GROUNDWORK plus

MEPPEM QUARRY
ENVIRONMENTAL MANAGEMENT PLAN

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1. Introduction

1.1 Project Overview

Groundwork Plus has been commissioned to prepare an Environmental Management Plan (EMP) for the Meppem Quarry. The EMP has been prepared for activities including extraction, stockpiling and processing of hard-rock materials, the site is primarily on land described as Lot 10 DP751753 located on Manamoi Rd, Belatta, New South Wales (the site) (refer Drawing 2519.DRG.002 – Site Location Plan).

1.2 Site Details

John Meppem (the proponent) proposes to establish a hard rock quarry at Manamoi Road, Bellata, New South Wales at the site. The site is approximately 9 kilometres east of the nearest section of the Inland Rail Project and approximately 50 kilometres North of Narrabri, 44 kilometres south of Moree and 10 kilometres north-east of Bellata, in north-east New South Wales (refer Drawing 2519.DRG.003 – Site & Surrounds). The conceptual site layout plan is provided as Drawing 2519.DRG.004 – Concept Site Layout Plan).

1.3 Relevant Legislation

The *Protection of the Environment Operations Act 1997 (*POEO Act*)* is the key piece of environment protection legislation administrated by the Environment Protection Authority. The *POEO Act* sets the framework for regulation of scheduled activities under Schedule 1 of the Act, which requires certain activities to hold an Environmental Protection Licence (EPL). Extractive activities are identified as a scheduled activity under Section 19 of Schedule 1 of the POEO Act as '*extractive activities that involve extraction, processing or storage of more than 30,000 tonnes per year of extractive materials'.* As the site satisfies this definition and it is proposed to undertake a scheduled activity, an EPL is required to be held.

1.4 Potential Environmental Impacts

The identification of activities and potential impacts is fundamental to designing and implementing procedures and measures proposed in the EMP. Activities associated with carrying out extractive industry have been tabulated against potential environmental impacts to provide a focus for preparing the EMP, refer to Table 1 – Identification of Potential Environmental Impacts.

Table 1 – Identification of Potential Environmental Impacts

ACTIVITY/EQUIPMENT	Noise	Air Quality	Water Quality	Traffic	Visual Amenity	Social and Economic Factors	Land Contamination	Soils	Stormwater and Soil Erosion	Fauna and Flora	Waste
Vegetation Clearing	.	.	.			.		.	.		
Construction	.	.	.	.	.	.		.	.		
Topsoil Stripping	.	.	.					.	.		
Overburden Stripping	.	.	.						.		.
Raw Material Extraction	.		.								
Raw Material Stockpiling and Loading	.		.						.		
Raw Material Hauling	.		.	.					.		
Raw Material Unloading	.		.						.		
Washing and Screening	.		.						.		.
Product Stockpiling	.	.	.						.		

Product Handling	·	·	·						·		
Maintenance Activities	·		·				·		·		·
Handling and storage of oils, greases, fuels and chemicals			·				·	·	·		·
Rehabilitation Activities	·	·	·		·	·		·	·		·
Stormwater Management			·						·		
Waste Management			·				·				
Extracting water from extraction pit for dust control and wash plant use	·										
Stormwater Discharge	·		·		·	·			·		

· potential risk if inappropriately managed

1.5 Purpose of Environmental Management Plan

This EMP is a management document that links the potential environmental impacts with commitments and measures to safeguard the surrounding environment. It is the principal management tool for guiding environmental management at the site, by providing the framework for environmental management at the operational level to prevent or minimise environmental impacts. The objective of the EMP is also intended to comply with development consent and EPL requirements.

The structure of the EMP comprises a series of procedures for ease of implementation. The elements of the EMP are based on a standard format that may be applied to manage a particular issue or activity, addressing the purpose, performance targets, relevant conditions, strategies/mitigation measures and monitoring.

2. Procedures and Policies

2.1 Environmental Policy

Site management is committed to being environmentally responsible and to conduct activities in compliance with environmental legislation, and will strive to achieve a sound practice of environmental management. In the process of implementing this policy, management shall:

- implement work programs to protect the surrounding environment.
- meet the requirements of all laws, acts, regulations and standards relevant to its operations and activities.
- make the most efficient use of natural resources taking due regard of environmental issues and ensuring land maintains long term productivity.
- implement a program to train all employees in general environmental issues and individual workplace environmental responsibilities.
- continually improve environmental practices to reflect changing legislation, new technology and scientific advances, lessons learned from environmental incidents and increasing knowledge and experience of site specific issues.
- allocate necessary resources to ensure the implementation of the environmental policy.

2.2 Implementation and Training

Implementation of the EMP will require:

- commitment by the Owners, Managers and employees of the site.
- access to technical expertise for tasks such as environmental monitoring, modelling or assessment, as needed.

Management shall ensure that sufficient funding is provided to implement the EMP. All employees and sub-contractors will be inducted on the environmental management procedures and practices to be carried out at the quarry and be informed of the environmental management objectives and the specifics of the EMP including protection of buffer areas, impact minimisation measures, operational practices, maintenance measures, reporting measures, and individual responsibilities. They shall also be made aware of penalties if development conditions are breached and reporting requirements for incidents involving environmental harm and safety in accordance with the relevant environmental legislation.

A record of all employee training/inductions will be maintained on site. Each employee shall be responsible for implementing environmental policies within the scope of their duty statement or job description.

The currency of the EMP should be checked regularly (at least every three years) or as a result of significant change(s) to operations, to ensure up-to-date versions are available and to avoid confusion and mistakes.

2.3 Incidents and Complaints Procedure

The objective of the Incidents and Complaints Procedure is to ensure that incidents and complaints are reported, investigated and appropriate action is taken. A summary of the Incidents and Complaints Procedure is provided below in Diagram 1 – Incidents and Complaints Procedure Summary. For further details regarding each element of the procedure refer to Attachment 1 – Incidents and Complaints Procedure.

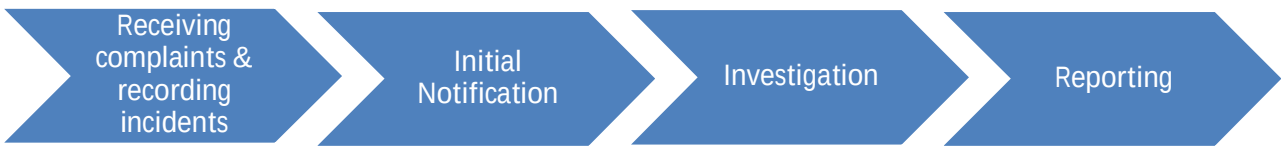


Diagram 1 – Incidents and Complaints Procedure Summary

2.4 Monitoring Requirements

The controls nominated in this EMP will require regular surveillance and review, to ensure that performance aligns with design criteria and also reflects the dynamic nature and changing needs of the operation. The monitoring requirements are contained in each management plan, as outlined in Section 3.0.

All instruments used to measure or monitor parameters required under the relevant conditions of development and operational requirements are to be calibrated, maintained and operated appropriately. All monitoring is to be undertaken by a person or body possessing appropriate experience and qualifications to perform the required measurements.

2.5 Records and Reporting

All environmentally relevant documentation, including policies, procedures, forms, records, and reports required to be kept as per this EMP shall be available at the approved/licensed premises for a period of at least five (5) years and be available for inspection by an authorised person.

If monitoring is required following a complaint or incident, the report shall:

- record the date and time of sampling.
- be endorsed by a person or body possessing appropriate experience and qualifications to perform the required measurements on all records of analysis results.
- record the results of all analyses, measurements and observations and interpretations (if appropriate).
- be made available on request to any authorised person who must be permitted to make copies thereof.

3. Management Plans

3.1 Air Quality (Dust) Management Plan

Purpose	This Air Quality (Dust) Management Plan has been prepared to control potential air quality impacts occurring as a result of land disturbance and operations necessary for the extractive industry operation. Quarry activities have the potential to generate dust that, if inadequately controlled, has the potential to cause nuisance to surrounding sensitive receptors. Activities that may generate dust emissions include: · crushing and screening operations · rock drilling and blasting · wind action on topsoil / overburden and material stockpiles and disturbed areas · topsoil / overburden stripping · extraction and transportation of raw materials (e.g. earthmoving machinery-ground interaction, materials digging, loading / unloading, haul truck and light vehicle movements on unsealed roads, material spillage from haul trucks) · product stockpiling and dispatch (e.g. stockpiles and stockpile pads, product loading, truck tyre-road interaction, material spillage from trucks) · rehabilitation works.
Performance Targets	Dust and particulate matter not exceeding the following levels when measured at any sensitive receptor: · dust deposition of 4 g/m^2/month (130 mg/m^2-day), when monitored in accordance with Australian Standard AS 3580.10.1 *Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – Gravimetric method*; and · an aerodynamic diameter of less than 10 µm (PM_{10}) suspended in the atmosphere of 50 µg/m^3 over a 24 hour averaging time when monitored in accordance with Australian Standard AS 3580.9.6 *Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} high volume sampler with size-selective inlet – Gravimetric method*.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Strategies/mitigation measures for the management of dust emissions will be implemented in accordance with the relevant conditions of development and may include the following: <u>*Disturbed Areas*</u> · Dampen down cleared areas, extraction working areas, stockpiles and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation and propagation from point or mobile sources. · Limit clearing, topsoil and overburden removal at any one time to that necessary whilst providing for effective production of the resource. · Monitor meteorological conditions to time particular activities with favourable weather conditions. · Restrict vehicle and mobile machinery movements to designated routes and standing areas to the extent practicable. · Maintain the buffer between operational areas and the site boundaries where possible.

