amenity…': Telstra Corporation Ltd v Hornsby Shire Council [2006] NSWLEC 133.* The impact of the Project on the landscape and the extended duration of those impacts over time in the context of existing land use patterns at the regional, sub-regional and local scales would create a moderate dynamic landscape impact (Appendix M). MACH would continue to engage with agricultural industries to identify and manage any concerns (including concerns regarding customer perceptions) over the life of the Project.

Following the completion of mining, the Project would be rehabilitated to a combination of woodland areas and more limited areas for potential agricultural use associated with the gentler slopes within existing infrastructure facilities (Section 3.17 and Attachment 8).

Recreation, tourism, scenic values and agricultural, agribusiness and agritourism land uses in the vicinity of the Project are expected to be likely preferred land uses.

For similar reasons to those given above with respect to existing approved uses of this nature, the Project is expected to be compatible with these likely preferred land uses.

MACH would continue to encourage and be supportive of other community and government proposals or initiatives for the use of MACH land or infrastructure that can co-exist with the Project. Any proposals or initiatives would need to be permissible land uses and would require relevant assessment and approvals.

Continued Productive Co-Existence with Local Agricultural Industries

The Mount Pleasant Operation is a major operating open cut coal mine and is a key feature of the existing environment to the west of Muswellbrook, along with a range of local agricultural enterprises, Dartbrook Mine and Bengalla Mine.

Potential Project impacts on proximal agricultural enterprises would effectively be a continuation and extension of the existing impacts of the approved Mount Pleasant Operation. MACH would continue to facilitate the productive use of agricultural land it owns outside of Project active mining areas through leasing arrangements (e.g. to local farmers) over the life of the Project.

With the adoption of the Project management measures, no material incompatibility between the Project and equine or viticulture enterprises in the region has been identified.

In addition to the Project design measures already incorporated (Section 3 and Section 7) and the engagement conducted to date (Section 6), MACH will address perceptions or queries of stakeholders from local and regional agricultural enterprises as follows:

- MACH has met with a number of proximal agricultural enterprises over the course of the development of this EIS, and will continue to offer to meet with representatives of proximal enterprises to discuss the findings of this EIS, once it is on public exhibition;
- MACH will offer to meet with representatives of the Hunter Thoroughbred Breeders Association and Godolphin to discuss the findings of this EIS and any residual concerns held by these parties once it is on public exhibition; and
- when and where appropriate, MACH will use website and media platforms to disseminate information that outlines the beneficial outcomes of the Project, including the benefits of productive co-existence of mining and agricultural interests.

8.2 KEY ENGAGEMENT OUTCOMES, DESIGN ALTERNATIVES AND PROPOSED PROJECT STAGING

MACH has undertaken extensive regulatory and public engagement for the Project (Section 6). This engagement has identified the following key environmental considerations for the Project, including comparisons to the approved impacts of the existing Mount Pleasant Operation:

- The location, mining method and increased scale of Mount Pleasant Operation mining activities, including potential:
  - air quality and noise emissions;
  - visual impacts;
  - demand on water resources; and
  - greenhouse gas emissions.
- Mount Pleasant Operation infrastructure extensions and augmentations in support of the Project, including:
  - Fines Emplacement Area;
  - CHPP and additional fine reject dewatering infrastructure;
  - public road infrastructure; and
  - mine water dams.
- Design of mine landforms, including:
  - integrated waste rock emplacement;
  - final void; and
  - revegetation and final land use.
- Potential impacts of direct land disturbance activities on biodiversity and heritage values, benefits of the Relinquishment Area and continuation of existing Mount Pleasant Operation established offsets.
- Continuation of the existing social impacts of the approved Mount Pleasant Operation and the progressive expansion of the existing positive impacts on employment, regional expenditure, royalties and community contributions.

A number of alternatives to the Project have been considered by MACH in light of engagement feedback. An analysis of feasible alternatives to the Project considered by MACH is provided below, in accordance with clause 7 of Schedule 2 of the EP&A Regulation (Table 1-3) and requirements pertaining to assessment under the Commonwealth EPBC Act (Attachment 2).

8.2.1 Project Location, Mining Method and Scale

Project Location

The presence of coal seams able to be economically mined in the vicinity of the Mount Pleasant Operation and within MACH's existing mining and exploration tenements determines the potential location of the Project.

MACH initially considered the expansion of the Project open cut outside of the approved Mount Pleasant Operation MLs (e.g. expanding mining activities east across Kayuga Road). However, this alternative was discounted before the lodgement of the Project Scoping Report, as it would have had potential environmental outcomes that were not aligned with MACH's objectives (MACH, 2019j). The development of this Project proposal was therefore focused on optimising mining operations within the existing Mount Pleasant Operation MLs.

Continuation of development of the coal reserves in the existing Mount Pleasant Operation MLs and continued use of the extensive supporting facilities would maximise returns on existing financial investments and minimise potential land disturbance in comparison to development of an alternative greenfield site.

Mining Methods and Target Seams

The coal reserves at the Mount Pleasant Operation lend themselves to open cut mining due to the presence of multiple economically viable seams and the low strip ratio of the deposit (Section 3 and Attachment 12). Underground mining of the reserves would result in lower recoveries and increased mining costs per tonne of coal recovered.

The approved Mount Pleasant Operation includes the recovery of 197 Mt of ROM coal by open cut mining methods from the surface to the Vaux Seam in the North Pit and from the surface to the Edderton Seam in South Pit.

MACH has evaluated the economics of varying target coal seams for the Project and has identified that open cut mining to the Edderton Seam is the optimal depth of mining for the Project.

Targeting the Edderton Seam as the basal seam across the Project open cut extent would facilitate the recovery of an additional 247 Mt of ROM coal, without significantly increasing the disturbance area of the approved Mount Pleasant Operation (Section 3.1). This optimises the efficient extraction of coal reserves for the benefit of NSW.

MACH has evaluated the potential use of a dragline as part of the mining fleet and identified that use of a dragline may have some merit as a replacement for a large excavator, but would come at a higher capital cost. While it is not the currently preferred option, a dragline may be employed over the life of the Project, subject to further feasibility studies.

MACH has also evaluated the option of moving from the current contract mining arrangements (i.e. where a contractor undertakes bulk mining and/or coal processing activities on behalf of MACH) to an owner-operator arrangement. This is largely an economic alternative (i.e. one has larger capital costs, and the other has higher operational costs for MACH) and has very limited potential environmental implications. MACH would periodically review the economics of the Project and may adopt either approach over the life of the Project.

Staging of Increases to ROM Coal Production

Economic returns to MACH, employment, and generation of royalties to the State of NSW would be optimised by increasing the rate of ROM coal production to the feasible maximum extraction rate at the commencement of the Project. However, any Project proposal that included material increases above regulatory thresholds for noise and air quality emissions at large numbers of private receivers would be an adverse societal outcome.

MACH therefore conducted various initial screening studies to evaluate a range of feasible ROM coal production rates. The potential environmental emissions, and relative economic returns on existing and additional mobile plant and infrastructure, were evaluated.

As a result, the Project proposed by MACH includes a lengthy staging of the Mount Pleasant Operation ROM coal production rate over a period of more than 10 years (Table 3-2):

- In the Project Establishment Phase, the ROM coal extraction rate would continue at the currently approved Mount Pleasant Operation rate of 10.5 Mtpa.
- In the Intermediate Phase, once the Eastern Out-of-Pit Emplacement has been sufficiently developed, the ROM coal extraction rate would increase to 15.75 Mtpa.
- When the Eastern Out-of-Pit Emplacement is further developed and the open cuts have moved further west, the Peak Production Phase would commence, with the ROM coal extraction rate increasing to 21 Mtpa.

