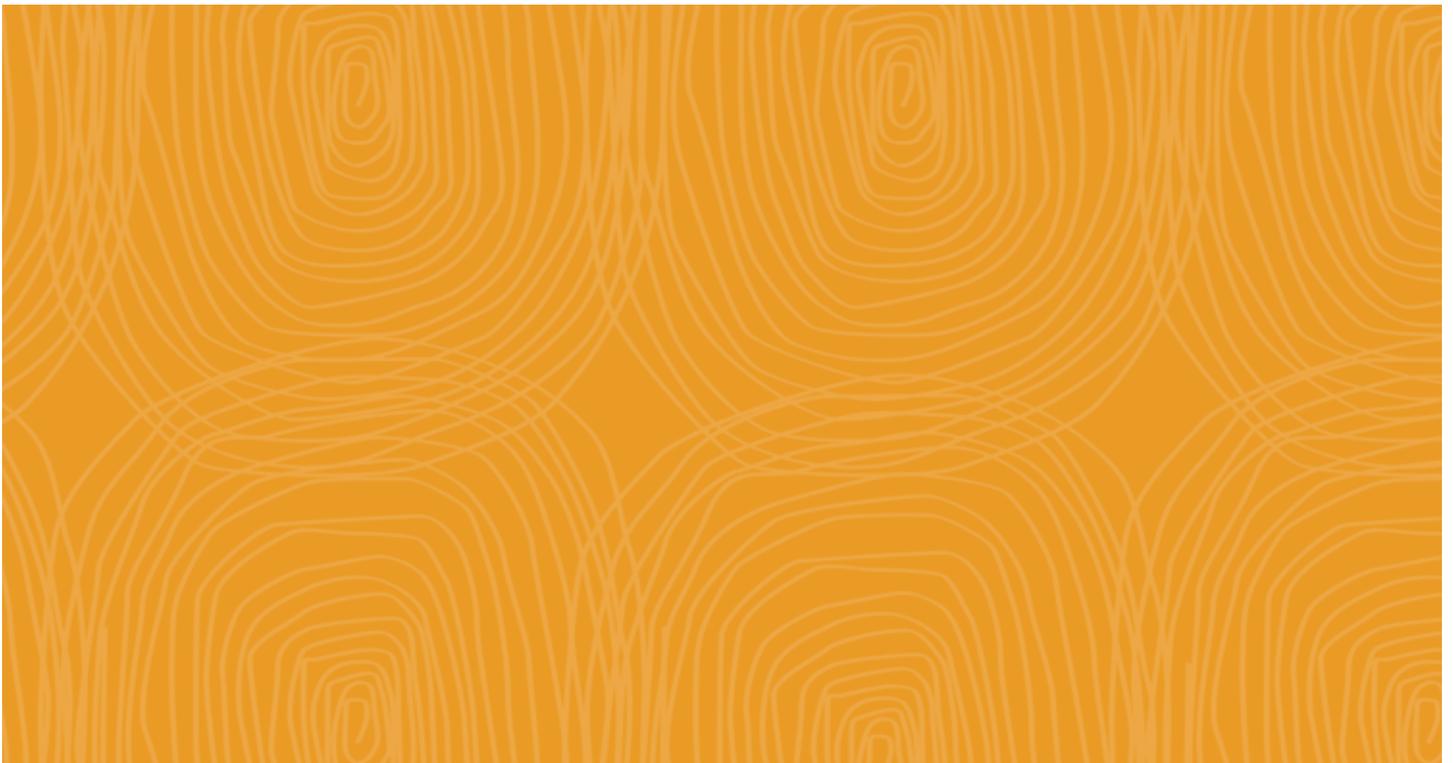