3.1 Air Quality (Dust) Management Plan

Processing Plant

- Dampen down work areas.
- Dampen materials prior to transport.
- Use water sprays at the processing plant.
- Use shielding and/or windbreaks where possible.
- Maintain vehicles and equipment in accordance with the original equipment manufacturers' specifications.

Stockpiles

- Use water sprays or chemical dust suppressant products as required during high wind conditions likely to generate dust releases.
- Stabilise and revegetate topsoil and overburden stockpiles where possible.
- Use dust suppressants and shielding where possible.
- Limit the height and slope of stockpiles.

Trafficable Areas

- Water haul and access roads at a rate of approximately 2 litres/m^2/hr at times when dust emissions are visible from vehicle movements.
- Enforce speed limits on unsealed haul and internal roads.
- Keep trafficable areas as clean as possible.
- Maintain road surfaces in good condition.

Material Transport and Transport Vehicles

- Ensure signage is installed to advise drivers to contain and cover all loads of material prior to leaving the site.
- Ensure loads are appropriately contained and covered prior to leaving the site.
- Dampen down the load prior to transport where necessary and practicable.
- Clear spillages from side rails, tailgates and draw bars of trucks (following loading and tipping).
- Level loads prior to truck exit from the site (e.g. via shaker pad) where possible.
- Securely fix tailgates of all material transport vehicles prior to loading to prevent material.

Screening Equipment

- Install windshields, enclosures and/or barriers where possible.
- Maintain material in moistened state.

Rehabilitation

- Progressively rehabilitate the site as areas become available.
- Minimise windblown dust during any rehabilitation activities.
- Ensure vehicles use established roads and tracks where possible and limit access to any rehabilitated areas.

Other

- The rock drill is to have an appropriate dust extraction system with collector fitted to the rig and/or wet drilling system via water sprays.

3.1 Air Quality (Dust) Management Plan

- Blasting should be limited to periods of favourable weather conditions where possible (apart from observing prescribed blasting times).
- Employees and contractors are to be made aware of dust management practices.
- Ensure sufficient on site water supply is available for dust suppression.
- Apply good housekeeping practices.

Monitoring

The controls nominated will require regular monitoring and review to ensure that performance accords with design criteria and also reflect the dynamic nature and changing needs of the operation.

Daily visual surveillance will be undertaken by all employees to ensure dust generation on Site is controlled appropriately.

Dust and particulate monitoring if requested by the regulator in response to a dust complaint from a sensitive receptor. Monitoring will be carried out at a place relevant to the potentially affected, nuisance-sensitive place. Monitoring is to be undertaken by a suitably qualified person in accordance with:

- Australian Standard *AS3580.10.1 of 2003 – Determination of particulate matter – Deposited matter – Gravimetric method* (or most recent edition).
- *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2001).
- *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA 2001).*

When requested to undertake monitoring, results are to be provided to the administering authority following completion of the monitoring event. Monitoring shall be carried out at a place(s) relevant to the potentially affected dust sensitive place and must include:

- for a complaint alleging dust nuisance, dust deposition.
- for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM_{10}) suspended in the atmosphere over a 24hr averaging time.

3.2 Water Management Plan

Purpose	This Water Management Plan has been prepared to control potential environmental impacts occurring as a result of land disturbance, necessary for the extractive industry operation, and to facilitate the site's compliance with Section 120 of the POEO Act. Section 120 of the POEO Act states that: *A person who pollutes any waters is guilty of an offence.* Extractive industry operations have the potential to impact on surface runoff water quality. These activities include: · Vegetation clearing · Topsoil stripping · Overburden removals · Extraction pit development · Construction and maintenance of internal roads and hardstands · Stockpiling of topsoil, raw feed and product · Spillage during handling of materials · Use and storage of oils, greases, fuels and other chemicals.
Performance Targets	· To ensure pollutants are not directly, or indirectly, released from the site to any waters, or the bed and banks of any waters. · To ensure no environmental nuisance complaints are received. · To ensure the quality of surface water discharged from the site does not cause environmental harm.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	*General* The stormwater control principles for the site comprise: · Ensure the disturbance activities at the site include the installation of stormwater management, erosion and sediment controls to ensure stormwaters are adequately managed. Sedimentation basins shall be installed where required. · A general philosophy that any overland flow from disturbed areas is considered to be contaminated with sediment/suspended solids therefore requires treatment prior to release. · Divert clean catchment overland flow around and away from disturbed areas to the extent practicable using a diversion bank and natural contours. · Overland flows from the disturbed areas within the quarry area are to be captured in the quarry sump/pit and/or sediment basins for treatment prior to discharging (naturally or pumped) as either concentrated flow into an existing drainage line or as sheet flow over the adjacent vegetated buffer areas. · Sediment basins are to be designed in accordance with *Managing Urban Stormwater, Soils and Construction – Volume 1 – Blue Book and Volume 2E - Mines and Quarries* (NSW Department of Environment and Climate Change, 2008). · Manage stormwater by use of preventative procedures such as using a perimeter bund, diversion banks or drains, containment, recycling, treatment and by use of corrective procedures such as maintenance, de-silting and revegetation of disturbed areas. · Within 120 hours of the most recent significant rainfall event, the required freeboard capacity within the site's sediment basins should be reinstated for the capture and storage of stormwater runoff from the next rainfall event.

3.2 Water Management Plan

Stormwater Contamination Management

Measures to be taken to minimise the potential for contamination of stormwater overland flow from Site are as follows:

- Treat access roads and hardstand areas using a layer of gravel where possible.
- Prevent and/or minimise the contact of incidental rainfall and stormwater runoff with wastes or other contaminants.
- Clean up any spillage of wastes, contaminants or other materials as quickly as practicable.
- Direct surface water runoff from disturbed areas to the quarry sump/pit and sediment basins for treatment prior to release off-site.
- Recycle water collected in the quarry sump/pit and sediment basins to the maximum extent practical (e.g. dust suppression, irrigation).
- Undertake any necessary on Site maintenance in an area where contaminants cannot be directly released to any receiving waterways or on site sediment basins.
- Store all hazardous materials, chemicals and wastes generated on site in bunded areas and under cover where possible or with appropriate safeguards.
- Undertake progressive rehabilitation of disturbed areas to the extent practicable.
- Dispose of wastes off-Site on a regular basis.

Erosion Control Measures

Reasonable and practicable erosion control measures will be implemented on Site to limit soil erosion, including stabilising and vegetating road embankments and batters, temporary overburden and topsoil stockpiles and diversion banks or perimeter bunds.

Strategies/mitigation measures for the management of surface runoff, surface water quality, groundwater quality and erosion and sediment transport from the site will be implemented in accordance with best practice and any relevant conditions of approval and may include the following measures:

- Divert clean catchment runoff using a series of suitable banks and/or diversion drains.
- Stabilise permanent bunds via revegetation.
- Minimise land disturbance to the extent practicable.
- Limit exposure duration of unprotected batters and slopes.
- Install stormwater drainage devices as soon as practical and in a logical progression.
- Implement a monitoring program to assess the effectiveness of erosion and sediment control methods and devices.
- Diversion or catch drain outlets will be treated appropriately unless otherwise stated.
- Install silt fences to control sheet runoff and sediment traps to treat concentrated flows if necessary.
- Construct internal roads with an appropriate cross fall to direct runoff from the road surface into drains, then to the sediment basins where necessary.
- Use flocculation or coagulant agents, such as gypsum, to assist in the settling of suspended solids if required.
- Induct and train staff on the prevention and control of erosion.
- Monitor the water quality of the stormwater released in accordance with approval requirements.
- Design, construct and maintain bunded fuel storage and handling areas and roofed storage with holding capacities to conform to the appropriate regulatory requirement or the provisions of Australian Standard *AS1940-2004 - The Storage and Handling of Flammable and Combustible Liquids*, or most recent edition.

3.2 Water Management Plan

Monitoring

The stormwater controls nominated will require regular monitoring and review to ensure that performance accords with design criteria and also reflects the dynamic nature and changing needs of the operation.

Monitoring of surface water will be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (DECCW, 2004).

The Quarry Manager shall carry out monthly surveillance of on Site water storages and treatment systems. Inspection of Site water storages and treatment systems shall also be carried out by the Quarry Manager immediately prior to anticipated runoff-producing rainfall and as soon as practicable following the event.

Monitoring will consist primarily of visual inspection of the site, particularly with regards to erosion control structures during storm events and/or extended periods of heavy rain. Observations of the performance of the various components of the system will be made and ameliorative action taken to rectify underperformance.

The Quarry Manager may engage the services of a suitably qualified person to conduct any water quality sampling and/ or review monitoring results to provide advice in relation to water quality management.

A summary schedule of the various inspections, performance criteria and responses that shall be performed on-site is shown in Table 2 – Action Plan for the Surveillance and Maintenance of Stormwater Control Devices.