The Project staging of the ROM coal production rate maximises financial returns to MACH, employment, and the generation of royalties to the State of NSW, while maintaining noise and air quality emissions that are broadly consistent with the existing Mount Pleasant Operation under Development Consent DA 92/97 (Sections 7.3 and 7.7).

Further, the Project would result in a significant reduction in the number of private landholders being subject to noise affectation or moderate noise exceedances when compared to the existing Development Consent DA 92/97 (Section 7.3).

The Mount Pleasant Operation incorporating the Project would also have night-time operational noise limits that are more stringent for a very large number of private residences to the east of the Project, including lower predicted noise levels for residences on the western outskirts of Muswellbrook (Section 7.3).

It is noted that this outcome would be achieved by MACH adopting an extensive range of noise and air quality emission mitigation measures, including (Sections 7.3 and 7.7):

- continued implementation of noise attenuation on all new major mobile plant items where reasonable and feasible, in addition to the continued use of noise attenuated mobile plant at the existing Mount Pleasant Operation;
- continued implementation of acoustic design of all new fixed plant (e.g. enclosure) where reasonable and feasible, in addition to the continued use of fixed plant with extensive enclosure elements at the existing Mount Pleasant Operation;
- implementation of rail noise barriers both within and outside of the Mount Pleasant Operation MLs;
- continued use of the proactive/reactive noise management system, with alterations made to operations in response to relevant real-time monitoring alerts;
- continued use of general dust mitigation measures (e.g. watering of haul roads and stockpiles, enclosure and watering of ROM hopper unloading, conveyors and transfer points, minimisation of material drop heights, minimisation of disturbed areas and progressive rehabilitation);
- continued use of predictive meteorological and air quality forecasting to guide daily operations; and
- continued use of the proactive/reactive air quality management system, with alterations made to operations in response to relevant alerts (including pausing key dust generating activities as required by the conditions of EPL 20850).

The proposed staging of the ROM coal production rate increases would also result in a gradual build-up in employment at the Project, with the peak operational employment projected in 2041. This would allow sufficient time for service providers to plan for any associated minor changes in regional population, and may also offset other coal mine closures and ramp-downs that are expected to occur over the life of the Project.

The extended staging of the Project ROM coal increases would also facilitate progressive adoption of applicable greenhouse gas mitigation and reporting measures that may be required to continue to conform with Commonwealth requirements under the NGER Act and the associated Safeguard Mechanism (Section 7.21 and Appendix S).

Water Supply Sources and Reliability

The existing Mount Pleasant Operation largely sources its water from the regulated flows of the Hunter River in accordance with its existing water access licences, with lesser volumes contributed by groundwater inflows and incident rainfall (Sections 7.8 and 7.9).

The implementation of secondary flocculation in the Fines Emplacement Area and fine reject dewatering in the two new CHPP modules (Section 3.10) would reduce water usage rates per tonne of Project coal produced. However, the increased rates of coal production would increase Project demand for water for the washing of coal and dust suppression on haul roads.

Consideration was initially given to development of a supplementary aquifer borefield to supply a proportion of Project water. However, the main aquifer that has a high productivity in the vicinity of the Project is the Hunter River alluvium (Section 7.8). As the Hunter River alluvium is primarily used to support agricultural production, this option was discounted for the Project.

The EPA and the MSC have advocated for increased beneficial water sharing between local industrial users to minimise total water use from the Hunter River. The Mount Pleasant Operation is permitted to share water with the neighbouring mining operations.

MACH has recently investigated the feasibility of beneficial re-use of excess water held in the Dartbrook Mine underground workings in consultation with Australian Pacific Coal Limited (Section 6.3.5). It is anticipated that beneficial water re-use from Dartbrook Mine would continue to be investigated and, if feasible, would be implemented over the life of the Project to reduce water demand from the Hunter River.

With the implementation of the above, consistent with the existing Mount Pleasant Operation, the bulk of make-up water demand over the life of the Project is expected to be supplied from the Hunter River, in accordance with MACH's existing water access licences (Section 7.9 and Appendix D).

MACH has also investigated alternative measures to further improve water supply reliability, including the installation of an additional mine water dam (MWD2) as described below, use of chemical dust suppressants to reduce haul road dust suppression water requirements, and obtaining additional water access licences.

MACH would adaptively apply supplementary water management measures during low rainfall periods to maintain water supply (Section 7.9).

8.2.2 Project Infrastructure Augmentations

Road Network Changes

Condition 38, Schedule 3 of Development Consent DA 92/97 requires MACH to construct the Western Link Road (Figure 1-3) prior to the closure of Wybong Road (Section 2.2.8).

MACH has considered the closure of Wybong Road to access the underlying coal reserves, and associated development of the approved Northern Link Road and Western Link Road alignments (Figure 1-3).

Given that the approved Stage 2 rail infrastructure would be constructed adjacent to Wybong Road, access to the underlying coal reserves would be constrained and the closure of Wybong Road is less viable. In addition, previous engagement with the community to the west of the Mount Pleasant Operation identified significant opposition to the potential closure of Wybong Road.

Further, in accordance with a Consent under section 138 of the *Roads Act, 1993* MACH will resurface Wybong Road from the Mount Pleasant Operation Access Road to the Overton Road intersection as part of Stage 2 rail works.

The approved Western Link Road, therefore, would not form part of the Project and Wybong Road would remain open. The majority of the Western Link Road is therefore included in the Project Relinquishment Area (described below).

Without the construction of the Western Link Road, the current alignment of the approved Northern Link Road intersection with Castlerock Road would be a right-angle intersection. Therefore, MACH proposes to realign the Northern Link Road for improved efficiency and safety (Section 3.5.2).

Two alternative alignments for the revised Northern Link Road have been identified and are assessed in this EIS (Section 3.5.2).

Fines Emplacement

MACH has established a Fines Emplacement Area for the Mount Pleasant Operation in accordance with Development Consent DA 92/97 (Section 2). The approved Mount Pleasant Operation also includes a second smaller fines emplacement located in the catchment immediately to the south of the current Fines Emplacement Area, which has not been developed to date and is subject to Condition 51 of Schedule 3 of Development Consent DA 92/97 (Figure 1-3).

As part of the development of the Project description, MACH has considered potential alternative technologies and emplacement methodologies to address the total requirements for CHPP reject disposal for the life of the Project.

MACH investigated a number of alternatives including:

- maximising the capacity of the current Fines Emplacement Area;
- development of the second approved emplacement area;
- in-pit fines emplacements; and
- the addition of fine reject dewatering technologies to allow for co-disposal of fine reject material with coarse rejects in-pit.

In-pit fine reject emplacements are undertaken in the Hunter Valley, often in open cut voids where mining has been completed, or where mining is being conducted up-dip (i.e. the mine is rising in elevation relative to the emplacement facility). Recognised limitations of such facilities can include reduced water recoveries (i.e. due to water losses to the in-pit waste rock material) and increased risk of inrush events into the active mining area. In the case of the Mount Pleasant Operation, the mine is progressing down-dip and therefore in-pit impoundment was not considered practical.

MACH is applying secondary flocculation at the Mount Pleasant Operation to maximise water recoveries and fine reject *in-situ* density in the Fines Emplacement Area (Section 2.2.5). The Project would also maximise the available storage capacity of the existing Fines Emplacement Area, without significantly increasing its disturbance area (Section 3.5.4).

