

## 20.1 Description of Environmental Values

This section examines the potential hazards and risks to people and property associated with the ECMP during the construction and operational phases. The potential impacts on existing community values resulting from air, noise and vibration and health and safety are addressed in Sections 11.1.6, 12.2.3 and 18.2.1 respectively. The risks to ECMP employees, contractors and public have been assessed and where appropriate, mitigation measures are described. Emergency response planning and incident management strategies linked to the outcomes of the hazard and risk assessment have been incorporated into the EM Plan (Section 22).

The hazard and risk assessment has been undertaken in accordance with AS/NZS 4360:2004 *Risk Management*.

### 20.1.1 Safety Management Systems

The ECMP SMS will apply to the project construction and operational phases and has been based on the AS/NZS 4801 *Occupational Health and Safety Management Systems*. The SMS represents a formalisation of the systems, standards, methods and procedures that will be applied to ensure the mitigation of risk associated with hazards that are relevant to construction and mining activities. The SMS reflects the Proponents belief that all injuries and environmental exposures are preventable through demonstrated leadership and the application of this system through their policy and operating philosophy. The system model is presented in more detail in Section 18.2.4 (Health and Safety).

### 20.1.2 Legislative and Australian Standards

Table 20.1.1 identifies the relevant legislation and regulatory requirements applicable to the ECMP and details how the project will achieve compliance with legislative standards.

**Table 20.1.1 Applicable Legislation and Compliance Requirements**

Legislation	Legislative Requirement	Compliance
<i>Coal Mining Safety and Health Act 1999 (CMSH Act)</i>	The objective of the Act is to protect the health and safety of persons at a coal mining operation and ensure activities are undertaken at an acceptable level of risk.	The ECMP Safety Management System has been developed and implemented with due consideration to the requirements of the Act.
<i>Coal Mining Safety and Health Regulation 2001</i>	The objective of the regulation is to establish minimum mandatory health and safety standards to be maintained at a coal mining operation.	The ECMP Safety Management System has been developed and implemented with due consideration to the requirements of the regulation.
<i>Explosives Act 1999</i>	The Act sets out the requirements for the handling, storage, transport and manufacture of explosives.	The use and handling of explosive materials will be in compliance with the Act.
<i>Explosives Regulation 2003</i>	Establishes minimum mandatory for the handling, storage, transport and manufacture of explosives.	The use and handling of explosive materials will be in compliance with the regulation.
Dangerous Goods Safety Management Act 2001 (QLD)	Permit required for the storage of flammable and combustible liquids from the relevant local Council.	All necessary permits will be obtained to store flammable and combustible material.
<i>Transport Operations (Road Use Management) Act 1995</i>	Set standards for the transport and storage of substances and the systems to be adopted based on these substances.	The storage and transport of substances will be in accordance with the requirements of the Act and relevant Australian standard (AS.)
AS1940 - 2004: <i>The storage and handling of flammable and combustible liquids</i>	Specifies requirements for the safe storage and handling of flammable and combustible liquids.	The design and construction of storages of appropriate substances will be based on principles contained in the AS.
AS 2187.1-1998/Amdt 1-2000 : <i>Explosives - Storage,</i>	Specifies requirements for the safe storage, transport and handling of	The storage, transport and use explosive materials will be based on

Legislation	Legislative Requirement	Compliance
<i>transport and use - Storage</i>	explosives and detonators.	principles contained in the AS.
AS 2187.2-2006 : <i>Explosives - Storage and use - Use of explosives</i>	Specifies requirements for the safe use of explosives and detonators.	The use and handling of explosive materials will be based on principles contained in the AS.
AS4360:2004 <i>Risk management</i>	Describes the elements of the risk management process.	ECMP risks will be assessed and controlled in accordance with the AS.
AS4801:2001 <i>Occupational health and safety management systems</i>	Specifies requirements for an OHSM to enable formation of policy and objectives.	ECMP Safety Management System developed in accordance with the AS.

## 20.2 Potential Impacts and Mitigation Measures

### 20.2.1 Dangerous Goods Management

The ECMP will use dangerous goods and hazardous substances, including fuel, oil and explosives. Transportation of hazardous goods will be undertaken in accordance with the *Dangerous Goods Safety Management Act 2001* and the *Transport Operations (Road Use Management) Act 1995*. Fuels and oils will be stored in accordance with AS1940 - 2004: *The storage and handling of flammable and combustible liquids*. ECMP will purchase a chemical database (Chem Alert) for the storage of Material Safety Data Sheets (MSDSs). The use and storage of all dangerous goods and hazardous substances that are used on-site will be communicated to the construction and operational staff during the induction program and in on-going training programs.

The transportation, handling, storage and use of explosives will be subject to a task specific risk assessment and the implementation of controls. Contractors and mining personnel will be required to work in accordance with the:

- *Explosives Act 1999*;
- *Explosives Regulation 2003*;
- *Coal Mining Safety and Health Regulation 2001*;
- *AS 2187.1-1998/Amdt 1-2000: Explosives - Storage, transport and use – Storage*; and
- *AS 2187.2-2006: Explosives - Storage and use - Use of explosives*.

Table 20.2.1 provides an indicative summary of the dangerous goods and hazardous substances that may be used throughout the construction and operational phases of the project.

