North East Link tunnel ventilation system works approval decision

EPA VICTORIA | Environment Protection Authority Victoria

VICTORIA State Government

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Summary report

Introduction

The North East Link (NEL) is a proposed new freeway standard road. It is designed to complete the missing link in Melbourne's metropolitan ring road. The project requires the construction of twin tunnels connecting the Eastern Freeway and M80. Each tunnel would be approximately 6 km in length with connections to the interchanges at Manningham Road and Lower Plenty Road.

North East Link Project is a division of the Major Transport Infrastructure Authority and an administrative office of the Department of Transport (the proponent). It has proposed constructing a ventilation system for the twin tunnels.

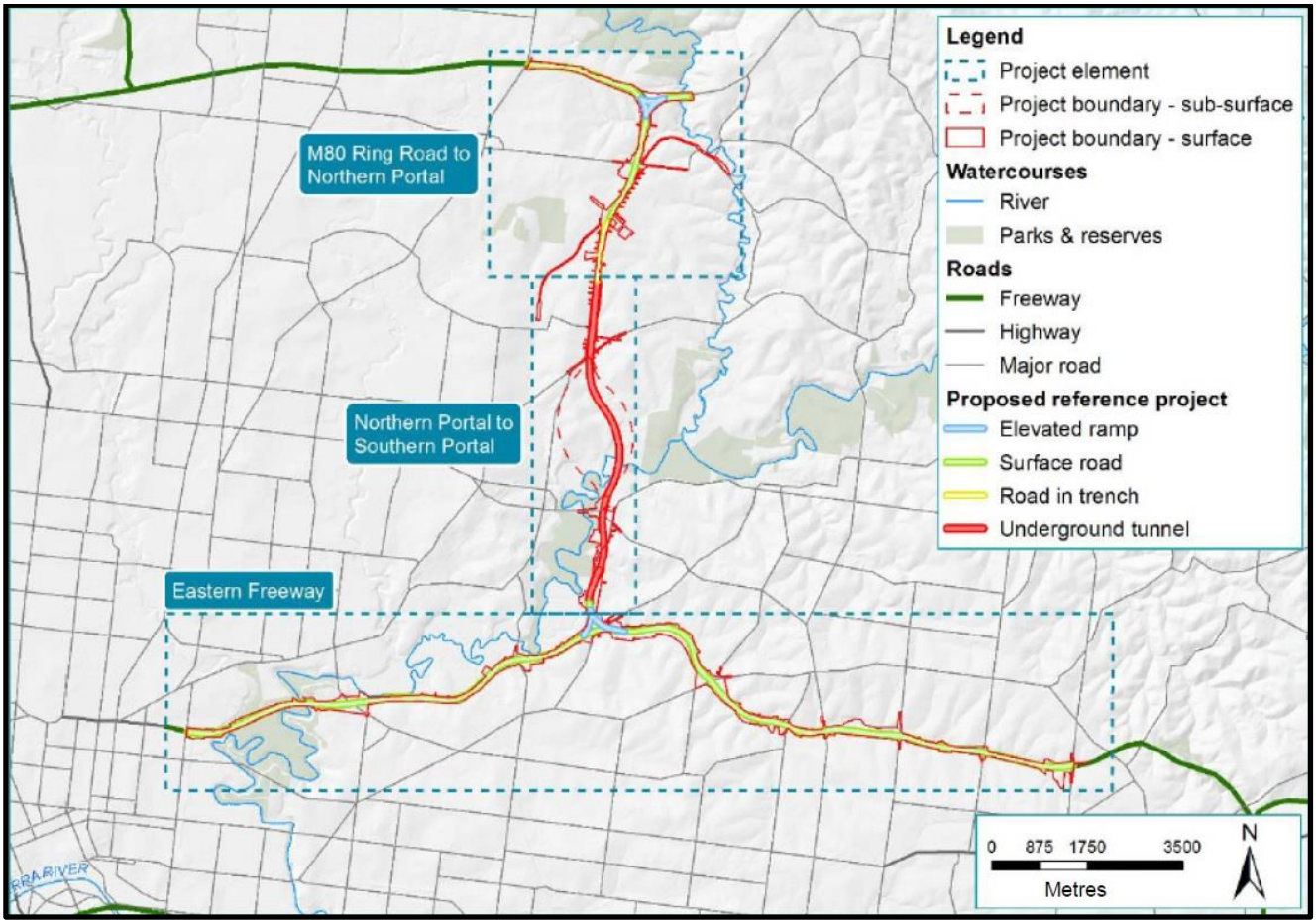

Figure 1: Location of the tunnel ventilation structures (source: works approval application).