At full capacity, the Project Fines Emplacement Area would have sufficient storage for more than half of the fine reject to be produced over the life of the Project (Section 3.5.4).

The development of new CHPP modules as a component of the Project was viewed by MACH as a potential opportunity to include some fine reject dewatering technology in the new facilities to facilitate in-pit disposal. While the inclusion of fine reject dewatering technologies would increase both the capital and operating cost of the new CHPP modules, the extra cost could be absorbed when conducted as part of the proposed Project site upgrades.

The Project's proposed maximisation of the capacity of the existing approved Fines Emplacement Area and installation of fines dewatering technologies in the two new CHPP modules was considered by MACH to optimise both financial and environmental outcomes, and avoids the need for development of the second emplacement area.

Mine Water Storages

Initial water balance modelling for the Project indicated that the potential reliability of water supply for use in the CHPP and for dust suppression would fall at peak Project coal processing rates without some augmentations to water management infrastructure. Further, in the latter years of the Project the existing MWD would be mined out (Section 3.11.1).

While it was initially thought that the existing MWD would provide sufficient capacity, iterative modelling indicated that the optimal solution was to introduce a new water dam (MWD2) before the rate of ROM coal production increased to 15.75 Mtpa. This extra capacity would then be maintained with the construction of a third MWD (MWD3) in 2041 before MWD is mined out.

Rather than developing the approved second fines emplacement area, MACH proposes to use the southern catchment for the development of the additional mine water storages (Section 3.5.1).

Water Release Infrastructure

The MWD can discharge excess water to the Hunter River via the Controlled Release Dam (CW1) (Figure 1-3) in accordance with the HRSTS (subject to obtaining relevant secondary approvals under EPL 20850).

The Mount Pleasant Operation Controlled Release Dam (CW1) is located within the approved extent of the Bengalla Mine and was negotiated between the two mines to facilitate the Bengalla Continuation Project (approved in 2015). This facility will be located adjacent to Bengalla Mine's existing controlled release dam (Figure 1-3).

Subject to agreement by the EPA, over the life of the Project, the Mount Pleasant Operation and the Bengalla Mine may consider alternative water release and water sharing arrangements (i.e. to maximise the efficient use of water storages and controlled release infrastructure at the two sites).

Any Project controlled releases would only be undertaken in accordance with the HRSTS and EPL 20850 (Sections 3.1 and 7.9).

8.2.3 Project Landforms and Land Use

Integrated Waste Rock Emplacement

The originally approved Mount Pleasant Operation final landform included three large out-of-pit waste emplacements:

- the Eastern Out-of-Pit Emplacement – constructed up to approximately 250 m AHD in the early part of the mine life (as modified by Mod 3);

- the South West Out-of-Pit Emplacement – approved to be constructed up to approximately 320 m AHD in the early part of the mine life; and
- the North West Out-of-Pit Emplacement – approved to be constructed up to approximately 320 m AHD in the latter part of the mine life.

The North West Out-of-Pit Emplacement would not be developed in the currently approved mine life (based on mining to December 2026 only).

The revision to the waste emplacement strategy associated with Mod 3 provided MACH with the opportunity to improve the Mount Pleasant Operation final landform design in comparison to the landform originally approved in 1999. In particular, the eastern emplacement extension (approximately 67 ha) allowed MACH to avoid construction of the approved South West Out-of-Pit Emplacement.

Further to the landform improvements associated with Mod 3, MACH has identified that the optimal Mount Pleasant Operation open cut development profile is to develop three contiguous pits that advance westwards and extract all economic coal seams to the Edderton Seam floor. This leads itself to consolidation of the Project open cut development on the eastern side of ML 1645 and avoids the need to develop the North West Out-of-Pit Emplacement.

Initial mine planning completed for the Project produced an engineered Eastern Out-of-Pit Emplacement landform that was angular, with steep slopes that required engineered drop structures to facilitate surface water drainage. However, consistent with MACH's approach to Mount Pleasant Operation landforms in Mod 3, landform design work was undertaken to produce a final landform that integrates with the surrounding natural landforms and improves long-term drainage stability (Section 3.17 and Attachment 8).

The landform design process has involved application of geomorphic design principles and iterative investigation of long-term landform stability by static erosion risk assessment and landscape evolution modelling (i.e. the University of Newcastle SIBERIA model) (Attachment 8).

Northern Waste Rock Bund

MACH considered whether to implement a noise bund on the northern boundary in advance of mining in North Pit.

While the bund would increase capital costs, the development of a bund of approximately 20 m elevation above natural ground was adopted as a component of the Project, as it provided some shielding of mobile plant noise sources in the initial development near the northern boundary of ML 1645.

The design of the bund was subsequently incorporated with the integrated waste rock emplacement landform, so that it would conform with geomorphological principles and could remain as part of the final landform (Section 3.17 and Attachment 8).

Final Void

The originally approved Mount Pleasant Operation final landform included two final voids associated with the North Pit and South Pit open cuts and a smaller third final void located in a low-lying area between the two larger final voids (Figure 2-5a).

Variations to the final landform associated with Mod 3 did not significantly alter the original EIS final void concepts. However, only the South Pit would be developed in the currently approved mine life (i.e. the North Pit is not planned to be developed by MACH before 2026). Therefore, the 2026 final landform includes one final void in South Pit (Figure 2-5b).

The development of the Mount Pleasant Operation open cut as three contiguous pits that advance in parallel provides the opportunity to emplace more waste material in-pit, rather than relying on additional out-of-pit emplacements (i.e. the approved South West Out-of-Pit Emplacement and North West Out-of-Pit Emplacement). As a result, the Project would only leave one final void.

Initial mine planning completed for the Project resulted in a residual final void that spanned the full length of the western side of the Project open cut. The initial final void was based on full mined-out strips to the base of the Edderton Seam and was rectangular in shape. However, in response to initial feedback from regulatory and community stakeholders, MACH has re-designed the final void to:

- backfill approximately 1.5 km of the northern part of the final void;
- reduce the depth of the final void in the North and Central Pit areas and decrease the slope of the internal final batters;

- apply geomorphic design concepts to parts of the Project landform that drain internally to the final void; and
- push down the western highwall to an overall angle of approximately 18°.

As a result of the above, the Project final void is considered safe, stable and minimises the catchment reporting to the void whilst maintaining geomorphic design concepts (i.e. providing sufficient slope length to improve post-mining stability and reduce long-term erosion risk).

MSC's input to the Project SEARs requested that this EIS considers a Project design/mining sequence that would result in no final voids. As described above, the Project would result in a single final void as opposed to the three final voids associated with the originally approved Mount Pleasant Operation final landform.

MACH has completed mine planning for a Project scenario that would result in no final void (i.e. backfilled landform to an elevation that drains freely to the north of the Project). The analysis considered mining efficiency, operational costs and environmental implications relative to the proposed Project final landform.

The closure costs for a no-void scenario would increase by over $1 billion relative to the rehabilitation cost associated with the Project final landform. These additional closure costs would render the Project uneconomic.

In addition to the significant additional closure costs, the no-void scenario would result in the following (refer Attachment 8):

- Mining inefficiencies and environmental risks associated with rehandling emplaced coal rejects and PAF material associated with the Wynn Seam.
- Delays to the establishment of woodland rehabilitation until emplacement areas reach the final landform surface.
- Storage of topsoil for extended periods of time, reducing its value for rehabilitation.
- Increased seepage of water from the backfilled waste rock material to the Hunter River alluvium (as shown by MODPATH modelling undertaken by AGE Consultants for the no-void scenario) (Attachment 8).

