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Summary of Mitigation Measures

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A9 SUMMARY OF MITIGATION MEASURES

In accordance with the Secretary's Environmental Assessment Requirements (SEARs), this Attachment provides a consolidated summary of MACH's¹ commitments in relation to mitigation and monitoring activities for the Mount Pleasant Optimisation Project (the Project).

References to Sections 1 to 8 in this Attachment are references to Sections in the main text of the Environmental Impact Statement (EIS). References to Appendices A to S in this Attachment are references to Appendices of the EIS. References to Attachment 8 refer to Attachment 8 of the EIS. Internal references within this Attachment are prefixed with "A9".

A9.1 PROJECT ENVIRONMENTAL MANAGEMENT

Section 7 of the EIS outlines proposed environmental mitigation, adaptive management, monitoring and offset measures for the Project.

These include measures relating to noise, blasting, air quality, groundwater, surface water, biodiversity, Aboriginal cultural heritage, historical heritage, agriculture and land resources, visual and landscape character, socio-economics, hazards, health and greenhouse gas emissions.

Section 3.17 and Attachment 8 of this EIS describe the approach to rehabilitation for the Project. The Biodiversity Offset Strategy for the Project is described in Section 7.10.6.

The Mount Pleasant Operation operates in accordance with its Environmental Management Strategy (MACH, 2019a) (or its latest approved version), which comprises a number of monitoring and management plans. These existing monitoring and management plans will be reviewed and updated as required to address the Project activities.

The management plans required under the current *Environment Protection and Biodiversity*Conservation Act, 1999 (EPBC Act) approval (EPBC 2011/5795), will also continue to apply to the Project.

¹ MACH Mount Pleasant Operations Pty Ltd is the manager of the Mount Pleasant Operation as agent for and on behalf of the unincorporated Mount Pleasant Joint Venture between MACH Energy Australia Pty Ltd (95 per cent [%] owner) and J.C.D. Australia Pty Ltd (5% owner). Throughout this Attachment, MACH Mount Pleasant Operations Pty Ltd and the unincorporated Mount Pleasant Joint Venture will be referred to as MACH.

Table A9-1 presents a provisional list of management plans for the Project.

It is recognised that changes to the Project environmental mitigation, adaptive management, monitoring and reporting proposed in the EIS may be considered necessary during further consultation with government agencies in the assessment and approval process for the Project. Changes may also be required as an outcome of adaptive management, during the life of the Project.

Project environmental mitigation, adaptive management, monitoring and reporting will be conducted in accordance with the finalised Development Consent conditions and associated licences and approvals. Monitoring details (locations, parameters and frequencies) will be provided in the relevant management plans and monitoring programs and will be updated as required over the life of the Project.

A9.2 KEY SPECIFIC ENVIRONMENTAL MITIGATION MEASURES

Along with reasonable and feasible mitigation measures currently being applied at the Mount Pleasant Operation, the Project incorporates various additional design features (Sections 3 and 7), including:

- staging increases to run-of-mine (ROM) coal production;
- open cut mining operations remaining within the existing Mount Pleasant Operation mining leases;
- relinquishment of a significant area that is currently approved to be disturbed as part of the Mount Pleasant Operation (i.e. the Relinquishment Area);
- use and augmentation of existing Mount Pleasant Operation infrastructure;
- addition of fine reject dewatering infrastructure; and
- development of an integrated waste rock emplacement landform incorporating geomorphic drainage design principles for hydrological stability, and varying topographic relief to be more natural in exterior appearance.

Table A9-1 Summary of Project Management, Mitigation, Monitoring and Reporting

Propo	sed Management, Monitoring and Reporting	Key EIS Sections and Appendices				
Management, Mitigation and Monitoring						
Environmental	Management Strategy	Section 2.2.12				
Noise Manage	ment Plan	Sections 7.3 and 7.4 and Appendix A				
Blast Manager	nent Plan	Section 7.6 and Appendix A				
Air Quality and	Greenhouse Gas Management Plan	Sections 7.7 and 7.21 and Appendices B and S				
Water Manage	ment Plan, incorporating:	Sections 7.8 and 7.9 and Appendices C and D				
Site Water	Balance					
Erosion ar	nd Sediment Control Plan					
Surface W	ater Management Plan					
 Groundwa 	ter Management Plan					
	nd Ground Water Response Plan					
	anagement Plan	Sections 7.10 and 7.11 and Appendices E and F				
Aboriginal Heri	tage Management Plan (AHMP), incorporating the tage Conservation Strategy	Section 7.12 and Appendix G				
Maintenance N	Management Plan	Section 7.15.2				
Visual Impact I	Management Plan	Section 7.16 and Appendix M				
Waste Manage	ement Plan	Sections 3.10, 3.14 and 7.19 and Appendix Q				
Rehabilitation	Strategy	Section 3.17 and Attachment 8				
Mining Operati	ons Plan and Rehabilitation Management Plan	Section 3.17 and Attachment 8				
Spontaneous (Combustion Management Plan	Section 7.7 and Appendix B				
Bushfire Mana	gement Plan	Sections 7.19 and 7.21 and Appendices Q and S				
Site Access Ma	anagement Plan	Sections 7.5 and 7.15 and Appendices A and J				
Pollution Incide	ent Response Management Plan	Sections 7.14 and 7.19 and Appendices L and Q				
Historical Herit	age Management Plan	Section 7.13 and Appendix H				
Social Impact I	Management Plan	Section 7.17 and Appendix N				
Disease	Offset Management Plan and Re-Establishment Plan	Section 7.10				
Plans required	Weed Project Plan	Section 2.2.12				
under EPBC 2011/5795	Woodland Birds Project Plan	Section 2.2.12				
2011/0/30	Mine Closure Plan	Section 7.18 and Attachment 8				
Reporting Rec	quirements					
Annual Review	1	Sections 5.2.8 and 5.7				
Greenhouse G	as Reporting	Section 7.21 and Appendix S				
Community Co	nsultative Committee	Section 6.3.6				
Complaints Re	gister	Sections 2.2.12 and 7				

In addition, key environmental mitigation measures and commitments to be implemented for the Project include:

- continued implementation of a comprehensive suite of reasonable and feasible mitigation measures on-site to minimise noise generation during construction and operation;
- continued implementation of a comprehensive suite of reasonable and feasible mitigation measures on-site to minimise dust generation during construction and operation;
- continued management of blasts to minimise impacts on sensitive receivers;
- holding appropriate water access licences under the New South Wales (NSW) Water Management Act, 2000 for water taken for the Project; and
- biodiversity offsets for any residual impacts on threatened species and communities after the application of the Relinquishment Area.