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Environment Protection Authority Victoria
200 Victoria Street, Carlton VIC 3053
W epa.vic.gov.au | T 1300 372 842 (1300 EPA VIC)

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The proposed tunnel ventilation system requires a works approval from Environment Protection Authority Victoria (EPA) under the *Environment Protection Act 1970* (EP Act). A works approval is required for industrial and waste management activities with the potential for significant environmental impact.

On 7 March 2019, EPA received a formal works approval application. The application is for:

- the construction of the ventilation system
- its related infrastructure
- the installation of associated equipment.

This summary report outlines what EPA considered in our decision-making process and assessment.

The full assessment report and the statutory works approval are available on EPA's website:

epa.vic.gov.au/for-community/current-projects-issues/major-infrastructure-and-development/north-east-link/epas-role-north-east-link

EPA's decision on the works approval application

On 28 February 2020, EPA approved the works approval application, subject to conditions.

What was proposed in the works approval application?

A tunnel ventilation system manages the air quality in the tunnel by:

- providing fresh air
- removing air polluted by vehicle emissions.

The proposed ventilation system would introduce fresh air through **two mainline entry portals** and expel polluted air to the atmosphere via **two stacks**.

It would have two ventilation structures with stack heights of 40 m each. One stack would be located at the northern portal close to Blamey Road (northbound traffic) and the other one at the southern portal south of the Veneto Club, Bulleen (southbound traffic) (Figure 1).

The ventilation system will be designed to prevent air pollution from the exit of the tunnel (i.e. portal emissions). The proposed system would also include:

- a smoke duct running through the whole tunnel
- an emergency exhaust structure at the Manningham interchange for smoke extraction during an incident.

Smoke would be expelled from the emergency exhaust structure and one of the tunnel portal ventilation stacks in the event of a fire incident.

Key equipment installation would include:

- ventilation extraction fans
- in-tunnel jet fans
- various dampers
- noise attenuators.

The construction for the tunnels is expected to start in 2022 and open to traffic in 2027.

Activities to follow works approval

Following the works approval, the proponent will need to:

- complete final detailed designs
- obtain EPA's approval under the appropriate works approval conditions
- undertake a construction phase
- undertake a commissioning phase
- obtain operating permission from EPA.

Works approval application process

The major steps of this works approval application and assessment process were:

EPA assessment process

Relevant legislation and policies

A works approval application is required to comply with the EP Act and subordinate legislation. Other legislation also needs to be considered, such as the *Climate Change Act 2017*.

The EP Act, Regulations and state environment protection policies (SEPPs) establish a framework to ensure the tunnel ventilation system is appropriately:

- located
- designed
- constructed
- operated
- managed

to minimise risks to human health and the environment.

EPA considers the following SEPPs and protocols for environmental management particularly relevant for this proposal:

- SEPP (Air Quality Management)
- *Protocol for Environmental Management: Greenhouse Gas Emissions and Energy Efficiency in Industry* (Greenhouse PEM)
- SEPP (Control of Noise from Commerce, Industry and Trade No. N1) (SEPP N-1)

Environmental performance requirements (EPRs)

The project will be delivered in line with the environmental management framework and the EPRs approved by the Minster for Planning (the Minister).

In making the decision, EPA considered the relevant EPRs. EPA has included these EPRs as conditions of the works approval.

Departmental and agency consultation

In assessing the application, EPA consulted with:

- Manningham City Council
- Banyule City Council
- the Metropolitan Fire Emergency Services Board.

Community engagement

The works approval application, planning scheme amendment and the Environmental Effect Statement (EES) were subject to a joint advertisement under section 20AA of the EP Act and the *Environment Effects Act 1978* (EE Act).

They were placed for exhibition between 10 April and 7 June 2019 for public comments. The Inquiry and Advisory Committee (IAC), appointed by the Minister, also held public hearings between 25 July and 16 September 2019. The hearings considered the respective EES submissions during the exhibition period.

The works approval application assessment took into consideration:

- the submissions (relating to the tunnel ventilation system)
- the findings and recommendations of IAC
- the Minister's assessment of the EES.

EPA assessment

What did EPA assess?

The ventilation system is at the centre of how the project complies with the required environmental and safety standards.