MACH recognises that a no-void scenario would also have some environmental benefits by restoring additional land to potential productive post-mining use, removing a long-term saline water body from the landscape and restoring free-draining catchment to the Hunter River. However, the additional operational costs and environmental consequences described above are considered to significantly outweigh these potential benefits.

MACH would continue to consider alternative final void options over the life of the Project, including potential beneficial uses of the final void (e.g. for off-river storage of supplementary water flows in the Hunter River).

Final Land Use

MACH would establish open woodland communities across the majority of the Mount Pleasant Operation final landform. This remains the preferred final land use for the majority of the Project landform given:

- These vegetation communities are consistent with remnant vegetation in the surrounding environment.
- It is consistent with the planned revegetation of the eastern face of the Bengalla Mine landform, improving the visual integration of these landforms when viewed from Muswellbrook.
- The majority of slopes on the Project final landform would not be conducive to high-intensity agricultural use (e.g. likely to only support low-intensity grazing).

MACH has identified parts of the Project final landform that would be conducive to high-intensity agricultural use (e.g. MIAs). These level or more gently sloping areas would be rehabilitated to pasture using appropriate grass species (Attachment 8). These areas are characterised by:

- low gradient slopes and flat areas;
- proximity to existing land used for agricultural purposes; and
- access to supporting infrastructure that could potentially remain in place to support intensive agricultural use (e.g. rail loop, water storages, high capacity water pumps and pipelines, electrical infrastructure and other services).

MACH recognises that government and community stakeholders may identify final land uses that provide greater net benefits to the locality over the life of the Project. MACH would encourage and be supportive of other community and government proposals or initiatives for the use of MACH land or infrastructure that can co-exist with the Project. These alternative final land uses would be subject to separate assessments and approval, and do not form part of the Project.

8.2.4 Potential Land Disturbance and Relinquishment Area

The Mount Pleasant Operation has already offset the approved biodiversity impacts of the mine, with the establishment of major biodiversity offsets of some 12,875 ha on a number of regional properties with a combined area of 15,590 ha and managed in accordance with the Offset Management Plan and Re-Establishment Plan (MACH, 2020b).

As described in Sections 3 and 7, the Project would involve the relinquishment of a significant portion of the approved disturbance area of the Mount Pleasant Operation, to compensate for the proposed Additional Disturbance Area. The proposed Project Relinquishment Area includes part of North Pit and some major approved infrastructure of the Mount Pleasant Operation that MACH does not intend to develop, including:

- the Western Link Road – a public road running north-south through ML 1645 (described above);
- the South West Out-of-Pit Emplacement – approved to be constructed up to approximately 320 m AHD in the early part of the mine life; and
- the North West Out-of-Pit Emplacement – approved to be constructed up to approximately 320 m AHD in the latter part of the mine life.

MACH has previously relinquished the majority of the South West Out-of-Pit Emplacement area. This was relinquished to compensate for minor additional land disturbance areas associated with Mod 3 and Mod 4.

Further, as discussed above, MACH has identified that the optimal Mount Pleasant Operation open cut development profile is to develop three contiguous pits that advance westwards and extract all economic coal seams to the Edderton Seam floor.

This favours relinquishment of the large contiguous area (including the North West Out-of-Pit Emplacement) in the north-west. The ecological values of the proposed Relinquishment Area are materially higher than the various infill disturbance areas adjacent to the existing Mount Pleasant Operation development that would be disturbed by the Project (Section 7.10 and Appendix E).

MACH has therefore identified an opportunity to recover an additional 247 Mt of ROM coal within the existing Mount Pleasant Operation MLs, while also reducing approved impacts on regional biodiversity values, irrespective that the approved impacts on biodiversity values have already been offset to meet stringent Commonwealth Government requirements.

8.2.5 Key Socio-economic Impacts

The development of the Project would involve the continuation of the existing social impacts of the Mount Pleasant Operation (Section 7.17 and Appendix N). However, it would also involve the expansion and significant extension of the economic and social benefits of the existing mine (Section 7.18 and Appendices N and O).

The Project is considered to facilitate significant ongoing socio-economic benefits in the region and to the State of NSW, given it would:

- provide for the continuation and significant expansion of the existing Mount Pleasant Operation workforce, providing direct employment for an average of 600 people over the Project life;
- provide for the continuation of MACH's existing relationships with local suppliers, businesses and community groups;
- result in additional expenditure in the local and regional economies during construction and development phases of the Project, noting the capital investment value for the Project is approximately $950 million; and
- support the ongoing contribution of the Mount Pleasant Operation to NSW State royalties, with incremental Project royalties of approximately $2 billion (NPV approximately $684 million) (Appendix O).

MACH considers that the Project optimises many aspects of the currently approved Mount Pleasant Operation, to provide the continuation of direct and indirect socio-economic benefits. These benefits can be realised while minimising potential adverse impacts on the local community. Where potentially adverse impacts from the Project cannot be avoided, measures to minimise and offset these potential impacts have been developed (Section 7).

8.3 STATUTORY REQUIREMENTS AND PLANNING/POLICY OBJECTIVES

8.3.1 Consideration of the Project against the Objects of the Environmental Planning and Assessment Act, 1979

Section 1.3 of the EP&A Act describes the objects of the EP&A Act as follows:

> *(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*
>
> *(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,*
>
> *(c) to promote the orderly and economic use and development of land,*
>
> *(d) to promote the delivery and maintenance of affordable housing,*
>
> *(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,*
>
> *(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),*
>
> *(g) to promote good design and amenity of the built environment,*
>
> *(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,*
>
> *(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,*
>
> *(j) to provide increased opportunity for community participation in environmental planning and assessment.*

The Project is considered to be generally consistent with the objects of the EP&A Act, as:

- The Project would facilitate continued and expanded local and regional employment, economic development opportunities and community development (Sections 7.17 and 7.18, and Appendices N and O).
- The Project would develop the State's coal resources within MACH's MLs, with the value of coal production recognised in the NSW Government's 2020 *Strategic Statement on Coal Exploration and Mining in NSW* (NSW Government, 2020).
- The Project would incorporate relevant ESD considerations (Section 8.3.5).
- The Project is compatible with its near neighbours, including agricultural businesses (Sections 7 and 8.1).
- The Project would incorporate a range of measures for the protection of the environment, including the relinquishment of some approved disturbance areas, and the protection of native plants and animals, threatened species, and their habitats (Section 7).
- Aboriginal and historical heritage assessments have been undertaken and the Project would incorporate suitable mitigation measures for potential direct and indirect impacts of the Project on heritage (Sections 7.12 and 7.13, and Appendices G and H).
- The Project would make maximum use of the existing Mount Pleasant Operation infrastructure, coal handling, rail transport and the existing Fines Emplacement Area. The Project incorporates leading mine landform design principles and progressive rehabilitation that would act to minimise the visual contrast of the integrated waste rock emplacement with the surrounding environment (Sections 3.17, 7.16 and 8.2).
- A PHA (MACH, 2020e) has been conducted to assess the potential hazards associated with the Project (Section 7.19 and Appendix Q). The Project would operate within MACH's safety management systems and NSW legislation to manage risks to workers and other persons.
- The Project would be determined by the Minister or IPC; however, a wide range of stakeholders have been consulted throughout the assessment process.

