



NorthConnex Modification 3

*Amendment of
VOC ventilation
outlet limit
(SSI 6236 MOD 3)*

December 2019

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Cover photo

NorthConnex Modification 3 (Source: Roads and Maritime Services)

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Glossary

Abbreviation	Definition
Approval	Infrastructure Approval
Department	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
Minister	Minister for Planning and Public Spaces
TfNSW (RMS)	Transport for New South Wales (Roads and Maritime Services)
RtS	Response to Submissions
Secretary	Secretary of the Department of Planning, Industry and Environment
SSI	State Significant Infrastructure



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1. Introduction

This report provides an assessment of a request to modify the then Minister for Planning's approval of the NorthConnex M1-M2 State significant infrastructure (SSI) project (SSI 6136). Transport for New South Wales (RMS) (the Proponent) has submitted a request to modify condition E11 of the Minister's approval to amend the Volatile Organic Compounds (VOC) limit from 1 mg/m³ to 4 mg/m³.

1.1 Background

The NorthConnex project was approved on 13 January 2015 by the then Minister for Planning under Section 115ZB of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The NorthConnex project comprises twin tunnels each at nine kilometres in length containing separate northbound and southbound carriageways. NorthConnex will link the M1 Pacific Motorway at Wahroonga and the Hills M2 Motorway at West Pennant Hills and generally follows the alignment of Pennant Hills Road (see **Figure 1**).

