8.2 Air quality

This section provides an assessment of air quality impacts associated with the construction and operation of the project. Air quality was not identified as a key issue in the Director-General's requirements (DGRs) for the project. However, an *Air Quality Technical Paper* (PAEHolmes, 2012) has been prepared for the project. The technical paper is provided in **Appendix N** and has been summarised below.

8.2.1 Approach to assessment

Air quality criteria

Carbon monoxide, oxides of nitrogen (nitric oxide and nitrogen dioxide , sulphur dioxide and particulate matter (including PM_{10}, total suspended particulates and deposited dust) are emitted by motor vehicles and are known to be potentially harmful to human health if the concentration is too great over a particular exposure period.

Carbon monoxide is produced from the incomplete combustion of fuels, where carbon is only partially oxidised instead of being fully oxidised to form carbon dioxide. When inhaled, carbon monoxide reduces the capacity of blood to transport oxygen, leading to symptoms including lethargy and headaches. Air quality goals set by the EPA provide a significant margin for safety to protect a wide range of people in the community, including the very young and the elderly.

Oxides of nitrogen are produced by motor vehicles when nitrogen from the air is oxidised at high temperatures and pressures in the combustion chamber. Nitrogen oxides emitted by motor vehicles are mainly made up of nitric oxide and nitrogen dioxide. Concern with nitric oxide is related to its transformation to nitrogen dioxide and its role in the formation of photochemical smog, which can cause harm to the eyes, respiratory system, plants and building materials. Nitrogen dioxide has been reported to affect respiratory function, although the evidence has been mixed and conflicting.

Particulate matter or dust can be generated by construction activity and/or the operation of a development. There are two ways in which particulate matter can affect humans and the environment:

- Health impacts, which arise when finer particles (below 10 microns in diameter, referred to as PM_{10}) enter bronchial and pulmonary regions of the respiratory tract.
- Amenity impacts, which arise when dust is deposited on surfaces, such as roofs, causing a reduction in amenity.

Particulate matter is emitted by motor vehicles due to the incomplete combustion of fuels, additives in fuels and lubricants, worn material that accumulates in the engine lubricant and brake and tyre wear. The presence of particulate matter can have health and amenity impacts.

Particulate matter emitted during dust-generating construction activity can also potentially have short-term health and amenity impacts.

There are three categories of particulate matter. These are PM_{10}, total suspended particulates (TSP) and dust deposition. TSP is a measurement of the total of all particles suspended in the air, of which PM_{10} is a subset. PM_{10} is one of the main causes of dust-related health impacts. Dust deposition is a measurement of the weight of dust falling on a given area over time, and is another way of measuring the amenity impact.

The EPA specifies ground-level concentration criteria for these pollutants within 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW' (NSW Department of Environment and Conservation (DEC), 2005). These criteria are provided in **Table 8-2**.

The criteria for sulphur dioxide is not included in **Table 8-2**, as emissions of sulphur dioxide from motor vehicles are minor and were not considered further in this assessment.

Table 8-2 EPA air quality assessment criteria

Pollutant	Averaging period	Goal	Source*
Carbon monoxide	1 hour	30 mg/m^3	WHO (2000)
	8 hour	10 mg/m^3	NEPC (1998)
Nitrogen dioxide	1 hour	246 µg/m^3	NEPC (1998)
	Annual	62 µg/m^3	NEPC (1998)
Particulate matter <10 µg (PM_{10})	24 hours	50 µg/m^3	NEPC (1998)
	Annual	30 µg/m^3	EPA (1998)
Total suspended particulates	Annual	90 µg/m^3	NHMRC (1996)
Deposited dust	Annual	4 g/m^2/month	NERDDC (1988)

** WHO – World Health Organisation, NEPC – National Environment Protection Council, EPA – Environment Protection Authority, NHNRC – National Health and Medical Research Council, NERDCC – National Energy Research, Development and Demonstration Council.*
mg/m^3 – milligrams per cubic metre
µg/m^3 – micrograms per cubic metre
g/m^2 – grams per square metre

Air quality modelling

The Caline series of dispersion models has been used to estimate the concentration of oxides of nitrogen, carbon monoxide and particulate matter that are likely to occur in the vicinity of the existing Princes Highway. The information input into this model includes meteorological conditions, traffic volumes, emissions information and receptor location information.