- The Project would be developed in a manner that incorporates community engagement through the Project EIS consultation program (Section 6) as well as the public exhibition of the EIS document and the major project assessment process.

8.3.2 Consideration of the Project against the Objects of the Environment Protection and Biodiversity Conservation Act, 1999

Section 3 of the EPBC Act describes the objects of the EPBC Act as follows:

> *(1) The objects of this Act are:*
>
> *(a) to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance; and*
>
> *(b) to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources; and*
>
> *(c) to promote the conservation of biodiversity; and*
>
> *(ca) to provide for the protection and conservation of heritage; and*
>
> *(d) to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples; and*
>
> *(e) to assist in the co-operative implementation of Australia's international environmental responsibilities; and*
>
> *(f) to recognise the role of indigenous peoples in the conservation and ecologically sustainable use of Australia's biodiversity; and*
>
> *(g) to promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.*

The Project is considered to be generally consistent with the objects of the EPBC Act, as:

- The Project incorporates measures to protect the environment (including MNES), through the Project design including the relinquishment of approved disturbance areas (Section 3.3.2) and the application of mitigation, offsets and other measures (Section 7).
- The Project would develop the State's mineral resources (i.e. coal resources) while incorporating relevant ESD considerations (Section 8.3.5).
- An assessment of potential biodiversity impacts has been undertaken, and the Project includes a proposal for offsetting unavoidable impacts on ecology (including threatened species and communities listed under the EPBC Act) associated with the Action and other compensatory measures (Section 7.10, Attachment 9 and Appendix E).
- The Action under the EPBC Act would not have a significant impact on water resources in consideration of the guidance in the Significant Impact Guidelines for Water Resources (DotE, 2013) (Sections 7.8 and 7.9 and Appendices C and D).
- Aboriginal and historical heritage assessments have been undertaken, which identify relevant cultural values (including the significance of biodiversity in Aboriginal cultural values), and suitable mitigation measures for potential direct and indirect impacts have been incorporated into the Project (Sections 7.12 and 7.13 and Appendices G and H).
- The Project would be developed in a manner that incorporates engagement from the community, landholders and Indigenous peoples through the Project EIS consultation program (Section 6 and Appendix N), the public exhibition of the EIS document and the NSW major project assessment process.
- This EIS includes consideration of the Project's contribution to maintaining Australia's international environmental responsibilities and the potential impacts on these (e.g. consideration of greenhouse gas emissions) (Section 7.21 and Appendix S).

8.3.3 Evaluation Under Section 4.15(1) of the Environmental Planning and Assessment Act, 1979

In evaluating the Development Application for the Project under section 4.15(1) of the EP&A Act, the consent authority is required to take into consideration a range of matters as are of relevance to the Project, including:

> *(a) the provisions of:*
>
> *(i) any environmental planning instrument, and*
>
> *(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and*

(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and

(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),

…

that apply to the land to which the development application relates,

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,

(c) the suitability of the site for the development,

(d) any submissions made in accordance with this Act or the regulations,

(e) the public interest.

This EIS has been prepared to address the requirements of section 4.15(1) to assist the Minister or the IPC in evaluating the Project, as follows:

- Consideration of the requirements of relevant environmental planning instruments, and the EP&A Regulation is provided in this EIS.
- The Mount Pleasant Operation currently has a Voluntary Planning Agreement with MSC. While no revised planning agreement or draft planning agreement has been agreed for the Project to date, MACH has commenced consultation with MSC (Section 6) and intends to negotiate with MSC in good faith to reach agreement on the terms of a planning agreement.
- The predicted impacts of the Project, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality are provided in Section 7 and Appendices A to S.
- The suitability of the proposed site for the Project is considered in Sections 3, 4, 7 and 8.1.
- Consideration of whether, on evaluation, the Project is considered to be in the public interest is provided in Section 8.5.

8.3.4 Potential Implications of Climate Change

The Project's contribution to global climate change effects would be proportional to its contribution to global greenhouse gas emissions.

The Project's Scope 1 and Scope 2 emissions have together been estimated at approximately 0.54 Mt CO_2-e per year, which represents approximately 0.4% of the estimated total greenhouse gas emissions in NSW from 2017 and approximately 0.1% of Australia's annual greenhouse gas emissions from 2017 (Appendix S).

The estimated annual average Scope 3 emissions due to the combustion of coal produced by the Project by its customers would be approximately 0.065% of the total anthropogenic greenhouse gas emissions globally in 2017 (excluding land use change).

The potential contributions of Project greenhouse gas emissions to national and international emissions are further considered in Section 7.21 and Appendix S.

MACH has considered the key potential climate change risks to the Project (namely increased frequency of bushfires, water reliability during dry periods and storm surges) in the design of the Project, and would continue to assess climate change risks on an ongoing basis via implementation of an adaptive management approach.

8.3.5 Ecologically Sustainable Development Considerations

Background

The concept of sustainable development came to prominence at the World Commission on Environment and Development (1987), in the report titled *Our Common Future*, which defined sustainable development as:

> *Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

In recognition of the importance of sustainable development, the Commonwealth Government developed a National Strategy for Ecologically Sustainable Development (NSESD) (Commonwealth of Australia, 1992) that defines ESD as:

> *…using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.*

The NSESD was developed with the following core objectives:

- to enhance individual and community wellbeing and welfare by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations; and
- to protect biological diversity and maintain essential processes and life support systems.

In addition, the NSESD contains the following goal:

> *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.*

In accordance with the core objectives and a view to achieving this goal, the NSESD presents private enterprise in Australia with the following role:

> *Private enterprise in Australia has a critical role to play in supporting the concept of ESD while taking decisions and actions which are aimed at helping to achieve the goal of this Strategy.*

The Project will require approval under both the EP&A Act and the EPBC Act (Sections 5.2.1 and 5.2.7).

In deciding whether or not to approve the Project, the Commonwealth Minister must take into account the principles of ESD pursuant to section 136(2) of the EPBC Act. The relevant definition of the principles of ESD is provided in section 3A of the EPBC Act.

Clause 7(4) of Schedule 2 of the EP&A Regulation sets out the principles of ESD. The term ESD is defined under the EP&A Act to have the same meaning as it has in section 6(2) of the NSW *Protection of the Environment Administration Act, 1991* (PoEA Act). The principles of ESD as outlined in section 3A of the EPBC Act and section 6(2) of the PoEA Act are presented and compared in Table 8-4.

Consideration of Ecologically Sustainable Development for the Project

The design, planning and assessment of the Project has been carried out applying the principles of ESD, through:

- incorporation of risk assessment and analysis at various stages in the Project design, environmental assessment and decision-making;
- adoption of high standards for environmental and occupational health and safety performance;
- consultation with regulatory and community stakeholders;
- optimisation of the economic benefits to the community arising from the development of the Project; and
- taking into account biophysical considerations in the Project design.

Assessment of potential medium and long-term impacts of the Project was carried out during the preparation of this EIS on aspects of surface water and groundwater, visual character, agriculture, transport movements, air quality emissions, greenhouse gas emissions, noise emissions, aquatic and terrestrial ecology, heritage and socio-economics.

In addition, it can be demonstrated that the Project can be operated in accordance with ESD principles through the application of management measures, compensatory measures and offset measures that have been developed based on conservative impact assumptions for the Project.

The following sub-sections describe the consideration and application of the principles of ESD to the Project.

Precautionary Principle

Environmental assessment involves predicting the likely environmental outcomes of a development. The precautionary principle reinforces the need to account for risk and uncertainty, especially in relation to threats of irreversible environmental damage.