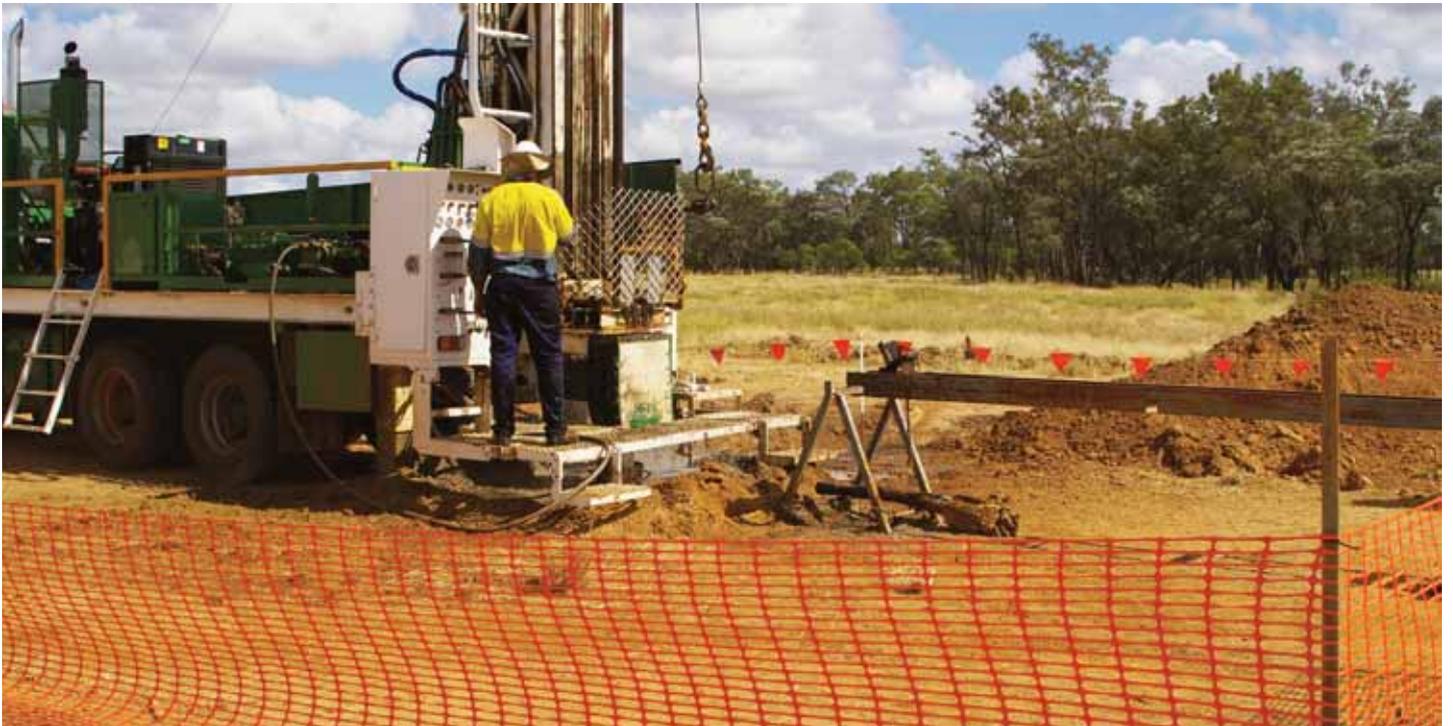


