

Taroborah Coal Project

Environmental Impact Statement

Section 4.13 – Environmental Values and Management of Impacts – Hazard and Risk

Prepared for:

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Table of Contents

LIST OF TABLES

4.13 HAZARD AND RISK

This section describes the potential hazards and risks to people and property, as opposed to hazards and risks associated with the natural environment, which may arise as a result of the Project.

Risk is an inherent challenge for the mining industry due to the nature and scope of the associated activities undertaken during the life of a Project. Hazard and risk assessment is a fundamental component to proactive risk management in order to foresee risks and mitigate their potential impacts prior to their development.

The following sections outline the hazards and risks which have been identified in association with the Project during construction, operation and decommissioning.

4.13.1 Description of Values

Regional values were described during the community consultation with various members of the Central Highlands Regional Council (CHRC) and local landholders.

Core to community values was natural resource management, a thriving natural environment and protection of groundwater resources.

Table 4.156 describes the values related to people and property that could be affected by the hazardous materials and operations associated with the Project.

Table 4.156 Environmental Values Relating to People and Property

Value	Context	Description
Air Quality	Health and well being	Air quality in the region is a risk to health of the local community, particularly adjoining landholders and Project employees. Potential Project impacts upon air quality (dust and particulates) include the mining, transport and handling of coal and the combustion of diesel fuel. Air quality will be monitored and regulated on a regular basis to minimise potential impacts on residents and employees.
Noise and Vibration Levels	Health and well being	Noise and vibration levels generated by coal extraction, transport, handling, washing and rock blasting are a risk to the health and well being of the community and will be monitored and regulated on a regular basis in order to minimise potential impacts upon residents and employees.

Value	Context	Description
Cultural Heritage Values	Cultural	Land associated with the Project exhibits low to medium Indigenous and non-Indigenous values relating to historical use, settlement and practices on the land. Cultural heritage management measures will be developed and employed in order to minimise Project impacts upon both known and potential (unexpected finds) sites and places of Cultural Heritage Significance
Land Use	Economic	Land within the local region is of agricultural value to landholders. The predominant land uses are low-medium intensity cattle grazing and broadacre dryland cereal cropping. The development of opencut pits, spoil dumps and underground longwall mining will impact land use
Land Value	Economic	Soil and sub-soil of the region is of value to local landholders.
Groundwater Quality	Health	Groundwater aquifers that may be potentially impacted by Project activities are of value to local landholders.
Waterway Health	Health	The quality of water in some watercourses on the Project site and in the broader area have community value, as they flow into the water supply of Emerald.
Visual Amenity	Social	Visual amenity of the natural landscape is of social value to the local and broader community, particularly adjoining landholders.
Local Community Values and Liveability	Social / Cultural	Social values are typical of a rural community influenced by the growth of the resources sector in the region.
Community Health and Safety	Social / Health	A high value is placed on the health and safety of Project employees, adjoining landholders, all members of the local community and others associated with Project activities.
Workforce Values	Social	Project workforce values are typical of industry employees.
Workforce Health and Lifestyle Values	Social	The liveability and lifestyle values of the workforce are important to individual workers.

4.13.2 Potential Impacts And Mitigation Measures

4.13.2.1 Hazard and Risk Assessment

The potential hazards and risks associated with the Project were assessed by applying the principles of risk analysis, in accordance with *Risk Management Standard 4360:2004* (Standards Australia / Standards New Zealand 2004) and *HB203:2006 Environmental Risk Management Principals and Processes* (Standards Australia / Standards New Zealand 2006), during the Preliminary Hazard Analysis (PHA), encompassing each phase of the Project (construction, operation and decommissioning).

The hazard assessment involved consultation with the Department of Community Safety, Queensland Fire and Rescue Service, Queensland Police Service and Queensland Ambulance Service in addition to the Department of Transport and Main Roads (DTMR), members of the Central Highlands Regional Council (CHRC) and the Department of Environment and Heritage Protection to gain an understanding of the scope of the impacts that may affect associated stakeholders.