The key environmental mitigation measures and commitments are summarised in the sections below, with reference to the relevant sections of the FIS where further detail is available.

A9.2.1 Operational and Construction Noise

Noise management measures for the Mount Pleasant Operation are described in the Noise Management Plan and will continue to be implemented for the Project.

These include the following planning controls (MACH, 2019b):

- sound power testing of new operational mobile fleet, and sampling of mobile equipment and fixed plant annually to check noise performance;
- procurement of new and/or best available technology plant where reasonable and feasible to do so (including acoustic design of fixed plant, such as cladding);
- periodically refining the Mount Pleasant
 Operation noise model by using noise monitoring data to assist with model calibration over the life of the mine;
- predictive meteorological and noise level forecasting to guide daily operations; and
- developing awareness and understanding of potential noise issues through site inductions for staff and contractors.

Proactive and reactive construction and operational noise management measures and controls currently implemented at the Mount Pleasant Operation will also continue for the Project where it is reasonable and feasible to do so, including (MACH, 2019b):

- operating mobile equipment in less exposed areas during the more sensitive evening/night-time period;
- limiting vegetation clearance to daytime hours;
- using 'quackers' in place of reverse beepers on mobile equipment;
- provision of noise suppression on major operational mobile equipment;
- considering temporary cessation of work within an area, or of a particularly noisy piece of equipment, when adverse meteorological conditions are present;
- maintaining all plant and machinery regularly to minimise noise generation; and
- operating all plant and machinery used on-site in a proper and efficient manner (e.g. at correct speed) to minimise noise generation.

The Noise Management Plan will be reviewed and updated to address the Project, subject to the conditions of any Development Consent for the Project.

Other key Project noise mitigation measures include:

- staging the increases in ROM coal extraction, as mining progresses west;
- design of the integrated eastern waste rock landform to provide shielding of operations to receivers in and around the township of Muswellbrook and village of Aberdeen, including advance development of a bund on the boundary of North Pit that will subsequently be incorporated with the integrated emplacement; and
- a rail noise barrier within the Mount Pleasant Operation mining leases, to reduce operational noise levels experienced at receivers to the south-east of the Mount Pleasant Operation.

A wide range of alternative reasonable and feasible noise mitigation measures would be available to MACH to achieve compliance with the noise levels predicted for the Project. Selection of the most reasonable and feasible options will be undertaken by MACH at the relevant time based on currently available technologies and operational priorities.

Noise Management and Affectation Zones

The privately-owned receivers where noise emissions are predicted to exceed the Project noise criteria can be divided into a Noise Management Zone and a Noise Affectation Zone.

Proposed management procedures for receivers in these zones, in addition to the mitigation and management measures described below, include:

- response to any community issues of concern or complaints, including discussions with relevant landowners:
- refinement of on-site noise mitigation measures and mine operating procedures;
- implementation of reasonable and feasible acoustic mitigation at relevant receivers (i.e. receivers with moderate and significant residual impacts) upon request, in accordance with the Voluntary Land Acquisition and Mitigation Policy (VLAMP) (NSW Government, 2018) and any Development Consent for the Project; and
- entering into agreements with landowners (including acquisition for receivers identified to be in the Noise Affectation Zone, in accordance with any Development Consent for the Project).

Noise Management Plan

The Noise Management Plan will, as relevant, be revised for the Project to include the following (subject to any Development Consent conditions for the Project):

- The additional reasonable and feasible noise mitigation and operational management measures that will be adopted for the Project.
- Details of any required revisions to the predictive meteorological forecasting system used as part of proactive noise management in conjunction with real-time monitoring.
- Updated locations for continuous operational noise monitoring to assist with noise management and operator attended compliance monitoring as mining progresses.
- Details of triggers for the Project real-time monitoring and management system. This will include trigger-based protocols incorporating review of prevailing meteorological conditions, identification of on-site noise levels and operational adjustments (including shutdowns), where necessary, to achieve the relevant Project Development Consent noise criteria.

A9.2.2 Rail Transport Noise

Rail transport noise management measures for the existing Mount Pleasant Operation are described in the Noise Management Plan. This plan will be reviewed and updated to address the Project, subject to the conditions of any Development Consent for the Project.

MACH will continue to require the provision of product train locomotives and rolling stock that are approved to operate on the NSW rail network in accordance with the noise limits in Sydney Trains' Environment Protection Licence (EPL) 12208 and Australian Rail Track Corporation's EPL 3142.

A9.2.3 Road Transport Noise

The existing Mount Pleasant Operation Site Access Management Plan will be reviewed and updated subject to the conditions of any Development Consent for the Project.

Project staff and contractors will be made aware of the potential for road transport noise impacts at proximal private residences through site-specific inductions and staff education programs to reinforce quiet driving practices.

A9.2.4 Blasting

Blast management measures for the Mount Pleasant Operation are described in the Blast Management Plan and will continue to be implemented for the Project (including management of blasting impacts at private receivers, heritage sites and public infrastructure).

Wybong Road, Kayuga Road and Castlerock Road will continue to be temporarily closed during blasts within 500 m of the road. Dorset Road/Northern Link Road will also be temporarily closed during Project blasts within 500 m.

MACH will continue to implement blast fume management measures, in accordance with the Code of Practice: Prevention and Management of Blast Generated NOx Gases in Surface Blasting (Australian Explosives Industry and Safety Group Inc., 2011).

The Blast Management Plan will be reviewed for the operation of the Project and revised to address the Project, including a specific Trigger Action Response Plan for blasts undertaken after 3.00 pm.

A9.2.5 Air Quality

Particulate matter mitigation measures implemented for the Mount Pleasant Operation are detailed in the Air Quality and Greenhouse Gas Management Plan (MACH, 2019c).