21 | Health and Safety



Section 21 Health and Safety

21.1 Introduction

This section describes the existing community values for public health and safety that may be affected by the Alpha Coal Project (Rail) (herein referred to as the Project) and to identify actions for mitigating or reducing these. The scope of this assessment includes the identification of health and safety impacts on the community from the construction and operation of the Project. Included in this consideration is the rail line, maintenance tracks, the marshalling yard and workers' camps. Excluded from this consideration are the Port of Abbot Point Multi Cargo Facility and the Alpha Coal Project (Mine).

21.2 Description of Public Health and Safety Community Values

21.2.1 Overview

The main community values for public health and safety that may be affected by the Project are air quality and noise levels. To a lesser extent, there is a potential for the Project to cause increases in disease vectors and to directly or indirectly lead to increased road accidents from increased traffic volumes.

The health and safety aspects for proposed activities are detailed in Table 21-1.

Table 21-1: Public health and safety values

Aspects	Community public health and safety values
Air environment	<ul style="list-style-type: none"> air quality that is conducive to human health and well being; air quality that supports agricultural activities; and dust and odour.
Noise environment	<ul style="list-style-type: none"> the qualities of the acoustic environment that are conducive to human health and wellbeing. This includes provision of a suitable acoustic environment for individuals to sleep, study or learn or be involved in recreation, including relaxation and conversation; and the qualities of the acoustic environment that are conducive to protecting the amenity of the community.
Disease Vectors	<ul style="list-style-type: none"> construction activities not leading to increases in local populations or spread of biting insects or pests that are known disease vectors.
Train and Road Safety	<ul style="list-style-type: none"> roads supporting traffic volumes appropriate to their design standard; and rail safety.
Air environment	<ul style="list-style-type: none"> air quality that is conducive to human health and well being; air quality that supports agricultural activities; and dust and odour.
Noise environment	<ul style="list-style-type: none"> the qualities of the acoustic environment that are conducive to human health and wellbeing. This includes a suitable acoustic environment for individuals to sleep, study or learn or be involved in recreation, including relaxation and conversation; and qualities of the acoustic environment that are conducive to protecting the amenity of the community.

Aspects	Community public health and safety values
Disease Vectors	<ul style="list-style-type: none"> • construction activities not leading to increases in local populations or spread of biting insects or pests that are known disease vectors.
Train and Road Safety	<ul style="list-style-type: none"> • roads supporting traffic volumes appropriate to their design standard; and • rail safety.

21.2.2 Baseline Conditions

21.2.2.1 Noise

The environmental values for the acoustic environment are described in Part 3, Section 7 of the *Environmental Protection (Noise) Policy 2008* (EPP (Noise)). Planning Levels prescribed by the EPP (Noise) 2008 have been used for noise assessment in this EIS (refer to Volume 6, Appendix I). The Planning Levels as prescribed are as follows:

- 65dB(A) $L_{eq,24hr}$; and
- 87dB(A) L_{Amax}

The existing acoustic environment is described in Section 15 of the *Australian Standard AS 1055.2.-1997, Acoustics – Description and measurement of environmental Noise*. AS 1055.2 provides typical values dependent on land use and time of day as a method of estimating background noise.

The land use immediately surrounding the Project is predominantly rural in nature. Two potential sensitive receptors have been identified within 500 m of the Project corridor. For the nearest affected rural residential area to the Project, the appropriate description is considered to be “R1”. Category R1 is defined as – ‘areas with negligible transportation’. The standard provides estimated background noise levels for this category of land use for different times of the day. These vary from 0 to 40 LA90,T. For further detail refer to Volume 3, Section 15 of this Environmental Impact Statement (EIS).

21.2.2.2 Air

The key existing sources of smoke and dust are primarily combustion from engines which produces fine particulates, smoke from low-temperature scrub and agricultural burning, and vegetation fires during the dry periods of the year. Natural sources of dust are more prevalent than anthropogenic sources within the areas surrounding the Project corridor. The only exception to this is vegetation burning which is a human initiated activity that produces more dust than a natural source. Volume 3, Section 13 of this EIS provides a more detailed assessment of the air quality surrounding the Project corridor. This section has identified that the majority of air pollution around the Project corridor originates from scrub fires and some from natural wind erosion. As a result, it can be assumed that the majority of the particulate load in the ambient air is comprised of particulate matter, namely PM_{10} and $PM_{2.5}$.