Methodology

In accordance with relevant standards (Standards Australia / Standards New Zealand 2004: Standards Australia / Standards New Zealand 2006), the qualitative risk analysis framework adopted during the PHA is provided in Table 4.157 (qualitative measures of consequence), Table 4.158 (qualitative measures of likelihood) and Table 4.159 (qualitative risk analysis matrix).

These scales have been adapted to suit the circumstances and descriptions applied to each event associated with the Project.

Once the level of risk was determined, risks were then compared against pre-established criteria and risk treatments to lessen the likelihood, negative consequences or both associated with the risk.

Table 4.157 Qualitative Measure of Consequence

Level	Descriptor	Environmental Impacts	Legal	Public / Media Attention	Financial Impact
1	Catastrophic	Significant extensive detrimental long term impacts on the environment, community or public health. Catastrophic and / or extensive chronic discharge or persistent hazardous pollutant. Damage to an extensive portion of aquatic ecosystem. Long term impact on water resource.	Licence to operate likely to be revoked or not granted.	Probable public or media outcry with national / international coverage. Significant green NGO campaign.	>$1million
2	Major	Off-site release contained with outside assistance. Short to medium term detrimental environmental impact off-site or long term environmental damage on-site.	May involve significant litigation and fines. Specific focus from regulator.	May attract attention of local and state media and local community groups.	$500,000 - $1 million
3	Moderate	Onsite release contained with outside assistance. Significant discharge of pollutant, a possible source of community annoyance. Non persistent, but possible widespread damage to land. Damage that can be remediated without long term loss or very localised long persistent damage.	Probably serious breach of regulation. Possible prosecution and/or fine. Significant difficulties or delays experienced in gaining future approvals.	May attract attention from local media, heightened concern by local community.	$50,000 – $500,000
4	Minor	On site release immediately contained without outside assistance. Ongoing or repeat exceedances of odour, dust or noise / vibration limits.	Minor on the spot fines or formal written correspondence from regulator.	Local community attention or repeated complaints.	$5,000 – $50,000
5	Insignificant	Negligible environmental impact. Minor transient release of pollutant including odour, dust and noise / vibration.	No serious breach of regulation. Minor licence non-compliances.	Local landholder verbal discussion / complaint.	Less than $5,000

Source: *Environmental Risk Management – Principles and Process. HB 203:2006.* (Standards Australia/Standards New Zealand, 2006).

Table 4.158 Qualitative Measures of Likelihood

Level	Descriptor	Example	Frequency
A	Almost certain	Is expected to occur in most circumstances	> Once per year
B	Likely	Will probably occur in most circumstances	Once per year
C	Possible	Could occur	Once every 5 years
D	Unlikely	Could occur but not expected	May happen within Project life
E	Rare	Occurs in only exceptional circumstances	Not likely to happen within Project life

Source: *Environmental Risk Management – Principles and Process. HB 203:2006.* (Standards Australia/Standards New Zealand, 2006).

Table 4.159 Qualitative Risk Analysis Matrix – Levels of Risk

Likelihood	Consequences				
	1 Catastrophic	2 Major	3 Moderate	4 Minor	5 Insignificant
A - Almost certain	E	E	E	H	H
B - Likely	E	E	H	H	M
C - Possible	E	E	H	M	L
D - Unlikely	E	H	M	L	L
E - Rare	H	H	M	L	L

Source: *Environmental Risk Management – Principles and Process. HB 203:2006.* (Standards Australia/Standards New Zealand, 2006).

Legend:

E = Extreme risk; immediate action required.

H = High risk; senior management attention needed.

M = Moderate risk; management responsibility must be specified.

L = Low risk; manage by routine procedures.

Hazard Analysis

Natural and man-made hazards associated with the Project were considered during the PHA and their subsequent interaction with people and property to identify the cumulative impact to surrounding land uses and values.

During the PHA, technical and / or natural hazards were identified which could pose a risk to people, property or surrounding land uses during the construction, operation and decommissioning phases of the Project as outlined below.