8.2.2 Existing environment

The existing air quality in the project area is mainly influenced by local road traffic. Agricultural and manufacturing activities, such as dairy and beef production, also contribute to air quality in the region, particularly dust emissions. However, the effects of agriculture and manufacturing on air quality are relatively small and localised only.

For the purposes of this assessment, 69 sensitive residential receivers were identified in the vicinity of the project. These sensitive receivers have been used to assess the air quality impacts of the project, when operational (refer to **Figure 8-5**). These receivers were chosen from over 600 in the region as they were the closest to the project. A total of 169 residences located closest to the proposed temporary ancillary construction facilities were also assessed as sensitive receivers and were used to model the potential construction impacts. A number of these residences were also assessed as operational receivers. The minimum distance of sensitive receivers from the boundaries of ancillary facilities varied from site to site. The closest receiver was located around 50 metres from a property boundary of an ancillary facility site.

Climatic conditions

Temperature, humidity and rainfall data was collected from the Nowra Royal Australian Navy (RAN) automatic weather station at HMAS Albatross, located around eight kilometres south-west of the central business district of Nowra. This data was collected between 1942 and 2000 (Bureau of Meteorology, 2011).

The annual average maximum and minimum temperatures recorded at the Nowra RAN automatic weather station are 21.3 and 11.3 degrees Celsius respectively. On average, January and February are the hottest months, with an average maximum temperature of 25.8 degrees Celsius. July is the coldest month, with an average minimum temperature of 6.2 degrees Celsius. February has the highest humidity, with a 9am average of 76 per cent, while August and September have the lowest humidity, with a 3pm average of 52 per cent.

The average annual rainfall recorded at the Nowra RAN automatic weather station is 1110 millimetres. February is the wettest month with an average rainfall of 120 millimetres. March is the driest month with an average rainfall of 24.4 millimetres.

Data on wind direction and wind speed was collected in 2000 from a site at the Gerroa Tip, which is located around five kilometres south-west of Gerringong. On an annual basis, the most common winds are from the west, west northwest and north east. The annual average wind speed is 2.4 meters per second. A stability class was assigned to each hour of the meteorological data using concurrent cloud cover information and the methodology of Turner as documented in the *Workbook of Atmospheric Dispersion Estimates* (Turner, 1970). Stability is dependent on a number of factors, such as wind speed, terrain and the temperature profile of the atmosphere. Class A is defined as very unstable through to Class F which is defined as very stable conditions.

In the project area, the most common stability occurrences were calculated to be D class (21 per cent of the time) and E and F classes (20 per cent of the time each). E and F class conditions would be more stable and would generally have lower wind speed than D class conditions. As a result, emissions are likely to disperse more quickly under D class conditions but more slowly under the E and F class conditions.