There is no existing data available for the average concentrations of PM_{10} and $PM_{2.5}$ within the Project area. The Air Impact Assessment (AIA) for the QCoal, Sonoma Coal Mine Project near Collinsville assumed a background PM_{10} concentration of $16.8 \mu\text{g}/\text{m}^3$. In the absence of site specific data, the same value has been adopted for the Project. However, the background PM_{10} value may be slightly higher inland away from the coast due to:

- natural regional inland conditions; and
- the presence of industry and other physical facilities (e.g. coal mine) along the Project corridor which can either act as a buffer zone or an additional source (GHD, 2010).

As there is no existing data along the Project corridor, background values for all other constituents are considered to be negligible as the area is remote with a very low number of anthropogenic sources, such as cars, industry and farming operations (GHD, 2010).

21.2.2.3 Biting Insects

Mosquitoes are known carriers of malaria, dengue fever, Ross River virus (RRV), and other viruses. The most suitable breeding sites for mosquitoes are estuarine habitats located within the Caley Valley Wetland, Palustrine habitats (offstream wetlands) and the Bowen River - Birralee - Pelican Creek Aggregation (adjacent to chainage 355 km to chainage 382 km of the Project corridor).

Mosquito life cycle depends on environmental factors such as the temperature and humidity. Various studies have indicated that residents who live within three kms of major breeding sites of the mosquito vector of RRV have a higher risk of contracting the disease than those residing further away. There are no major populations in close proximity to the Project corridor at these locations. The closest settlements are the Collinsville Township and the workers' Camp 2 near Collinsville (refer to Figure 2-1 in Volume 3, Section 2 of this EIS). However, these settlements are more than three kms away from the breeding sites and as such potential health issues are minimal.

With the land use surrounding the Project corridor being predominantly grazing land and of rural nature, residential premises are scattered within the surrounds of the Project corridor. A desktop analysis of aerial images has identified two potentially sensitive receptors within 500 m of the Project corridor (refer to Figure 7-1 in Volume 3, Section 7 of this EIS). As these have been identified on the basis of a desktop study, the occupancy of these dwellings is unknown. For the purposes of this EIS, a conservative approach has been taken in assuming that these dwellings are fully occupied residences. No kindergartens, schools, hospitals, aged care facilities, residential areas or work centers exist within the 500 m radius of the Project.

21.3 Potential Impacts and Mitigation Measures

21.3.1 Overview

The aim of the following section is to assess the potential impacts of the Project upon the community in terms of health and safety and quality of life and upon workforce in terms of occupational health and safety. Impacts during the construction and operation stages of the Project have been identified. Corresponding mitigation measures have also been identified so as to eliminate or minimise any negative impacts upon these factors.

21.3.2 Construction Dust

21.3.2.1 Potential Impact

Construction of the rail formation and access tracks is likely to result in dust emissions along the Project corridor. The particulate emissions to air during the construction phase of the Project are expected to be generated by:

- dust emissions from mechanical disturbance: due to construction and maintenance vehicles and equipment;
- wind erosion of crustal material: from exposed disturbed soil surfaces under high wind speeds; and

- exhaust emissions from the range of motor vehicles and mobile plants required for the Project.

The best practice dust control measures are outlined in Part 4.5 of the Environmental Protection Agency (EPA) Document, *Best Practice Environmental Management – Environmental Guidelines for Major Construction sites (Publication 480)*. This guideline will be utilised during the establishment of a Dust Management Framework for the construction stage of the Project.

21.3.2.2 Mitigation Measures

Mitigation measures for the management and control of dusty are addressed in Volume 3, Section 5 and 13 of this EIS. Principally the management comprises the development of an Erosion and Sediment Management and Control Plan (ESMCP).

21.3.3 Operational Emissions

21.3.3.1 Potential Impact

The operations stage of the Project is likely to generate exhaust emissions that may include PM₁₀ and PM_{2.5}, Carbon Monoxide, Nitrogen Dioxide, Sulphur Dioxide, Benzene, and Volatile Organic Compounds (VOC's). It is anticipated that fugitive coal dust emissions such as total suspended particles (TSP), PM₁₀ and PM_{2.5} will be released into the atmosphere from uncovered coal wagons in addition to other fugitive losses of coal dust material (for further detail refer to Volume 3, Section 13.3.5 of this EIS).