A PHA (Appendix Q) and an ERA (Appendix P) were conducted to identify Project-related risks and develop appropriate mitigation measures and strategies.

Table 8-4
Principles of Ecologically Sustainable Development – EPBC Act and PoEA Act

Section 3A of the EPBC Act	Section 6(2) of the PoEA Act
(a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;	*(2) …ecologically sustainable development requires the effective integration of social, economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:*
(b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;	*(a) the **precautionary principle** – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.* *In the application of the precautionary principle, public and private decisions should be guided by:* *(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and* *(ii) an assessment of the risk-weighted consequences of various options,*
(c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;	*(b) **inter-generational equity** – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*
(d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;	*(c) **conservation of biological diversity and ecological integrity** – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*
(e) improved valuation, pricing and incentive mechanisms should be promoted.	*(d) **improved valuation, pricing and incentive mechanisms** – namely, that environmental factors should be included in the valuation of assets and services, such as:* *(i) polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,* *(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,* *(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanism, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

The PHA (Appendix Q) considers off-site risks to people, property and the environment (in the presence of controls) arising from atypical and abnormal hazardous events and conditions (i.e. equipment failure, operator error and external events) from fixed installations.

The ERA (Appendix P) considers potential environmental impacts associated with the Project, including long-term risks. In addition, long-term effects are considered by the specialist studies conducted in support of this EIS (Section 7).

In the Groundwater, Surface Water and Economic Assessments (Appendices C, D and O), risk and uncertainty have also been taken into account through sensitivity and/or uncertainty analysis. Other specialist studies have accounted for uncertainty by adopting conservative Project assumptions and/or prediction methodologies, such as the Noise and Blasting Assessment, Air Quality Assessment and Greenhouse Gas Assessment (Appendices A, B and S).

Findings of these specialist assessments are presented in Section 7 and relevant appendices. Measures designed to avoid, mitigate and offset potential environmental impacts arising from the Project are also described in Section 7, and summarised in Attachment 9.

The specialist assessments, PHA, Human Health Assessment and ERA (Appendices Q, R and P) have evaluated the potential for harm to the environment associated with the development of the Project. A range of measures have been adopted as components of the Project design to minimise the potential for serious and/or irreversible damage to the environment. These include operational controls, physical controls (e.g. a rail noise barrier), and the development of environmental management and monitoring programmes (Sections 7 and Attachment 9). Where residual risks are identified, contingency controls have also been considered (Section 7).

In addition, for key Project environmental assessment studies (i.e. the Noise and Blasting Assessment [Appendix A], Air Quality Assessment [Appendix B], and Groundwater Assessment [Appendix C]), peer review by recognised experts was undertaken (Attachment 5).

Social Equity

Social equity is defined by inter-generational and intra-generational equity. Inter-generational equity is the concept that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations, while intra-generational equity is applied within the same generation.

The principles of social equity are addressed through:

- assessment, and where relevant mitigation, of the social and economic impacts of the Project (Sections 7.17 and 7.18 and Appendices N and O), including the distribution of impacts between stakeholders and consideration of the potential social and economic costs of climate change;
- management measures to be implemented in relation to the potential impacts of the Project on water resources, heritage, land resources, noise, air quality, biodiversity, transport, hazards and risks, greenhouse gas emissions, visual character, economics, social values and surrounding land uses (Section 7);
- implementation of environmental management and monitoring programs (Attachment 9) to minimise and evaluate potential environmental impacts (which include environmental management and monitoring programs covering the Project life); and
- reduction of potential biodiversity impacts with the relinquishment of approved disturbance areas to compensate for additional impacts that have been identified for the development (Section 7.10).

The Project would benefit current and future generations through the continuation of existing, and creation of significant additional, employment opportunities that would continue to 2048. It would also provide significant stimulus to local and regional economies and provide continued NSW export earnings and royalties, thus contributing to current and future generations through social welfare, amenity and infrastructure.

The Project incorporates a range of mitigation measures to minimise potential impacts on the environment. The costs of these measures would be met by MACH and these costs have been included in the Economic Assessment (Appendix O). The potential benefits to current and future generations have therefore been calculated in the context of the mitigated Project.

Conservation of Biological Diversity and Ecological Integrity

Biological diversity, or “biodiversity”, is considered to be the number, relative abundance, and genetic diversity of organisms from all habitats (including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are a part) and includes diversity within species and between species as well as diversity of ecosystems (Lindenmayer and Burgman, 2005).

For the purposes of this EIS, ecological integrity has been considered in terms of ecological health and ecological values.

The Mount Pleasant Operation was approved in 1999 and is a major existing open cut coal mine (Section 2). The Project would not result in any significant increase in the disturbance area of the approved Mount Pleasant Operation as the Project includes the relinquishment of some approved disturbance areas to compensate for Project infill disturbance areas.

Surveys conducted for the Project have identified threatened ecological communities and habitat suitable for threatened flora and fauna species. Detailed results from recent terrestrial flora and fauna and aquatic ecology surveys are outlined in Appendices E and F.

The environmental assessment in Sections 7.10 and 7.11 (and Appendices E and F) describes how the relinquishment of approved areas would minimise the potential incremental impacts of the Project on local and regional ecology.

Greenhouse Gas Emissions, Biological Diversity and Ecological Integrity

Many natural ecosystems are considered to be vulnerable to climate change. Patterns of temperature and precipitation are key factors affecting the distribution and abundance of species (Preston and Jones, 2006). Projected changes in climate will have diverse ecological implications. Habitat for some species will expand, contract and/or shift with the changing climate, resulting in habitat losses or gains, which could prove challenging, particularly for species that are threatened.

Anthropogenic Climate Change is listed as a key threatening process under the BC Act, and *Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases* is listed as a key threatening process under the EPBC Act.

It is acknowledged that (subject to the efficacy of national and international greenhouse gas abatement measures) all sources of greenhouse gas emissions in NSW, irrespective of their scale, will contribute in some way towards the potential global, national, state and regional effects of climate change.

The Project's potential contribution to global climate change would be proportional to its contribution to global greenhouse gas emissions (Sections 7.21 and 8.3.4, and Appendix S).

Measures to reduce the Project's direct (Scope 1) greenhouse gas emissions are described in Section 7.21 and Attachment 9. However, approximately 96% of the estimated total Scopes 1, 2 and 3 emissions are associated with the end use of the Project product coal by customer organisations (i.e. primarily for electricity generation). Emissions associated with the end use of Project coal would, therefore, be managed under the NDCs of these countries (Appendix S).

Valuation of potential impacts of Project Scope 1 and Scope 2 greenhouse gas emissions has been incorporated into the Economic Assessment (Appendix O) for the Project. Further consideration of the Scope 3 emissions associated with the use of Project product coal is provided in Section 8.4.1.

The potential implications of climate change on local groundwater and surface water resources are addressed in Appendices C and D, respectively.

Measures to Maintain or Improve the Biodiversity Values of the Surrounding Region

A range of measures would be implemented for the Project to maintain or improve the biodiversity values of the surrounding region in the medium to long-term. As summarised below and detailed in Section 7, these measures include impact avoidance, minimisation, mitigation and offsets (for residual impacts).