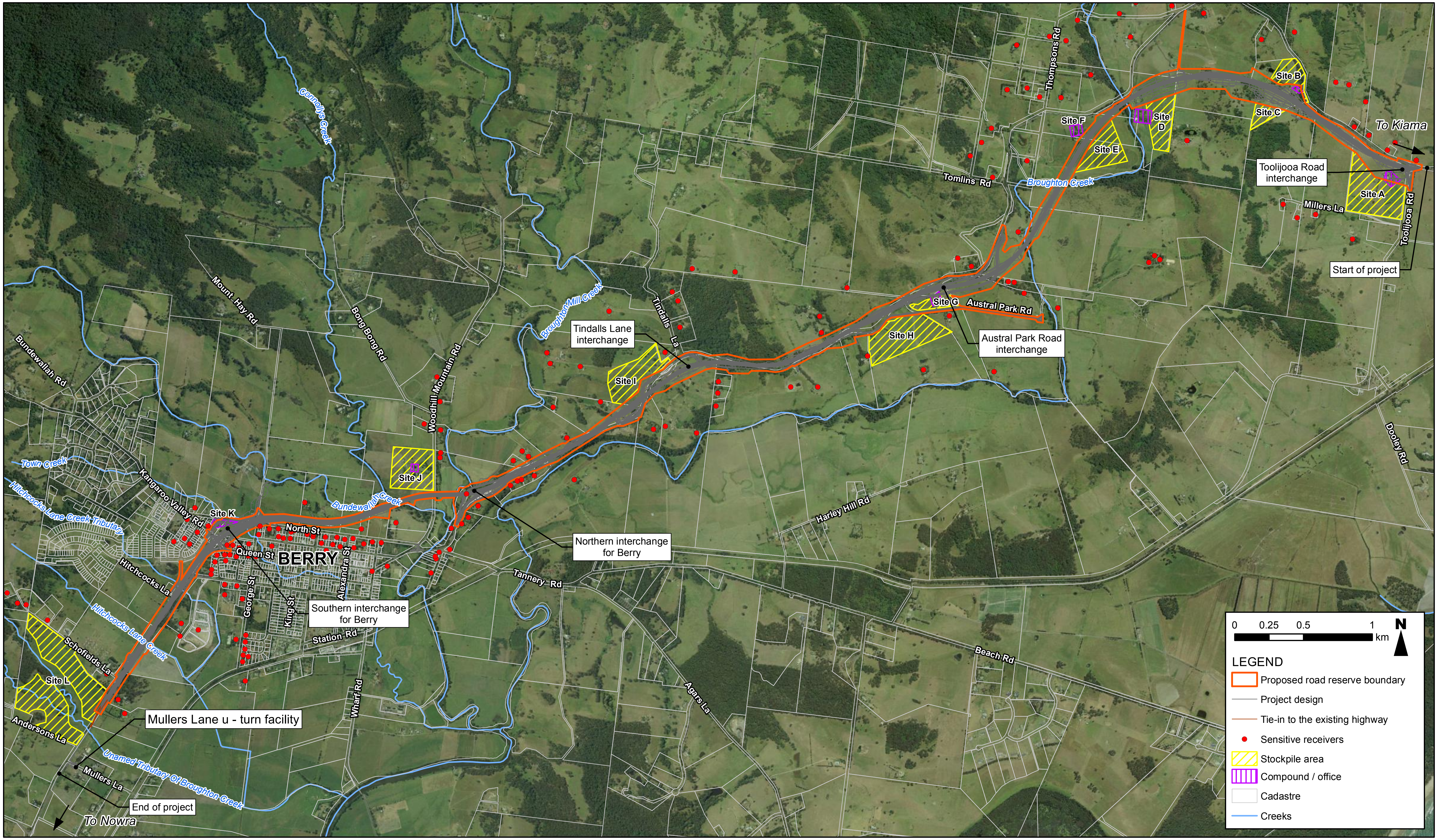

Figure 8-5 Location of sensitive receivers in the vicinity of the project

Source: Dept. of Lands (2007), Fugro (2007), RTA (2011)

Background air quality

Air quality standards and goals refer to pollutant levels, which include pollutants from both the project and existing sources.

Background air quality data for nitrogen dioxide and particulates (PM_{10}) was sourced from the closest EPA operated monitoring stations. Between 1997 and 2005, data was sourced from a monitoring station at Croome Road, Albion Park, around 20 kilometres north of Gerringong. This station was decommissioned in early 2005 and a new station was commissioned at Terry Reserve, Albion Park South in December 2005. Data was collected from the Terry Reserve monitoring station between 2005 and 2007. Data collected from these stations has been combined to provide an air quality dataset for a 10 year period between 1997 and 2007. Data for carbon monoxide was sourced from a monitoring site in Wollongong.

Between 1997 and 2007, air quality for the area was within EPA criteria for nitrogen dioxide and carbon monoxide with:

- Maximum nitrogen dioxide one hour average (166 µg/m^3) and annual average (31 µg/m^3) concentrations below the EPA goal air quality criteria of 246 µg/m^3 and 62 µg/m^3 respectively.
- Maximum carbon monoxide one hour average (10.6 mg/m^3) and eight hour average (5.3 mg/m^3) concentrations below the EPA air quality criteria of 30 mg/m^3 and 10 mg/m^3 respectively.

Maximum particulate concentrations (PM_{10}) were on occasion above the maximum 24 hour goal of 50 µg/m^3 over the 10 year period. This includes a concentration of 281 µg/m^3 in 2003 that corresponded with a recorded dust storm in the region. As particle pollution is affected by environmental factors such as bushfires and dust storms, other high levels recorded may also be attributed to these factors. The annual average concentrations of PM_{10} are below the EPA air quality criteria of 30 µg/m^3 with the exception of the annual average for 2003, which was likely the result of dust storms recorded in that year.