Air dispersion modeling results detailed in Volume 3, Section 13.3.5.2 of this EIS identified:

- predicted emissions of CO, SO₂, NO₂, Benzene, PM₁₀ and PM_{2.5} from locomotive exhausts alone from the proposed operation are compliant with the Environmental Protection Policies (EPP) (Air) criteria within ten m from the Project corridor;
- predicted emissions of dust including TSP, PM₁₀ and PM_{2.5} from locomotive exhausts combined with the fully loaded coal wagons in transport along the Project are compliant with the applicable EPP (Air) criteria within ten m from the Project corridor;
- predicted dust deposition from the worst case scenario of locomotive engines plus fully loaded coal wagons is below the four g/m²/month criterion within ten m of the Project corridor and at both of the sensitive receptors. At 100 m distance from the railway the predicted dust deposition rate with background included is 2.04 g/m²/month (51% of the criterion), having no significant effect to either of the sensitive receptors or to the environmental values described in Volume 3, Section 13 of this EIS.

21.3.3.2 Mitigation Measures

The results of the air quality assessment included in Volume 3, Section 13 of this EIS indicate that air emissions are within established guidelines. Therefore no mitigation measures are identified.

21.3.4 Noise Impacts

21.3.4.1 Potential Impact

Noise can affect wellbeing in a range of ways including residential amenity, sleep disturbance and general physiological stress. Noise levels have been assessed for construction and operation phases and are within established guidelines. This is discussed further in Volume 3 Section 15 of this EIS.

21.3.4.2 Mitigation Measures

As noise levels have been assessed as being within the established guidelines, no mitigation measures are proposed.

21.3.5 Project Workforce

21.3.5.1 Potential Impact

Potential health and safety impacts on the workforce are dealt with through separate legislative processes established under the *Workplace Health and Safety Act 1995*. These issues are not addressed further in this EIS.

21.3.5.2 Mitigation Measures

No mitigation measures are identified in regard to the Project workforce.

21.3.6 Disease Vectors

21.3.6.1 Potential Impact

The Project is not expected to impact on water bodies or drainage in any way that would cause an increase in local populations of biting insects or increase the spread of biting insects. Some of the water required for construction activities will be harvested surface water stored in purpose built tanks/dams. Similarly some of the water for construction will be groundwater and recycled or reclaimed water and it will be stored in turkey nests, and treated effluent will be stored at each construction camp and at the marshalling yards.

These dams and turkey nests will be constructed in accordance with the Queensland Health, *Guidelines to minimise mosquito and biting midge problems in new development areas (2002)*, particularly the provisions of Section 4.3.2.2 *Artificial wetlands/water impoundments in respect to depth, banks and mosquito control management*. Treated effluent storages will also comply with Section 7.1.4 of the Department of Environment and Resource Management (DERM), *Queensland Water Recycling Guidelines 2009*.

21.3.6.2 Mitigation Measures

While the potential for the Project to increase risks in relation to the disease vectors is assessed as minimal. If a potential health risk from mosquito breeding is identified, active control measures are to be taken. The Local Government Association of Queensland has produced a Mosquito Management Code of Practice (LGAQ, 2002) which contains detailed advice to be followed for control of mosquitoes in Queensland.

Management Plan for mosquito and biting midge has been summarised in Table 21-2 .

