Preliminary Construction Environmental Management Plan

Dugald River Wind Farm Project

PREPARED FOR

MMG Dugald River Pty Ltd

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SIGNATURE PAGE

Preliminary Construction Environmental Management Plan

Dugald River Wind Farm Project

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BUS	Bird Utilisation Survey
DRM	Dugald River Mine
ERM	Environmental Resources Management Australia Pty Ltd
ESCP	Erosion and Sediment Control Plan
MMG	MMG Dugald River Pty Ltd
PCEMP	Preliminary Construction Environmental Management Plan
PVFMP	Preliminary Vegetation and Fauna Management Plan
PIR	Passive Infrared Sensor
SDAP	State Development Assessment Provisions
SDS	Safety Data Sheet
SMP	Stormwater Management Plan
WTG	Wind Turbine Generator
WONS	Weeds of National Significance

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by MMG Dugald River Pty Ltd (MMG) to prepare a Preliminary Construction Environmental Management Plan (P-CEMP) for the proposed Dugald River Wind Farm Project (the Project). The Project is located on the Knapdale Range to the west of the Dugald River Mine (DRM), approximately 63 kilometres (km) north, north-east of the Township of Cloncurry.

The Project is proposed to be constructed in two stages. Stage One will comprise of up to eight (8) Wind Turbine Generators (WTGs) and associated ancillary infrastructure including, access tracks, laydown areas, above and below ground electrical cabling, a substation and provisions for a future Battery Energy Storage System (BESS). Stage Two will consist of up to an additional 16 WTGs and ancillary infrastructure, including an expanded BESS facility. Once completed, the Project will consist of up to 24 WTGs.

MMG has identified the proposed design and layout, and as such, potential impacts as a result of the Project have been identified. Baseline management measures are required to avoid or minimise these impacts to the greatest extent as practicable, through the construction stage.

1.1 PURPOSE

This P-CEMP has been prepared to support the Development Application for the Project in accordance with State Code 23: Wind Farm Development (State Code 23) and State Code 27: Battery Storage Facility Development (State Code 27).

The purpose of this P-CEMP is to provide an overview of key infrastructure required for the Project, outline the potential impacts from these works and to provide baseline management and mitigation measures for identified impacts.

This P-CEMP addresses potential project impacts to environmental values, water quality objectives and amenity specifically within the Project footprint. Separate approvals and management plans for the transport of Project components, and any other associated requirements, are subject to separate documentation.

It is anticipated that this P-CEMP will provide the management and mitigation measures to support construction, as well as roles and responsibilities for key parties, with a final CEMP to be prepared once the Project has undergone the detailed design phase and prior to commencement of construction.

2. CONSTRUCTION ENVIRONMENTAL MANAGEMENT FRAMEWORK

2.1 ROLES AND RESPONSIBILITIES

The Project construction team is divided into numerous roles, including:

- Project Developer – facilitated by MMG;
- Principal Contractor – either facilitated by MMG or an Independent Power Provider (IPP); and
- All other personnel including subcontractors (to be appointed by the Principal Contractor).

The responsibilities of each of the above listed roles are outlined in Table 2-1.

TABLE 2-1 ROLES AND RESPONSIBILITIES

Roles	Responsibilities
Project Developer	• Responsible for obtaining primary State and Federal approvals for the Project, with secondary consents a shared responsibility between the Proponent and Principal Contractor; • Responsible for reviewing all plans, including the P-CEMP, prepared for the Project; and • Responsible for supporting and undertaking implementation where required in the Contract requirements or as outlined within this Preliminary CEMP.
Principal Contractor	• Preparation of site-specific management plans including the P-CEMP and Health and Safety documentation; • Preparing, reviewing and implementing the P-CEMP and communicating the P-CEMP requirements to all Project personnel; • Engage qualified and experienced staff and provide management support to ensure all activities relating to environmental performance are undertaken by trained and competent personnel; • Report to administrating authorities where required; • Managing implementation of all environmental requirements in accordance with the project approvals, client requirements, the specification, the contract requirements and legislative obligations; • Establish and maintain a list of current contact names and telephone numbers for all personnel relevant to environmental matters; • Inducting all personnel in their roles and responsibilities; • Escalating environmental incidents where required; • Maintain up-to-date personnel training and competencies as required; • Undertake and record corrective actions, release incidents and non-compliances; and • Support the continued review and update of the environmental management framework to address risks relevant to each construction phase or activity.

Roles	Responsibilities
All personnel	• Follow the requirements of the P-CEMP and the Principal Contractor; • Participate in pre-start meetings and Tool Box Talks; • Undertake the appropriate training and inductions prior to commencement of construction works; • Report any site-specific environmental issues (i.e., dust generation, spillages, excessive noise and vibration etc.) to the appropriate representative as communicated in the site induction; and • Comply with all relevant environmental laws associated with the delivery of the Project.

2.2 PROJECT HEALTH AND SAFETY RECORDS

The Principal Contractor will appoint a suitably qualified and experienced management team who will be responsible for the Project and the associated activities, including legal and environmental responsibilities, site health and safety, ensure adherence to the P-CEMP and approved work method statements. Contractors and subcontractors will be required to adhere to this P-CEMP by extension.