Table 2 – Action Plan for the Surveillance and Maintenance of Stormwater Control Devices

Inspection	Minimum Frequency	Performance Criteria	Response
Inspect drainage lines including catch drains, contour drains and diversions	Quarterly	· erosion in areas adjacent to water conveyancing structures · overtopping of water conveyancing structures (identified by the scouring of the drain batters perpendicular to the direction of flow)	· eroded areas shall be treated appropriately (e.g. rock lined) as soon as practicable · drains to be cleaned of sediments and retreated as necessary to original design specifications · treatment of the drains may be required to reduce sediment loadings of runoff e.g. Grassing, rock lining etc.
Inspect potential sediment storage capacity of sediment dams and structures	Quarterly or following major rainfall events	· storage capacity maintained	· sediment to be removed from the structure when required to re-instate capacity and reused on site where possible · recycle or treat/ discharge sediment basin waters to ensure adequate free storage is maintained for the collection and holding of runoff
Waste containers	Quarterly	· waste to be stored in appropriate containers	· ensure waste materials are stored and disposed of appropriately and in accordance with approved conditions and/ or legislative requirements
Spill response stations	Quarterly and following use	· equipment to be properly maintained and stocked	· maintain equipment · replace / restock equipment as necessary
Maintenance / refuelling area	Quarterly	· fuel, oil spills · contractor maintenance · fuel storage integrity maintained	· clean up spills and investigate spill source · maintain contractor maintenance records · investigate and repair potential leaks

3.3 Noise Management Plan

Purpose	Uncontrolled or unmitigated site noise has the potential to be a nuisance at neighbouring residences. Site equipment or activities that have potential to generate significant noise have been identified and include: · Excavators (clearing vegetation, stripping topsoil, raw product handling, rehabilitation) · Drill rigs · Processing plant (processing of raw materials) · Front end loaders (product haulage, loading) · Off highway haul trucks (haulage of raw material to the processing plant) · Water truck (water cartage, dust suppression) · Face loaders (raw product handling) · Road trucks (product delivery) · Light vehicles (employee vehicles, maintenance vehicles, service vehicles) · Maintenance activities · Ancillary plant and equipment (e.g. pumps, welders). Section 3.4 – Blasting Management Plan addresses vibration and overpressure associated with Site blasting activities.
Performance Targets	Noise from the site must not cause an environmental nuisance at any nuisance sensitive place or commercial place. The level of continuous noise emanating from the operation of the plant or processes (LAeq) measured for at least 15 minutes in or on the premises shall not exceed the background noise level LA90) by more than 5 dBA, when measured at any point within one metre of any residential boundary or other noise sensitive area.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Strategies/mitigation measures for the management of noise emissions from the site will include the following where required: · Hours of operation will be restricted to the following: - 6 am to 6 pm Monday to Friday and 6am to 1pm Saturday and no work Sunday or Public Holidays. · Hours of blasting will be restricted to the following: - 9 am to 3 pm Monday to Friday · No operations are proposed on Sundays and Public Holidays. · Enclose fixed engines, pumps and compressors where practicable. · Maintain equipment in accordance with the original equipment manufacturer's specifications. · Shut down equipment when not in use. · Reduce vehicle speed on internal access roads. · Heavy mobile equipment (e.g. front-end loaders, dozers, haul trucks, excavators) shall be fitted with broadband reversing alarms to mitigate potential nuisance from tonal characteristics of traditional beeper alarms. · Avoid unnecessary operation of plant or revving of mobile or stationary motors and engines. · Fixed and mobile plant and equipment operated at the site should be selected and maintained to minimise noise emissions.

3.3 Noise Management Plan

	Wherever practicable materials shall be stockpiled at locations that shield noise from internal traffic routes and truck loading areas from the nearest residences. All raw material haul truck trays are to be lined with an appropriate absorptive material. The rock pick shall be operated at the most shielded location practically available within the pit to provide acoustic shielding to the north and east. The internal traffic routes will be shielded by topographic cut, earth bund and/or acoustic barrier where possible. All internal roads for road haulage and off-road trucks shall be constructed and maintained to avoid excessive noise associated with uneven surfaces and potholes.
Monitoring	The Quarry Manager will: · Ensure regular surveillance of the site to qualitatively assess noise generation from plant and machinery. · Ensure all plant and machinery and vehicles are serviced in accordance with, or more frequently than, manufacturers' specifications. · Initiate a noise survey when requested by the administering authority, or as otherwise deemed necessary, to investigate a non-vexatious noise complaint. Methods for measurements and reporting of noise monitoring will comply with the current edition of the *NSW Industrial Noise Policy*. The measurement and reporting of noise levels will be undertaken by a person or body possessing both the qualifications and the experience appropriate to perform the required measurements. Monitoring shall include: · $L_{Amax,\ adj,\ T}$ · Background noise (Background) as $L_{A\ 90,\ adj,\ T}$ or $L_{abg,\ T}$ · Max $L_{pA,T}$ · The level and frequency of occurrence of any impulsive or tonal noise effects due to extraneous factors such as traffic noise · Atmospheric conditions including wind speed and direction · Effects due to extraneous factors such as traffic noise · Location, date and time of recording.

3.4 Blasting Management Plan

Purpose

Blasting will be required to fragment rock to a manageable size that can be transported and fed into the processing plant. Blasting practice has the potential to generate excessive overpressure and vibration impacts that may cause annoyance and discomfort to surrounding neighbours.

Performance Targets

Blasting activities must not exceed the limits for peak particle velocity and air blast overpressure in Table 3 – Blasting Noise Limits when measured at any sensitive place.

Table 3 – Blasting Noise Limits

Blasting criteria	Blasting limits
Airblast overpressure	115dB (Linear) Peak for 95% of blasts initiated and not greater than 120dB (Linear Peak) at any time.
Ground vibration peak particle velocity	5mm/second peak particle velocity for 95% of blasts and not greater than 10mm/second peak particle at any time.

Relevant Conditions

Refer to EPL once issued.

Strategies/mitigation measures

The following control measures may be implemented to assist in mitigating potential noise nuisance from blasting associated with the site activities:

- Unless prior approval is obtained from the EPA blasting is only permitted during the following hours:
  - 9 am to 3 pm Monday to Friday
  - No blasting at any time on Sundays or public holidays.
- Handling, transport and use of explosives shall be carried out in accordance with the requirements of Australian Standard AS2187, and the Explosives Act 2003 and Explosives Regulation 2013.
- Only suitably experienced and qualified blasting personnel shall be employed or contracted to provide blasting services.
- Blast volumes shall be maximised to reduce the frequency of disturbances to the neighbouring properties whilst maintaining legislative limits. Orientate blasts with free faces not directly facing the sensitive receivers, to assist with airblast overpressure control.
- A blast plan shall be prepared for each blast, containing blast hole layout, initiation sequence, charging, stemming type and height, charge weight and any other design element, required for good blasting practice.
- Blast areas may be dampened down prior to blasting to minimise dispersion of dry and fine materials where practicable, or where it is identified as a source of potential dust nuisance.

Monitoring

Monitoring of blasting activities must be undertaken in accordance with the *NSW Industrial Noise Policy* and the Australian and New Zealand Environmental Council (ANZECC, 1990) *Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration*. Permanent blast monitoring locations will be established at the two (2) closest neighbouring properties.

Airblast overpressure and ground vibration monitoring

For the purposes of checking compliance with the airblast overpressure conditions and ground vibration conditions and for investigating complaints of noise and vibration annoyance, monitoring must be undertaken and at least the following descriptors, characteristics and conditions determined:

1. maximum instantaneous charge (MIC) in kg
2. location of the blast within the quarry (including which bench level)

3.4 Blasting Management Plan

3. airblast overpressure level, dB (linear) peak
4. peak particle velocity (mms-1)
5. location, date and time of recording
6. meteorological conditions (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction)
7. distance/s from the blast site to noise-affected building/s, structure/s or the boundary of any noise-sensitive place.

Where a nuisance complaint regarding airblast overpressure or ground vibration is received, consideration will be given to available monitoring results and locations, and if required or advantageous, a monitor will be installed at an appropriate location in consultation with the administering authority. All monitoring and reporting shall be undertaken by a person or body possessing both the qualifications and the experience appropriate to perform the required measurements.