Key dust mitigation measures that will continue to be implemented for the Project include:

- use of water to minimise emissions from drilling:
- minimising fall height of materials where practicable;
- application of water and regular maintenance of unsealed surfaces, including travel routes and work areas:
- enclosure of the ROM coal hoppers at the coal handling and preparation plant (CHPP) on three sides and activation of fogging sprays during unloading of ROM coal;
- conveyors and transfer points are enclosed and water sprays operated at transfer points, if required; and
- application of water to stabilise the surface of stockpiles and inactive exposed areas.

In addition to these physical dust mitigation measures, reactive operational mitigation strategies and management measures will continue to be implemented for the Project in accordance with EPL 20850 for the Mount Pleasant Operation.

These reactive strategies and measures include high dust concentration alarms, and modification of mining activities to reflect predicted and measured meteorological conditions. Relevant dust-generating operations are also ceased under relevant wind direction and dust level triggers described in EPL 20850.

Over the life of the Project, MACH will also continue to evaluate reasonable and feasible dust reduction technologies and apply these where relevant to minimise particulate matter emissions.

Air Quality Affected Receivers

It is anticipated that the privately-owned receivers predicted to exceed relevant air quality criteria due to the Project will be afforded acquisition upon request rights under the VLAMP. Proposed management procedures for these receivers, in addition to the mitigation and management measures described above, include:

- response to any community issues of concern or complaints, including discussions with relevant landowners;
- refinement of on-site dust mitigation measures and mine operating procedures;
- implementation of reasonable and feasible air quality mitigation at relevant air quality affected receivers upon request, in accordance with the VLAMP and any Development Consent for the Project; and
- entering into agreements with landowners (including acquisition for receivers identified to be air quality affected, in accordance with any Development Consent for the Project).

Real-time Air Quality Monitoring and Management

A number of meteorological monitoring stations currently operate within the region. MACH also operates an on-site meteorological station in addition to real-time air quality monitoring stations for the Mount Pleasant Operation.

The real-time monitoring network and associated trigger levels will be reviewed for the operation of the Project and any required updates detailed in the Air Quality and Greenhouse Gas Management Plan.

Air Quality Management Plan

MACH will continue to implement the air quality mitigation and management measures, and predictive and real-time air quality management system and associated response protocols, detailed in the Air Quality and Greenhouse Gas Management Plan for the Mount Pleasant Operation.

The Air Quality and Greenhouse Gas Management Plan will be reviewed for the operation of the Project and, if required, revised to reflect any changes that arise.

Spontaneous Combustion Management Plan

MACH will continue to implement the monitoring and management measures detailed in the Spontaneous Combustion Management Plan for the Mount Pleasant Operation, which will be reviewed for the operation of the Project and, if required, revised to reflect any changes that arise.

A9.2.6 Groundwater

Groundwater Licensing

Project groundwater licensing requirements are described in the Groundwater Assessment (Appendix C).

MACH holds sufficient licences to account for the take from each water source, with the exception of 13 megalitres per year (ML/year) of predicted take from the Dart Brook Water Source, which is regulated under the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources*, 2009. MACH will acquire this entitlement for the Project.

Numerical Model and Water Balance Review

The numerical model developed and used for the Groundwater Assessment (Appendix C) will be used as a management tool for the periodic review and calibration of predicted groundwater impacts through the life of the Project.

Consistent with Australian Groundwater and Environment Consultants Pty Ltd (AGE Consultants) (2020) (Appendix C) recommendations, MACH will make some additional amendments to the groundwater monitoring network for the Project (Section A9.3.1).

The results of the groundwater monitoring program will inform progressive refinement of the numerical model. Revised outputs from the numerical model will be reported in the Annual Review, as relevant over the life of the Project and used to inform regular site water balance reviews.

Water Management Plan

The existing Water Management Plan, including the Groundwater Management Plan and the Surface and Ground Water Response Plan, will be revised to reflect the Project and the requirements of any associated water licences (subject to the conditions of any Development Consent for the Project).

A9.2.7 Surface Water

Surface Water Licensing

MACH will comply with water licensing requirements under the *Water Management Act, 2000* over the life of the Project.

Water Management Plan

The Water Management Plan describes the operational site water management system and will include provisions for review of the site water balance, erosion and sediment controls, surface water (and groundwater) monitoring and management.

The Water Management Plan will describe the water management protocols and response procedures for the water management system that will be adhered to throughout the operation of the Project.

The existing Water Management Plan will be reviewed and revised to incorporate the Project subject to the conditions of any Development Consent for the Project.

Erosion and Sediment Control

The Erosion and Sediment Control Plan identifies activities that could cause soil erosion and generate sediment and describe the specific controls (including locations, function and structure capacities) to minimise the potential for soil erosion and transport of sediment off-site.

The Erosion and Sediment Control Plan will be reviewed and updated for the Project (i.e. to address additional surface disturbance areas and relevant construction activities) subject to the conditions of any Development Consent for the Project.

Surface Water Management and Monitoring

The existing surface water monitoring program, which is included in the Surface Water Management Plan, will be retained for the Project and updated subject to the conditions of any Development Consent for the Project.

Water quality monitoring will continue to be undertaken in accordance with the Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) guidelines and the Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (NSW Department of Environment and Conservation [DEC], 2004).

The surface water monitoring program will be updated to include some additional analytes for the Project (Section A9.3.2).

A9.2.8 Biodiversity

Existing biodiversity impact avoidance and mitigation measures for the Mount Pleasant Operation as described in the Biodiversity Management Plan will continue to be implemented for the Project. Measures to mitigate impacts from the Project are detailed in Section 7.10.4 and include the following:

- a Vegetation Clearance Protocol;
- · rehabilitation and revegetation measures;
- Tiger Orchid relocation;
- weed management measures;
- animal pest management measures;
- speed limits; and
- bushfire prevention and control measures.

Project disturbance areas will be progressively rehabilitated throughout the life of the mine as described in Attachment 8.