All construction management documents are subject to ongoing review and continual improvement. This includes times of change to scheduled activities or to legislative or licensing requirements. Only the relevant Principal Contractor, or delegate, has the authority to change environmental management documentation.

All construction management documentation will be developed to be Project specific and will ensure reference to, and consistency with, environmental and safety documentation associated with mining operations at the DRM.

2.3 ASSOCIATED ENVIRONMENTAL MANAGEMENT PLAN COMMITMENTS

In association with this P-CEMP, the Project commits to develop and implement the following environmental management plans to support the construction of the Project:

- Bird and Bat Management Plan;
- Bushfire Management Plan;
- Stormwater Management Plan;
- Erosion and Sediment Control Management Plan;
- Construction Traffic Management Plan;
- Rehabilitation Management Plan;
- Safety and Emergency Management Plan;
- Incident Investigation and Response Plan;
- Cultural Heritage Management Plan;
- Weed and Pest Management Plan;
- Preliminary Cleared Vegetation Management Plan; and
- Preliminary Vegetation and Fauna Management Plan.

2.4 P-CEMP UPDATES, APPROVAL AND DISTRIBUTION

The Principal Contractor appointed prior to the commencement of construction work will coordinate the preparation, review, and distribution, as appropriate, of construction management documents.

During the construction and commissioning phases of the Project, this P-CEMP and any other Project generated documentation will be held at either the site office, online or other appropriate locations as required.

The Principal Contractor will implement a document control procedure to control the flow and revisions of documents within and between stakeholders and sub-contractors, e.g. checklist or compliance forms, Safe Work Method Statements, Journey Hazard Assessments, and site access procedures. The document control procedure requires that documentation is:

- Developed and reviewed prior to issue;
- Issued for use;
- Controlled and stored for the legally required timeframe;
- Removed from use when superseded or obsolete; and
- Archived.

A register and distribution list will identify the current revision of documents and data.

2.5 COMMUNICATION

The suitably qualified management team appointed by the Principal Contractor will be the main point of contact for any environmental issues that may arise during the construction phase of the Project. Onsite personnel will report environmental issues as they arise to the relevant manager. Personnel will be advised during the site induction as to who the relevant manager is. The relevant manager will take further action where required.

All personnel onsite are required to undertake a site-specific induction prior to commencement of any onsite work.

2.6 STAFF TRAINING AND AWARENESS

Prior to commencing work, inductions and other relevant training shall be undertaken by all employees, sub-contractors and visitors. Records shall be maintained on site throughout the life of the project. The training will include the following:

- First Aiders – Emergency First Aid response;
- Fire Wardens – Warden Training;
- General environmental duty and duty to notify;
- Conditions of environmental licences, permits and approvals;
- Definition of and management of environmental incidences; and
- Refuelling, waste disposal, litter collection, location of spill kits

All staff involved on the works site will be made aware of environmental responsibilities and requirements of the Project. In addition to the above, the Principal Contractor will keep a list of people or organisations to contact should an environmental incident occur at the works site.

3. PROJECT DESCRIPTION

3.1 PROJECT LOCATION

The Project involves the construction and operation of a Wind Farm and ancillary BESS, located approximately 63 km north, north-east of the Township of Cloncurry, Queensland within the Cloncurry Shire Council Local Government Area. The Project is mapped as being within the Rural Zone of the Cloncurry Shire Council Planning Scheme 2016 with the predominant land use being low-intensity cattle grazing and mining.

Clearing relevant to the Project will be located within a defined Disturbance Footprint which comprises an area of up to (maximum) of up to 136.4 hectares (ha), which will be located within the defined Disturbance Footprint.

3.2 SENSITIVE LAND USES

Sensitive Land Uses are defined in Schedule 24 of the Planning Regulation 2017 and means any of the following land uses:

1. Caretakers' accommodation
2. Childcare centre
3. Community care centre
4. Community residence
5. Detention facility
6. Dual occupancy
7. Dwelling house
8. Dwelling unit
9. Educational establishment
10. Health care services
11. Hospital
12. Hotel
13. Multiple dwelling
14. Non-resident workforce accommodation
15. Relocatable home park
16. Residential care facility
17. Resort complex
18. Retirement facility
19. Rooming accommodation
20. Rural workers' accommodation
21. Short-term accommodation
22. Tourist Park

Construction activities have the potential to impact the amenity of sensitive land uses through increased traffic, noise, dust, visual impact and environmental degradation. Table 3-1 outlines the sensitive land uses identified within 5km of the Project.

TABLE 3-1 SENSITIVE LAND USES RELEVANT TO THE PROJECT

Lot Description	Land Use
Lot 92 on SP303378	Dwelling House (McMillan Residence)
Lot 36 on AP23793	DRM Accommodation Camp
Lot 36 on AP23793	DRM Fly Camp

3.3 PROJECT DESCRIPTION

The Project will be located on the Knapdale Range, adjacent to the Dugald River Mine, owned and operated by MMG. The Knapdale Range is situated within the Mount Isa subregion, which is characterised by tilted metamorphic hills and ranges, low open woodlands with *Eucalyptus spp., Corymbia spp* and Spinifex dominant grasslands with *Acacia spp.* dominant shrub layers throughout. Soil types range from rocky, skeletal soil types to shallow-moderate sandy loam towards the eastern base of the range.