**Table 20.2.1 Dangerous Goods and Hazardous Substances Used and Stored at the ECMP**

Chemical Name	DG Class	UN No.	Packaging Group	Raw conc. (wt%)	Storage conc. (wt%)	Purpose/use
Diesel Fuel	3 (Class C1)*	1202	III	N/A	N/A	Fuel for mobile equipment
Lubrication oils (hydraulic oil)	3 (Class C2)**	N/A	N/A	N/A	N/A	Lubricate plant and equipment
Longwall lubrication emulsion	N/A	N/A	N/A	N/A	N/A	Lubricating agent for longwall machinery.
Methyl Isobutyl Carbinol (MIBC)	3	2053	III	N/A	N/A	Frothing agent in CHPP
Hypochlorite Solution (Chlorine)	8	1791	II or III	N/A	N/A	Potable water treatment
Lime (Calcium oxide)	8	1910	III	93	93	Potable water treatment
Caustic Soda	8	1823	II	50	50	Concrete degreasing agent
Packaged explosives	1.1	0082	III	N/A	N/A	Box cut blasting or Underground blasting
Solvents	3	1090	III	99.5	99.5	Plant maintenance
Paints	3	1263	III	N/A	N/A	Paint

\* C1 – a combustible liquid that has a flashpoint 150°C or less.

\*\* Class C2—a combustible liquid that has a flashpoint exceeding 150°C.

### 20.2.1.1 Construction Phase

Table 20.2.2 provides an indicative list of dangerous goods and hazardous substances that will be used during construction. The table details the relevant rate of usage and the maximum storage capacity during the construction period.

**Table 20.2.2 Dangerous Goods and Hazardous Substances Storage and Usage – Construction**

Chemical Name	Max Inventory	Indicative Rate of Usage
Diesel Fuel	Two 26 kL tanks in separate facilities	230,000 L/y
Lubrication oils	5,000 L	10,000 L/y
Hypochlorite Solution	500 L	460 L/month

### 20.2.1.2 Operational Phase

Table 20.2.3 provides an indicative list of dangerous goods and hazardous substances that will be used throughout the operation. The table details the relevant rate of usage and the maximum storage capacity throughout the operation.

**Table 20.2.3 Dangerous Goods and Hazardous Substances Storage and Usage – Operations**

Chemical Name	Max Inventory	Indicative Rate of Usage
Diesel Fuel	Two 26 kL tanks in separate facilities	2,300,000 L/y
Longwall lubrication emulsion	Two 20 kL tanks in separate facilities	120,000 L/y
Lubrication oils	10,000 L	85,000 L/y
Methyl Isobutyl Carbinol (MIBC)	Two 26 kL tanks in single facility	150,000 L/y
Hypochlorite Solution	500 L	5,000 L/y
Lime (Calcium oxide)	20 kg	5 kg/month
Caustic Soda	1,000 kg	100 kg/month
Explosives (ANFO) – for box cut preparation	500kg (TBC)	7,000 t/y
Explosives (Power gel) – for underground operation	100 kg	1,000 kg/y
Solvents	300 L	50 L/month

## 20.2.2 Risk Management Framework

A preliminary hazard assessment (PHA) was conducted for the EIS. The preliminary hazard and risk assessment has been undertaken in accordance with AS/NZS 4360:2004 *Risk Management*. The assessment outlines the implications for the ECMP and the potential hazards and risks to people and property.

The PHA involved:

- understanding the intended operations and the proposed design of the Project (described in Section 2);
- identifying the hazards during the construction and operational phase;
- developing risk scenarios in the form of risk tables;
- establishing possible causes and consequences from the hazards and appropriate mitigation measures;
- assessment of the risk level associated with each hazard scenario using qualitative methods;
- qualitative assessment of the risks levels associated with natural hazards and external risks to the public and major infrastructure; and
- providing recommendations for the most appropriate management systems needed to minimise potential impacts from hazardous incidents.

The context for the assessment of the PHA has considered the:

- frequency of potential hazards, accidents, spillages and abnormal events occurring;
- cumulative risk levels to surrounding land uses;
- duration of any identified hazards;
- hazardous substances that will be used, stored, processed, produced or transported;
- rate of hazardous substance usage;
- types of processes, machinery and equipment used; and
- potential wildlife hazards such as snakes.

### 20.2.2.1 Risk Assessment Methodology

Hazard identification was based on a project checklist developed in conjunction with an experienced project team familiar with similar projects and regional conditions. The Department of Emergency Services (DES), now DCS, including the Queensland Fire and Rescue Authority (QFRA) and the Queensland Ambulance Service (QAS) were consulted to ensure that the regional emergency response capability is sufficient to address the hazards contained within the PHA.

For each hazard identified, the following matters were considered:

- potential causes of hazards and the likelihood of each cause occurring, taking into account existing proposed control measures;
- consequence of each hazardous incident occurring;
- assessment of the severity of the consequences, considering the potential mitigation measures
- proposed controls and mitigation measures for each hazard, including preventative and responsive measures.

### 20.2.2.2 Risk Assessment Criteria

Risk is measured in terms of a combination of the consequences of an event and the likelihood of that event occurring. The consequences assessed are based on the definitions shown in Table 20.2.4 and are rated based on the implementation of control measures. Table 20.2.5 defines the likelihood of occurrence that can be assigned to potentially hazardous incidents.

By assigning consequence and likelihood ratings for each of the potential hazardous incidents, the level of risk can be determined by using the qualitative risk assessment matrix, developed in accordance with AS/NZS 4360:2004 and shown in Table 20.2.6.