Mitigation measures relevant to groundwater and surface water are described in Sections A9.2.6 and A9.2.7, respectively. These measures are designed to manage water quality and flow in the vicinity of the Project and, therefore, are relevant to mitigating potential impacts on aquatic ecology.

Stream health, including assessment of habitat, water quality, aquatic macroinvertebrates and fish, will continue to be monitored regularly as part of the existing Stream Health Monitoring Program over the life of the Project.

Biodiversity Offset Strategy

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 properties with a combined area of 15,590 ha (Figure 7-24).

NSW Offset

The benefits on biodiversity values as a result of not clearing the Relinquishment Area outweigh the net additional impacts on biodiversity values of the Project Additional Disturbance Area, because the Relinquishment Area is larger, with a greater area of vegetation which is of a higher conservation status under the *Biodiversity Conservation Act*, 2016 (BC Act) (Appendix E).

Given the existing biodiversity offsets and proposed Relinquishment Area, MACH are of the view that no ecosystem or species credits should be required for the Project (other than the Commonwealth offset described below).

It is noted that the Department of Planning, Industry and Environment (DPIE) may or may not require MACH to retire biodiversity credits as it sees fit, as a condition of any Development Consent for the Project.

Commonwealth Offset

MACH will address the Commonwealth biodiversity offset requirement (for the realigned Northern Link Road option 1 or 2) through a combination of the following options, consistent with the NSW Biodiversity Offsets Scheme under the Bilateral Agreement:

- application of like-for-like biodiversity credits from the Western Link Road Relinquishment Area; and
- retirement of residual biodiversity credits for relevant EPBC Act listed threatened species and ecological communities as required by the EPBC Act.

These credits will be associated with the following EPBC Act listed threatened species and communities:

- Box-Gum Woodland CEEC² listed under the EPBC Act, and
- Striped Legless Lizard.

A9.2.9 Aboriginal Cultural Heritage

The Project mitigation, management and monitoring measures have been developed in consultation with the Project Registered Aboriginal Parties (RAPs). South East Archaeology (2020) (Appendix G) has provided recommended management measures for each known Aboriginal heritage site of relevance to the Project.

Aboriginal Heritage Management Plan

The currently approved Mount Pleasant Operation AHMP (MACH, 2019d) will be replaced by a new AHMP prepared to include provisions relating to the Project, and to specify the policies and actions required to manage Aboriginal heritage consistent with the conditions of any Project Development Consent.

² Critically Endangered Ecological Community.

The Project AHMP will be formulated by an appropriately qualified heritage practitioner with expertise in Aboriginal heritage and will be prepared in consultation with RAPs and Heritage NSW. The Project AHMP will be developed prior to any works associated with the Project that would harm Aboriginal cultural heritage sites.

For those areas where Aboriginal heritage sites will be subject to direct surface disturbance as a result of the Project, a number of mitigation measures and management strategies have been identified in consultation with RAPs, including:

- continued implementation of a Ground Disturbance Permit process;
- all potential direct disturbance areas (e.g. for Project ancillary infrastructure) that have not yet been subject to systematic survey sampling will be subject to supplementary survey;
- consideration of the location of known
 Aboriginal heritage sites during final detailed engineering designs of road realignments and ancillary infrastructure; and
- progressive surface collection of Aboriginal objects/sites potentially impacted by surface development.

Management strategies for identified Aboriginal heritage sites and cultural areas/values that could potentially be impacted by ancillary works are detailed in Appendix G and will be reflected in the updated AHMP.

A number of general management measures have also been formulated in consultation with the RAPs to mitigate potential impacts and would be included in the AHMP, including (Appendix G):

- Curation of all heritage evidence salvaged under the Project in an appropriate manner, as determined in consultation with the RAPs and Heritage NSW during preparation of the revised AHMP.
- Investigation and assessment of alternative conservation measures for the provisional Aboriginal Conservation Areas B and C for the existing approved Mount Pleasant Operation in consultation with the RAPs.
- Heritage awareness training of all relevant contractors and staff engaged for the Project who may have interactions with Aboriginal heritage, prior to commencing work on-site. The current training package at the Mount Pleasant Operation will be reviewed in consultation with the RAPs.

 Ongoing consultation with the RAPs over the life of the Project, including Aboriginal representation during archaeological fieldwork (e.g. salvage of artefacts prior to disturbance).

Further detail is provided in Section 7.12 and Appendix G.

A9.2.10 Historic Heritage

Management measures for the identified historic heritage sites will be described in a Historical Heritage Management Plan to be developed for the Project.

Specific management measures for each historic heritage site that would potentially experience direct or indirect impacts associated with the Project are provided in Section 7.13 and Appendix H, and will include:

- archival recording of up to seven local significance sites prior to demolition;
- archaeological investigations or analysis at four local significance sites;
- management of Project blasting vibration levels at relevant proximal heritage sites; and
- preparation of Conservation Management Plans for Rosebrook and Negoa Homesteads.

Further detail is provided in Section 7.13 and Appendix H.

A9.2.11 Agricultural and Land Resources

Soils

Management of soils is described in A9.2.18.

Land Contamination

If areas potentially containing contaminated media are disturbed by the Project, an assessment and management of the identified contamination items would be undertaken in accordance with the recommendations of the Land Contamination Assessment (Appendix L).

As part of the Project decommissioning phase, a further land contamination assessment will be undertaken and any contaminated soils removed and area remediated in accordance with NSW Contaminated Land Management Act, 1997 (Attachment 8).

Continuation of Agricultural Land Uses

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.

A9.2.12 Road Transport

The Road Transport Assessment (The Transport Planning Partnership, 2020) (Appendix J) concluded that the existing road network can satisfactorily accommodate the forecast traffic demands resulting from the Project without any specific additional road upgrade requirements.

The Northern Link Road will be designed and constructed consistent with Austroads (2017) *Guide to Road Design* requirements, and in consultation with Muswellbrook Shire Council.

MACH contributes to the maintenance of local roads under the control of the Muswellbrook Shire Council under a Voluntary Planning Agreement for the Mount Pleasant Operation. It is anticipated that a new Voluntary Planning Agreement will be negotiated with the Muswellbrook Shire Council as an outcome of the Project.