The Project is proposed to be constructed in two stages. The first stage is proposed to comprise the construction and operation of a Met Mast and up to eight WTGs, with an associated substation and BESS. Following the construction and operation of the first stage of the Project, the second stage is proposed to consist of an additional Met Mast, up to 16 WTGS and an expanded BESS.

Once both stages of construction are completed, the Project will consist of the following:

- Up to 24 X 6 MW WTGs;
- A staged BESS facility comprising 48 battery units and 24 Medium Voltage Power Stations;
- Two permanent Met Masts;
- Access tracks, Hardstand and Material laydown areas;
- Supporting infrastructure (including a collection substation, switchyard and underground and overhead powerlines);
- An Operations And Maintenance Facility.

3.4 CONSTRUCTION DETAILS

3.4.1 EQUIPMENT AND MACHINERY

It is anticipated that the construction work for the two Project phases (subject to detailed design and geotechnical conditions), is likely to include the following:

- Removal of vegetation;
- Earthworks and excavation;
- Equipment and material haulage;
- Crushing and/or screening of materials;
- Construction of roads and hardstand areas;
- Concrete batching, formwork and pouring;
- Construction of BESS;
- Assembly of WTG components;
- Erection of WTG components;
- Installation of sediment control measures and environmental controls; and
- Construction of auxiliary infrastructure, powerlines and switchyards.

Noise emissions from construction can be reduced by fitting exhaust mufflers, using reversing alarms that emit a broadband noise (e.g. white noise) rather than a beep, maintaining plant in good working order and following industry standard construction methodologies.

Noise will be generated by mobile plant such as excavators, bulldozers, mobile cranes, and the movement of heavy vehicles. It is expected that the following typical equipment will be used:

- **Site mobilisation** – Road loaders, graders, backhoes, trucks, small crane, and generators;
- **Access tracks and hardstands** – Road loaders, bulldozers, excavators, graders, scrapers, rollers, articulated dump trucks, belly dumper trucks rock crushing plant, semi-trailers, tractors water carts and hydroseed trucks;
- **Wind Turbine Generators** – Excavators, rock breaker, concrete trucks, flat-bed trucks, vacuum trucks, large crawler/all-terrain heavy lift cranes, small/medium crawler cranes, generators, tele-handlers and elevated work platforms;
- **BESS** – Rock breaker, concrete trucks, flat-bed trucks, large crawler/ all-terrain heavy lift cranes;
- **Electrical reticulation works** – Trenchers, backhoes, excavators, graders, tractors, cable laying machines, and small terrain cranes;
- **Concrete batching plants** – Concrete mixing plant, batching equipment, conveyors, stackers, storage bins and silos;
- **Site services** – Option for vans or buses to transport staff around site and water delivery and effluent removal trucks (if required); and
- **Transmission line and towers** – Earthmoving equipment, elevated work platforms, concrete trucks, borers, cranes, and other heavy machinery.

Other equipment and machinery may be required, depending on the nominated construction techniques.

3.4.2 WATER SUPPLY

The provision of water is essential for the construction of the Project. The construction activities likely to require water are:

- Bulk earthworks and material conditioning;
- Cleaning of WTG components prior to assembly;
- Dust suppression;
- Concrete pours; and
- Water for ablution facilities.

Water demand will vary over time, depending on the stages of the work. The total expected water requirement will be further refined during the detailed design process.

Water demands for the Project will require different water quality standards. A water sourcing strategy will be developed so that water used during the construction phase does not cause issues to adjacent landowners or other stakeholders. The quality of water will be confirmed prior to use to ensure compliance with environmental requirements.

Potable water fit for human consumption will be required at the site offices, while both medium (suitable for use in the concrete batching) and low-quality raw water (for earthworks and dust suppression) may be used for construction purposes. Potable water will be sourced from the existing Sunwater pipeline which services the DRM. The existing tailing storage facility around the DRM may be used for the provision of lower quality water where testing confirms suitability.

Construction water supply options will be determined during the detailed design of the Project and confirmed prior to construction. Appropriate permits and approvals will be sourced to ensure compliance where required.

3.4.3 WORKFORCE AND ACCOMODATION

The Project is anticipated to have a 2-year construction timeframe and at its peak, is expected to create approximately 100 Full-time-equivariant Jobs. Maintenance crews will vary in size and will range from small teams of 3-5 people for regular maintenance and between 15-20 during major refurbishments and uplift.

Operations at the DRM are benefitted by the DRM Accommodation Camp and DRM Fly Camp which provides accommodation and amenities to the DRM workforce. The DRM Accommodation assets have a sufficient capacity to accommodate the workforce associated with the Project.

3.4.4 CONSTRUCTION HOURS AND TIMEFRAME

The general construction hours of the Project will be refined prior to the commencement of construction. For the purposes of this P-CEMP, nominal construction hours will be:

- Monday to Sunday: 06:00 to 18:00; and
- Public holidays (as required).