In 2007, Holmes Air Sciences (now PAEHolmes) conducted a modelling study which investigated the air quality impacts due to the existing highway within the project area (Holmes Air Sciences, 2007). The predicted concentrations for carbon monoxide, nitrogen dioxide and PM_{10} were below their respective air quality goals at the setback distances modelled (which had a range of zero metres to 50 metres from the existing highway). The results of this study are in the Air Quality Technical Paper at **Appendix N**.

8.2.3 Assessment of potential impacts

Construction impacts

Dust would be generated as a result of drilling, blasting, general earthwork activities, haulage and stockpiling associated with the construction of the project. The total amount of dust generated by construction activities would depend on the silt and moisture content in the soil, and the type of activity being carried out.

Airborne dust has the potential to cause health and amenity impacts during construction. Health impacts would be measured by concentrations of PM_{10} expected to be released by the project. Amenity impacts would be measured by expected dust deposition on surfaces. Amenity impacts would include dust settling on items such as solar panels and roof areas which may carry dust into rainwater tanks. As identified in **Section 8.2.2**, dust deposition criteria have been set to protect against these amenity impacts (NSW DEC, 2005).

For the purposes of the environmental assessment, the ancillary facilities have been considered separately to general earthwork activities as these facilities would potentially involve continuous operation throughout the 39 month construction period. General earthwork activities in any one location would not occur throughout the entire construction period.

Earthwork activities

The main activities that would generate dust during earthworks would include blasting and the exposure and movement of soil by excavators, front-end loaders and dump trucks. Wind erosion from exposed surfaces and spoil would also generate dust. Earthwork activities at Toolijooa ridge in particular have the potential to impact on neighbouring sensitive receivers due to the extent of excavation and blasting required for the large cutting.

To assess these potential impacts, a number of assumptions have been made including the number of blasts, the volume of rock requiring excavation and the surface area exposed to wind erosion (refer to the *Air Quality Technical Paper* (PAEHolmes, 2012) at **Appendix N** for further information). It was also assumed that blasting would only occur intermittently during the first 24 months of the 39 month construction period, and that no mitigation measures were implemented.

Dust emissions from vehicle movements on unsealed (haul) roads were included in the assessment. Assumptions were based on an estimation of haulage capacities and distances travelled. It should be noted that these sources are not easily quantifiable as distances travelled would be highly variable.

Based on these assumptions, it was estimated that around 103,370 kilograms of dust would be generated during the construction period or around 31,800 kilograms of dust per year. Dust emissions of this scale are unlikely to cause any significant adverse impacts at the nearest sensitive receivers. Major dust producing industries, such as quarries, emit dust at rates significantly greater than this and still comply with both health and amenity criteria.

However, there may be short-term amenity impacts at locations adjacent to the construction site when wind speeds are high. The implementation of the management and mitigation measures identified in **Section 8.2.4**, including the use of dust suppression techniques and ceasing dust generating activities during high winds, would assist to substantially reduce emissions and minimise potential impacts on sensitive receivers.

Ancillary facilities

At ancillary facility sites, exposed stockpiles affected by wind erosion are the main potential source of dust. To assess the potential impacts of these activities, conservative modelling was undertaken to predict the impacts at the closest sensitive receivers using a modified version of the United States Environmental Protection Agency (USEPA) Industrial Source Complex model. The conservative modelling has allowed for the assessment of the worst-case impacts associated with the project.

Modelling was undertaken for the maximum 24 hour and annual average particulate (PM_{10}) concentrations, the annual average TSP and dust deposition levels, to determine if levels at the closest sensitive receivers satisfy the air quality criteria provided in **Table 8-2**. In doing so, the following worst case scenario assumptions were made:

- All ancillary sites would involve stockpiling compounds.
- All stockpiles would be 50 per cent exposed at all times over a 12 month period.
- All stockpiles would be subject to wind erosion 24 hours a day.
- Wind erosion would be occurring from all stockpile compounds simultaneously over a 12 month period.
- No mitigation measures would be implemented.