Project risks which have been identified and assessed during the construction or operations are summarised in Table 20.2.7 and Table 20.2.8. Hazards that represent a higher order risk have the highest priority for application of additional risk controls. Low risk hazards are subject to existing operational controls that will be continuously improved as part of the SMS.

**Table 20.2.4 Consequence Categories for Loss**

Consequence rank	Descriptor	Health and Safety	Community and Reputation	Property Loss	Environmental Sensitivity
1	Insignificant	Slight injury or health effects	Public awareness but no concern	No loss of infrastructure and easily rectified	Release with no damage to on or off-site natural resources
2	Minor	Minor injury or health effects	Limited local public concern	Superficial damage to infrastructure	Short term detrimental effect with full recovery
3	Moderate	Major injury or health effects	Regional public concern	Moderate damage to infrastructure	Serious medium term environmental effects
4	Major	Permanent total disability	National public concern	Major damage to infrastructure	Long term detrimental effects but reversible effects
5	Catastrophic	Multiple fatalities	International public concern	Future operation/use of infrastructure seriously affected	Irreversible damage to natural resources

Table 20.2.5 Likelihood of Occurrence for Hazardous Incidents

Probability Rank	Descriptor	Description	Frequency of Occurrence
A	Almost Certain	The event is expected to occur in most circumstances	1 per month
B	Likely	The event will probably occur in most circumstances	1 per year
C	Possible	The event might occur at some time	1 in 10 years
D	Unlikely	The event could occur at some time	1 in 100 years
E	Rare	The event may only occur in exceptional circumstances	1 in 1,000 years

Table 20.2.6 Risk Assessment Matrix

Likelihood	Risk Level				
	(1) Insignificant	(2) Minor	(3) Moderate	(4) Major	(5) Catastrophic
Almost Certain (A)	Medium	High	High	Extreme	Extreme
Likely (B)	Medium	Medium	High	Extreme	Extreme
Possible (C)	Low	Medium	High	High	Extreme
Unlikely (D)	Low	Low	Medium	High	High
Rare (E)	Low	Low	Medium	Medium	High

### 20.2.3 Construction Hazard Identification

The hazard and risk assessment for the construction phase is shown in Table 20.2.7, with C denoting Consequence and L denoting Likelihood.

Table 20.2.7 Construction Risk Assessment Table

No	Risk Description	Principal Controls	Risk Profile		Risk Level
			C	L	
02	Water runoff causes downstream impact (e.g. downstream water quality impact or dam construction failure)	<ul style="list-style-type: none"> <li>Water management plan;</li> <li>Positive evaporation rate;</li> <li>Known creek systems downstream of CHPP;</li> <li>Waste emplacement facility has sediment dams to capture sediment;</li> <li>Dam integrity is high with appropriate design and construction method.</li> </ul>	2	D	Low
06	Pests/weeds transported to site during construction or from site to other properties	<ul style="list-style-type: none"> <li>Clean high risk plant/vehicles prior to entering/leaving site;</li> <li>Weed mapping of operation properties.</li> </ul>	2	D	Low
07	Explosion	<ul style="list-style-type: none"> <li>Explosive standard operating procedures (SOPs);</li> <li>Explosive storage designed to AS;</li> <li>Gas monitoring controls</li> <li>Intrinsically safe and explosion protected equipment in relevant zoned areas;</li> <li>Mine ventilation;</li> </ul>	5	E	High

No	Risk Description	Principal Controls	Risk Profile		Risk Level
			C	L	
		<ul style="list-style-type: none"> <li>Mine gas management procedures;</li> <li>Fire management systems (underground and surface);</li> <li>Coordination with external emergency services.</li> </ul>			
08	Bushfire	<ul style="list-style-type: none"> <li>Set-back of buildings and infrastructure from hazardous vegetation;</li> <li>Reliable water supply for fire fighting;</li> <li>Maintenance of firebreaks;</li> <li>Documented Emergency Response Plan;</li> <li>Coordination with external emergency services.</li> </ul>	3	C	High
10	Chemical release - liquid from leaks, ruptures, overflows, spillages. Release to atmosphere	<ul style="list-style-type: none"> <li>All storage and handling facilities designed and operated in accordance with AS;</li> <li>Hazard and Operability (HAZOP) review undertaken during design stage;</li> <li>Personnel trained in appropriate storage and handling and incident response;</li> <li>MSDS available on-site;</li> <li>Appropriate spill response/incident equipment and training;</li> <li>Preventative maintenance program.</li> </ul>	2	C	Medium
11	Chemical release - liquid from leaks, ruptures, overflows, spillages. Release to surface/groundwater	<ul style="list-style-type: none"> <li>All storage and handling facilities designed and operated in accordance with AS;</li> <li>HAZOP review undertaken during design stage;</li> <li>Site drainage designed for retention of spills on-site;</li> <li>Personnel trained in appropriate storage and handling and incident response;</li> <li>MSDS available on-site;</li> <li>Appropriate spill response/incident equipment and training;</li> <li>Preventative maintenance program.</li> </ul>	2	C	Medium
12	Transport incident relating to bus in transit to and from camp/Mackay	<ul style="list-style-type: none"> <li>Externally engaged bus company.</li> </ul>	5	E	High
13	Emergency response to incident results in accident	<ul style="list-style-type: none"> <li>External emergency response organisations (QMRS and emergency services);</li> <li>Emergency response management plan;</li> <li>External Mine Rescue Station;</li> <li>Standard 555 emergency response number;</li> <li>Level 2,3,4 Emergency response exercises;</li> <li>First response training.</li> </ul>	5	E	High
14	Cultural heritage - Mining operations adversely impact on sites of cultural heritage (Aboriginal or Archaeological)	<ul style="list-style-type: none"> <li>Cultural heritage survey/assessment during EIS;</li> <li>Cultural heritage management plan;</li> <li>Cultural heritage awareness training for all</li> </ul>	3	D	Medium