A roster system will be adopted to allow construction to be undertaken seven days a week. Standard working hours on site will be 06.00 to 18:00. Work outside of these times may be necessary on occasion as required (e.g. concrete pours for WTG foundations).

Construction activities that may need to be undertaken outside standard working hours may include turbine installation (to take advantage of low wind conditions), where unacceptable safety risks would arise if works were to cease, undertaking specialist works which could impact, or be impacted by, typical construction activities, and emergency preparation and response activities.

Construction schedules will be prepared to minimise the need for works to be undertaken outside standard working hours.

3.4.5 TEMPORARY SITE ILLUMINATION

Temporary site lighting and the use of lights on construction plant will be required outside daylight hours or under low light weather conditions where limited available natural light increase safety risks. Lighting will be required for work inside buildings or structures. Temporary lighting shall be provided to allow the construction activities to be carried out safely.

When providing temporary lighting or using lights on construction plant, the potential for light pollution or nuisance will be considered, although there are no residential receptors within close proximity to working areas.

The placing of temporary lighting will also consider species which may be disturbed by unnatural light, such as bats.

Site lighting will be designed to the minimum required level to ensure safety and security and reduce potential impacts on neighbours. Sensor lights are likely to be installed within areas, including walkways and office spaces, while accommodation will have permanent lighting remaining on to ensure workers can safely access these spaces at all times. Passive Infrared Sensor (PIR) activated floodlights may also be utilised on site and located at selected locations to facilitate safe access at gates, highlight safety controls near excavations or deter unauthorised access to plant and material storage areas.

4. CONSTRUCTION RISK IDENTIFICATION AND MANAGEMENT MEASURES

4.1 SUMMARY OF POTENTIAL IMPACTS

The Project has the potential to impact numerous ecological values, particularly during the clearing and construction phases, including:

- Impacts to flora and fauna through habitat clearing and direct mortality;
- Impacts to flora and fauna habitat areas as a result of noise and dust emissions;
- Impacts to soil and land, contributing to issues such as contamination and erosion;
- Introduction of weed and pest species;
- Impacts to stormwater through spills and leakage equipment, adversely affecting aquatic ecology;
- Changes to catchment with regards to surface water flow regimes (quantity and timing impacts);
- Impacts to air from dust generated by increased traffic and unpaved road surfaces, and fugitive dust emissions from construction activities;
- Impacts to air from increased vehicle, plant, and equipment exhaust emissions;
- Noise and vibration from haulage and construction activities impacting sensitive receptors;
- Increased risk of bushfire due to potential ignition sources and fuel associated with construction activities; and
- Potential disturbance to cultural heritage sites, items or values (if located onsite).

4.2 FLORA AND FAUNA

The construction of WTGs has potential to impact Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES). The potential impacts on MNES and MSES have been identified as:

- Habitat clearance for permanent and temporary construction facilities (e.g. WTGs and associated infrastructure). The consequences of this impact may include:
  - Direct loss of native flora and fauna habitat;
  - Injury and mortality to fauna during clearing of fauna habitat;
  - Potential vehicle strike to fauna resulting in injury or mortality;
  - Light and noise pollution, and vibration impacts;
  - Fragmentation of connectivity areas;
  - Introduction and spread of priority weeds and pathogens that impact flora and fauna;
  - Introduction of invasive species (flora and fauna);
  - Disturbance to habitats within fallen timber, dead wood and bush rock; and
  - Indirect impacts on flora and fauna identified include risks of soil and water contamination, creation of barriers to fauna movement, and the generation of dust, light and/or noise.

A Preliminary Vegetation and Fauna Management Plan has been developed for the Project which details the proposed management and mitigation measures to be implemented.

4.3 SOIL AND LAND MANAGEMENT

The Project has the potential to impact soil and land primarily through activities that involve vegetation removal, soil compaction, increase in erosive processes from soil disturbance, improper stockpiling of topsoil and the uncovering of contaminated material. Soil and land management measures proposed have been outlined within Table 4-1 below.

TABLE 4-1 SOIL AND LAND MANAGEMENT MEASURES

Soil and Land Objectives

- Compliance with legal requirements including permits, licences, approval conditions as well as Federal and State Acts and local laws;
- Ensure contamination impacts are avoided or minimised to the greatest extent practicable; and
- Ensure the Project avoids causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Uncovering of contaminated material	Record the nature, quantity and location of any hazardous materials encountered.	Principal Contractor	Construction and Operation
Land contamination by on-site construction activity	Determine whether any activities to be undertaken will constitute a Notifiable Activity.	Principal Contractor	Design and Construction
	Undertake Environmental Management Register and Contaminated Land Register search across Project Area.	Principal Contractor	Design
	Develop an Emergency Spill Containment Plan.	Principal Contractor	Design
	Ensure any chemical storage areas to be on site are designed in accordance with AS1940 and AS3780.	Principal Contractor	Design
	Record the nature, quantity and location of any hazardous materials to be stored on site.	Principal Contractor	Construction
	Spillages of any dangerous goods or contaminated materials to be immediately neutralised and managed in accordance with the Emergency Spill Containment Plan.	Principal Contractor	Construction and Operation
	Any fill material required to be imported for the Project is to be legally sourced and uncontaminated.	Project Developer	Construction