This provides a worst case assessment as it is more likely that construction would occur in phases and therefore not all stockpiles would be active simultaneously for the whole year. In addition, management and mitigation measures would be implemented in accordance with the *Stockpile site management procedure* (RTA 2005) and the *RMS QA Specification R44 – Earthworks* to ensure that the typical (representative) potential impacts are minimised.

Figure 8-5 identifies the ancillary facilities (assumed to be stockpile compounds for the purposes of this assessment) and the sensitive receivers considered in the worst case assessment.

The results of the modelling study found that for the worst case scenario, annual average criteria for particulates (PM_{10} and TSP) would not be exceeded at any sensitive receiver due to wind erosion from the stockpile compounds with:

- The highest predicted annual average PM_{10} concentration at any of the sensitive receivers estimated to be around 6.4 $\mu g/m^3$. This is below the EPA assessment criteria of 30 $\mu g/m^3$.
- The maximum predicted annual average TSP concentration was eight $\mu g/m^3$. This is below the EPA assessment criteria of 90 $\mu g/m^3$.

For 24-hour PM_{10} concentrations at sensitive receivers, almost all predictions were below 10 $\mu g/m^3$. The most affected receiver, located near Austral Park Road, was predicted to experience a maximum 24-hour PM_{10} concentration of 38 $\mu g/m^3$. When considering the project alone, this would be below the EPA assessment criterion of 50 $\mu g/m^3$. However, as discussed in **Section 8.1.1**, existing background levels are often above this criterion. As such, the predicted levels at the most affected receiver as a result of the construction activities were considered further. The assessment concluded:

- The receiver would experience only two days in the year where predictions were above 20 $\mu g/m^3$.
- The 90th percentile 24-hour average PM_{10} level at the receiver was very low at four $\mu g/m^3$. The 90th percentile is the concentration at the receiver for 90 per cent of the time over the 24-hour period.

The low 90^{th} percentile indicates that these higher values are infrequent and likely to be the result of winds blowing directly from the stockpile towards that particular sensitive receiver for a number of hours within the 24-hour period. This does not factor in any reductions in dust levels that can be achieved through mitigation measures, which can reduce the ground level concentration significantly over a 24-hour period.

Dust deposition criteria have been set to protect against amenity impacts (NSW DEC, 2005). The maximum acceptable increase in dust deposition over the existing dust levels from an amenity perspective is two g/m^2/month. So for the project alone, the incremental criterion is two g/m^2/month and for total deposition (including background) it is four g/m^2/month.

Predictions at almost all sensitive receivers are below two g/m^2/month for the annual dust deposition levels. However, there would be one sensitive receiver (the same receiver as detailed above) that may experience an annual average dust deposition level of three g/m^2/month as a result of the project. This would cause an exceedance of the incremental criterion but would be unlikely to exceed the cumulative criterion when added to existing background levels. With the implementation of management and mitigation measures described in **Section 8.2.4**, particularly during times of elevated wind speeds, the emissions are likely to be lower than those modelled and would be within the criteria. Therefore impacts of airborne dust on solar panels and rainwater tanks are unlikely.

Overall, the potential impacts on the single sensitive receiver would be a worst case impact and would be minor. These impacts would be managed, or potentially avoided, by implementing standard and best practice mitigation measures as outlined in **Section 8.2.4**.

Operational impacts

To assess the potential impacts of the operation of the project, air dispersion modelling was undertaken (using the CALRoads package). The modelling was used to predict concentrations of carbon monoxide, nitrogen dioxide and PM_{10} that are likely to occur due to vehicle emissions from the project at the nearest sensitive receivers. These were then assessed against the criteria set by EPA as provided in **Table 8-2**.

The model used is able to determine concentrations at sensitive receivers downwind of 'at-grade', 'fill', 'bridges' and 'cut section' highways located in relatively simple terrain. The model is applicable to any wind direction, highway orientation and receiver locations. Information that was entered into the model included:

- Meteorological conditions collected from a site at the Gerroa Tip.
- Traffic volumes, using predicted hourly traffic volumes for 2017 and 2027, and the percentage of heavy vehicles predicted for these years.
- Vehicle emissions information, using vehicle emissions data from the Permanent International Association of Road Congresses (PIARC) (PIARC, 2004) adjusted to reflect the age of NSW vehicle fleet using NSW traffic registration data from the Australian Bureau of Statistics Motor Vehicle Census (ABS, 2005).
- Receiver location information.