No	Risk Description	Principal Controls	Risk Profile		Risk Level
			C	L	
		<ul style="list-style-type: none"> <li>staff;</li> <li>Induction.</li> </ul>			
17	Contact with high voltage electricity	<ul style="list-style-type: none"> <li>Principal Hazard Management Plan (PHMP), SOP, MOP for general electricity including cable management;</li> <li>Application of relevant standards relating to electricity Act;</li> <li>Compliance check on contractors;</li> <li>Contractor management system;</li> <li>Overhead lines marked;</li> <li>Clearance for overhead lines.</li> </ul>	4	C	High

## 20.2.4 Operations Hazard Identification

The hazard and risk assessment for the construction phase is shown in Table 20.2.8, with C denoting Consequence and L denoting Likelihood.

**Table 20.2.8 Operations Risk Assessment Table**

No	Risk Description	Principal Controls	Risk Profile		Risk Level
			C	L	
01	Water supply balance affected by mining operations	<ul style="list-style-type: none"> <li>Commercial agreements in place with Sunwater for water supply;</li> <li>Assessment by Sunwater to determine mine water supply impact on regional supply.</li> </ul>	4	E	Medium
02	Water runoff causes downstream impact (e.g. downstream water quality impact or dam construction failure)	<ul style="list-style-type: none"> <li>Water management plan;</li> <li>Positive evaporation rate;</li> <li>Known creek systems downstream of CHPP;</li> <li>Waste emplacement facility has sediment dams to capture sediment;</li> <li>Dam integrity is high with appropriate design and construction method.</li> </ul>	2	D	Low
03	Development exacerbates downstream flooding risk	<ul style="list-style-type: none"> <li>Hydrological modelling;</li> <li>Stormwater retention storages;</li> <li>Water storage monitoring.</li> </ul>	1	E	Low
04	Inrush (water)	<ul style="list-style-type: none"> <li>Box cut design;</li> <li>Surface design;</li> <li>Inrush assessment;</li> <li>Positioning of portal;</li> <li>Inrush SOP;</li> <li>Pumps for box cut.</li> </ul>	2	C	Medium
05	Mining operation impacts on groundwater resources	<ul style="list-style-type: none"> <li>Minimal extraction of ground water by existing land holders (Most stock water sourced from surface water storages);</li> <li>No groundwater dependant ecosystems;</li> <li>Groundwater monitoring.</li> </ul>	3	D	Medium

No	Risk Description	Principal Controls	Risk Profile		Risk Level
			C	L	
07	Explosion	<ul style="list-style-type: none"> <li>Explosion SOPs;</li> <li>Explosive storage designed to AS;</li> <li>Gas monitoring controls</li> <li>Intrinsically safe and explosion protected equipment in relevant zoned areas;</li> <li>Mine ventilation;</li> <li>Mine gas management procedures;</li> <li>Fire management systems (underground and surface);</li> <li>Coordination with external emergency services.</li> </ul>	5	E	High
08	Bushfire	<ul style="list-style-type: none"> <li>Set-back of buildings and infrastructure from hazardous vegetation;</li> <li>Reliable water supply for fire fighting;</li> <li>Maintenance of firebreaks;</li> <li>Documented Emergency Response Plan;</li> <li>Coordination with external emergency services.</li> </ul>	3	C	High
09	Fire in coal storage and handling facilities	<ul style="list-style-type: none"> <li>Spontaneous Combustion Management Plan;</li> <li>Fire fighting equipment on all vehicles;</li> <li>Documented Emergency Response Plan;</li> <li>Water trucks;</li> <li>Plant design to limit ignition sources;</li> <li>Fire suppression system designed to standards;</li> <li>Low "spon com" potential of coal.</li> </ul>	3	C	High
10	Chemical release - liquid from leaks, ruptures, overflows, spillages. Release to atmosphere	<ul style="list-style-type: none"> <li>All storage and handling facilities designed and operated in accordance with AS;</li> <li>HAZOP review undertaken during design stage;</li> <li>Personnel trained in appropriate storage and handling and incident response;</li> <li>MSDS available on-site;</li> <li>Appropriate spill response/incident equipment and training;</li> <li>Preventative maintenance program.</li> </ul>	2	C	Medium
11	Chemical release - liquid from leaks, ruptures, overflows, spillages. Release to surface/groundwater	<ul style="list-style-type: none"> <li>All storage and handling facilities designed and operated in accordance with AS;</li> <li>HAZOP review undertaken during design stage;</li> <li>Site drainage designed for retention of spills on-site;</li> <li>Personnel trained in appropriate storage and handling and incident response;</li> <li>MSDS available on-site;</li> <li>Appropriate spill response/incident equipment and training;</li> </ul>	2	C	Medium