A9.2.13 Visual and Landscape Character

MACH manages visual impacts of the approved Mount Pleasant Operation in accordance with a Visual Impact Management Plan (2019e), which describes screen plantings, visual bunds, lighting controls and other visual treatments.

There are also various visual mitigation measures incorporated into the design of the Project. These include:

- location of additional Project major infrastructure to the west of the integrated waste rock emplacement landform, which significantly reduces the visibility of mine infrastructure components from key public vantage points;
- progressive development of the integrated waste rock emplacement to screen development of the open cut, infrastructure and haul roads;
- design of the integrated waste rock emplacement landform to incorporate geomorphic drainage design principles for hydrological stability, and varying topographic relief to be more natural in exterior appearance;

- progressive rehabilitation of the integrated waste rock emplacement landform; and
- use of compatible tones for building and cladding colours in forest tones to assist in assimilating infrastructure components into the setting.

Additional mitigation measures for reducing visual impacts that may be adopted for the Project are described below. The existing Visual Impact Management Plan will be revised to reflect the Project, subject to the conditions of any Development Consent for the Project.

On-site Treatments

On-site visual impact management measures and treatments for the open cut mining areas will include:

- protect and maintain existing trees and vegetation screening outside of the open cut clearing zone by creating vehicle and machinery exclusion zones; and
- provide additional reasonable and feasible tree screening at key on-site locations on an asneeded basis in accordance with the Mount Pleasant Operation Visual Impact Management Plan.

Off-site Treatments

Project off-site mitigation measures may include the development of additional roadside or at-receiver tree screens in accordance with the Mount Pleasant Operation Visual Impact Management Plan.

In consultation with local private landholders, this may include reasonable and feasible treatments (e.g. planting of additional site-specific tree screens) at the most proximal privately owned residences with direct views of the Project (e.g. residences within 1 kilometre [km] of mine landforms on Kayuga Road and Collins Lane).

Night-lighting

All external lighting associated with the Project will comply with AS/NZS 4282:2019 – Control of the Obtrusive Effects of Outdoor Lighting, including the minimisation of light spill.

A9.2.14 Socio-Economic

MACH will continue to work with local government and the community to minimise potential social impacts of the Project and maximise potential socio-economic opportunities. A number of mitigation and management strategies have been identified by Just Add Lime (JAL) (2020) and will be implemented by MACH, including (Appendix N):

- continue to work with the neighbouring landholders and people from surrounding villages and communities to develop engagement methods that suit them and that are reasonable and feasible;
- continue to engage with stakeholders who are directly impacted and interested organisations to develop, implement and review environmental management measures that are reasonable and feasible;
- support for the agricultural industry through, for example, supporting continuation of agriculture on MACH-owned land that is not required for mining operations, or temporary trading of water licences for periods the licences are not required by MACH;
- continue to work with the Upper Hunter Mining Dialogue to understand the impacts the mining industry is having on the region (e.g. air quality work), and participate/advocate for developing and implementing management strategies for material impacts from an industry perspective;
- working with the main contractors on site

 (i.e. mining services and coal processing) to
 identify ways to prioritise local employment
 (existing population) and develop strategies for
 people to relocate to Muswellbrook, Singleton,
 and Upper Hunter Local Government Areas;
- include local residential workforce as a Key Performance Indicator in procurement processes for main contractors with associated management, monitoring and reporting;
- provide information regarding the Project workforce and the associated predicted housing demand to the local councils on a regular basis;
- develop strategies to employ, train and upskill people from the local area who are unemployed;
- continue to deliver positive social initiatives or Aboriginal people with connections to the land and waters on which the Project is located by supporting on-country land management (such as cool burns) and involvement in rehabilitation programs; and
- engage with stakeholders regarding mine closure planning and how the Project can contribute to the Upper Hunter long-term transition from coal mining and power generation.

Social impact management measures and enhancement measures for positive impacts will be described in a Social Impact Management Plan to be developed for the Project (subject to the conditions of any Development Consent for the Project).

In addition to the strategies summarised above, MACH has commenced negotiation with the Muswellbrook Shire Council regarding a revision of the existing Mount Pleasant Operation Voluntary Planning Agreement, for the Project.

A9.2.15 Hazards

MACH has a safety management system to manage risks to health and safety in accordance with the requirements of the *Work Health and Safety (Mines and Petroleum Sites) Act, 2013* and the *Work Health and Safety (Mines and Petroleum Sites) Regulation, 2014.* MACH will continue to meet these obligations for the Project.

Bushfire Hazards

Bushfire risk mitigation measures employed by MACH under the existing Bushfire Management Plan will continue for the Project.

Declared Dams

MACH will continue to operate the existing declared dams under the NSW *Dams Safety Act, 2015* for the Project, including construction and inspection requirements.

MACH will continue to consult with Dams Safety NSW regarding the management of declared dams operated by MACH and also meet Dams Safety NSW requirements applicable to new Project dams, or any Project works within Bengalla Mine's declared dam notification areas.

Dangerous Goods

Control and mitigation measures for the handling and storage of hazardous materials for the Project will be documented in the applicable Mount Pleasant Operation management plans.

A9.2.16 Health

Environmental Risk Sciences (EnRiskS) (2020) (Appendix R) does not recommend any specific mitigation measures for potential health-related impacts beyond the recommendations adopted for air quality, noise, blasting and water management as described above.

It is anticipated that the small number of proximal receivers with predicted potential health impacts, (which are a subset of those predicted to be affected for air quality) will be afforded acquisition upon request rights under the VLAMP, should the Project be approved.

A9.2.17 Greenhouse Gas Emissions

Existing greenhouse gas mitigation and management measures implemented at the Mount Pleasant Operation will continue for the Project.

As diesel fuel consumption represents more than half of estimated direct emissions, the existing measures are generally focused on minimising greenhouse gas emissions through the efficient use of diesel, by:

- optimising the design of haul roads to minimise the distance travelled:
- minimising the re-handling of material (i.e. coal, overburden and topsoil); and
- maintaining the mobile fleet in good operating order.