Construction Hazards

Construction of the Project will involve the transport of equipment, materials and machinery, clearing of vegetation and the construction of infrastructure on site. Associated with these activities are the following hazards:

- Transport, storage, handling and use of chemicals and dangerous goods;
- Operation of both light and heavy vehicles;
- Water storages;
- Exposure to sources of heat, pressure, electricity; and
- Contact with potentially harmful wildlife (e.g. snakes).

Operational Hazards

In addition to those hazards identified during the construction phase of the Project, activities occurring during the operations or production phase of the Project are primarily associated with coal mining. Rehabilitation will also begin progressively throughout the operations stage, as areas become available. The major hazards associated with operational activities include the following:

- Interaction with mine structures such as the mined pit, regulated dams, Coal Preparation Plant (CPP), ROM stockpiles, spoil dumps, conveyor and truck loading etc.
- Use of and potential contact with explosives; and
- Operation and interaction of light and heavy vehicles, machinery and equipment.

Decommissioning Hazards

Further rehabilitation activities will occur during the decommissioning phase of the Project and similar hazards will exist throughout this phase such as the interaction with machinery and equipment and contact with potentially harmful wildlife. Additional hazards unique to the decommissioning phase of the Project will include the dismantling and removal of infrastructure from the site.

Risk Assessment

Initially, the likelihood and associated consequence value was determined for each hazard associated with the Project to qualify the level of risk associated with each event.

Prior to the application of control strategies, 19 hazards were assigned an extreme risk rating, 51 hazards were assigned a high risk rating and 10 hazards were assigned a medium risk rating.

Following the application of control strategies, all extreme risks were eliminated and many other risk categories were reduced. The remaining residual risk categories associated with the hazards identified on the Project include 2 high risks, 29 medium risks and 57 low risks.

Table 4.160 below indicates the hazards assessed during the PHA which were assigned a high risk rating following application of associated control measures to reduce the initial level of risk associated with each hazard. Note that these residual high risks are associated with the consequences of possible serious injury or death, rather than the likelihood of this occurring.

Table 4.160 Hazards Associated with a High Risk Level

Hazard	Potential Impact	Control Measure
Operation of light and heavy vehicles, machinery and equipment	Personal Injury	Site Procedures
Dismantling and removal of infrastructure on decommissioning	Death or injury	Operational procedures, training, emergency response, first aid

Table 4.161 below indicates the hazards assessed during the PHA which were assigned a medium risk rating following application of associated control measures in order to reduce the initial level of risk associated with each hazard.

Table 4.161 Hazards Associated with a Medium Risk

Hazard	Potential Impact	Control Measure
Clearing/Topsoil Stripping	Loss of flora and fauna	Detailed flora/fauna studies in design/planning phase, progressive rehabilitation and biodiversity offsets
Blast	Odour nuisance	Correctly designed shots, quality blasting products and blasting clearance zones
Coal/waste Loading	Wall failure	Geotechnical studies undertaken, engineered pit design, exclusion zones, ROPS on vehicles
Spoil Dumps	Land contamination	Progressive rehabilitation, dirty water containment, surface water/groundwater monitoring programme
	Surface water contamination discharge off site	Progressive rehabilitation, dirty water containment, surface water monitoring programme
	Groundwater contamination	Progressive rehabilitation, dirty water containment, /groundwater monitoring programme
	Slope stability/mass failure	Engineered spoil dump design
ROM stockpile	Noise nuisance	Noise attenuation on equipment and adequate compensation of affected sensitive receivers
	Dust nuisance	Dust suppression spraying, adequate compensation of affected sensitive receivers
	Land contamination	Site dirty water containment system, final rehabilitation