Project surface infrastructure has been located and designed to avoid or minimise impacts to vegetation and habitat disturbance through (Section 8.2):

- the use of the existing Mount Pleasant Operation infrastructure (including the CHPP, rail spur, rail loop and MIA), reducing the requirement to develop new infrastructure;
- optimising the Mount Pleasant Operation design, by relinquishing some approved disturbance areas (including the North West Out-of-Pit Emplacement) to compensate for Project infill disturbance areas;
- the optimisation of the existing Fines Emplacement Area to maximise its capacity, without significantly increasing its disturbance area;
- avoidance of the need to construct a new fines emplacement by the adoption of fines dewatering technologies for the Project additional CHPP modules, and associated in-pit emplacement of dewatered fines from these modules;
- locating the new MWD2 and MWD3 within the catchment area previously approved for construction of a second fines emplacement at the Mount Pleasant Operation;
- consolidation of the disturbance area of the Project with infill of incidental areas in the vicinity of approved development, and relinquishment of areas of higher habitat value;
- locating the majority of additional infrastructure within the infrastructure area of the existing Mount Pleasant Operation; and
- incorporating the continued rehabilitation of the current mining disturbance areas at the Mount Pleasant Operation.

Sections 7 and 8, and Attachment 9 summarise a number of Project measures that would assist in maintaining the biodiversity of the region, including measures such as clearance protocols, weed management and rehabilitation of disturbed areas.

The BDAR (Appendix E) conducted for the Project in accordance with the SEARs and BC Act has demonstrated that the threatened species habitat and vegetation community values of the area to be relinquished is generally of higher conservation value than the additional areas to be disturbed by the Project.

Valuation

One of the common broad underlying goals or concepts of sustainability is economic efficiency, including improved valuation of the environment. Resources should be carefully managed to maximise the welfare of society, both now and for future generations.

In the past, some natural resources have been misconstrued as being free or under-priced, leading to their wasteful use and consequent degradation. Consideration of economic efficiency, with improved valuation of the environment, aims to overcome the under-pricing of natural resources and has the effect of integrating economic and environmental considerations in decision-making, as required by ESD.

While environmental costs have been considered to be external to development costs historically, improved valuation and pricing methods attempt to internalise environmental costs and include them within Project costing.

The Economic Assessment (Appendix O) undertakes an analysis of the Project and incorporates environmental values via direct valuation where practicable (e.g. greenhouse gas costs). Furthermore, wherever possible, direct environmental effects of the Project are internalised through the adoption and funding of mitigation measures by MACH to mitigate and offset potential environmental impacts (e.g. noise mitigation and Project staging costs).

The Economic Assessment in Appendix O indicates a net benefit of $855 million in NPV terms to the State of NSW would be forgone if the Project is not implemented (i.e. net of the value of externalities including Scope 1 and 2 greenhouse gas emissions).

The value of externalities from indirect (Scope 3) greenhouse gas emissions are not considered in the net benefit calculation of the Project's impacts on the NSW economy. This is consistent with economic assessment convention, where the potential negative and positive economic impacts of an activity are considered together, in the country where the activity takes place (e.g. economic positives and externalities of Japanese electricity generation in a customer facility, including the Scope 1 greenhouse gas emissions of that facility). The *Paris Agreement* and its transparency framework seeks to avoid double counting of emissions.

Notwithstanding, Scope 3 greenhouse gas emissions that may be emitted by other parties, such as from the use of the product coal produced by the Project, are considered in this EIS. On average, over the life of the Project, the indirect (i.e. Scope 3) emissions from these activities are estimated to be approximately 33.1 Mt CO_2-e per year (Appendix S).

These (typically electricity generation) greenhouse gas emissions would be accounted for under the customer countries NDCs under the *Paris Agreement* (Appendix S).

8.3.6 NSW Government Strategic Statement on Coal Exploration and Mining

The NSW Government's 2020 *Strategic Statement on Coal Exploration and Mining in NSW* outlines how the NSW Government will continue to support responsible resource development for the benefit of the State (NSW Government, 2020).

The statement indicates that the NSW Government will take a balanced approach to the future of coal mining in the State by setting a clear and consistent policy framework that supports investment certainty, so the NSW coal sector can satisfy long-term global demand for coal, while giving NSW coal-reliant communities time to adapt to a low carbon future.

The Project would be consistent with the statement (Section 4). It is also noted that the NSW Government's Net Zero Plan reiterates that actions on climate change should not undermine the businesses, jobs and communities supported by mining (DPIE, 2020a) (Section 4.3.1).

8.3.7 Other Policies and Strategic Objectives

Other policies and strategic objectives are described in Section 4 and Attachment 6. The Project is generally consistent with applicable relevant policies and strategic objectives.

8.4 EVALUATION OF KEY IMPACTS AND BENEFITS

8.4.1 Key Potential Impacts

Regulatory and community engagement identified key assessment issues for the Project (Section 6). Key potential Project direct adverse impacts and indirect adverse impacts are described below.

Potential Direct Adverse Impacts

Key potential direct adverse impacts associated with the Project include:

- continuation of existing noise and air quality impacts at the most proximal rural residences that would be managed in accordance with NSW Government policy, noting that predicted Project night-time noise levels would fall in Muswellbrook, relative to the current approved Mount Pleasant Operation;
- continuation of Hunter River regulated water extraction in accordance with applicable water access licences, surface water catchment excisions, controlled releases, groundwater depressurisation effects, which would not materially affect downstream water quality;
- continuation and extension of existing impacts on Aboriginal heritage sites, which would be managed in consultation with the Aboriginal community through salvage and other management measures;
- continuation of existing approved impacts on historical heritage items;
- continuation and extension of existing visual effects associated with the Mount Pleasant Operation, including the development of the integrated waste rock emplacement, which is currently visible from Muswellbrook, rural residences and the public road network, plus dynamic impacts in the context of existing mining in the locality, sub-region and region;
- potential for negative perceptions or reservations of agricultural enterprises located proximal to the Project, or equine and viticulture enterprises that are located in the Upper Hunter region;
- the scale of the Mount Pleasant Operation final void that would remain post-mining, long-term water quality effects and post-mining land use options;
- potential for social impacts (such as stress, anxiety or community conflict) due to uncertainties or concerns about the environmental or social impacts associated with the Project, which would be managed through ongoing community engagement during the life of the Project;
- distributional impacts associated with the amenity impacts of the Mount Pleasant Operation and the Project being primarily experienced by the nearest neighbours, while positive impacts are more widely felt across the regional community (Appendix N); and
- the potential for increased demand or competition for rental housing and skilled labour where the Project overlaps with other local and regional developments.

Other potential direct adverse impacts would be mitigated or offset, such that potential impacts would be very low, negligible or nil. For example, biodiversity impacts have been assessed in accordance with the BAM (OEH, 2017), which sets a standard that would result in no net loss of biodiversity values in NSW.

A consolidated summary of proposed mitigation measures for the Project is provided in Attachment 9.

Potential Indirect Adverse Impacts

Most potential indirect impacts of the Project identified in Project engagement have been positive in nature (e.g. indirect employment effects, expenditure in the region and local business benefits).

However, consultation has also identified concerns regarding Scope 1 and Scope 2 greenhouse gas emissions from NSW coal mining developments, and Scope 3 greenhouse gas emissions (e.g. overseas greenhouse gas emissions from the use of Project product coal) potentially contributing to global climate change effects (Appendix N).

It is acknowledged that (subject to the efficacy of national and international greenhouse gas abatement measures) all sources of greenhouse gas emissions will contribute in some way towards the potential global, national, state and regional effects of climate change (Section 8.3.5).

