Project Interaction	Potential Effects	Mitigative Factor and Measure	Significance Criteria*	Assessment of Significance
	waters; • Salt is considered a toxic deleterious substance in the environment.	applications; • Alternatives to salt are continuously being evaluated (CaCl, Urea) by municipalities in an effort to limit the impacts to surface and ground waters; • Runoff to be treated through oil and grit separators, then run through Howland Swales and the receiving wetland systems, which will help polish nutrients and a fraction of the dissolved salt; • Use of Best Management Practices during regular maintenance.	• Spatial Extent - *Local;* • Duration - *Seasonal, continuous;* • Frequency - *Moderate;* • Permanence – *Annually;* • Ecological Context – *Local.*	Management Practices.

** Magnitude High-affect; Large amounts of ground water to be liberated from highly porous soils, requiring ongoing pumping. Moderate – Some groundwater to be liberated, but easily managed by pumping; Low – seepage or no groundwater expected in excavations, pumping generally not required.*

6.3 Air Quality & Dust

6.3.1 Current Baseline Conditions

The majority of the study area is either open farmland or forested, and in both regards the levels of dust are negligible and the air purity of highest quality. Green house gas emissions do originate in the manure generated by livestock (methane) and in the aerobic and anaerobic decomposition processes of the wetlands in the South March Highlands (Carbon dioxide, hydrogen sulphide, methane). Levels in both areas would be at the lower end of the detection range.

6.3.2 Effects Assessment

The main interaction of the proposed construction activities with the atmosphere is through dust generation and emissions from construction equipment and vehicles (sulphur compounds, carbon dioxide, carbon monoxide and nitrogen oxides).

Dispersion of dust generated by construction will vary with conditions such as wind, temperature and humidity and the speed of construction vehicles. Residents located adjacent to the proposed alignment (e.g. those on the north side of the existing section of roadway) may be periodically exposed to dust from heavy equipment and vehicles within the construction area. In addition, heavy diesel construction equipment and trucks can emit particulate matter from the engine exhausts.

Construction Measures

Mitigation for dust will include the application of water or other dust suppression agent, and appropriate storage and handling procedures for soils and aggregate, particulate emissions will not result in significant impacts off the site. Shot rock is granite originated, and is likely to have less dust associated with it than crushed limestone products. Reuse of the shot rock is preferred over a dust management and to avoid the air quality cost of transporting crushed product from quarries. Dust management is expected to focus on areas with potential for localized fugitive releases such as storage piles and cleared routes from supply to application. Where possible these areas will be located away from populated areas. A tire wash down area

to be available at the worksite will minimize the tracking soil onto the public roadways. Regular sweeping of the streets will also help minimize dust from mud tracking.

Operational Measures

Greenhouse gas (GHG) emissions are generated by all fossil fuel combustion sources. Vehicle emissions during the construction and operations phases are sources of GHG emissions. During the summer months, especially during smog events or ozone-action days, diesel truck or equipment idling will be minimized. Refuelling activities will be conducted during cooler morning or evening hours as much as possible.

During the operations period, vehicles using the road may emit several types of pollutants, including: carbon monoxide, nitrogen oxides (NOx), volatile organic compounds (VOCs or non-methane hydrocarbons - NMHC), particulate matter (PM), carbon dioxide (CO_2) and sulphur oxides (SOx).

Impacts on Greenhouse Gas (GHG) emissions must also be considered for new roadway projects. Levels of air pollutants at any point in the environment at any particular time are dependent on source emission rates, dispersion characteristics and removal (scavenging) rates. The primary contaminants associated with tailpipe emissions that contribute to GHG emissions and global warming are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Most of the primary pollutants are transformed in the atmosphere to secondary pollutants including smog, ozone and various nitrogen and sulphur compounds. These compounds along with water vapour and ozone are naturally occurring greenhouse gases and these compounds are continuously emitted to and removed from the atmosphere by natural processes. Concentrations of the primary pollutants tend to be highest immediately adjacent to the roadway, with a rapid decrease in concentration as one moves away from the corridor.

The impacts on air quality from vehicle emissions during operations with improved traffic flow are expected to be not significantly different than under a future development scenario without the roadway with a congested local road network concentrated along Goulbourn Forced road and other arterials.

6.3.3 Assessment of Significance

Table 6-5 provides a summary of the air quality effects assessment.

Table 6-5 – Summary of Effects on Air Quality and Dust

Project Interaction	Potential Effect	Mitigative Factor and Measure	Significance Criteria*	Assessment of Significance
Construction				
Site Preparation and General Construction Activities	• Increased levels of airborne particulate matter.	• Adherence to the Environmental Code of Good Practice for General Construction ; • Dust control plan implementation and monitoring in response to complaints; • Reuse of granite shot rock.	• Nature of Effect: *negative, direct;* • Magnitude – *Low;* • Geographic Extent - *Low;* • Duration - *one season;* • Frequency - *once;* • Permanence – *No;* • Ecological Context – *Local.*	Not significant with mitigation.

Project Interaction	Potential Effect	Mitigative Factor and Measure	Significance Criteria*	Assessment of Significance
Vehicle Use/Transport of Materials	• Tailpipe emissions and resultant smog and GHG effects.	• Air contaminant emissions will be minimized by proper maintenance of vehicles and equipment associated with construction.	• Nature of Effect: *negative, direct;* • Magnitude – *Low;* • Geographic Extent - *Low;* • Duration - *One season;* • Frequency - *Continuous;* • Permanence - *No* Ecological Context – *Local.*	Not significant with mitigation.
Operations				
Routine operations and maintenance (Vehicle Use)	• Tailpipe emissions and resultant smog and GHG effects.	• Improvements to traffic flow is expected to result in no significant increase in emissions from current levels.	• Nature of Effect: *negative, direct;* • Magnitude – *Low* • Geographic Extent - *Low;* • Duration - O*n-going;* • Frequency - *Continuous;* • Permanence – *No;* • Ecological Context – *GHG Local and Global.*	Not significant.

** Magnitude High-affect above EC Guideline; moderate – affect near guideline; Low – affect below guideline.*