No	Risk Description	Principal Controls	Risk Profile		Risk Level
			C	L	
		<ul style="list-style-type: none"> <li>Preventative maintenance program.</li> </ul>			
12	Transport incident relating to bus in transit to and from camp/Mackay/Moranbah	<ul style="list-style-type: none"> <li>Externally engaged bus company.</li> </ul>	5	E	High
13	Emergency response to incident results in accident	<ul style="list-style-type: none"> <li>External emergency response organisations (QMRS and emergency services);</li> <li>Emergency response Management Plan;</li> <li>External Mine Rescue Station;</li> <li>Standard 555 emergency response number;</li> <li>Level 2,3,4 Emergency response exercises;</li> <li>First response training.</li> </ul>	5	E	High
14	Cultural heritage - Mining operations adversely impact on sites of cultural heritage (Aboriginal or Archaeological)	<ul style="list-style-type: none"> <li>Cultural heritage survey/assessment during EIS</li> <li>Cultural heritage management plan</li> <li>Cultural heritage awareness training for all staff</li> <li>Induction</li> </ul>	3	D	Medium
16	Subsidence - Physical impacts on third party property (i.e. HV transmission line)	<ul style="list-style-type: none"> <li>Subsidence impact assessment;</li> <li>Mining method;</li> <li>EMOS;</li> <li>Monitoring;</li> <li>Minimal physical infrastructure located on surface within mining area.</li> </ul>	2	E	Low
17	Contact with high voltage electricity	<ul style="list-style-type: none"> <li>PHMP, SOP, MOP for general electricity including cable management;</li> <li>Application of relevant standards relating to electricity Act;</li> <li>Compliance check on contractors;</li> <li>Contractor management system;</li> <li>Overhead lines marked;</li> <li>Clearance for overhead lines.</li> </ul>	4	C	High
18	Community interactions	<ul style="list-style-type: none"> <li>Proactive attitude towards the community;</li> <li>Communications procedure with local landholders;</li> <li>No major densely populated areas around the mine.</li> </ul>	1	D	Low
19	Excessive noise (blasting, coal preparation plant, mine equipment)	<ul style="list-style-type: none"> <li>Explosive SOPs;</li> <li>Distance of mine/CHPP to nearest neighbour.</li> </ul>	1	D	Low
20	Traffic incidents on site	<ul style="list-style-type: none"> <li>Physical separation of surface vehicles and haul trucks;</li> <li>Induction</li> <li>Speed controls</li> <li>Access restrictions for visitors</li> </ul>	3	D	Medium
21	Wildlife hazards (i.e. snake bite, disease vectors)	<ul style="list-style-type: none"> <li>Housekeeping of site</li> <li>First aid</li> </ul>	2	D	Low

No	Risk Description	Principal Controls	Risk Profile		Risk Level
			C	L	
		<ul style="list-style-type: none"> <li>Personal Protective Equipment</li> </ul>			
22	Level crossing accident at public level crossing relating to increased number of trains from mine output	<ul style="list-style-type: none"> <li>Level crossing signalling;</li> <li>Level crossing boom gates.</li> </ul>	4	E	Medium
23	Train derailment	<ul style="list-style-type: none"> <li>Ballast stability;</li> <li>Track tampering;</li> <li>Regular inspection and maintenance.</li> </ul>	4	E	Medium

## 20.2.5 Health and Safety Controls

### 20.2.5.1 Air Quality

Dust will be generated during the construction and operation of the ECMP. The impact of dust on surrounding land users and the mitigation measures to be implemented are addressed in Section 11.1.6 – Air Quality.

Vale management has a demonstrated commitment to dust monitoring and management and the EM Plan for air quality presents the scale of monitoring and mitigation practices that are required for the management of dust.

Exposure standards for vapours that may be produced through work related practices will be implemented to ensure that mine personnel will not be exposed to adverse health effects. Respiratory devices will be utilized where required.

### 20.2.5.2 Noise

Section 12 - Noise and Vibration describes the environmental values that are to be protected in relation to noise impacts, the ECMP related impacts and the mitigation measures proposed to maintain noise levels within acceptable limits.

The SMS will be implemented to ensure that construction or operations personnel are not adversely impacted by noise levels. This includes the identification and assessment of occupational noise hazards, and the development of noise management programs to protect site personnel and visitors from adverse exposures.

### 20.2.5.3 Chemicals

The chemicals that will be used throughout the operational life of the project include fuels, lubricants and oils, flocculants, acids, solvents and domestic cleaning agents.

Table 20.2.1 provides an indicative list of the dangerous goods that will be used during construction and operations. Chem Alert will be used for the storage of Material Safety Data Sheets (MSDS) and dangerous goods will be managed in accordance with the MSDS. Storage areas for bulk liquids and smaller quantity chemicals will be located and designed in accordance with AS1940-2004: *The storage and handling of flammable and combustible liquids*.

The ECMP SMS will be implemented at the commencement of the project and provides guidance in spill prevention and response. In the event of a spill, spill response kits will be utilised by trained personnel. The site will have sedimentation dams strategically positioned downstream from working areas to prevent contaminated run-off entering off-site water bodies. Stormwater will be diverted away from bunded storage area and the risk of contaminated run-off entering off-site waterways and impacting on surrounding property values is considered negligible.

#### 20.2.5.4 Pest and Weed Management

A weed management plan will be implemented at the ECMP to address the occurrence of Class 2 weeds on-site and to limit the spread of these species on and off-site. All vehicles that may enter weed infested areas will be washed, inspected and free of pests prior to leaving site. It is expected that prior to arriving on site all vehicles will be clean and free of weeds.