As part of the Project, MACH will review and update existing direct (Scope 1) greenhouse gas minimisation measures at the Mount Pleasant Operation, including consideration of the fuel efficiency in mobile fleet items. In addition, MACH will investigate whether it is reasonable and feasible to also reduce Scope 2 greenhouse gas emissions associated with on-site electricity use (e.g. evaluation of sourcing a proportion of site electricity demand from renewable sources).

A9.2.18 Rehabilitation and Mine Closure

Landform Design

The Project integrated waste rock emplacement landform incorporates geomorphic drainage design principles for hydrological stability, and varying topographic relief to be more natural in exterior appearance.

Management of Potential Acid-Forming Waste Rock Material

The Geochemistry Assessment (RGS Environmental, 2020) (Appendix K) concluded the waste rock materials generated from the Project would generally be expected to be non-acid forming. However, the Archerfield sandstone interburden materials would be potentially-acid forming.

Non-acid forming material would be placed on the outer 5 m of the Eastern Out-of-Pit Emplacement and outer 2 m of any backfilled areas of the mine void. If potentially-acid forming material is exposed in the floor of the final void, it would be either:

- covered with non-acid forming waste rock material to a minimum depth of 5 m;
- excavated and disposed of as potentially-acid forming waste rock material; or
- flooded with water from the site water management system.

Soil and Growing Media Development

Topsoil and subsoil would be stripped and salvaged to maximise its value for re-use in rehabilitation. Where direct placement of soil on rehabilitation areas is not practical, topsoil and subsoil would be stockpiled separately and would be managed to maintain the viability of the soil.

Following confirmation that the landform construction and shaping has been undertaken in accordance with the geomorphic landform design, soil placement and growing media development would be undertaken.

This would typically involve:

- spreading topsoil mixed with relevant ameliorants onto rehabilitation areas at a minimum depth of 100 mm;
- deep ripping along the contour to a minimum depth of 500 mm to encourage infiltration;
- seeding with a native seed mix that includes native grass, shrub and tree species and temporary cover crop species;
- installation of habitat features including habitat/stag trees, log piles and rock piles;
- planting of tubestock, including ground, middle and upper stratum species, of the target Plant Community Types (PCTs) when suitable climatic conditions prevail; and
- installation of signage to restrict access and minimise the potential for disturbance of the rehabilitated area.

MACH would target reshaping to final surface level and initial revegetation seeding of the majority of outer emplacement batter lifts of the Eastern Out-of-Pit Emplacement within 6 months of each subsequent dump panel lift being completed (subject to potential delays associated with localised design constraints or climatic extremes when soil placement and revegetation works may need to be delayed).

Decommissioning of Infrastructure

Project infrastructure not required for future use post-mining would be decommissioned and removed (as agreed with relevant regulatory authorities).

Final Land Use

The Mount Pleasant Operation EPBC Act approval (EPBC 2011/5795) requires a Threatened Ecological Community Mine Site Rehabilitation Plan to guide the re-establishment of *Box-Gum Woodland CEEC* in the Mount Pleasant Operation area, including rehabilitated mine landforms.

MACH would establish open woodland communities across the majority of the Mount Pleasant Operation final landform, which is the preferred final land use for the majority of the Project.

MACH has also identified parts of the Project final landform that would be conducive to low-intensity or high-intensity agricultural use post-mining (e.g. mine infrastructure areas).

Research and Trials

The rehabilitation program at the Mount Pleasant Operation aims to incorporate management practices that have resulted from industry research into the establishment of woodland and grassland communities across mined landscapes in the Hunter Valley region.

Over the life of the Project, MACH proposes to build on industry research results and conduct various research studies and trials to inform the most suitable practices that would enable the re-establishment of woodland and grassland areas on final mine landforms and disturbed areas of the Mount Pleasant Operation.

Mine Closure Plan

A Mine Closure Plan would be developed for the Project in consultation with relevant regulatory authorities and community stakeholders. The Mine Closure Plan would be developed over the Project life, with more detailed measures developed closer to Project completion. The Mine Closure Plan would include consideration of amelioration of potential adverse socio-economic effects due to the reduction in employment at Project closure.

A9.3 ENVIRONMENTAL MONITORING

A summary of the existing monitoring regime at the Mount Pleasant Operation is provided in Section 2.2.12, including figures showing the locations of relevant environmental monitoring sites.

The existing monitoring regime will generally continue for the Project. Monitoring results, as well as monitoring site locations, parameters and frequencies will continue to be reviewed annually through the annual review process, in consultation with relevant authorities. If changes are proposed, they will be incorporated into the relevant Project management plan.

Specific changes to the existing environmental monitoring regime for groundwater and surface water for the Project are described in Sections A9.3.1 and A9.3.2. Sections A9.3.3 and A9.3.4 provide rehabilitation and mine landform related monitoring, and monitoring associated with the Social Impact Management Plan respectively.

A9.3.1 Groundwater

Consistent with AGE Consultants' (2020) recommendations, MACH will add the following bores to the monitoring network for the Project:

- replacement bores for those that have been destroyed (i.e. those within the mining footprint);
- additional alluvial bores:
 - one to the north-east of the Mount Pleasant Operation;
 - an additional bore to the east to monitor for drawdown and potential seepage;
- an additional shallow groundwater bore in the vicinity of the potential Type 3 terrestrial Groundwater Dependent Ecosystem (Section 7.11);
- a vibrating wire piezometer to the west of the Mount Pleasant Operation to capture pressure changes in relevant Permian units; and
- private bores in the potential areas of impact (dependent on landowner agreement).

A9.3.2 Surface Water

The surface water monitoring program will be updated to include the full suite of analytes considered in the Geochemistry Assessment, including additional metals, antimony and beryllium.

A9.3.3 Rehabilitation

Landform and Rehabilitation Monitoring

Rehabilitation monitoring sites would be established progressively as mining and waste emplacement areas are rehabilitated. Monitoring sites would be documented progressively in Mount Pleasant Operation Mining Operations Plan and Rehabilitation Management Plans (MOP).

MACH has entered into an agreement with the University of Newcastle to establish a field data collection program to support landform design and rehabilitation practices at the Mount Pleasant Operation site over the life of the Project.