EPA assessed whether the proposed reference design of the ventilation system addressed the:

- in-tunnel performance and safety standards
- potential environmental impacts of its air and noise emissions
- greenhouse gas emissions associated with energy consumption.

EPA also considered the potential risks to human health resulting from the atmospheric discharge of the polluted in-tunnel air.

This section summarises the findings relating to the most important issues as part of EPA's assessment. For more information on how EPA assessed all the key issues of concern, see sections 3 and 6 – 9 of the full report.

Regulatory compliance

EPA has determined that subject to conditions:

- the proponent meets the 'fit and proper person' requirement of the EP Act
- the proposal meets the environment protection principles of the EP Act
- the proposal complies with the relevant SEPPs and protocol, subject to the conditions
- the proposal has considered potential climate change impacts in accordance with EPA's obligations
- the proposal is protective of human health and the environment.

Key issues

Ventilation system design

Why use a ventilation system design?

The tunnel ventilation system is the major factor determining environmental performance and safety standards of the project. It also affects the degree of the project's public health impact.

What is the concern?

EPA has assessed the proposed reference design of the ventilation system and concluded that:

- energy consumption and greenhouse gas emissions are relatively high compared to other tunnels in Australia
- it meets in-tunnel air quality design criteria for all pollutants
- the engineering design of the smoke extraction system for fire incident management needs to be further considered.

Conclusions of the assessment

A tunnel ventilation system of this type is not rare worldwide and can be designed to meet performance specifications. The use of stacks to disperse pollutants is considered best practice.

The requirements for zero portal emissions and nitrogen dioxide standards for in-tunnel air quality are considered stringent, compared to international practice.

These issues should be resolved during the detailed design phase. The subsequent design and operation of the tunnel ventilation system will be able to meet the relevant SEPPs and EPRs, subject to works approval conditions.

Other issues assessed

Climate change and greenhouse gases

EPA has considered the potential impacts of climate change in its decision and determined the proposal has appropriately addressed these impacts.

Ambient air emission

EPA has considered the potential impact of air emissions from the ventilation stacks. EPA has assessed that a further detailed air quality assessment will be required prior to construction. This will confirm that air emissions from the final design of the tunnel ventilation system can meet the requirements set out in the SEPP (Air Quality Management) and determine the licence discharge limits.

Noise emission

EPA has considered the potential impact of noise. A further detailed noise assessment will be required prior to construction. This will confirm that noise emissions from the final design of the tunnel ventilation system can meet the requirements set out in the SEPP N-1.

Human health

EPA has considered the potential effects on human health posed by this proposal. The potential for exposure to emissions for the nearest sensitive receptors and the potential for health impacts are negligible.

Environmental management for construction

EPA has considered the potential impact of noise and dust emissions and the management of wastes during the construction phase. The construction impact can be managed through:

- the comprehensive environmental management framework
- EPRs approved by the Minister.

The Construction Environmental Management Plan (CEMP), with details of segment management plans, must be submitted to EPA for review before beginning construction to confirm the compliance with relevant EPRs.

Conditions of approval

The works approval is subject to conditions. Some conditions must be met prior to the commencement of construction. Others relate to the commissioning of the facility. In addition, operation of the facility will be regulated through an EPA-issued licence.

The works approval conditions also require providing the following information or plans for EPA's approval:

Prior to construction:

- The final ventilation system design with detailed assessment of the compliance with relevant SEPPs and EPRs.

  These EPRs include:

  - energy efficiency (SCC2 and SCC3)
  - in-tunnel air quality criteria (AQ3)
  - ambient air discharges (AQ2)
  - noise emissions standards (NV6).
- Space is provided for future pollution control equipment to be installed in the ventilation stacks.
- CEMP demonstrates compliance with relevant EPRs for managing dust (AQ1), noise (NV4 and NV5) and waste (SCC4)
- Monitoring plans as required by EPRs for:
  - in-tunnel air quality monitoring
  - ventilation stack monitoring (AQ5
  - ambient air (AQ4).

Prior to commissioning:

- Develop a comprehensive commissioning program to verify noise and air emissions and on-going monitoring with contingency measures in the event of non-compliance (AQ5 and NV7).

More information

Read EPA's full assessment report on the EPA website: epa.vic.gov.au/for-community/current-projects-issues/major-infrastructure-and-development/north-east-link/epas-role-north-east-link

Please contact EPA on 1300 372 842 (1300 EPA VIC) or via email on contact@epa.vic.gov.au