3.5 Hydrocarbons and Chemical Management Plan

Purpose	The Hydrocarbons and Chemicals Management Plan has been prepared to control the potential for spills or leaks from chemicals and hydrocarbons associated with the extraction activities. Site operations have the potential to contaminate land and water in and surrounding the site by the release of various chemicals used and/or stored on site. These chemicals could include: · distillate (e.g. fuel for stationary and mobile engines) · oils and greases (e.g. lubricants and hydraulic oils for stationary and mobile equipment) · miscellaneous chemicals (e.g. herbicide, paint, solvents).
Performance Targets	The following performance targets are relevant: · No land contamination that would require notification to the EPA. · No serious spills of oils, greases, fuels or other hazardous chemicals (for this purpose, hydrocarbon spill incidents have been classified as follows: minor spill ≤5 L, major spill 5 L to 20 L, and serious spill ≤20 L). · No preventable release of hydrocarbons and chemicals to the environment.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Strategies/mitigation measures for the management of hydrocarbons and chemicals at the site will be implemented in accordance with the relevant conditions of development and may include the following: *General* · Spills are to be cleaned up immediately. · Undertake refuelling and equipment maintenance within designated hardstand or paved areas where practicable. · Maintain all Safety Data Sheets (SDSs) and information relating to the storage, use and handling of chemicals at the site office. · Ensure employees are familiar with proper fuelling and spill clean-up procedures. · Induct all new employees on the use of handling of chemicals used on site. · Maintain the site in a neat and tidy condition. · Discourage “topping off” of fuel tanks. · Use drip pans during refuelling and equipment maintenance. *Spill Kits* · Maintain appropriate spill kits at locations known to all employees (e.g. refuelling locations, chemical storage facilities, mobile equipment). · Ensure employees are familiar with proper spill clean-up procedures. *Bunding and Storage* · All chemical storage facilities on site must meet specifications of Australian Standard *AS 1940 - The storage and handling of flammable and combustible liquids*. · Bunding will be constructed of material which is impervious to the material stored and transferred therein.

3.5 Hydrocarbons and Chemical Management Plan

	· Bunds will be kept in good condition (e.g. no cracks, gaps or leaks). · Roofed storage facilities will be provided where practicable. · Stormwater captured within bunding is to be removed as soon as practicable and disposed of as contaminated water. Prior to removal, the water is to be free from contaminants. · Empty hydrocarbon and chemical containers are to be stored with closures in place on a concrete hardstand or within a bunded area. · Where vehicle access to the bunded area is required, access must be by way of a rollover bund. · Bunds and/or drains are to be in place to exclude surface waters from washing/degreasing areas.
	Disposal · Hydrocarbon contaminated materials are to be appropriately disposed of at a licensed facility. · If the material is a Classified Liquid Waste, it will be transported and disposed of by a licenced transport contractor. · Oily waste materials, including liquid hydrocarbons, should be segregated from general wastes for disposal off-site by a licensed contractor. · Records are to be kept on disposal of waste for all Hazardous Waste Materials.
Monitoring	Areas where handling of hydrocarbons and chemicals occur (e.g. refuelling or minor on site servicing) shall be regularly inspected by the Quarry Manager. All employees will be responsible for the safe day-to-day handling, use and temporary storage of chemicals being used on site.

3.6 Waste Management Plan

Purpose	This Waste Management Plan has been prepared to ensure wastes produced on Site are appropriately managed. Unmanaged wastes can detract from the amenity of the site and locality and can increase operational costs. The principal wastes that may be generated from the site operations may include, but are not necessarily limited to: · Classified Liquid and Non-Liquid Wastes (e.g. batteries, oil filters, waste oil/hydrocarbons and containers, oil/water emulsions and tyres) · metal and used or faulty parts and equipment · food scraps, packaging and consumables (e.g. paper, cardboard) · green waste. The *Protection of the Environment Operations (Waste) Regulation 2014* is the legislation governing waste management in NSW and the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (EPA, 1999*) guide the classification and management of wastes. The waste management hierarchy nominates a preferred order of waste management as follows: *(a) AVOID unnecessary resource consumption;* *(b) REDUCE waste generation and disposal;* *(c) RE-USE waste resources without further manufacturing;* *(d) RECYCLE waste resources to make the same or different products;* *(e) RECOVER waste resources, including the recovery of energy;* *(f) TREAT waste before disposal, including reducing the hazardous nature of waste; and* *(g) DISPOSE of waste only if there is no viable alternative.*
Performance Targets	The following performance targets are relevant: · Apply the waste management hierarchy to the minimisation of waste. · Maintain a record of any disposal of Classified Wastes in accordance with the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes 1999*. · No unlawful disposal of wastes on or off site.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Strategies/mitigation measures for the management of waste materials at the site will be implemented in accordance with the relevant legislation and guidelines and may include the following: *Waste Avoidance* Waste avoidance relates to preventing the generation of waste or reducing the amount of waste generated. Reasonable and practicable measures for achieving waste avoidance may include, but are not necessarily limited to: · Input substitution (using recyclable materials instead of disposable materials, for example using oil delivered in recyclable steel drums instead of non-recyclable plastic containers). · Increased efficiency in the use of raw materials, energy, water or land (purchasing consumables in bulk (large containers) rather than in small quantities).

3.6 Waste Management Plan

- Improved maintenance and operation of equipment (keep equipment in good working order to reduce wear and overhaul).
- Undertaking an assessment of waste minimisation opportunities from time to time.

Waste Re-use

Waste re-use refers to re-using waste, without first substantially changing its form. Reasonable and practicable measures for reusing waste may include, but are not necessarily limited to:

- Recovering and separating solvents, metals, oil, or components or contaminants and reusing separated solvents for degreasing plant and equipment.
- Applying waste processing fines to land in a way that gives agricultural and ecological benefits (using fine sediments in rehabilitation activities).
- Using overburden for constructing bunds and landforming.
- Reusing silt/sediment on site to the maximum practicable extent.

Waste Recycling

Waste recycling refers to treating waste that is no longer useable in its present form and using it to produce new products. Reasonable and practicable measures may include, but are not necessarily limited to:

- Recovering oils, greases and lubricants for collection by a licensed oil recycling contractor, recovering, separating and recycling packaging (including paper, cardboard, steel and recyclable plastics).
- Recycling used plant and equipment to the maximum practicable extent.
- Finding alternatives to disposal of non-recyclable materials (using conveyor belts for noise attenuation, mudflaps, utility vehicle tray liners).
- Providing suitable receptacles and storage areas for collection of materials for recycling.

Energy Recovery from Waste

This refers to recovering and using energy generated from waste. Due to the small scale of the operation, energy recovery is not considered viable.

Waste Disposal

This refers to disposing of waste which cannot otherwise be reused, recycled or used for energy recovery. Reasonable and practicable measures may include, but are not necessarily limited to:

- Regulated wastes must be transported and disposed of in accordance with the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes*.
- Disposal to a licensed waste disposal facility (i.e. landfill or transfer station).

Waste Storage

Waste storage containers or areas to be provided and located at safe and convenient locations at the site. Each container will be identified with the type of wastes which may be disposed of in each container. Each container or area will be designed to prevent the escape of materials.

3.6 Waste Management Plan

	Classified Waste and Licenced Waste Transport Classified waste is commercial or industrial waste, whether or not it has been immobilised or treated and is of a type or contains a constituent of a type listed in *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes 1999*. The *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* sets out the process by which wastes are classified. These will be followed for Classified Wastes. All Classified Wastes will be transported by a licensed commercial transporter.
Monitoring	The Quarry Manager will undertake a monthly visual inspection to ensure the waste management hierarchy is being effectively implemented. All employees and contractors shall be responsible for ensuring wastes are stored and removed from the site on a regular basis (e.g. daily or weekly). The Quarry Manager shall ensure that required waste treatment measures are implemented at the site. The Quarry Manager shall ensure waste receptacles are provided and the waste type identified and that temporary waste storage areas are signed, recycling bins are emptied when full and materials which may cause land contamination are not disposed of on the site. The Quarry Manager shall keep a record of Classified Waste generated at the site, treatment and disposal methods, licenced contractors for transporting and disposing of waste and the location of the facility for accepting the waste.

3.7 Fauna and Flora Management Plan

Purpose	This Flora and Fauna Management Plan has been developed to protect fauna and flora within the site. In general, the area required to be disturbed for the project is of low ecological value and includes parts already cleared of native vegetation. Adjacent areas of native vegetation are protected from clearing and development via exclusion from the development area.
Performance Targets	No damage to fauna and flora within the site.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Restrict disturbance and access to areas absolutely necessary for the construction and the operation of the Quarry. Clearly cordon off all adjacent vegetation and buffer extents that are not to be disturbed from clearing activities, creating 'no go zones' for vehicles, materials, machinery, workers, excavated soil or fallen timber. · Implement strict controls on construction and operational/maintenance activities that encroach into buffer areas around wetlands and known populations/habitats of significant species. · Implement measures to avoid the spill of earth and rock downslope of the quarry footprint into areas of retained vegetation. · Design and install temporary erosion control measures to avoid impacts on retained vegetation downslope of the quarry footprint. · Leave ground layer vegetation (grasses and herbs) in situ wherever possible to assist soil stability. Mulching of heavily disturbed areas can assist in reducing soil erosion. Where necessary, temporary interception devices such as hay bales or geotextile fabric fencing can be employed to slow stormwater and intercept sediment. · Non-millable vegetation can be mulched and used in rehabilitation or soil stabilisation works, provided that no weeds are incorporated into the mulch. · Consider the installation of nest boxes in areas where hollow-bearing trees must be removed and relocate large fallen logs and boulder piles to adjacent habitat to increase sheltering opportunities for displaced animals where it is not feasible to avoid such features during clearing.