Rehabilitation monitoring sites would be established in representative rehabilitation and analogue locations. Each monitoring site would consist of a flume to measure surface water runoff and soil erosion rate and a weather station that records rainfall (pluviograph), air temperature, and incoming and outgoing radiation as well as soil moisture.

Data from the rehabilitation monitoring sites would be reviewed on an annual basis and used to inform future rehabilitation and adaptive management of the geomorphic landform design (Section A9.4.8).

Geotechnical Monitoring

MACH would implement a range of geotechnical monitoring and management measures during the life of the Project, including (Attachments 8 and 13):

- groundwater pressure monitoring in the Wybong Road corridor;
- structural geological information would be obtained by routine mapping as part of exploration activities; and
- visual inspections as part of the implementation of a geotechnical principal hazards management plan.

A9.3.4 Social Impact Management Plan

Social impacts associated with the Project will be monitored throughout the Project life to evaluate the effectiveness of the Social Impact Management Plan. An appropriate monitoring framework will be established as part of the Social Impact Management Plan, which may include (Appendix N):

- regular completion of workforce and/or community surveys;
- review of human resource and complaints data; and
- review and consideration of feedback received through an established dialogue with relevant stakeholders including local community groups (including Aboriginal groups), neighbouring residents, community service and facility providers, and local suppliers.

The Social Impact Management Plan will be regularly reviewed, and if necessary revised, throughout the Project life.

A9.4 ADAPTIVE MANAGEMENT

A9.4.1 Operational and Construction Noise

When the real-time noise monitoring system indicates noise trigger levels are reached or exceeded, a message will be delivered to a MACH representative, alerting them to the elevated noise levels. The Project meteorological monitoring stations will allow personnel to evaluate the likely origin of the elevated noise levels (i.e. on-site or off-site sources) in conjunction with listening to the recorded audio files. Appropriate mitigation and response measures will then be implemented in accordance with the response protocol detailed in the Noise Management Plan.

Trigger levels and response procedures outlined in the Noise Management Plan will be updated for the Project (subject to any Development Consent conditions for the Project).

A9.4.2 Air Quality

When the real-time air quality monitoring system indicates specified real-time trigger levels are reached or exceeded, a message will be delivered to a MACH representative, alerting them to the elevated short-term dust levels.

The Project meteorological monitoring stations will report wind conditions at the time, allowing personnel to evaluate the likely origin of the elevated dust levels (i.e. on-site or off-site sources) enabling appropriate mitigation and response measures to be implemented in accordance with the response protocol detailed in the Air Quality and Greenhouse Gas Management Plan.

Project personnel will also undertake visual monitoring of stockpiles and exposed areas. In the event that any substantial dust plumes are observed, additional dust management measures will be implemented.

Project air quality adaptive management measures will include response to any community issues of concern or complaints, including discussions with relevant landowners and/or refinement of on-site air quality mitigation measures and mine operating procedures.

A9.4.3 Groundwater

Contingency Measures

Consistent with the requirements of the NSW *Aquifer Interference Policy* (AIP) (NSW Government, 2012), MACH will continue to implement appropriate contingency measures for Project related drawdown greater than 2 m at any relevant private or public groundwater bores.

The contingency measures developed for the existing/approved Mount Pleasant Operation, which will continue to be implemented for the Project, include:

- deepening the affected groundwater supply bore;
- construction of a new groundwater supply bore; or
- provision of an alternative water supply.

Trigger Action Response Plans

The AIP (NSW Government, 2012) requires development of remedial actions for impacts greater than those that were predicted as part of the relevant approval.

Water level and water quality triggers (electrical conductivity [EC] and pH) have been developed as part of the Water Management Plan for the Mount Pleasant Operation. The Water Management Plan will be reviewed and updated as necessary to reflect Project Development Consent requirements. In the event groundwater monitoring identifies an exceedance of an established trigger, MACH will implement a response in accordance with the Water Management Plan.

Groundwater Monitoring and Review

The observed groundwater levels will be reviewed against the model predictions on an annual basis. A suitably qualified hydrogeologist will determine when water levels deviate significantly from that predicted by the groundwater model and determine the reason for this deviation.

The review will consider the impact of mining, and other factors that could result in varying water levels including climatic conditions, rainfall recharge and pumping from privately-owned bores and/or other mining operations.

The Groundwater Assessment used hydrogeological information to understand and characterise the groundwater regime. During the Project, additional hydrogeological data will be collected, including details on lithology, groundwater intersection and intersection of structures (i.e. faults and dykes). The additional hydrogeological data will be stored and made available as required for future groundwater investigations and/or updates to the groundwater model.

A9.4.4 Surface Water

Surface and Ground Water Response Plan

The existing Surface and Ground Water Response Plan, which is included in the Water Management Plan for the Mount Pleasant Operation, will be reviewed and revised for the Project subject to the conditions of any Development Consent for the Project.

The Surface and Ground Water Response Plan will describe any additional measures and procedures that will be implemented over the life of the Project to respond to any potential exceedances of surface water related criteria and contingent mitigation, compensation, and/or offset options if downstream surface water users are adversely affected by the Project.

Water Balance

The water consumption requirements and water balance of the Mount Pleasant Operation water management system will fluctuate based on varying climatic conditions, and as the extent of the mining operation changes over time.

Review and progressive refinement of the site water balance will continue to be undertaken periodically over the life of the Project to record the status of inflows (water capture), storage and consumption (e.g. CHPP usage, fines emplacement area return water, dust suppression and discharges) and to optimise water management performance.

MACH will adaptively apply supplementary water management measures during low rainfall periods to maintain water supply. This may include:

- Use of chemical dust suppressants to reduce haul road dust suppression water requirements.
- Obtaining additional water access licences.
- Sourcing water from other external sources, such as excess mine water from the adjoining mines (i.e. Dartbrook and Bengalla Mines).
 Should this water sharing be undertaken, it would be subject to MACH and other relevant parties obtaining all necessary secondary approvals.

A9.4.5 Biodiversity

The existing MOP will be updated to include the Project in consultation with the relevant government agencies, and in accordance with the relevant rehabilitation and mine closure guidelines.

The MOP will also detail rehabilitation methods and requirements, including target PCTs that will be established in rehabilitation based on the findings of rehabilitation monitoring (Section A9.3.3) (Attachment 8).