The findings of the air quality modelling are provided in **Table 8-3**, **Table 8-4** and **Table 8-5**. Each table provides the predicted emissions at the most affected sensitive receiver. Predictions are provided for the project alone as well as the cumulative impact of the project taking into consideration background air quality. Results for all 69 sensitive receivers are in the *Air Quality Technical Paper* at **Appendix N**.

Carbon monoxide

As shown in **Table 8-3**, predicted carbon monoxide contributions from the project alone are within the EPA assessment criteria at the most affected receivers for both the one hour and eight hour average periods and the two years modelled (being 2017 and 2027 as representative years following the completion of construction). These also remain below the EPA assessment criteria when factoring in background air quality levels. It is also noted that:

- Levels of carbon monoxide would be lower at receivers located further away from the roadway.
- The modelling does not account for the likelihood that the percentage of older, more inefficient vehicles would be lower in 2027, further reducing carbon monoxide emissions.
- Background air quality data used for the project is the highest level recorded and includes emissions from the existing highway, providing a conservative assessment of cumulative air quality impacts.

Overall, the results of the modelling indicate that it is unlikely that the EPA carbon monoxide criteria would be exceeded at sensitive receivers, as a result of carbon monoxide emissions from the project.

Table 8-3 Predicted maximum carbon monoxide ground-level concentrations at the most affected sensitive receiver in 2017 and 2027

	Maximum one hour average Carbon monoxide concentration (mg/m³)		Maximum eight hour average Carbon monoxide concentration (mg/m³)	
EPA criteria	**30 mg/m³**		**10 mg/m³**	
Maximum background	**10.6 mg/m³**		**5.3 mg/m³**	
Year	**2017**	**2027**	**2017**	**2027**
Project alone	0.4	0.6	0.1	0.2
Cumulative impact (including background)	11	11.2	5.4	5.5

Oxides of nitrogen

It is more difficult to estimate nitrogen dioxide concentrations than carbon monoxide concentrations. It is dependent on the rate of conversion of nitric oxide and other oxides of nitrogen into nitrogen dioxide, which increases as the distance of the receiver from the roadside increases. Studies conducted in 1997 by the then RTA suggest that a conversion rate of 15 per cent at ten metres from the roadway is conservative (RTA 1997). For the purposes of this assessment, it has been assumed that a 100 per cent conversion would occur. This is a highly conservative approach and assumes a worst case scenario.

As shown in **Table 8-4**, the predicted nitrogen dioxide concentrations from the project are well within the EPA assessment criteria at the most affected receiver for both the one hour and annual average periods and the two years modelled (2017 and 2027). These also remain below the EPA assessment criteria when factoring in background air quality levels, which is the highest level recorded over a 10 year period.

As such, it is not likely that nitrogen dioxide levels would be exceeded at sensitive receivers located along the project corridor.

Table 8-4 Predicted maximum nitrogen dioxide ground-level concentrations at the most affected sensitive receiver in 2017 and 2027

	Maximum one hour average Nitrogen Dioxide concentration (µg/m³)		Maximum annual average Nitrogen Dioxide concentration (µg/m³)	
EPA criteria	**246 µg/m³**		**62 µg/m³**	
Maximum background	**166 µg/m³**		**31 µg/m³**	
Year	**2017**	**2027**	**2017**	**2027**
Project alone	10.8	13.0	0.4	0.5
Cumulative impact (including background)	176.8	179	31.4	31.5

Particulates – PM_{10}

As shown in **Table 8-5**, the highest predicted 24-hour average PM_{10} concentrations and maximum annual average PM_{10} concentration contributed by the project alone at the nearest residential receiver are below the EPA criteria in 2017 and 2027. These are not significant increases and are not likely to result in adverse impacts on air quality at sensitive receivers.