3.7 Fauna and Flora Management Plan

Strategies/mitigation measures (continued)	· Where required, ensure a fauna spotter/catcher is present during clearing and site preparation works to: - Check habitat (vegetation, logs, rock outcrops) for fauna and breeding sites, - Check any stored materials, including stockpiled timber, prior to removal, - Check temporary excavations for trapped fauna, and - Ensure appropriate treatment of injured/orphaned animals through liaison with local Wildlife Carers. · Establish 'go slow zones' for vehicles and machinery where non-gazetted roads or tracks are located adjacent to patches of native vegetation communities. · Limit construction and operational work to daylight hours as far as practicable, and any lighting within outdoor areas should comply with relevant Australian Standards and be of low spillage, with no or limited upward spillage. · Minimise vehicle and machinery access and subsequent soil compaction and weed transfer risk within and adjacent to retained vegetation. · Undertake regular monitoring of the health and condition of retained vegetation and habitat, and the health of significant plant specimens. · Undertake regular monitoring of road kills. · Educate the workforce on the location of significant/sensitive communities and species and potential impacts from unauthorised activities.
Monitoring	All employees on site shall carry out general daily visual surveillance for cordoned off areas within the quarry. The Quarry Manager shall: · Conduct a weekly inspections of all areas and access routes on site to ensure that cordoned off areas are maintained in an undisturbed state. Disturbance of cordoned off areas will be reported to senior management and corrective action taken to protect the disturbed area.

3.8 Weed Management Plan

Purpose	This Weed Management Plan has been developed to ensure adequate control measures are implemented to control the spread and infestations of weeds and declared plant species within the site. Weed impacts that may occur due to the extractive industry operations include: · areas of exposed earth available for weed colonisation including topsoil stockpiles · spread of existing weed infestations due to disturbance and vehicle traffic · unsuccessful or weed-infested revegetated areas. The Biosecurity Act 2015 provides for the identification, classification and control of noxious weeds. The Biosecurity Act imposes obligations on occupiers of land to control noxious weeds declared for their area.
Performance Targets	Prevent the introduction and spread of noxious weeds on the site.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Specific control measures to be implemented may include, but not necessarily be limited to the following strategies. *General* · Noxious weed infestations are to be controlled as soon as possible to prevent further spread of weeds. · Maintain groundcover for as long as possible by minimising land disturbance at any one time, where practicable. · Annual weed spraying campaigns should be implemented at the site, with additional spraying campaigns (e.g. spot spray, bi-annual sprays, etc.) undertaken if necessary. · Noxious weeds identified on Site will be prioritised for weed management according to the class of weeds identified, and the cause of the weed establishment will be determined to prevent or minimise further introduction and spread. · Weed plant materials and seed should be disposed of at a Council refuse station, or buried at an appropriate depth on site, whenever possible. · Employees should be trained appropriately to recognise existing and potential weeds present on site and within the surrounding area to ensure they are not inadvertently brought onto the site via items contaminated by seed (e.g. vehicles, machinery, hand tools, soil, mulch or livestock). · Obtain pest free certification for any soil, fill, mulch, etc. entering the site. · Appoint a person responsible for regularly monitoring for potential pest occurrences (and treatment if required) of equipment, vehicles, machinery and materials (including soil, mulch, fill) entering the site. · If areas containing noxious weeds are encountered, clean all equipment, vehicles and machinery prior to leaving the area. · Species-specific control methods are to be used in accordance with State government guidelines.

3.8 Weed Management Plan

Access Roads/Hardstand areas

- All access routes and hard stand areas will be maintained in a weed-free or weed-reduced state, to lessen the spread of weed seed by vehicle movements.
- Established roads and tracks should be used wherever possible and noxious weed-infested areas / sites are to be avoided.

Topsoil Management

- Visual surveys will be undertaken prior to all topsoil stripping operations and, if necessary, control mechanisms will be undertaken to reduce the risk of the contamination of topsoil stockpiles with seed and vegetative weed material.
- Weed control mechanisms may include separate stockpiling, herbicide spraying of stripped soils, or disposal as fill of soil materials infested with weeds.
- Weed control mechanism strategies will be implemented to control weed infestation if required, both before and after use of top-dressing material in the rehabilitation program.
- All topsoil stockpiles will be regularly monitored and managed for weed infestation.

Rehabilitation

- Implement progressive rehabilitation as soon as practical as areas become available.
- Avoid importing topsoil onto the site where possible.
- Prior to the establishment of vegetation:
  - a spraying campaign may be required to prevent migration or establishment of weed species into the area under rehabilitation
  - alternative methods for controlling both grasses and weeds may be used, including manual weeding, burning, slashing, weed matting and mulching, where practicable.

Weed Control Methods

As a guide to assist in planning weed control, a summary of weed control options that may be implemented are presented in Table 4 – General Weed Control Options

Monitoring

All employees on site shall carry out general daily visual surveillance for weeds within the quarry and ensure that vehicles leaving site are free of soil and vegetation.

The Quarry Manager shall:

- Conduct weekly inspections of all access routes on site to ensure they are maintained weed free or in a reduced state to lessen the spread of weed seed by vehicle movements.
- Conduct inspection of any area/s and treat any weed infestations prior to topsoil removal.
- Carry out at least four thorough inspections per year of the quarry to identify:
  - effectiveness of weed control measures implemented and whether an amendment is required
  - new areas where weed control is required
  - infestations of new weed species
  - areas where rehabilitation should be carried out.

Note: The frequency of inspections will vary depending on the identified weed species on-site and what management requirements are necessary for those species.

Table 4 – General Weed Control Options

Infestation Level	Biological	Chemical	Mechanical	Physical
Low (Canopy cover between 1% and 10%)	Not suitable.	Spot-spraying by hand with a registered herbicide.	Not suitable.	Hand grubbing (remove roots and burn plant).
Medium (Canopy cover between 11% and 50%)	Release of biological control agents.	Spot-spraying by hand with a registered herbicide.	Chaining, rolling, raking or back-ploughing, then burning.	Follow up control of seedlings – could include physical removal.
High (Over 50% canopy cover)	Inspect infestation to see if, and what, bio-control agents are already present. If necessary, release biological control agents and monitor their progress.	Aerial spraying with a registered herbicide.	Chaining, rolling or raking. Use fire to kill any regrowth and break seed dormancy.	Follow up control of seedlings – could include physical removal.

3.9 Rehabilitation Management Plan

Purpose	This Rehabilitation Management Plan has been prepared to guide planning, landforming, revegetation, maintenance and environmental management associated with land disturbed by extraction activities at the site. Extractive industry is a temporary land use - designing and implementation of rehabilitation works is therefore an important element of an extractive industry. Integration of rehabilitation and extractive operations assists in cost control as well as minimising potential environmental impacts. Potential impacts resulting from extractive industry include: · Soil erosion · Pollution of stormwater run off · Sedimentation of waterways · Increased nutrient loads in waterways · Introduction of weed species · Potential clearing of vegetation · Potential loss of habitat and biodiversity. The requirement to develop and implement detailed rehabilitation plans would be triggered 12 months prior to the event that terminal faces of the quarry are achieved.
Performance Targets	Performance targets nominated for rehabilitation of the site are to: · Return the site to a safe, stable, non-polluting state, suitable for reinstatement of previous land use (i.e. rural – cattle grazing). · Maintain the general amenity (visual, air quality, water quality, etc.) of the surrounding area. · Prevent the degradation of non-operational areas. · Limit land disturbance to that which is necessary at any one time. · Identify any land contamination and implement appropriate remediation or management where necessary. · Ensure progressive rehabilitation is carried out during the progression of quarry activities where practicable and commence progressive rehabilitation as areas become available. · Select suitable plant species for revegetation. · Reinstate stable drainage patterns. · Prevent the introduction or spread of declared weeds and pest species.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Strategies/mitigation measures for the management of rehabilitation activities at the site will be implemented in accordance with the relevant conditions of development and may include the following: *Rehabilitation Staging* The staging of the rehabilitation works will follow the sequence of quarry development as terminal benches are reached. As the development of the quarry is in a generally westwards direction, these benches will remain active in the foreseeable future and therefore be rehabilitated at the end of the life of the quarry.

3.9 Rehabilitation Management Plan

Final Land Use

The following measures shall ensure that the landform created by extraction activities is stable and is connected into the surrounding landscape:

- Using earthmoving equipment to progressively shape and trim the workings to the desired design profiles and flattening the gradients of selective batters to a stable angle of repose on reaching the terminal limits of extraction.
- Rounding or marrying the contours into the natural ground surface.
- Scaling down loose rock.
- Topsoiling and grassing of contours.
- Providing access to the terminal workings to allow maintenance of rehabilitation works.
- Designing landform and drainage to control erosion for the particular hydrological regime.
- Where necessary, planting media should be spread and shaped over selected rock faces and topsoiled to assist in retaining precipitation and controlling sediment movement.

Terminal quarry benches shall be battered to varying slopes depending on the geotechnical properties of the substrate.

Once quarry operations are completed, the extraction floor will either be contoured to a gentle grade to establish a free draining platform or, if the final extraction area results in an area below grade, then an artificial lake will be created with a surrounding area free draining into the lake. The free draining area will be covered in topsoil to a suitable depth and seeded with paddock grass species to return the land to its current use of cattle grazing.

Topsoil Management

Topsoil and any overburden / remaining extracted material on site will be used as part of the rehabilitation of the final landform. Topsoil supports and promotes plant growth, soil micro-organisms, organic matter and nutrients. Topsoil is defined as the organic rich, friable layer beneath the natural ground surface. The physical properties of topsoil are important for promoting and supporting plant growth.