The Biodiversity Management Plan will, as relevant, be revised for the Project (subject to the conditions of the Development Consent for the Project).

A9.4.6 Road Transport

The existing Site Access Management Plan for the Mount Pleasant Operation provides guidance for all vehicles accessing the site and will also apply to Project-generated traffic. The Site Access Management Plan will continue to be reviewed and updated as required over the life of the Project.

A9.4.7 Greenhouse Gas Emissions and Climate Change

MACH will manage its contribution to Australian greenhouse gas emissions inventories through reporting under the Commonwealth *National Greenhouse and Energy Reporting Act, 2007* (NGER Act), as well as any other government initiatives implemented to manage emissions at the national level.

Under the NGER Act, relevant sources of greenhouse gas emissions and energy consumption must be measured and reported on an annual basis, allowing major sources and trends in emissions/energy consumption to be identified.

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. MACH will continue to assess climate change risks on an ongoing basis via implementation of an adaptive management approach.

This will include conducting climate change risk assessments in consideration of the DPIE's *Guide to Climate Change Risk Assessment for NSW Local Government* (DPIE, 2019) and implementing appropriate risk treatment strategies.

A9.4.8 Landform Design

Design of the Project landform would be an iterative process that would utilise data gathered in the site rehabilitation monitoring programmes (Section A9.3.3) to adaptively manage landform design and construction methodologies over the life of the Project (Attachment 8). The Rehabilitation Strategy for the Mount Pleasant Operation would be reviewed and revised as required over the life of the Project.

A9.5 REPORTING

The following subsections describe the expected reporting requirements for the Project (based on requirements at the time of preparation of this EIS). MACH will adjust its reporting should requirements change in the future.

A9.5.1 Incident Reporting

Consistent with the reporting requirements of the Standard Conditions for State Significant Development Mining Projects August 2018 (Department of Planning and Environment [DPE], 2018), MACH will notify the DPIE immediately after becoming aware of an incident.

MACH will also notify the Environment Protection Authority and any other relevant government agencies of incidents causing or threatening material harm to the environment immediately after becoming aware of the incident, in accordance with Part 5.7 of the *Protection of the Environment Operations Act, 1997* (PoEO Act) and consistent with any requirements of an EPL for the Project.

A9.5.2 Annual Review

MACH will continue to produce an Annual Review to describe the environmental performance of the Project for a 12-month reporting period. Copies of the Annual Review will be made available on the MACH website, consistent with the reporting requirements of the Standard Conditions for State Significant Development Mining Projects August 2018 (DPE, 2018).

Environmental monitoring results will be compared against relevant statutory requirements, the requirements of any plan or program required under the Development Consent, monitoring results of previous years and relevant predictions of the EIS.

Biodiversity management, proposed development and rehabilitation, as well as environmental performance improvement measures proposed for the next 12-month period, will also be discussed in the Annual Review.

A9.5.3 Development Consent Requirements

MACH will provide regular reporting of environmental performance of the Project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of the Project Development Consent and associated licences and approvals.

A9.5.4 Community Consultative Committee

MACH will continue to operate a Community Consultative Committee in accordance with the conditions of the Development Consent and consistent with the *Community Consultative Committee Guideline: State Significant Projects January 2019* (NSW Government, 2019) (or its latest equivalent version).

A9.5.5 Independent Environmental Auditing

Consistent with the reporting requirements of the Standard Conditions for State Significant Development Mining Projects August 2018 (DPE, 2018), MACH will commission an independent environmental audit of the Project within one year of the commencement of any Development Consent, and every three years after or at an alternative interval, as required by any Development Consent for the Project.

Upon completion of the independent environmental audit, MACH will submit a copy of the independent environmental audit and its responses to the DPIE.

A9.5.6 Other Reporting

Annual Return

A summary of the results of any monitoring required by EPL 20850 (including a register of any complaints) and a Statement of Compliance will be provided in Annual Returns and submitted to the Environmental Protection Authority.

EPBC Act Approval – Annual Reporting

MACH will prepare annual reports assessing compliance with relevant conditions of EPBC Act approvals for the Project (including EPBC 2011/5795), as required.

Greenhouse Gas Reporting

MACH will continue to report relevant energy use and production and greenhouse gas emissions associated with its activities for the Project in accordance with the NGER Act.

Community Complaints Register

A community complaints register will continue to be maintained for the Project. Complaints and subsequent actions undertaken will be reported in the Annual Review and on the MACH website.

A9.6 REFERENCES

- Australasian Groundwater and Environment
 Consultants Pty Ltd (2020) Mount Pleasant
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 Ltd.
- Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality.
- Australian Explosives Industry and Safety Group Inc. (2011) Code of Practice: Prevention and Management of Blast Generated NOx Gases in Surface Blasting.
- Austroads (2017) Guide to Road Design.
- Department of Environment and Conservation (2004) Approved Methods for the Sampling and Analysis of Water Pollutants in NSW.
- Department of Planning and Environment (2018)

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 Development Mining Projects August 2018.
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- MACH Energy Australia Pty Ltd (2019a) Mount Pleasant Operation Environmental Management Strategy.
- MACH Energy Australia Pty Ltd (2019b) Mount Pleasant Operation Noise Management Plan.
- MACH Energy Australia Pty Ltd (2019c) Mount Pleasant Operation Air Quality and Greenhouse Gas Management Plan.
- MACH Energy Australia Pty Ltd (2019d)

 Mount Pleasant Operation Aboriginal
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- MACH Energy Australia Pty Ltd (2019e)

 Mount Pleasant Operation Visual Impact
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- New South Wales Government (2012) NSW Aquifer Interference Policy – NSW Government Policy for the licensing and assessment of aquifer interference activities.
- New South Wales Government (2018) Voluntary

 Land Acquisition and Mitigation Policy.
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- RGS Environmental (2020) Mount Pleasant
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 Assessment. Prepared for MACH Energy
 Pty Ltd.
- South East Archaeology (2020) Mount Pleasant Optimisation Project – Aboriginal Cultural Heritage Assessment. Prepared for MACH Energy Pty Ltd.
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