Hazard	Potential Impact	Control Measure
In-Pit Rejects Disposal Facility	Groundwater contamination	Groundwater studies, monitoring piezometers, low permeability, selective placement of spoil
	Surface water contamination	Rejects capped below surface level, Cover and progressive rehabilitation, dirty water containment, surface water/groundwater monitoring programme, engineered design
Regulated Dams	Land contamination (dam overflow)	Engineered Dam design, operational procedures in place, regular inspections, annual engineering inspection by registered engineer, progressive rehabilitation
	Surface water contamination (dam overflow)	Engineered Dam design, operational procedures in place, regular inspections, annual engineering inspection by registered engineer, progressive rehabilitation. Dirty water containment on-site
	Land contamination (dam pipeline rupture)	Pipelines protected from vehicles, daily inspections, regular pipeline maintenance, engineering design
	Surface water contamination (dam pipeline rupture)	Pipelines protected from vehicles, daily inspections, regular pipeline maintenance, engineering design
	Groundwater contamination(dam pipeline rupture)	Pipelines protected from vehicles, daily inspections, regular pipeline maintenance, interception trench and pump back system
	Land contamination (wall failure)	Engineered Dam design, operational procedures in place, regular inspections, annual engineering inspection by registered engineer, engineered spillway

Hazard	Potential Impact	Control Measure
	Surface water contamination (wall failure)	Engineered Dam design, operational procedures in place, regular inspections, annual engineering inspection by registered engineer, engineered spillway
	Groundwater contamination (wall failure)	Engineered Dam design, operational procedures in place, regular inspections, annual engineering inspection by registered engineer, engineered spillway
Rehabilitation	Erosion	Monitoring of rehabilitation, assess failure mechanisms, rework rehabilitation based on amended strategy, rehabilitation design including sediment control structures
Ignition sources (workshop, process plant, clearing activities)	Loss of habitat, loss of fauna species	Fire breaks around lease boundaries, maintained annually. Fire extinguishers in all vehicles, adequate water supplies and training for firefighting. Site water trucks with firefighting capabilities, slashing and cleaning around ignition sources
Flooding	Surface water contamination (erosion)	Site dirty water containment
	Land contamination	Site dirty water containment, final rehabilitation, contaminated land assessment and remedial action such as removal of soil
	Land contamination (dam overflow)	Engineered Dam design, operational procedures in place, regular inspections, annual engineering inspection by registered engineer, progressive rehabilitation

Hazard	Potential Impact	Control Measure
	Surface water contamination (dam overflow)	Engineered Dam design, operational procedures in place, regular inspections, annual engineering inspection by registered engineer, progressive rehabilitation. Dirty water containment on-site
Cyclones	Infrastructure collapse	Engineered infrastructure design, regular inspections by registered engineer, emergency procedures
Harmful wildlife	Illness	Staff induction, safety awareness, emergency response, first aid, immediate medical attention
	Illness, injury, possible death	Staff induction, safety awareness, emergency response, first aid, immediate medical attention, anti-venom

4.13.2.2 Dangerous Goods

In Australia at present, chemicals may be classified as hazardous substances or dangerous goods or both. In line with the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), hazardous substances or dangerous goods are now classified as hazardous chemicals (The State of Queensland (Department of Justice and Attorney-General) 2009) and are regulated by the Queensland *Work Health and Safety Act 2011* (the WHS Act).

The *Australian Code for the Transport of Dangerous Goods by Road and Rail 7th Edition* (National Transport Commission 2011) sets out the requirements for the transport, storage, handling and use of dangerous goods in order to minimise the likelihood of accidents and spillages. Under Australian and international standards, classes of dangerous goods that may be used for Project activities are:

- Class 1 (Division 1.1) - Substances and articles which have a mass explosion hazard;
- Class 1 (Division 1.2) - Substances and articles which have a projection hazard but not a mass explosion hazard;
- Class 1 (Division 1.3) - Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard;
- Class 1 (Division 1.5) - Very insensitive substances which have a mass explosion hazard;
- Class 2 (Division 2. – Flammable gases;

- Class 2 (Division 2.2) – Non-flammable, non-toxic gases;
- Class 3 – Flammable liquids;
- Class 4 (Division 4.1) – Flammable solids;
- Class 4 (Division 4.2) – Substances liable to spontaneous combustion;
- Class 5 (Division 5.1) – Oxidising agents;
- Class 6 (Division 6.1) – Toxic substances;
- Class 8 – Corrosive substances; and
- Class 9 – Miscellaneous dangerous goods.