#### 20.2.5.5 Wildlife

Project personnel may encounter wildlife hazards such as snakes. The volume of traffic using mine infrastructure areas and haul roads is likely to minimise the potential interaction between staff and hazardous wildlife, rendering the potential for snake bites as low. Trained first-aid personnel are available on-site to treat snake bites. Transportation of snake bite victims is available using the ambulance from Coppabella to Moranbah hospital or the Central Queensland helicopter rescue service to Mackay.

#### 20.2.5.6 Vehicle Accidents

Vehicles that are proposed to be used at the ECMP include surface and underground vehicles operating around the surface and underground infrastructure and coal haulage trucks transporting coal to the CDCM. Vehicle collision from these activities is confined to mine personnel. The haul road will be designed and constructed in accordance with the CMSH Act and will be appropriately graded, speed restricted and is regularly watered for dust suppression to maintain visibility. The haul road will be suitably designed to account for environmental factors such as weather conditions and the 24-hour nature of the operation with suitable lighting. Safety rills will be constructed and maintained to protect persons and equipment from driving over embankments. Berms will be regularly inspected by appropriate personnel to ensure structural integrity. Site vehicles will be fitted with two way radios and training will be provided to the drivers so that the vehicles are driven in accordance with the road rules that are prescribed for the ECMP site.

The movement of vehicles used in underground mining operations will be restricted to the underground workings or dedicated access roads located between the surface facilities and the mine portal entrance. Underground mine vehicles will not have any interaction with other mine traffic.

New visitors to the site are required to undertake an induction before entering the site or will be escorted by mine personnel. The induction will include driving rules and regulations required for the site. Risk to staff and visitors from vehicle accidents are medium due to the ongoing maintenance of roads and vehicles. Boom gates manned by 24-hour security are installed at the Peak Downs Highway entrance to prevent visitors easily accessing the site.

Construction workers operating vehicles on-site will be trained and licensed. Speed control (signage), demarcation, driving to conditions and prescribed driving etiquette within the construction area will be used to control the risk. All vehicles will be fitted with radios for two-way communication.

#### 20.2.5.7 Fuel Storage and Handling (Static and Mobile)

Fuel storage on-site will be predominantly diesel, which presents a relatively low combustion risk. Ignition sources will be controlled to avoid fire involving bulk fuel oil. Fire fighting facilities will be provided at fuel storage facilities.

Storage areas for bulk liquids and smaller quantity chemicals will be located and designed in accordance with AS1940-2004: *The storage and handling of flammable and combustible liquids*. Standard operating procedures for the storage, containment, disposal and spill response for fuels and oils will be developed in accordance with the SMS. The application of the Australian Standards (AS1940) for the design and construction of bulk storage bunding will reduce the potential for a spill to a low level.

During operations, the hazards associated with storage of fuel arise from leaks and/or failures in the operating systems. To minimise the hazards associated with a fuel oil tanker leaking during unloading, the following controls will be put in place:

- a program of regular equipment inspection and testing will be implemented to ensure reliable performance;
- operators will be trained in the safe operation of the system and emergency procedures in the event of a fuel oil leakage;
- spill containment equipment will be located at the unloading envelope for use in the event of a spillage;
- a sump will be provided to collect any spillage and allow product recovery;
- ignition sources will be strictly controlled to avoid a fire;
- appropriate fire fighting equipment will be available to suppress fires; and
- an approved fire protection system will be installed around the hydrocarbon storage area.

The following measures will be put in place to minimise leakage of fuel oil from storage tanks:

- design and construction of a bunded area to AS1940;
- tank level indicators will be installed on fuel oil tanks for monitoring of fuel oil levels;
- maintenance and inspection of fuel oil tanks will be undertaken to ensure structural integrity and safe working operation of all tank components; and
- the tank will be designed in accordance with AS1692:1989 *Tanks for flammable and combustible liquids* to minimise the potential for failure of the diesel storage vessel.

#### 20.2.5.8 Explosives

Explosives will be used during the project for the box cut construction and development of underground mine roadways.

All explosives required for the project will be managed in accordance with the operational procedures for the transportation, storage and handling of explosives on site and the following regulations:

- *The Explosives Act 1999*;
- *AS2187.1-1998/Amdt 1-2000: Explosives - Storage, transport and use – Storage*; and
- *AS 2187.2-2006: Explosives - Storage and use - Use of explosives*.

#### 20.2.5.9 Blasting

Blasting undertaken on site will be minimal. When required, the potential risks associated with blasting include air blast overpressure, ground vibration, fly rock, dust and incomplete detonation. These risks are considered to be negligible in relation to the ECMP as with the exception of the initial box cut blast patterns most blasting will be underground. Control measures to reduce the risk of hazards will include the following where appropriate:

- use of trained, qualified, and appointed personnel to load explosives and undertake blasting process;
- use of trained, appointed, and qualified shot firer to fire explosives;
- control of access to the blast area (including temporary road closure);
- evacuation warnings prior to blasting (to ensure personnel are a safe distance from the blast area); and
- appropriate PPE to be worn by personnel in the vicinity of the blast.

Incomplete detonation events are a potential risk that can be reduced to low levels by ensuring that safe operating procedures are adhered to on site by suitably qualified personnel who are familiar with CSMH Regulations and AS2 S 2187.2-2006: *Explosives - Storage and use - Use of explosives*.

### 20.2.5.10 Exposure to High Voltage

Electricity will be supplied to the ECMP through connection into the Powerlink 132 kV overhead transmission line that currently traverses the ECMP area. It is proposed to construct 3 km of 132 kV overhead transmission line to the mine substation around the northern and western boundaries of the mining lease to avoid crossing the mine subsidence area and the surface infrastructure.