Table 8-5 Predicted maximum ground-level concentrations for particulates at the most affected sensitive receiver in 2017 and 2027

	Maximum 24 hour average PM_{10} concentration (µg/m^3)		Maximum annual average PM_{10} concentration (µg/m^3)	
EPA criteria	**50 µg/m^3**		**30 µg/m^3**	
Median background	**63 µg/m^3**		**17 µg/m^3**	
Year	**2017**	**2027**	**2017**	**2027**
Project alone	0.6	0.6	0.1	0.2
Cumulative impact (including background)	63.6	63.6	17.1	17.2

To assess the cumulative impact of the project, the median background levels have been applied instead of the maximum value recorded. Median background levels are considered to be more appropriate to assess the potential cumulative impact of the project for PM_{10}, as:

- PM_{10} levels can be greatly affected by dust storms and bush fires, and in the case of 24-hour average levels, greatly affected by local dust generating activities that are short lived.
- The majority of readings recorded were below the EPA assessment criteria for the 24-hour average.
- The maximum recorded level for the annual average for PM_{10} represents the only year within the 10 year period that the EPA assessment criteria was exceeded, with all remaining years below the EPA assessment criteria (being 20 µg/m^3 and below).

Applying this approach, the median annual PM_{10} concentration remains within the EPA assessment criteria when factoring in existing background air quality levels at the most affected receiver (refer to **Table 8-5**). For the median 24-hour average, PM_{10} concentrations are above the EPA assessment criterion of 50 µg/m^3 (refer to **Table 8-5**). However, existing background levels are already above this criterion prior to the inclusion of the predicted emissions from the project.

In these cases, the degree to which the contributions from the project alone make up the relevant impact assessment criterion is then considered. The maximum predicted 24 hour average concentration from the project in 2017 is 0.6 µg/m^3. This represents about one per cent of the EPA assessment criteria, and this remains around the same in 2027. It is therefore unlikely that the EPA air quality goal would be exceeded as a result of the project. As such, the project is not likely to result in adverse impacts at sensitive receivers located along the project corridor.

8.2.4 Environmental management measures

Mitigation and management measures would be implemented to avoid, minimise or manage air quality impacts. These mitigation and management measures are identified in **Table 8-6** and incorporated in the draft statement of commitments in **Chapter 10**.

Table 8-6 Mitigation and management measures

Potential impacts	Mitigation and management measures
Construction	
Dust	Prior to the commencement of construction, develop an Air Quality Management Plan (AQMP), which would incorporate measures to minimise dust generation from the project and would form part of the overall construction environmental management plan (CEMP) for the project. The AQMP would include the following provisions: • Minimise dust generation from the project by: – Stabilising all disturbed areas as soon as practicable to prevent or minimise wind-blown dust. – Watering unsealed roads and sealing of roads where possible, with unsealed trafficable areas kept sufficiently damp during working hours to minimise wind-blown or traffic generated dust emissions. – Controlling truck speed and movements onsite and restrict trucks to designated roadways. – Installing truck wheel washes or using other dust removal procedures to minimise the transport of dust offsite, and regularly inspecting public roads to remove and dispose of any dust, soil or mud deposited on public roads by construction vehicles. – Modifying or stopping construction activities during periods of high wind, if necessary. – Maintaining stockpiles and handling areas in a condition that minimises windblown or traffic generated dust. – Using water sprays, sprinklers and water carts if needed to adequately dampen stockpiles, work areas and exposed soils to prevent the emission of dust from the site. – Regularly inspecting and maintaining erosion control structures to ensure silt does not become a source of dust. – Maintaining all equipment for dust control to keep it in good operating condition. The equipment would be operable at all times with the exception of shutdowns required for maintenance. • Locate dust monitors in areas close to sensitive receivers to monitor dust accumulation against the standard criteria. These would include areas where there is potential for amenity impacts due to dust deposition on roofs (leading to rainwater tanks) and solar panels. Dust monitoring would be undertaken on a monthly basis.

Potential impacts	Mitigation and management measures
	• On sites where there is a clear and unambiguous dust impact resulting from the construction of the project, implement appropriate management measures including: – Disconnect water tanks from roofing and maintain water supply to properties using tanks. – Wash-down of the roof at the completion of dust generating works to ensure a clean roof for water supply and reconnection of the water tanks. Stop dust generating activities should it become apparent that dust is leaving the site while those activities are being undertaken.
Vehicle and plant emissions	Maintain all vehicles, including trucks entering and leaving the site, in accordance with the manufacturer's specification to comply with all relevant regulations. Maintain all construction equipment to ensure exhaust emissions comply with the Protection of the Environment Operations Act 1997.
Operation	
	Air quality impacts during the operation of the project would be minimal and therefore no mitigation measures have been proposed.