The following measures should be implemented for topsoil stripping:

- Topsoil should not be stripped when it is too wet or too dry.
- Topsoil when stripped should be used directly for rehabilitation to the maximum practicable extent, or stockpiled and preserved for future use.
- Stockpiling of topsoil will be stockpiled in low mounds and should be shaped (i.e. batters no greater than 2:1) and revegetated to protect the soil from erosion and weed infestation.
- Stockpiles should be maintained in a free draining condition and long-term soil saturation should be avoided.
- Runoff waters external to the areas to be stripped should be diverted away from the working area.
- Stripping of topsoil should be limited to the minimum area necessary.

The following measures should be implemented for topsoil spreading:

3.9 Rehabilitation Management Plan

- Whenever possible, stripped topsoil should be directly placed on an area undergoing rehabilitation.
- Areas to be topsoiled should be re-shaped prior to placing topsoil.
- Equipment used to spread topsoil should be scheduled to avoid compaction.
- Before respreading the topsoil, loosen the subsoil to break up any compacted or surface sealing and to enable keying of the two (2) soils.
- On slopes less than 3:1, loosen lightly compacted subsoil with a tined implement ensuring all ripping operations occur along the contour.
- Topsoil is to be removed from stockpiles in a manner that avoids vehicles travelling over the stockpiles.
- Topsoil is to be respread in the reverse sequence to its removal so that the original upper soil layer is returned to the surface to re-establish the entrapped seed content of the soil.
- Ensure all exposed subsoils are covered.
- Topsoil is to be respread over selected batters, contours, bunds and disturbed areas to a minimum thickness of 100 mm.
- After spreading topsoil, ensure the surface is left in a roughened state to assist moisture infiltration and inhibit soil erosion.
- Prior to any planting, cultivate any compacted or crusted topsoil surfaces.
- Soil spreading is to be immediately followed by seeding or planting if applicable.
- Straw or organic mulch may be spread over the soil to minimise potential soil erosion until the area is revegetated.
- If erosion occurs on treated surfaces, the area is to be re-topsoiled and sown with cover grass.

Revegetation

There are a range of methods for establishing vegetation that may include; natural regeneration, hydro-mulching, seed broadcasting, seedling planting and direct seeding. Natural regeneration followed by seed broadcasting shall be the preferred method of establishing vegetation. All methods shall be accompanied by appropriate weed control to prevent rehabilitated areas from being overrun with weed species.

The quarry floor and former stockpile areas will be revegetated using suitable pasture species in order to return the area to its former use of cattle grazing.

Weed and Pest Control

Any materials (e.g. earth, soil, mulch and straw) brought onto the site for rehabilitation shall be inspected to ensure the materials are free from weeds and pests. Prior to the establishment of vegetation, a spraying campaign may be required to control weeds to prevent migration of weed species into areas under rehabilitation. Alternative methods for controlling both grass and weeds include manual weeding, slashing, weed matting and mulching. Predation (e.g. grazing animals, birds, kangaroos, hares, and insects) are risks for revegetation. Depending on the situation, specific measures may be required to protect the works from predation such as fencing, barriers, etc.

Buffers

- Site perimeter to be fenced to the extent necessary.
- Work areas to be clearly defined.
- Vehicles limited to defined tracks.

3.9 Rehabilitation Management Plan

Monitoring

Once rehabilitation commences, the Quarry Manager shall undertake a monitoring program to review the ongoing success of the rehabilitation treatment. Rehabilitation measures including landform stability, long-term sediment and erosion controls and revegetation of profiled final land surfaces will be visually monitored by the Quarry Manager and, where relevant, assessed by technical experts to determine the effectiveness of measures implemented. The Quarry Manager may engage a suitably qualified consultant to monitor the establishment of vegetation and land stability.

The key parameters to be measured as part of the monitoring program will include:

- Erosion
- Groundcover
- Vegetation species (richness of desired species)
- Weed presence.

The Quarry Manager shall conduct regular inspections of any rehabilitated areas to ensure timely maintenance works are carried out as necessary. Maintenance works may include fertilising, watering, repairs to barriers, guards and plant failure replacements, refer to Table 5 – Maintenance Schedule for Revegetation Works.

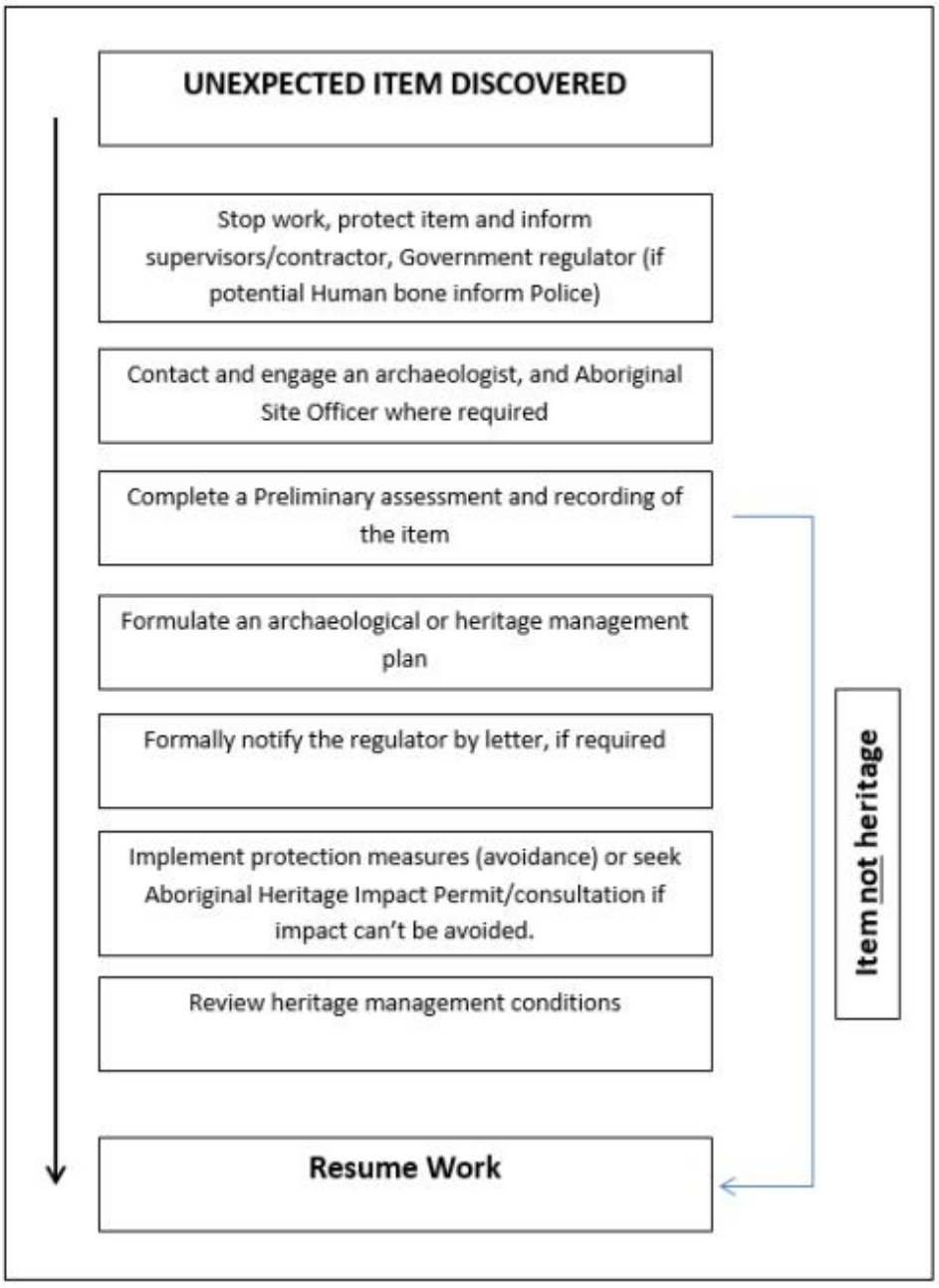
Table 5 – Maintenance Schedule for Revegetation Works

Item	Activity	Frequency
<u>Weed Control</u> Site Preparation (where necessary) Ongoing Weed Management Supplementary Weeding	 Application of herbicide and / or slashing Application of herbicide Application of herbicide	 One (1) treatment at least two (2) weeks prior to seeding / planting Suggested biannually or as required As required
<u>Revegetation Management</u>	Monitor performance and conduct any necessary maintenance Replace diseased or dead plants Fertilise (if applicable) Apply mulch (if available)	· One month after seeding / seedling planting. · Three (3) months after seeding / seeding planting. · Six (6) months after seeding / seedling planting. · 12 months after seeding / seedling planting. OR · following significant rainfall events (e.g. >25 mm). As necessary following maintenance inspections Two (2) months after topsoil spreading or seeding One-off around plantings
<u>Weed Control</u> Site Preparation (where necessary) Ongoing Weed Management	 Application of herbicide and / or slashing Application of herbicide	 One (1) treatment at least two (2) weeks prior to seeding / planting Suggested biannually or as required
<u>Pasture Management</u> Grass Height Grass Vigour	 Slashing Fertilise	 Biannually until established Annually (if necessary)