The Project's relative contribution to global climate change effects would be proportional to its contribution to global greenhouse gas emissions. Appendix S describes the predicted relative contribution of the Project to global emissions and the role of individual customer countries in setting the methods and targets for greenhouse gas reductions under their NDCs.

Any small quantities of Project product coal sold on the domestic market (e.g. to AGL's Bayswater Power Station) would be substituting supply from existing sources and, therefore, would not be expected to increase Australia's greenhouse gas emissions.

It is recognised that international measures to "decarbonise" global economies may alter the future demand for and/or supply of coal. Expected global trends are factored into coal price forecasts considered in the Economic Assessment (Appendix O). The Economic Assessment also includes sensitivity analysis for variations in export coal prices and the social cost per tonne of carbon emissions. The sensitivity analysis shows that the Project would still generate a substantial net benefit to NSW under the scenarios considered (Appendix O).

MACH would manage its contribution to Australian greenhouse gas emissions inventories through reporting under the NGER Act, as well as other applicable government initiatives and policies implemented to manage emissions at the national level under Australia's progressive NDCs.

8.4.2 Key Potential Benefits

The potential for the Project to provide continuation of existing Mount Pleasant Operation employment benefits, create increased local employment options and expand turnover for local and regional businesses were key benefits identified in local community and other stakeholder engagement (Appendix N).

The Economic Assessment indicates the Project would result in a total net benefit to the NSW economy of $855 million in NPV terms (Appendix O), which:

- is inclusive of the estimated costs for environmental externalities and internalisation of environmental management costs by MACH; and
- conservatively excludes any indirect economic impacts associated with benefits to workers or suppliers.

This tangible net benefit comprises:

- $172 million in company tax attributable to NSW (NPV) (Appendix O);
- $684 million paid to NSW in the way of coal royalties (NPV) (Appendix O);
- continuation of existing operational jobs at the Mount Pleasant Operation, and additional employment generation with an average of 600 direct, long-term jobs for the region, with consequent social benefits (Appendix N);
- continued development of local workforce capacity, with MACH's continued focus on local employment (Section 7.17 and Appendices N and O);
- continued support for local and regional businesses (e.g. through the continued and increased provision of inputs such as maintenance, supplies and professional services) (Section 7.17);
- continued and increased indirect (flow-on) employment as the result of wages and participation of regional businesses in the Mount Pleasant Operation supply chain comprising average flow-on employment benefits in NSW of some 440 full-time equivalent jobs per annum (Appendix O);
- continued support and funding contributions to local community programs and groups during the life of the Project (Section 6.4.5);
- certainty over future development of the Mount Pleasant Operation site for the local community; and
- certainty for the NSW Government on the continued receipt of coal royalties from the Mount Pleasant Operation to benefit the long-term investment priorities of the State.

8.4.3 Strategic Context

The Project would optimise the extraction of coal reserves within the existing MLs of the approved Mount Pleasant Operation.

The Mount Pleasant Operation currently employs up to 380 full-time equivalent people[1] and operates at a ROM coal production rate of 10.5 Mtpa at the mine's closest proximity to Muswellbrook. The proposed Project staging of the ROM coal production rate up to a maximum of 21 Mtpa would increase financial returns to MACH, employment, and the generation of royalties to the State of NSW, while maintaining key emissions at levels that are generally consistent with the existing Development Consent DA 92/97 (Sections 7.3 and 7.7).

Further, the Project would result in a significant reduction in the number of private landholders being subject to noise affectation or moderate noise exceedances (Section 7.3) when compared to the existing Development Consent DA 92/97.

The intensification of mining at the Mount Pleasant Operation as the Project proposes is a preferred land use outcome under the *Muswellbrook Land Use Development Strategy* (MSC, 2015b), rather than a new mining development in the shire (Section 4.3.5).

The NSW Government's 2020 *Strategic Statement on Coal Exploration and Mining in NSW* indicates that the NSW Government will take a balanced approach to the future of coal mining in the State, so the NSW coal sector can satisfy long-term global demand for coal, while giving NSW coal-reliant communities time to adapt to a low carbon future.

Long life and low operating-cost mines such as the Project that align with NSW's strategic objectives will be important to maintain the generation of royalties and employment in the NSW mining industry, facilitating a more gradual decline of coal mining in the region (Section 4.3.7).

8.4.4 Consideration of the Consequences of Not Carrying Out the Project

Were the Project not to proceed, the following consequences are inferred:

- 247 Mt of additional ROM coal to be extracted over the life of the Project would not be mined, mining would continue at the Mount Pleasant Operation until December 2026 and then a single final void would remain in South Pit, in accordance with the existing Development Consent DA 92/97;
- the current Mount Pleasant Operation workforce would be discontinued following the completion of the currently approved duration of mining at the Mount Pleasant Operation (2026);
- an average of approximately 600 direct operational employment opportunities to 2048 and the associated flow-on employment and economic effects would be forgone;
- construction employment opportunities over various stages of the Project life and associated significant construction capital expenditure of $950 million would not occur;
- the existing mine infrastructure of the Mount Pleasant Operation would be decommissioned and the potential benefits of its continued use under the Project would be lost;
- the Project thermal coal resources would remain available to be extracted by other means, however, the economic efficiencies associated with direct continuation of the Mount Pleasant Operation would be lost;
- substantial corporate tax contributions and royalties would not be generated (Appendix O);
- a net benefit of $855 million to the State of NSW in NPV terms would be forgone (Appendix O);
- the potential incremental environmental impacts described in this EIS would not occur; and
- economic and social benefits to the region (including to the Muswellbrook, Upper Hunter and Singleton LGAs) associated with the Project (Section 8.4.2) would not be realised.

8.5 CONCLUSION

The Project is a continuation of the existing approved Mount Pleasant Operation that would comply with applicable statutory requirements and relevant strategic planning policy objectives (Sections 4 and 5, and Attachments 6 and 7).

The optimisation of the Mount Pleasant Operation would provide for the continuation of employment of the existing workforce of approximately 380 personnel[1], with an average of approximately 600 full-time equivalent direct operational jobs. The Project would invest approximately $950 million in capital expenditure.

[1] As at mid-2020 the Mount Pleasant Operation employed 440 full-time equivalent people.

The Project would also contribute to the ongoing viability of existing suppliers, and provide continuation of supply to customers, including J.C.D. Australia Pty Ltd.

Engagement has informed MACH's design of the Project, including adoption of a range of extensive control measures to minimise potential impacts. The Project would result in lower predicted night-time noise levels for residences on the western outskirts of Muswellbrook than under the current Development Consent DA 92/97 (Section 7.3).

Consolidation of the disturbance area of the Mount Pleasant Operation with infill of incidental areas in the vicinity of approved development, and relinquishment of areas of higher habitat value in the north-west would result in a net positive biodiversity outcome for the region (Section 7.10). MACH would continue to apply existing offsets or other Project-specific measures to address residual impacts (Tables 8-1 to 8-4).

The Mount Pleasant Operation site is suitable for the proposed Project use, and the Project extension of MACH's mining activities in the existing MLs would generate a significant net benefit to the State of NSW (Section 7.18 and Appendix O).

Economic benefits potentially forgone if the Project does not proceed amount to a net benefit of $855 million in NPV terms to the State of NSW. This includes estimated total incremental Project coal royalties of approximately $2 billion (NPV approximately $684 million) (Appendix O).

In weighing up the main environmental impacts (costs and benefits) associated with the proposal as assessed and described in this EIS, the Project is, on balance, considered to be in the public interest of the State of NSW.