13 AIR QUALITY

13.1 INTRODUCTION

This chapter outlines potential air quality issues associated with the construction and operation of the western coal seam methane (CSM) water supply pipeline (the proposed pipeline). This chapter does not include assessment of greenhouse gases, which are covered in Chapter 14 Greenhouse Gases and Climate Change.

13.2 METHODOLOGY OF ASSESSMENT

13.2.1 LEGISLATION

The Environmental Protection Regulation 1998, stipulates that activities that will, or have the potential to, release contaminants into the environment and which may cause environmental harm are defined as Environmentally Relevant Activities (ERAs). Currently there is no ERA covering the construction and operation of a water pipeline. As such the air quality assessment follows the framework set out in the Environmental Protection (Air) Policy 1997 (EPP (Air)) to achieve the objectives of the *Environmental Protection Act 1994* with regard to Queensland's air environment.

13.2.2 HOW THE STUDY WAS CONDUCTED AND INFORMATION OBTAINED

This assessment was conducted as a qualitative desktop assessment based on the information provided in Chapter 5 Project Construction and Chapter 6 Project Operations. No specific criteria are outlined in the environmental protection documentation for air emissions from pipeline construction activities, therefore a qualitative assessment has been carried out for construction air emissions, based on typical pipeline construction activities.

13.2.3 LIMITATIONS

The construction phase of the development is assumed to be based on typical pipeline construction methods and equipment.

13.3 EXISTING ENVIRONMENT

13.3.1 BACKGROUND DATA

A background air quality survey has not been carried in the vicinity of any sensitive receptors. Indicative background air quality as measured at two locations near Wandoan as part of the air quality assessment carried out for Volume 1 Chapter 13 Air Quality. These results reflect the likely background air quality levels to be experienced at a lot of the sensitive receptors located along the pipeline route. The rural environment at the measurement sites reflects closely the environment in the vicinity of the pipeline receptors.

The region of Wandoan is primarily rural. The Leichhardt Highway is the main transport corridor in the region that links Wandoan with Taroom in the north and Miles in the south.

Agriculture and cattle grazing are the main local industries in the area along the pipeline route therefore the air quality in the region is likely to be good. Due to the relatively small nature of the construction activity and very low dust emissions from the pipeline operation, it is expected that nuisance from dust deposition would be the main issue to be managed.

Based on available data a dust deposition rate of 30 mg/m^2/day has been chosen as a conservative background level of natural dust deposition based on discussion in Volume 1 Chapter 13 Air Quality.

Table 13-1 shows the dust deposition guideline commonly used in Queensland as a benchmark for avoiding amenity impacts due to dust. The dust deposition guideline is not defined in the EPP(Air) and is therefore not enforceable by legislation, but is recommended by the Environmental Protection Agency (EPA) as a design goal and has been adopted for this project.

Table 13-1: Impact assessment criteria for dust deposition

Criteria	Averaging period	Concentration	Units
Dust deposition rate	Annual	120	mg/m^2/day

13.3.2 SENSITIVE RECEPTORS

Upon an aerial photo review of the proposed pipeline route 10 potentially sensitive receptors have been identified as shown in Figure 13.1-V3.3. Note that figures/documents with numbering ending in V3.3, for example, refer to figures/documents contained in Volume 3, Book 3 of the EIS. The atmospheric environment of the sensitive receptors is considered to be similar along the pipeline route. Sensitive receptors sparsely located along the route of the pipeline with various separation distances from the corridor. The closest identified dwelling from aerial photography was located approximately 600 m away from the proposed pipeline (receptor W-8) with the remaining receptors being separated by at least a 1 km buffer zone. No receptors were identified within 2 km of the pump station.

13.4 DESCRIPTION OF PROPOSED DEVELOPMENT

13.4.1 CONSTRUCTION ACTIVITIES

Typical machinery used for pipeline construction and installation will involve a wheel trencher and excavator, hydraulic rock breaking equipment (if hard rock is encountered), pipe delivery trucks, multiple tractors fitted with side cranes would be used to lift and move the pipe string over the trench and lower the pipe into position and, bedding sand deliveries.

Construction activities will include the use of the above machinery to prepare the area along the proposed pipeline route (and access tracks where necessary) by clearing vegetation and grading. The use of existing access tracks would be given first preference to avoid any unnecessary clearing.