Table 21-2: Management of mosquito and biting midge

Mosquito/Biting Midge Management Plan	
Elements	Hazards due to mosquito and biting midges
Management Objectives	Policy: To avoid anything that promotes local populations of potential mosquitoes and biting midges
Performance Criteria	The number of potential mosquito/biting midge breeding sites created on-site is to be minimised by preventing water from ponding.
Implementation Strategy	Responsibility
The following strategies will be implemented to achieve the objectives of the mosquito/ biting midge management EMP:	
Stormwater drainage for the rail alignment not to create new impoundments that will cause further ponding of water.	Civil Designer Construction Contractor
Storage containers capable of ponding water will be either discarded after use or stored in an inverted position (care will be taken to ensure that ponding does not occur in rubbish storage areas)	Construction Contractor
Removal of all vegetation in the zone of water fluctuation in the new dams/ponds (groundwater, treated effluent, etc) and inspected for the presence of mosquito larvae on a weekly basis by the Environmental Representative	Construction Contractor
Repair of open channels, culverts, etc that collect waters	Rail Operator
If larvae are detected in large numbers, contact Queensland Health for assistance in choosing a suitable treatment method. Treatment could either be aerial, ground or adulticiding (fogging).	Construction Contractor Rail Operator
Monitoring	The Environmental Representatives will inspect any potential mosquito breeding areas following rain to monitor the presence of mosquito larvae. The representative will also monitor the frequency of mosquito bites on the site, and through consultation with nearby communities and neighbours to identify where mitigation measures are not currently successful and to see whether adult eradication programs should be implemented.
Reporting	The Environmental Representative will record when and where any larvae or mature mosquitoes are found on-site, as well as when and where any incidences of bites may occur. Should a large number of larvae or bites be experienced, the relevant Council will be contacted for advice on appropriate remedial measures.
Corrective Action	Should an incident or failure to comply occur, a selection of the following actions will be taken: <ul style="list-style-type: none"> • an investigation will be undertaken into why directives are not being carried out; • employees will be re-educated on desired practices; and • work policies and procedures will be changed to improve the situation.

21.3.7 Train Safety and Road Safety

21.3.7.1 Potential Impact

Increased traffic during the construction phase of the Project has the potential to have a negative impact on road safety. These issues are discussed in more detail in Volume 3, Section 17 of this EIS. Volume 3,

Section 17 of this EIS rates the potential for a decrease in personal safety and increase in road safety hazard as high. Rail traffic during the operation of the Project presents a potential risk to personal safety.

The Project will cross and be in the vicinity of 24 public roads. In general major roads are crossed with grade separated crossing, either road over rail or in the case of the Bruce Highway rail over road. The remainder of crossings are at grade with signalling treatments to be determined during the final design (for further detail refer to Volume 3, Section 17 of this EIS).

21.3.7.2 Mitigation Measures

Mitigation measures to address road and transport safety during the construction and operation of the Project are detailed in Volume 3, Section 17 of this EIS. These measures include the development of Transport Management Plans for the construction phase of the Project and the incorporation of relevant design requirements for road crossings during the detail design phase of the Project.

21.3.8 Recycled Water

21.3.8.1 Potential Impact

Sewerage will be generated during the construction phase at each construction camp. Sewerage will be treated through a conventional sewage treatment plant. Treated effluent will be disposed of in an effluent spray area (no access to the area and located >445 m from the construction camp). At this stage no beneficial reuse of the treated effluent is proposed.

Wastewater will be generated during the operations phase at the marshalling yards from locomotive washing and potentially from the bulk fuel, oil and liquid storage area. Wastewater from the marshalling area will be treated by a wastewater treatment plant.

If a beneficial reuse for the treated effluent is identified it will be undertaken in accordance with the DERM, *Queensland Water Recycling Guidelines 2005* and the documentation prepared to comply with the requirements of the DERM *Recycled water management plan and validation guidelines 2008*.

21.3.8.2 Mitigation Measures

Treated water and other wastewater generated on site will be managed in accordance with established guidelines.

21.4 Conclusions

The Project has been assessed in regard to public health and safety issues related to the construction and operation of rail corridor and associated infrastructure and facilities. The assessment has identified a range of potential impacts which overlap with related environmental and social considerations.

Following appropriate mitigation through the implantation of either active controls and managements plans or design inputs it is concluded that issues relating to public health and safety can be effectively management for the construction and operation of the Project.