Soil and Land Objectives			
	Implementation of good practice storage and handling of dangerous and hazardous good procedure.	Principal Contractor	Construction and Operation.
Improper topsoil stockpiling	Ensure topsoil is stockpiled away from stormwater flow paths, waterways, roads and hazardous areas. Key considerations include location, height, duration and applicable erosion and sediment control measures.	Principal Contractor	Design and Construction
Exposure of soil surfaces making them increasingly vulnerable to erosive processes.	Implement appropriate erosion control measures based on a detailed sediment and erosion control plan.	Principal Contractor	Construction
Soil compaction from heavy machinery and traffic.	Minimise the number of vehicles and machinery operating on site, particularly in areas with sensitive soils. Establish designated access routes to minimise overall disturbance.	Principal Contractor	Construction

4.4 WEED AND PEST MANAGEMENT

The introduction of weed and pest species to the Project may be harmful to native and threatened species, and as such, relevant objectives and management measures (particularly relevant to the clearing and construction phases) are outlined in Table 4-2.

TABLE 4-2 WEED AND PEST MANAGEMENT MEASURES

Weed and Pest Objectives

- Compliance with legal requirements including permits, licences, approval conditions as well as Federal and State Acts and local laws;
- Prevent the introduction of invasive weed and pest species during Project construction to the greatest extent practicable;
- Avoid causing unlawful environmental harm;
- Minimise harm to flora and fauna to the greatest extent practicable, particularly direct fauna mortality; and
- Educate all staff of potential impacts and management measures regarding flora and fauna relevant to the Project and within the Study Area.

Potential Impact	Action	Responsibility	Project Phase
Introduction of Weed and Pests	All onsite personnel will be made aware of the locations and consequences of biosecurity threats within the Project Area.	Principal Contractor	Construction

Weed and Pest Objectives			
	A Weed and Pest Management Plan will be developed and implemented for the Project. The plan will include management measures such as vehicle wash down procedures, weed certification and obligations to restrict vehicle movements to access tracks.	Principal Contractor	Clearing and Construction
	Access to a landholder's property to be in line with protocols outlined in the site induction.	Principal Contractor	Clearing and Construction
	Weeds of National Significance (WoNS) and Restrictive Invasive species will be identified and monitored in the impact area. Appropriate weed monitoring will occur to ensure new weed species are identified and recorded. Specific requirements will be determined prior to construction.	Principal Contractor	Construction
	Onsite waste disposal strategies (particularly for food wastes) to be employed that will not encourage the presence of pest fauna.	Principal Contractor	Construction
	Monitoring and weed inspections particularly in response to reported outbreaks or complaints from adjacent property owners will be completed in a timely manner.	• Principal Contractor; and • Project Developer.	Construction

4.5 STORMWATER MANAGEMENT, WATERWAYS, EROSION AND SEDIMENT CONTROL

The construction of the proposed development has the potential to impact stormwater through:

- Adverse impacts on downstream water quality due to:
  - The potential increase in suspended solids, nutrients and metal concentrations; and
  - The potential introduction of chemical and fuel contaminants used during construction and maintenance.
- Adverse impacts to aquatic ecology as a result of the construction and implementation of waterway crossings, including:
  - Disturbance to riparian and aquatic vegetation;
  - Changes to the natural flow patterns of waterways;
  - Disturbance to fish passages, sediment transport as a results of waterway crossings; and
  - The potential increase in sediment and nutrient loads due to altered roadside drainage arrangements.

A Stormwater and Erosion Risk Assessment has been prepared to accompany the development application. However, an Erosion and Sediment Control Plan (ESCP) will be prepared prior to commencement of construction activities. The Stormwater and Erosion Risk Assessment aims to manage potential stormwater quality and quantities, and the ESCP will aim to support the reduction and management of erosion and sedimentation as a result of Project activities. Management measures are outlined below in Table 4-3.

TABLE 4-3 STORMWATER MANAGEMENT MEASURES

Stormwater Management and Waterways Objectives

- Compliance with legal requirements including permits, licences, approval conditions as well as Federal and State Acts and local laws;
- Compliance with the following Performance Outcomes (PO) of State code 23:
  - PO5 – Natural drainage patterns; and
  - PO6, PO7 and PO8 – Protecting water quality and erosion control.
- Comply with relevant Water Quality Objectives identified in the Queensland Department of Environment and Science's 'Environmental Protection (Water and Wetland Biodiversity) Policy 2019';
- Prevent accelerated soil erosion to the greatest extent practicable; and
- Ensure the Project avoids causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Erosion and sedimentation	A single stabilized entry/exit point to be established for each stage of construction to prevent the transfer, release or placement of sediment on sealed roads where sediments have potential to release into stormwater. The existing road network is predominantly gravel, therefore specific sediment containment measures will be investigated during pre-construction and detailed design to ensure the method implemented is appropriate given site specific conditions.	Principal Contractor	Pre-construction
	Where required, mitigation measures are to be placed along the low side of the site to slow flows, reduce scour and capture some sediment runoff.	Principal Contractor	Pre-construction
	Appropriate drainage measures and flow diversion methods will be designed and implemented around site access tracks as required.	Principal Contractor	Pre-construction
	Areas for plant and construction material storage will be designated as appropriate.	Principal Contractor	Pre-construction