Table 4.162 provides an inventory of dangerous goods that have the potential to cause harm to people and / or property that will likely be used and stored onsite during the life of the Project.

Table 4.162 Dangerous Goods Stored on the Project Site

Dangerous Goods (correct shipping name)	Dangerous Goods Class	U.N. Number	Packaging Group	Total Annual Consumption
Detonators, primers, boosters, cord	1.1	0029, 0030, 0042, 0065	n/a	11,250 kg
ANFO: Explosives, Blasting, Type B / Agent, Blasting Type B	1.1 / 1.5	0082 / 0331	n/a	4,050,000 kg
Nitric oxide and dinitrogen tetroxide mixture (nitric oxide and nitrogen dioxide mixture)	2.3	1971	n/a	Limited volumes stored
Petroleum gases, liquefied	2	1075	n/a	Limited volumes stored
Acetylene (Acetylene, Dissolved)	2.1	1001	n/a	Limited volumes stored
Nitrogen, refrigerated liquid	2.2	1977	n/a	Limited volumes stored
Oxygen, compressed	2.2	1072	n/a	Limited volumes stored
Paint (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or Paint related material (including paint thinning or reducing compound)	3	1263	I, II, or III	Limited volumes stored
Gas oil or diesel fuel or heating oil, light	3	1202	III	20,250,000 L
Petroleum distillates, N.O.S or petroleum products, N.O.S	3	1203	II	210,000 L
Acetone	3	1090	II	Limited volumes stored
Formaldehyde solution, flammable	3	1198	III	Limited volumes stored
Batteries, wet, filled with acid, electric storage / Sulphuric acid with not more than 51% acid or battery fluid, acid	8	2794 / 2796	II	Limited volumes stored

Hazardous Chemical Properties

Hazards presented by flammable and combustible liquids may potentially include:

a) Flammability - the potential to burn or explode when ignited;

b) Instability - the potential to undergo a spontaneous reaction (e.g. decomposition, polymerization), which could be violent;

c) Reactivity - the potential to react with other chemicals, water or fire-extinguishing media;

d) Toxicity - the immediate, delayed or long-term health effects on humans or animals, through inhalation, skin absorption or ingestion;

e) Environmental impact, including ecotoxicity - the effect on the environment, in particular to aquatic life; and

f) Corrosivity - the potential corrosive chemical action on other materials, in particular, packaging and living tissue (including skin).

Further information on the hazardous chemical properties associated with those chemicals used and stored on the Project site may be obtained from product labels, MSDS and the supplier of the liquids.

Storage Requirements of Hazardous Chemicals

In order to prevent a hazardous chemical spill or emergency event, hazardous chemicals on the Project site will be stored in accordance with the relevant Australian Standards as follows:

- *AS 3780 – 1994 The storage and handling of corrosive substances* - Provides requirements and recommendations for the storage and handling of corrosive substances;

- *AS 1940 – 2004 The storage and handling of flammable and combustible liquids* - Deals with flammable liquids of dangerous goods Class 3 and combustible liquids. Provides requirements and recommendations that are based on industry best practices; and

- *AS 2187.1 – 1998 Explosives – Storage, transport and use Part 1: Storage* - Provides acceptable requirements to ensure the security and safety of explosives and detonators.

However**,** notwithstanding the requirements of any Australian Standard, any liquids stored on site that have the potential to cause environmental harm will be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land.

Where no relevant Australian Standard is available, bunds will be designed to contain the following capacities:

a) Storage tanks shall be bunded so that the capacity and construction of the bund is sufficient to contain at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas; and

b) Drum storages will be bunded so that the capacity and construction of the bund is sufficient to contain at least 25% of the maximum design storage volume within the bund.

Hazardous Chemical Safeguards

General requirements for the storage, handling, use and transport of hazardous goods associated with the Project are:

- Material Safety Data Sheets (MSDS) will be used for all hazardous chemicals on the Project site and will be made available at storage and office locations;
- All hazardous chemicals kept on the Project site will be stored in accordance with current Australian standards; and
- Transport of dangerous goods to and from the Project site will be undertaken according to the requirements of the *Australian Code for the Transport of Dangerous Goods by Road and Rail 7th Edition (National Transport Commission 2011)*.