3.10 Cultural Heritage Management Plan

Purpose	To ensure any unexpected European or Aboriginal Heritage finds are dealt with appropriately. Provide workforce with a procedure to follow in the event of an unexpected find.
Performance Targets	· No damage to culturally significant relics, items or places is to occur as a result of quarry operations. · Stakeholder consultation occurs to ensure that expectations are meet and the correct processes can take place.
Strategies/mitigation measures	Workforce training All workers arriving at site are to be inducted on environmental matters including aboriginal heritage. Workers should be trained on their legal obligations and what to look out for in the during quarry operations. In the event of the an unexpected find the Quarry manager should be notified immediately and the procedure below should be followed. Unexpected finds procedure · During land disturbance activities, due care will be taken to monitor activities to determine if any unexpected object or materials are being disturbed. · If an unexpected relic, object or item is observed the work will cease to seek further clarification on the find. Aboriginal objects are defined as '*any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains'* · To remove any doubt if the find may or may not be a culturally significant, disturbance work in the area should cease to prevent any damage, the site should be secured, and advice sought from the project archaeologist to confirm the significance of the find. · Once the significance of the find has been confirmed, the project archaeologist will confirm the notification requirements including Office of Environment and Heritage (OEH). If the find includes human remains the NSW police service and the Coroner's Office will be required to be notified immediately. If the origin of the human remains is thought to be from aboriginal descent, then the local aboriginal party will be contacted. · Works will not recommence in the area until confirmation has been provided from the project archaeologist following clearance from the regulators. · If the find is significance written confirmation may be required to be provided to OEH and a plan developed around the salvage or preservation of the site. A flow chart of this procedures is provided below (adapted from Advitech 2019).

3.10 Cultural Heritage Management Plan



3.11 Emergency Response Plan / Pollution Incident Response Management Plan

Purpose	The Meppem Quarry Pollution Incident Response Management Plan (PIRMP) will provide the site workers with guidance on what is required in the event of a pollution event.
Performance Targets	Prevention of major environmental incidents through proactive site management principles. Workforce is trained correctly on the response to emergency situations to minimise the extent and impact of the event.
Relevant Conditions	Refer to EPL once issued.
Strategies/mitigation measures	Pollution hazards on-Site include chemical and fuel spills, dust emissions and water contamination. These are shown in Table 2 – Pollution Hazard Identification, Likelihood and Pre-emptive Actions with the likelihood of the incidence and the pre-emptive actions taken by the site to reduce the risk or prevent an incidence from occurring.

Table 2 – Pollution Hazard Identification, Likelihood and Pre-emptive Actions

Hazard	Likelihood	Pre-emptive Actions Taken
Hydrocarbon spills during maintenance and refuelling	Moderate	· Refuelling will be via mobile equipment. · Fuel or hazardous material is used for its intended use only (as specified on the Safety Data Sheets (SDS)). · SDS are reviewed and available for reference for the correct clean up procedures. · Compliance with the Workplace Health and Safety Management Plan. · Maintenance activities and refuelling are undertaken on a concrete slab, where practicable. · Supervision is provided when refuelling to ensure that overfilling does not occur. · Vehicles are maintained in good condition and as per manufactures' specifications. · Pre-start checks are completed on plant and equipment daily which include inspection for oil leaks. · Good housekeeping and tidy work areas are kept to help prevent accidents and spills.
Stored chemicals leakage and/or spillage causing contamination	Low	· Hazardous materials are stored in a covered area and on appropriate drip trays where practicable. · Fuel or hazardous material is used for its intended use only (as specified on the SDS). · SDSs are reviewed and available for reference for the correct handling and clean up procedures. · Compliance with the Workplace Health and Safety Management Plan. · Good housekeeping and tidy work areas are kept to help prevent accidents and spills.

		· See Table 3 – Hazardous Materials Inventory for list of chemicals stored on-Site)
Fire	Low	· Store flammable and combustible liquids in an undercover area on appropriate drip trays. · Fuel is not to be stored by permanent installations on-Site. · Refuelling is undertaken only in designated areas where possible. · Provision of appropriate spill kits and staff trained in their use. · SDS are reviewed and available for reference for the correct fire prevention and fighting procedures. · Compliance with the Workplace Health and Safety Management Plan. · Good housekeeping and tidy work areas are kept to help prevent accidents and spills. · Fire extinguishers are provided and staff are trained in their use. · Staff and visitors to Site are instructed of the emergency procedures and evacuation points.
Discharge of water with elevated suspended solid levels	Low	· Settling time is provided for waters within the settlement ponds prior to discharge. · Clean and contaminated runoff is segregated. · Sediment control measures are implemented and maintained. · Water monitoring is undertaken in accordance with licence conditions.
Dust emissions from operations	Low	· Hardstand areas and roads are kept in a damp state with the use of a water truck. · Crushing and screening plant is enclosed with water sprays operating at transfer points. · All loads are covered during transport.
General waste generated on-Site incorrectly managed and entering the surrounding environment	Low	· General waste and recycle bins are provided at the office and lunch room. · General waste is taken to Council Landfill as necessary. · Waste oil from machinery maintenance is stored correctly and disposed of at an oil recycler. · Unserviceable machinery parts are reused or recycled where possible or waste metal sold to scrap metal merchant. · Wastewater from the on-Site sewage and amenities waste water treatment tank is chlorinated and used to irrigate the office garden.

Pre-emptive Actions to be taken

The quarry operator will implement a Workplace Health and Safety Management Plan and this Environmental Management Plan which will identify and outline the pre-emptive actions to prevent, minimise and manage all potential safety and environmental hazards. The quarry operator shall implement WorkCover compliant methods for the following:

1. Chemical storage.
2. Chemical spill management.
3. Schedule of Safety Equipment and Personal management of pollution incidents:

    I. Spill kit.
    II. Safety Data Sheet Register.
    III. Fire Extinguishers.
    IV. Hard Hats.
    V. Steel Cap Boots.
    VI. Dust Mask.
    VII. Eye protection.
    VIII. Rigger Gloves.
    IX. Long Sleeve Shirts.

Inventory of Pollutants

As part of the site establishment phase. A Hazardous Materials Register will be developed. This will include an inventory of all hazardous substances that are brought to site and the corresponding Safety Data Sheet (SDS). Prior to the chemicals arriving at the site the SDS will be checked to determine the following;

- Safe storage requirements
- Compatibility of storage around other hazardous substances
- Quantity and concentration of active ingredients in substances
- PPE requirements for handling
- Environmental considerations for use on the site
- Disposal requirements at end of use
- Product expiry dates
- Particular transportation requirements

Following the assessment of this information a risk assessment will be undertaken prior to accepting the chemicals at the site to determine if any changes are required to ensure safety is maintained. Changes may include additional PPE, additional storage areas or ventilation upgrades on existing stores, exclusion areas for use around watercourses, establishment of new waste providers etc.

Incident Contact Details

External Contacts

1. Emergency Services – 000
2. Environment Protection Authority – 13 15 55
3. Public Health Unit — Lismore — 02 6620 7585 or (0417 244 966 after hours)
4. Narrabri Shire Council – 02 6799 6833 or (0429 911 111 after hours)
5. Moree Plains Council – 02 6757 3222
6. Essential Energy – 13 20 80

Communications to Adjoining Landowner Occupiers`

The surrounding land is rural residential properties. Due to the near distances of surrounding residences, should a severe incident occur, a door knock would be more appropriate and timely to advise neighbours of events.

Communications with the Community

- Local Newspaper.
- Letter box drop.
- Door knock.

The extent of the communications with the neighbours and the community will depend on the:

- Magnitude of the incident.
- Type of pollutant.
- What that pollutant may impact - water, land and air.
- The potentially impacted area.
- Weather conditions.
- Potential duration of the impact.

These factors will be considered in determining who will be contacted.

Emergency Management Key Responsibilities (pre-emergency)

The Quarry Manager or delegate is responsible for:

- The effectiveness and accuracy of the Emergency Plan, procedures and relevant emergency documentation.
- Maintenance of staff training in emergency preparedness, emergency information lists and emergency-related plant and equipment necessary for emergency evacuation compliance.
- Co-ordination of evacuation exercises.
- Post-emergency/exercise review.

Emergency Management Methods

- The Site has an emergency plan.
- A complete copy of the plan shall be displayed in all the main work areas.
- This plan forms part of the Workplace Health and Safety Plan.

Chief Emergency Controller (during and post-emergency)

Responsibilities include:

- Immediately responding to any emergency situation.
- Ascertaining the nature of the emergency and determining appropriate actions.
- Ensuring the appropriate emergency services have been notified.
- Co-ordinating the deployment of staff and any internal specialist resources.
- Where safe to do so take steps to contain or control the hazard.
- Ensuring that appropriate senior management are kept updated on the situation.
- Co-ordinating post-incident recovery strategies.

Staff, Employees and Contractors

Responsibilities include:

- Attendance of any emergency preparedness training.
- In the event of emergency event, report all emergency incidents to the Quarry Manager
- Follow instructions given in the event of an emergency.
- Co-operate with emergency personnel in the event of an emergency.
- When safe to do so take steps to contain or control the hazard.

Emergency Resources

Emergency Warning and Communications System

- Radios in all plant, weighbridge and vehicles, mobile phones, verbal.
- Communication with staff.
- In the event of a failure of the radio, landline telephone, emergency warning system and messages may be relayed via mobile phone or runner/driver.