Potential Impact	Action	Responsibility	Project Phase
	Prepare a detailed ESCP suitable for the site and the detailed design layout prior to commencing works	Principal Contractor	Pre-construction
	Site personnel are to be educated to the sediment and erosion control measures implemented on site.	Principal Contractor	Pre-construction
	Progressive stabilization of exposed areas where required.	Principal Contractor	Construction
	Construction activities are to be confined to the necessary construction areas.	Principal Contractor	Construction
• Net worsening of stormwater management; • Impacts to aquatic ecosystems; and • An increase in erosion and sediment runoff	Where required, watercourse crossing points will be adequately stabilised to prevent erosion.	Principal Contractor	Construction
	Construction works will be undertaken to minimise impacts on waterways and ensure water quality is maintained.	Principal Contractor	Construction
	Any work that intersects or disturbs fish passages must be completed in accordance with the accepted development requirements for operational work that is constructing or raising waterway barrier works.	Principal Contractor	Construction
	A site specific ESCP shall be prepared prior to construction and will be prepared in consultation with relevant site personnel.	Principal Contractor	Pre-Construction
	If control measures are found to be unsuitable, modify the measures to address any issues, in consultation with and approval from relevant site personnel.	Principal Contractor	Construction
	Sediment and erosion control to be managed in accordance with the Queensland ESCP and the Contractor's erosion and sediment control procedures.	Principal Contractor	Construction
	Minimise land clearing as much as possible.	Principal Contractor	Construction
	Rehabilitate and stabilise cleared areas as soon as practical following works.	Principal Contractor	Construction
	Where practicable, avoid leaving large areas of exposed soils for prolonged periods of time.	Principal Contractor	Construction

Potential Impact	Action	Responsibility	Project Phase
	Monitor and maintain cleared areas and unsealed access tracks following rainfall events.	Principal Contractor	Construction

4.6 AIR QUALITY

The Project has the potential to directly impact air quality through the generation of exhaust emissions and fugitive dust. Indirect impacts to adjacent habitat areas may also occur. Preliminary management measures relating to air quality impacts have been developed and are described in Table 4-5.

TABLE 4-4 AIR QUALITY AND DUST MANAGEMENT MEASURES

Air Quality and Dust Objectives

- Compliance with legal requirements including permits, licences, approval conditions as well as Federal and State Acts and local laws;
- Minimise exhaust and fugitive dust emissions to the greatest extent practicable; and
- Avoid causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Fugitive dust emissions from construction activities	Access track dust generation to be managed through water or application of dust reducing product, especially during prolonged dry periods.	Principal Contractor	Clearing and Construction
	Implement washing or shaking facilities (if applicable) to prevent mud from construction operations being transported onto adjacent public roads.	Principal Contractor	Clearing and Construction
Indirect impacts to adjacent habitat areas as a result of dust	Project personnel and contractors will participate in general site induction and training. These programs will address the Project's potential to generate dust and the control measures that will be adopted to mitigate impacts.	Principal Contractor	Clearing and Construction
	Dust generation is to be visually monitored on a daily basis and appropriate mitigation measures enacted accordingly.	Principal Contractor	Clearing and Construction
	Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation.	Principal Contractor	Clearing and Construction

4.7 NOISE AND VIBRATION

The Project is proposed in a remote location with minimal amenity impacts to surrounding properties. However, there remains the potential to impact nearby sensitive receptors through noise and vibration during the clearing and construction phase of the Project.

Preliminary management measures are proposed to minimise the impacts of noise and vibration to sensitive receptors to the greatest extent practicable. Noise and vibration management measures are presented in Table 4-5.

TABLE 4-5 NOISE AND VIBRATION MANAGEMENT MEASURES

Noise and Vibration Objectives

- Compliance with legal requirements including permits, licences, approval conditions as well as Federal and State Acts and local laws; and
- Avoid causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Impacts on Sensitive Receptors	Maintain construction equipment in good working order.	Principal Contractor	Construction
	Maintain a noise and vibration complaints procedure and register.	Principal Contractor	Construction
	Noise generation will be minimised through dropping materials utilising methods such as minimising drop height, dropping onto existing piles, dropping in bunded areas and other similar approaches.	Principal Contractor	Clearing and Construction
	Where practical, plant will be fitted with exhaust silencers and/or mufflers and will have covers closed when in use.	Principal Contractor	Construction
	Working hours may be reduced around residential properties and noise emissions will be considered during the selection of plant.	Principal Contractor	Construction
	Toolbox talks will be used to reiterate the importance of minimising noise on site.	Principal Contractor	Construction

4.8 WASTE

It is anticipated that the Project will generate waste, however, with appropriate management measures as identified within Table 4-6 and the implementation of a site-specific Waste Management Plan, waste generation will be minimised to the greatest extent practicable.