4.13.2.3 Natural Hazards

According to historical and contemporary meteorological data defined throughout Section 4.1, bushfires, droughts, floods and cyclones are all relevant natural hazards associated with the Project area.

These natural hazards were addressed during the PHA and considered in harmony with the principles of natural hazard management in *State Planning Policy 1/03 (SPP1/03), Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*.

Fires/Bushfires

The fire season in the Project region occurs during the dry spring months. Within the Project area, the risk of fire varies from low to medium.

Where necessary, fire breaks will be constructed around the Project site to reduce the likelihood of fire hazards. Fire fighting equipment will be provided at various locations around the Project site, including all buildings and infrastructure areas.

Droughts

Data captured by the Bureau of Meteorology (BOM 2013e), provided in Section 4.1, indicates no areas within the State of Queensland have experienced serious or sever rainfall deficiencies over the last 36 months. However, notwithstanding current expectations, the water management system designed for the Project site has considered worst case effects of drought in water storage design, emergency supply and management.

Floods

Flooding has the ability to create surface water run-off, potentially causing contamination of land and waterways within and surrounding the Project site.

Flooding has been considered and incorporated in the design of water management structures which will be constructed to provide adequate Annual Exceedance Probability (AEP) flood protection. The Project has also been assessed where final voids, spoil dumps and infrastructure at the end of mining would lie in relation to flood levels up to and including the 'probable maximum flood level' based on the BOM 'probable maximum precipitation' forecast for the region. Details of the flood modelling and

mitigation are provided in Section 4.5.

Cyclones

Over a 100 year period from 1906 to 2006, the average annual number of tropical cyclones within the vicinity of the Project area was recorded at less than 0.4 (BOM 2013d). Tropical cyclones are hazardous because they produce destructive winds and heavy rainfall with flooding, which shall be mitigated through the flood protection measures described throughout Section 4.5.

4.13.2.4 Spillage Management

Prevention

Spills may be prevented with correct handling and management. The following handling precautions as detailed within AS 1940 – 2004 *The storage and handling of flammable and combustible liquids* should be observed when handling packaged liquids:

a) Packages shall be handled in a manner that will reduce the likelihood of spills and leaks;

b) Appropriate personal protective equipment (PPE), as specified in the appropriate MSDS, shall be available for use;

c) Where packages or Intermediate Bulk Containers[1] (IBCs) are to be palletized, they shall be protected from the possibility of punctures or tears caused by splinters or nails in the pallets;

d) All movement of packages shall be subject to manual handling risk controls for the packages concerned; and

e) Packages shall not be pressurized in order to transfer their contents.

Safety

Always refer to the MSDS describing the properties of the liquids and the appropriate first aid and safe handling measures before making direct contact with a hazardous substance.

Action Plan

Table 4.163 details the emergency action plan to be undertaken by site personnel in the event of a hazardous chemical spill that is deemed safe for on-site staff to attend.

[1] Not more than 3000 L for solids and liquids (AS 1940-2004)

Table 4.163 Spill Management Action Plan

ACTION	DESCRIPTION
Spill / Release Detected	Assess the situation for remaining potential dangers If the incident is beyond the scope of site based emergency personnel or a threat to human life is posed contact emergency services without delay by calling triple zero (000), and relaying the words 'emergency, emergency, emergency' over the site radios
Trace the source of the release	Put on appropriate PPE Locate the cause of the release ***if safe to do so*** Determine if spill is still occurring
If safe to do so, prevent further release	Stop or limit further release by fixing (temporarily or permanently) the source point
Isolate the area	Display warning signs and / or use warning tape to limit unnecessary access to the area (particularly for larger spills) Turn off any potential ignition sources
Contain the spill	Use absorbent material (e.g. booms, pads, granules) or temporary earthen bund or drains to contain spill or direct away from stormwater drainage systems *DO NOT SPREAD OR DILUTE SPILLS WITH DEGREASERS, DETERGENTS OR WATER*
Recover the Product	Recover the spilled product (free liquid) by pumping into containers or tanks (if possible) Construct a temporary sump/dam to allow for a central collection point of spilt product (if appropriate) Use absorbent materials to collect the remainder of product if applicable
POST INCIDENT ACTIVITIES	
Complete an incident report form.	Individual whom initially reported incident to supervisor/manager to complete an incident report form
Clean equipment	Clean equipment used in the response (NOTE: the same protective clothing worn during the spill clean-up should be worn whilst cleaning the contaminated equipment) Porous material and equipment (e.g. brooms, leather shoes, cloth hats, gloves, contaminated clothing) that cannot be effectively decontaminated shall be discarded or destroyed if dealing with hazardous products