During the construction phase, the hazards associated with power line installation is considered relatively low as this work will be undertaken by qualified contractors that will employ appropriate procedures to maintain safety in their work areas.

Standard operating procedures for working with high voltage, including induction and training programs and isolation and tagging procedures, will be implemented throughout the construction and operations phase. Only trained personnel are permitted to isolate and access high voltage equipment.

### 20.2.5.11 Spontaneous Combustion

There is a risk of spontaneous combustion occurring on coal stockpiles, resulting in fire and smoke. The potential for spontaneous combustion is considered low to moderate due to the material properties of the coal and spontaneous combustion Principal Hazard Management Plan (PHMP).

Empirical testing has been carried out on ECMP coal samples to define the propensity of spontaneous combustion. The Leichhardt coal seam that is being mined has been assessed as having a low to moderate propensity to spontaneously combust. The coal is tested by adiabatic heating and the R70 index has been measured on several samples between 0.11 and 0.51. Gas evolution characteristics have been conducted on coal samples to determine the temperature at which gases are produced. The PHMP for Spontaneous Combustion defines the standards and controls for hazards in the underground mine. Spontaneous combustion fires in coal stockpiles usually begin as "hot spots" deep within the reserve of coal. The hot spots appear when coal absorbs oxygen from the air. Heat generated by the oxidation then initiates the fire.

The following controls will be established to control spontaneous combustion in underground workings:

- the ventilation control systems will be constructed to a high standard and in accordance with the CSMH Regulations;
- pressure differential monitoring around ventilation control devices to maintain minimal differential pressures on the sealed and secondary workings;
- comprehensive atmospheric monitoring of working areas and worked areas is undertaken by remote sensors and underground supervisors;
- leakage monitoring from ventilation control devices;
- inertisation of worked areas will be carried out in accordance with the level of risk and requires a management plan for the seal-up to be submitted to the mines inspector; and
- housekeeping of the underground working environment will be conducted to minimise the amount of combustible material.

The following controls will be established to control spontaneous combustion in coal stockpiles:

- rapid turnover of stockpiles to minimise the residency time of coal;
- visual inspections of the coal stockpile and provision of adequate equipment and water for fire fighting on the stockpiles; and
- specific training of coal stockpile personnel on the PHMP and broader training to all staff during the induction on procedures to follow in the event of the stockpile fire event.

## 20.2.6 Public Health and Safety

### 20.2.6.1 Public Roads

Materials and equipment that will be delivered to the ECMP during construction include mining equipment, building supplies, mechanical plant and equipment, fuel, concrete, steel and gravel. During operations, materials delivered will include fuel, explosives, spare parts and office consumables.

Where possible, construction materials will be sourced locally and road materials will be sourced on site. Mining equipment is likely to be imported and transported to site by road from Mackay or Brisbane over a 12 month period and will comply with the relevant codes for transportation of heavy and oversized goods. The DTMR and local shire councils will be consulted prior to the movement of any oversize individual loads, to minimise disruption to other road users. The increase on the Peak Downs Highway in heavy vehicle volumes will be less than 5%.

The traffic impacts of the project are addressed in Section 8.2 – Transport. The ECMP will use the existing southern Carborough Downs T1 intersection off the Peak Downs Highway. There will be a minimal increase of light and heavy vehicle traffic during the operations phase. To minimise the road safety risks, employees will be bused from their accommodation located in either Moranbah or Coppabella to the mine site, reducing the number of light vehicles on the Peak Downs Highway. There is likely to be a number of local contractors that travel from Nebo or Moranbah to the mine site, but these numbers are estimated to be less than 20 vehicles. Employees will be offered buses from camp accommodation to and from Mackay at the commencement and completion of the shift roster.

### 20.2.6.2 Transportation of Dangerous Goods

Transportation of hazardous goods will be undertaken by licensed transporters in accordance with the *Dangerous Goods Safety Management Act 2001* and the *Transport Operations (Road Use Management) Act 1995*. The licensed transporters of the explosives will operate in compliance with the Australian Explosives Code.

Transportation of dangerous goods such as diesel fuel oil to the site could result in accidental release or exposure as a result of an accident or collision. All vehicles will display Hazchem signage and carry spill containment equipment that can be used by emergency services personnel. The ECMP Emergency Response Plan (ERP) would be applied to manage such incidents and will be developed in consultation with local emergency services personnel and local council.

Explosives will be stored on-site in a location removed from any activities on the mine and access road. The storage location for the explosives and detonators will be approved under the *Explosives Regulation 2003* section 44 and Part 3 of *Explosives Act 1999* for construction. The location of the explosives will not pose a risk to public safety as it is expected to be approximately 1 km from the box cut and 25 km from the Peak Downs Highway.

The location of the explosives storage will be determined with consideration of:

- public risk;
- vehicular access routes and junctions with public roads;
- security; and
- protection from flood, fire, landslide, lighting and other natural incidents.

Minimal quantities of explosives will be kept on site due to operational requirements and expiry dates of explosives. Explosives will be handled on site in accordance with mine site operating procedures that comply with the CSMH Regulation.

### 20.2.6.3 Rail Corridor

ECMP is forecast to produce approximately 5 Mtpa, resulting in an additional 8 - 9 trains per week to the DBCT. The current proposal is for ROM coal to be hauled from ECMP to the CDCM CHPP and no extension will be made to the existing rail corridor that services the CDCM.