The volume of waste generated as a result of the Project will be minimised using the waste management hierarchy below and will be implemented in accordance with the *Waste Reduction and Recycling Act 2011*:

1. Elimination;
2. Reduction;
3. Re-use of materials;
4. Recycling; and
5. Disposal.

TABLE 4-6 WASTE MANAGEMENT MEASURES

Waste Objectives

- Compliance with legal requirements including permits, licences, approval conditions as well as Federal and State Acts and local laws;
- Minimise waste generation to the greatest extent practicable in-line with the waste reduction hierarchy; and
- Avoid causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Waste generation	Implement a site Waste Management Plan.	Principal Contractor	Clearing and Construction
	Use a hierarchical approach to waste management, from the most preferable (reduce, reuse or recycle wastes) to the least preferable (disposal), and prioritise waste management strategies to avoid waste generation.	Principal Contractor	Clearing and Construction
	Where waste cannot be avoided, waste materials will be segregated by type where appropriate for the waste management methods available for collection and removal (for processing or disposal) by licensed contractors.	Principal Contractor	Clearing and Construction

4.9 CULTURAL HERITAGE

The Project has the potential to uncover cultural heritage sites, values or items during the clearing and construction phase, therefore, preliminary management measures have been prepared to ensure there is no, or limited disturbance to cultural heritage. The cultural heritage preliminary management measures are outlined in Table 4-8.

TABLE 4-7 CULTURAL HERITAGE MANAGEMENT MEASURES

Cultural Heritage Objectives
• Compliance with legal requirements including permits, licenses, approval conditions and Federal; • Ensure exhaust emissions and fugitive dust emissions are minimised to the greatest extent practicable; • Ensure the Project avoids causing unlawful environmental harm.

Potential Impact	**Action**	**Responsibility**	**Project Phase**
Disturbance to cultural heritage sites / items / values	Undertake construction and operation in accordance with the agreed Cultural Heritage Management Agreement/Plan.	Proponent, Principal Contractor	Construction and Operation

5. STANDARD MANAGEMENT PRACTICES

5.1 SPILL MANAGEMENT

Spills are more likely to occur during the construction phase of the Project. Correct spill response and management education will be provided to site personnel during site-specific inductions and training.

In the instance that chemicals are required to be carried or stored onsite, these will be stored appropriately for the material or chemical type. Safety Data Sheets (SDS) must be kept, and where required, a risk assessment is to be entered into a chemical register, and an appropriate spill kit is to be made available on site.

5.2 REFUELING ACTIVITIES

A refuelling facility may be utilised during Project construction. The refuelling facility will be located away from fauna habitat wherever practicable. Where refuelling is to occur in the field, near sensitive receptors, appropriate spill management materials must be available and fully stocked ready for use.

5.3 EMERGENCY MEASURES

To minimise the risks and impacts of incidents during the construction period, the following equipment will be readily available in several locations, including site vehicles and plant, within the Project Area:

- Fire prevention and fighting equipment including fire blankets and fire extinguishers (e.g., water, foam, CO_2, powder, water mist and wet chemical);
- Spill response kits (e.g., absorbent pads and compound, personal protective equipment and bags for storage of used materials); and
- First Aid medical equipment including defibrillator and snake bite kits.

In the event of an emergency, all site personnel must comply with the direction given by Rural Fire Service Queensland and other relevant emergency services. Environmental harm[1] as defined under the *Environmental Protection Act 1994* is to be reported by an appropriately delegated person or senior manager to the Queensland environmental regulator through the 'Pollution Hotline' on 1300 130 372 (option 2).

The development of emergency procedures will be specific to the site and prepared by the Principal Contractor once engaged and prior to mobilising to site.

Site personnel will be made aware of the emergency procedures and specific responses through a combination of:

- Site employee record forms;
- Prestart meetings;
- Toolbox talks;
- Posters; and
- Site evacuation or emergency response drills.

[1] *Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.*

The effectiveness of emergency procedures will be tested periodically in accordance with emergency guidelines. Amendments to emergency procedures will be made when required in response to changes to emergency response equipment or storage locations and the outcomes of incident investigations. Training will be provided to site personnel where they have been allocated emergency response responsibilities, e.g. first aider responders, fire wardens, etc. First aid kits will be maintained fully stocked and located in appropriate locations onsite areas.

Site signage will identify the locations of key emergency response areas, including, but not limited to:

- Muster areas;
- Fire extinguishers and other fire prevention or fighting equipment;
- First aid kits and medical response areas; and
- Spill kit locations.

6. ENVIRONMENTAL INSPECTIONS, MONITORING AND REPORTING

This report has outlined environmental management measures for the works; however, it is possible that ongoing monitoring and auditing of the works could identify areas of non-conformance with the requirements. The following outlines the obligations for reporting of non-conformance:

- The Principal Contractor shall report non-conformance to MMG following site inspection and environmental audits; and
- The Principal Contractor and/or MMG shall report to the relevant regulatory agencies of any perceived breaches of licences, permits or approvals.