ACTION	DESCRIPTION
Replace used equipment	Shift supervisor/foreperson to replace absorbent equipment used from spill response kits
Restore the area to its original condition	DO NOT wash down the remaining product Clean site with absorbent material (e.g. roll, pads, mops) Recover absorbent material and transport to designated storage area (seek advice from the Site Environmental Co-ordinator if necessary) Contaminated soil to be excavated and transported to the appropriate area (on advice from Site Environmental Co-ordinator).
Post release monitoring	Site Environmental Co-ordinator to inspect the runoff / release site and ensure clean-up is satisfactory (if required) Site Environmental Co-ordinator to develop and implement a post remediation monitoring program to assess and monitor the impact to groundwater and surface water (if required) Monitoring should be undertaken at the release point and downstream of any release
Incident Investigation and Corrective Actions implemented	Site Environmental Officer to undertake incident investigation. Corrective actions and recommendations that result from investigation to be reviewed, approved, and implemented by management

4.13.2.5 Hazard Prevention and Management

An Integrated Risk Management Plan (IRMP) has been developed for the Project to facilitate assessment of the associated risks with each phase of the Project during the construction, operation and decommissioning phase.

Integrated risk management is a process designed to ensure safety assurance of potentially hazardous projects and takes into account both technical and the broader safety implications of potentially hazardous operations.

The IRMP outlines the way in which, and at what point, the Project will conduct an array of risk identification techniques including:

- *Operational Hazard Analysis* - to identify potential hazards and operational problems in terms of plant design and human error;
- *Fire Safety Assessment* – to be conducted as early as possible in the detailed design stage of the Project. To ensure that the proposed fire prevention, detection, protection and fighting measures are appropriate for the specific fire hazard and adequate to meet the extent of potential fires for the Project; and
- *Construction Safety Assessment* - to facilitate a systematic approach to the identification and management of construction and commissioning hazards.

Hazard Audits

Independent hazard audits will be conducted to identify previously unrecognised hazards and early recognition of below standard performance in areas such as management controls and the maintenance and testing of equipment (NSW Department of Planning 2011d).

The aim of a hazard audit is to evaluate the nature and scale of hazards and the systems — both hardware and software — that are used to control these hazards (NSW Department of Planning 2011d).

Emergency Response Plan

An Emergency Response Plan (ERP) is required to be developed under Section 35 of the *Mining and Quarrying Safety and Health Regulation 2001*. Section 35 of the Regulation states that the ERP must be developed with regard to the risk management process carried out under Section 32 of the regulation as follows:

- *Prepare the mine for managing and controlling the hazards causing the emergencies;*
- *Detect emergencies;*
- *Respond appropriately to the emergencies;*
- *Coordinate control of emergencies;*
- *Give notice, information and warnings about emergencies;*
- *The immediate availability of trained rescue persons or emergency services;*
- *Locating, and accounting for persons;*
- *Controlling or re-establishing control of the hazard causing the emergency;*
- *Isolating the area of the incident, including, for example, by cutting off the supply of energy to the area of the incident;*
- *Emergency egress and evacuation, including refuges;*
- *First aid and persons trained in giving first aid;*
- *Liaising with, and using, local or state emergency services; and*
- *Backup services and facilities for the emergency.*

The ERP shall be developed and updated consistently during the various stages of the Project in consideration to the hazards present and the controls in place.