Trenching would be used to construct the majority of the proposed pipeline route and would be prepared ahead of construction using a wheel trencher and excavator for the majority of the route. In some areas, harder rock may be encountered and hydraulic rock breaking equipment may be required.

Multiple tractors fitted with side cranes and counterweights would be used to lift and move the pipe string over the trench and lower the pipe into position.

Once the pipe is strung, it would be positioned using side boom tractors and internal line-up clamps and joined into a continuous string. The pipeline would either be welded or flange bolted.

Chapter 5 Project Construction contains further details on construction activities of the proposed pipeline.

13.5 POTENTIAL IMPACTS

13.5.1 CONSTRUCTION

Emissions during construction of the pipeline will associated with land clearing, ground excavation and back filling. It is not expected that background PM10 levels will be impacted by construction activities.

13.5.2 EARTHWORKS

The excavation of the pipeline trench and subsequent refilling once the pipe has been laid will be a relatively small source of fugitive dust emissions. This is due to the small surface area of worked land (approximately 10 m in width) as dust emissions are proportional to the area of land being disturbed (US EPA AP-42 1995). It is considered unlikely that exceedances of the EPA recommended guideline for dust deposition will extend beyond the pipeline corridor.

13.5.3 TRAFFIC

A large portion of fugitive dust emissions results from equipment traffic over temporary unsealed roads. As the majority of the construction activity will be co-located with the existing roads and due to the relatively small number of vehicles required for the operation and the mitigation measures that are proposed to be employed, impacts are considered to be negligible.

13.5.4 WELDING FUME

If welding is selected as the method for joining pipes, the impact of welding fume associated with industrial construction is not expected to have any impact outside the immediate vicinity of the activity (i.e. 1 to 2 m). Due to the minimal amount of time these activities will be occurring during the construction phase, impacts are considered to be negligible.

13.5.5 OPERATION

No air emissions will be produced by the operation of the proposed pipeline as the pipeline will be operating underground. Minor pipeline maintenance works could require minor excavation and inspection vehicles will traverse the pipeline routinely but again dust impacts are expected to be negligible.

13.6 MITIGATION MEASURES

13.6.1 CONSTRUCTION

Dust deposits can have a detrimental effect on plant life, especially horticultural crops. It is the larger particle sizes (greater than 30 µm) that readily settle on exposed surfaces and can cause a reduction in photosynthetic production or stomatal blockages. These effects however are only expected under extreme dust loadings in the order of more than double the EPP (Air) goal of 120 mg/m^2/day.

The rate at which dust settles out of the atmosphere is proportional to the particles size, where a 10 µm (PM10) particle will settle out of a still atmosphere at a rate of 0.5 cm/s while a 100 µm particle will fall at 45 cm/s. This means that when there is a 5 m/s wind the PM10 particle will travel around 1 km from the source before being deposited back on the surface while the 100 µm particle will only travel about 10 m. It is the larger dust particles (greater than 30 µm) which pose the potential for impacts to plant life and nuisance (visual and general amenity) for a residential community.

The EPP (Air) goal for dust deposition is considered as the level at which a nuisance impact will occur (visible dust in atmosphere or on plants/buildings) these levels are generally found to occur within 200 m to 300 m of the source. To ensure that levels remain well below the EPP (Air) goals for annual TSP, PM_{10} and dust deposition haul roads and stockpiles will not be located within 500 m of a sensitive receptor.

A dust management plan will be developed for the construction of the western pipeline as part of the Project's Construction Management Plan. This plan will include:

- use of water sprays during excavation when sensitive receptors are located within 500 m of the pipeline corridor
- rehabilitation of the disturbed area as soon practicable following trench refill
- use of water sprays on access roads as necessary during maintenance activities.

13.7 RESIDUAL IMPACTS

The construction of the proposed pipeline is anticipated to meet the required environmental targets once all of the mitigation measures are implemented, and therefore no residual impacts are expected to occur.

13.8 REFERENCES

Environmental Protection Agency (1997), 'Environmental Protection (Air) Policy', Subordinate Legislation 1997 No. 468 and amendments, Office of the Queensland Parliamentary Counsel, Queensland.

Queensland Environmental Protection Act (1994), Reprinted as in force on 6th June 1996 (includes amendments up to Act No. 10 of 1996).

U.S. EPA AP 42, Fifth Edition, Volume I Chapter 13: Miscellaneous Sources, section 13.2.3, 1995.