6.1 REPORTING VISITS BY ADMINISTERING AUTHORITIES

The Principal Contractor shall notify MMG of meetings with, inspections by, or visits from representatives of any administering authority (Department of the Environment, Tourism, Science and Innovation (DETSI)) within 24 hours of the Principal Contractor being advised.

6.2 ENVIRONMENTAL INSPECTIONS AND AUDITS

Environmental inspections and audits should incorporate best management practices, safeguards identified as well as any specific approval requirements. The Principal Contractor shall undertake and document regular site inspections for the purpose of verifying compliance with the P-CEMP, licences, permits and approvals and the other environmental performance requirements specified within the contract documents. Through the construction phase, Inspection records shall be submitted to MMG on a monthly basis.

The Principal Contractor's nominated environmental representative or other person acceptable to MMG shall undertake inspections. MMG will undertake site inspections (as required) and a P-CEMP Implementation Audit during the construction phase.

Any observation, issues and non-conformance identified during environmental site inspections and environmental audits may require the Principal Contractor to undertake an investigation of environmental management practices. Where inspection by the Principal Contractor, determines that measures are not effective the Principal Contractor shall implement corrective and preventative measures.

6.3 ENVIRONMENTAL MONITORING

Where required to undertake environmental monitoring, the Principal Contractor shall report monitoring results, analysis and any corrective actions to MMG monthly, except where there has been a breach of Development Approval Conditions or material or serious environmental harm as defined in the *Environmental Protection Act 1994* has been identified. These breaches or environmental incidents shall be reported in accordance with the Development Approval Conditions, *Environmental Protection Act 1994* and MMG reporting for environmental incidents and non-conformance practices.

6.4 REPORTING ENVIRONMENTAL INCIDENTS AND NON-CONFORMANCES

6.4.1 ENVIRONMENTAL OR HERITAGE INCIDENT

As soon as MMG or the Principal Contractor becomes aware of an environmental or heritage issue or incident either by complaint, report or observation, the Principal Contractor must immediately commence control measures to minimise the environment and heritage impacts (if not already done so). Staff are to notify their direct (Principal Contractor and MMG) Supervisor of the incident under the General Environmental Duty and Duty to Notify under the *Environmental Protection Act 1994*.

If the actual and potential environmental impact of the issue or event is a Minor Incident, then the issue may be recorded on a Minor Incident Log. The Minor Incident Log is used to report minor incidents that occur on the Project for the purpose of trend identification and self-management. The Principal Contractor is to update this form and forward to the relevant MMG Environmental Officer as part of monthly reporting requirements.

Where the issue or event is not a Minor Incident, the incident, issue or event is considered an Environmental Incident, and it must be reported to the relevant MMG Project Manager as soon as practicable (within 24 hours of becoming aware of the incident). The MMG Project Manager and the Environmental Officer must report the incident in the applicable reporting system.

6.4.2 DETSI NOTIFICATION

For a notifiable incident occurring on an infrastructure project site under the possession of a Principal Contractor, the Principal Contractor must notify DETSI within 24 hours of becoming aware of the incident.

DETSI is to be notified in writing, with the written notification describing the incident, its nature and the circumstances in which it happened. The Principal Contractor is also required to complete the DETSI Duty to Notify of Environmental Harm form ESR/2016/2271, which is to be emailed to the pollutionhotline@detsi.qld.gov.au, with a copy provided to MMG for record keeping. The subject line must include 'Duty to Notify of Environmental Harm'. It is an offence not to report to DETSI any incident causing serious environmental harm.

6.4.3 FURTHER MANAGEMENT OF ENVIRONMENTAL INCIDENT

The MMG Project Manager, with guidance and advice from the Environmental Officer, will commence investigation to:

1. Identify the extent and seriousness of the issues or event; and
2. Determine suitable management controls.

All incidents are to be documented. Investigations will then be conducted and action plans (if required) developed to ensure no repetition of the event. Where current procedures are identified as being ineffective, the CEMP should be revised by the Contractor and approved by the MMG Environmental Officer. All incidents, issues, events or non-conformance minor and significant shall be reported to the Project Lead on a monthly basis.

All personnel should report all incidents, as incident reporting is regarded as a valuable method of addressing shortcomings in procedures, training, or equipment, and is an opportunity for improvement.

6.5 RECORDS AND REGISTERS

The Principal Contractor will be required to keep records of all environmental inspection, monitoring results and any non-compliances with performance criteria. Any complaints received will also be recorded in a complaints register.

Records generated will be provided to MMG when requested. Records shall be stored in such a manner that they are readily accessible and protected from damage, loss or deterioration due to environmental conditions. It shall be ensured that all electronic records are regularly backed up and that the backup is kept off site. All records shall be maintained as per contract requirements. Records shall be made available as requested (auditors, authorities) at the discretion of MMG.

The Principal Contactor will be required to submit records to MMG on a monthly basis which include:

- Weekly diary including inspection of all environmental elements for the month;
- Monitoring results, analysis and corrective actions (if required);
- Environmental nuisance and non-conformance via the Environmental Monthly Report;
- Minor Environmental Incident Log; and
- Any other monthly reports as required or requested within contract.

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