Once the ECMP CHPP is operational, transportation of product coal to port is proposed to be via a newly constructed stockpile and RLO facility adjacent to the current CDCM RLO. An explanation of the possible transportation alternatives is presented in Section 3.3.6. The risk of collision at level crossings along the Goonyella rail line is managed through the installation of boom gates or signal lights and alarms and adequate lines of sight. Should a new rail loop be constructed from the existing Goonyella line, levels crossings would be minimised. Should level crossings be required, the risk of collision would be managed through the installation of boom gates or signal lights and alarms and adequate lines of sight.

## 20.2.7 Bushfire

The vulnerability of the area to bushfires is low. The risk of bushfire outbreak is currently minimised by the absence of large stands of trees and provision of a dedicated buffer of 50-100 m around the mine infrastructure area, which meets the requirements of the SPP1/03. The ERP has a requirement for staff to complete fire safety training during induction and thereafter on an annual basis. Water points will be located within the surface infrastructure area and comprehensive fire prevention and suppression system will be in place. The ECMP will have dedicated equipment on-site for fire-fighting and there will be ongoing communication with adjacent landowners regarding fire breaks and ongoing maintenance programs to minimise bushfire risk.

## 20.2.8 Flood

An assessment of the potential impacts from flooding and high rainfall events has been assessed in Section 9.2.6.2 - Surface Water and Watercourses. There is a very low risk of flooding impacting on the ECMP.

## 20.2.9 Emergency Planning

An ERP will be developed for the operation. The Isaac Regional Council Counter Disaster Plan and Queensland Government DCS guidelines will be considered when preparing the plan. The Isaac Regional Council will be advised of changes as a result of the ECMP that could affect the council and regional emergency plans. These include changes resulting from road diversions that could affect evacuation routes and response times. Table 20.2.9 contains generic elements that would be incorporated into the ERP. These generic elements were reviewed by the QFRS and QAS.

**Table 20.2.9 Generic Events Covered by ERP**

Event	Level of emergency	Emergency serviced required	Resources needed	Organisational aspects	Damage control actions
Fire at CHPP	Local/site Potential external alert	Local fire brigade Police/ambulance on alert	Fire fighting trucks and water tankers, Ambulance, Site fire fighting team	Evacuation of affected mine personnel, Site wide communication	Fire containment, Shutdown of affected ops
Vehicle collision	Local/site	Ambulance, Fire, Police	Rescue, Fire fighting capability, Fuel containment materials	People control, evacuation of immediate areas	Damage control actions, stabilise situation, contain fuel spillages, control ignition sources
Fall and impact incident	Local	Ambulance, Rescue	Site rescue equipment	Communication, Evacuation of immediate area	Stabilise, isolate source of incident
Spontaneous combustion	Site	Site fire fighting team	Dozer, fire truck and/or water truck	Communication, Evacuation from area	Extinguish, cool heat source

Event	Level of emergency	Emergency serviced required	Resources needed	Organisational aspects	Damage control actions
Bushfire	Local/site	Local fire brigade Police/ambulance on alert	Fire fighting trucks and water tankers Ambulance Site fire fighting team	Evacuation of affected mine personnel Site wide communication	Fire containment Shutdown of affected operations
Contact with high voltage electricity	Site Local	Ambulance/police	Site rescue team Ambulance	People control, evacuation of immediate areas	Damage control actions, stabilise situation, Isolate source of incident

### 20.2.9.1 Emergency Response

The ERP will address processes and procedures to be followed in the event of emergency evacuations, exercises, and audits and reviews of the emergency management system. These procedures will be applied throughout the construction and operations phase of the project.

All ECMP site personnel will be trained in first aid, fire training and the ERP at induction and selected personnel will be trained in advanced resuscitation techniques. First aid stations and emergency response kits will be located throughout the ECMP.

In the event of an emergency, ambulance support would be provided from Coppabella and/or Moranbah. The Central QLD Helicopter service can provide rapid assistance and transfer to medical facilities in Mackay.

### 20.2.9.2 Fire Fighting

All buildings will be fitted with approved fire fighting equipment including fire hose reels and hand held extinguishers which are suitably signed. Buildings and the CHPP will be fitted with emergency and exit lighting in accordance with the applicable Australian Standard. Fire detection systems are to be located in all accommodation buildings. Fire detection and suppression systems will be located in control rooms, plant rooms, transformers and the CHPP. Regular testing of the fire detection systems will occur.

The ECMP site personnel will be trained in basic fire fighting procedures with hand held extinguishers. Selected personnel will be trained in more advanced fire fighting techniques.

The fire fighting and detection systems will be designed and installed in accordance with the applicable Australian Standard and approved by the Queensland Rural Fire Brigade Service. All services will be serviced, maintained and inspected by an approved certification body.

### 20.2.10 Public Liability of Infrastructure

For the construction phase, public liability and protection of infrastructure will be managed by the principal constructor contractor/s. Physical control will be managed by closure of the area to the public, so there is no public access to the construction site.

Protection of infrastructure (key plant and equipment) will be maintained by ensuring the constructor has identified all assets and schedules construction in a way that limits damage to infrastructure.

Throughout the operation of the ECMP, public safety will be managed by limited access to the site through a single entry point and all visitors will be required to undertake a site induction or be accompanied by a site representative. Exclusion zones will be developed to prevent public access to the site, with fences and signs erected to delineate such areas.

The operators of the ECMP will have in place public liability insurance arrangements.