Fire-Fighting Appliances

The site facilities are equipped with various fire-fighting appliances which are strategically located throughout the site offices and plant as per the Emergency Response Plan.

Location of Extinguishers

Fire extinguishers are found in the following locations:

- On plant and in all Site offices as required.
- Next to fuel installation.
- The equipment shall comply with the relevant Australian Standards and be appropriately signposted.

All employees and contractors shall be competent in the use of the equipment.

All fire-fighting equipment shall be regularly checked and serviced. This will involve both internal inspections as well as external tests conducted by approved experts.

The Quarry Manager acts as the Fire Warden.

Incident and Accident Reporting

In the event that an injury is sustained to an employee or an incident occurs, contactor or visitor, the following contingencies have been put into place:

- Trained and accredited First Aid Officers will be in the workplace and shall be present on every shift.
- Contact number of the First Aid Officer is displayed on the site office.
- All injuries shall be reported to the supervisor immediately and recorded on the injury report form as soon as practicable after injury.
- All injuries will also be investigated immediately and corrective actions instigated in accordance with the Workplace Health and Safety Management Plan.

First Aid Equipment Locations

- Site Office.
- Quarry Vehicle.
- Loader.

Emergency Response and Evacuation Plan

Discovering a Dangerous Situation

- Move persons away from danger if safe to do so.
- Contact relevant emergency services (i.e. Ambulance/Fire/Police).
- Announce evacuation if dangerous situation requires (Radio/Runner).
- Contact the Quarry Manager.

Reporting an Emergency Externally

When reporting an emergency to an external agency, the following information should be included:

- Name of organisation.
- Exact nature of emergency - are there any casualties?
- Exact location (including address and location on site).
- Name of person reporting emergency.
- Contact number (where applicable).

This information is on display in the site office.

External reporting is to be carried out by the Quarry Manager, but, in that person's absence, may be carried out by their delegate.

Evacuation Alert

Verbal instructions for evacuation are executed by calling out "emergency, emergency, emergency" over the radio system or verbal directive issued by the appropriate personnel from the Quarry Manager will constitute the evacuation signal.

Assembly Areas

In the event of an evacuation, persons should assemble at the nearest safe assembly area as stated in the Quarry Safety Management Plans.

First Aid

If First Aid assistance is required contact the relevant First Aid attendant. First Aid attendant lists can be found in the site office.

Any injured people who can be moved safely should be taken to the nearest assembly area (whichever is more appropriate) for treatment. Those people who are trapped or unable to be removed immediately must be protected and given First Aid on the spot (providing it is safe to do so).

Media Liaison

No person other than the following can authorise or divulge any information to the media:

- General Manager
- Director

Any form of contact from the media should be referred to those mentioned above under all circumstances.

Should any staff be approached by media representatives for comment, the staff member must refer them to the Quarry Manager or the person authorised to speak on their behalf such as a media officer.

Actions to be taken during or immediately after Pollution Incident

During a Pollution Incident

All actions taken during and after a pollution incident will vary depending on the nature of the pollutants and severity of the incident.

Any action taken shall be in accordance with any Workplace Health and Safety requirements and the Environmental Management Plan (QEMP).

Detailed records/evidence collection shall be carried out, provided it is safe to do so and with approval of the person in control of the site. Evidence may include photographs or samples taken and written notes.

Follow all directives given by the Emergency Controller.

Follow only safe work practices.

Emergency Termination

Only the Emergency Controller may deem the emergency terminated. This action shall take place once all emergency services have concluded their involvement.

Only the Emergency Controller may deem the site safe to enter.

Incident Reporting

Reporting of the incidents to the EPA shall include the follow purposes:

- For recording of Pollution Complaints.
- For notification of Environmental Harm.
- For preparing a written report to EPA.

Site Personnel Competency

Management to ensure staff are competent in key functional areas, that ongoing training will be provided and currency of training monitored throughout their period of employment.

Records of training currency are maintained by the Quarry Manager. The Quarry Manager monitors expiry dates and arranges appropriate training as necessary and annual employee reviews are conducted to identify all required training needs.

Management will ensure Contractors are competent in key functional areas. Ongoing currency of skills will be monitored throughout the period of the contract.

All personal are trained in general and site specific Safe Work Method Statements.

Weekly tool box meetings are undertaken for quarry activities. All new Site employees and contractors shall be made aware of the PIRMP.

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drawings

attachments

Attachment 1

Incidents and Complaints Procedure

Incidents and Complaints Procedure

The objective of the Incidents and Complaints Procedure is to ensure that incidents and complaints are reported, investigated and appropriate action is taken. A summary of the Incidents and Complaints Procedure is provided below in Diagram 1 – Incidents and Complaints Procedure Summary. For further details regarding each element of the procedure refer to Attachment 1 – Incidents and Complaints Procedure.

Diagram 1 – Incidents and Complaints Procedure Summary

Receiving Complaints/Recording Incidents

The Quarry Manager will be responsible for ensuring that all employees at the site are familiar with the procedure for incidents and complaint recording. The Quarry Manager will liaise personally with the complainant to discuss the nature of the complaint, identify possible causes and explain actions to prevent further complaints.

All complaints received or any employee involved in an incident having environmental implications or who becomes aware of any situation that develops into an incident, shall be reported to the Quarry Manager or delegate as soon as practicable. Employees are to show respect and understanding to complainants.

The following details shall be recorded at the receipt of an incident or complaint:

- date, time, location and nature of the incident or complaint
- type of communication (telephone, letter, email, personal, etc.)
- name, contact address and contact telephone number of the person reporting the incident or complaint (i.e. note: if the complainant does not wish to be identified then '*not identified'* is to be recorded)
- details of incident or complaint
- response and investigation undertaken as a result of the incident or complaint
- name of person responsible for receiving and/or investigating the complaint
- response and investigation undertaken as a result of the complaint
- action taken as a result of the complaint investigation and signature of responsible person.

Step 1. Notification

When an environmental incident/complaint occurs, the Quarry Manager will notify the administering authority via telephone on 131 555 (Pollution Hotline) or local office as soon as practicable after becoming aware of any release of contaminants not in accordance with the conditions of the approval. A standard form for such notification is attached see below – INITIAL NOTIFICATION FORM.

Step 2. Investigation

All incidents and complaints should be investigated. The investigations should include:

- determining what activities (and equipment) were being carried out or operated at the time of the complaint/incident
- determining whether, at the time of the complaint, normal day to day activities were conducted
- identifying whether equipment or activities on site were the source of complaint (or whether other activities in the locality were the cause of the complaint)

- determining what potential actions may be carried out to resolve complaint and/or minimise the likelihood of further complaint or release of contaminants to the environment.

Appropriate action is to be undertaken as soon as practical, but no longer than two days, to either determine the source of the complaint, and/or minimise further impact in the case of an incident. Corrective action is to be implemented and an assessment conducted to determine what, if any, preventative action can be implemented to prevent a similar incident from occurring again. All incidents and complaints reported shall be filed in a complaint/incident register available on the site.

The incident/complaint form shall be checked by the Quarry Manager two (2) weeks after receipt of complaint to ensure appropriate corrective action has been taken and that the issue has been resolved. If monitoring is undertaken to investigate a complaint the Quarry Manager, or the consultant commissioned to undertake the study/survey, an objective summary of the results of the study/survey shall be provided to the complainant.

Step 3. Reporting

Within 14 days of the incident/emergency, in addition to the information provided in the initial notification form, provide further information to the administering authority as shown in the attached form (see FURTHER NOTIFICATION FORM).

Within fourteen (14) days of the incident/emergency the written advice of the results of any environmental monitoring (not previously supplied) in relation to the incident/emergency shall be supplied to the relevant regulatory authority.

EMERGENCY AND INCIDENT

Environment Protection Authority Initial Notification Form

This form is to be completed when notifying the EPA of any emergency or incident, which has or may cause environmental harm. The EPA is to be contacted by telephone or facsimile (of this form) within 24 hours after becoming aware of the emergency or incident.

Date: .....

Environmental Protection Licence (EPL) Number: .....

Operator's name: .....

Your name: .....

Site location: .....

Name and telephone number of contact person: .....

.....

Location of emergency or incident within Site: .....

.....

Time of the emergency / incident / event: .....

Time that operators became aware of the emergency / incident / event: .....

The suspected cause of the emergency / incident / event: .....

.....

The environmental harm caused, threatened, or suspected to be caused by the emergency / incident / event:

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Actions taken to prevent further environmental harm and mitigate any environmental harm caused by the emergency / incident / event:

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Name: ..... Signature: .....

EMERGENCY AND INCIDENT

Environment Protection Authority Further Notification Form

Not more than 14 days following the initial notification of an emergency or incident, the holder of the EPL must provide the following written advice along with the initial notification form.

This record must be kept for a period of five (5) years.

EPL Number .....

Designated contact person: .....

Date of Event: ...../...../..... Time of Event: ..... am/pm

Proposed action to prevent a recurrence of the emergency / incident / event:

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Outcomes of actions taken at the time to prevent or minimise environmental harm and / or environmental nuisance:

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Results of any environmental monitoring performed:

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Further comments:

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Name: ..... Signature: .....