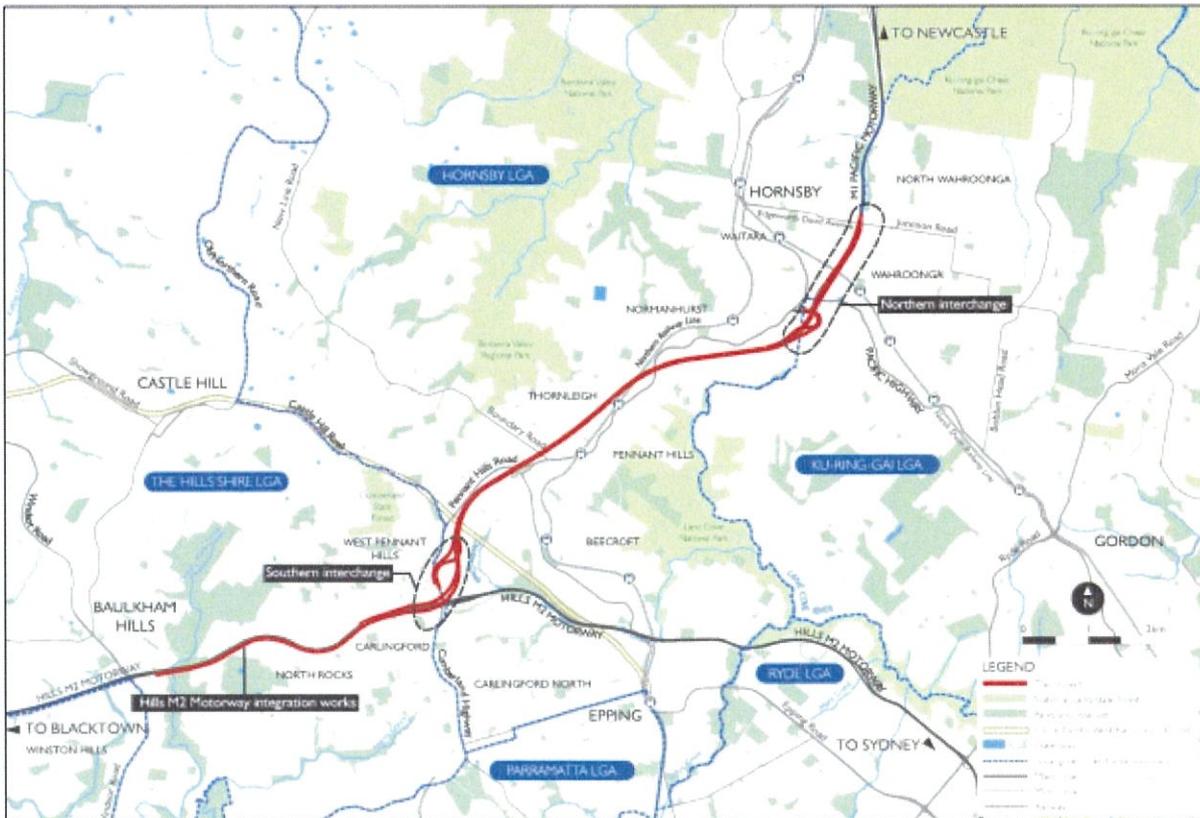


Figure 1: Approved project location (Source: Proponent's EIS)

The project includes twin tunnels, which are designed to be ventilated through a longitudinal ventilation system by moving air along the tunnels to a ventilation outlet at Gum Grove Place, West Pennant Hills, to the south (southern ventilation outlet) and Woonona Avenue, Wahroonga, to the north (northern ventilation outlet).

The project spans three local government areas (LGAs) – the Hills to the west, Hornsby to the north and Ku-ring-gai to the east of the alignment. NorthConnex traverses through the suburbs of Wahroonga, Normanhurst, Thornleigh, Pennant Hills, Carlingford, North Rocks, Westmead and Baulkham Hills.

Surrounding land uses vary along the alignment including low and medium density residential, educational and recreational zones. Mixed industrial, commercial and residential zones are located around the Trewlaney Street tunnel support facility and residential around the northern ventilation facility.

Construction of the NorthConnex project commenced following the approval of the project's construction environmental management plan in June 2015. Operation of the motorway is expected to commence in mid 2020.

1.2 Modification History

On 29 June 2016, a modification request (Modification 1) was approved under delegation. Modification 1 amended condition D47 of the Minister's approval for the project to extend the timeframe for the implementation of the Biodiversity Package.

On 26 February 2017, a modification request (Modification 2) was approved under delegation. The modification to condition B2 sought to clarify the reference point for the 20 metre height of each ventilation outlet and to correct and clarify the tip heights of both the northern and southern ventilation outlets at Woonona Avenue, Wahroonga and Gum Grove Place, West Pennant Hills, respectively.



2. Proposed Modification

The Proponent seeks approval to modify condition E11 of the approval to increase the approved Volatile Organic Compounds (VOC) limit from 1 mg/m³ to 4 mg/m³. The Proponent has identified that the Environmental Impact Statement (EIS) / Submissions and Preferred Infrastructure Report (SPIR) assessed the VOC limit of 1mg/m³. An increase of the limit to 4mg/m³ is requested to allow for the management of unplanned short-term incidents (within the tunnel) and to ensure compliance with maximum emission levels.

Table 1 shows the Ventilation Outlet Mass Pollutant Concentrations approved, with the proposed modification in bold and underlined.

Ventilation Outlets — Limits

E11 The concentration of a pollutant discharged from the ventilation outlets referred to must not exceed the respective limits specified for that pollutant in **Table 1**.

Table 1 — Ventilation Outlet Mass Pollutant Concentrations (Source: Instrument of Approval)

Pollutant	100 percentile limit	Units of measurement	Averaging period	Reference conditions
Solid particles	1.1	mg/m ³	1 hour, or the minimum sampling period specified in the relevant test method, whichever is the greater	Dry, 273K, 101.3kPa
NO ₂ or NO or both, as NO ₂ equivalent	20	mg/m ³	1 hour block	Dry, 273K, 101.3kPa
NO ₂	2.0	mg/m ³	1 hour block	Dry, 273K, 101.3kPa
CO	40	mg/m ³	1 hour rolling	Dry, 273K, 101.3kPa
VOC (as propane)	<u>4.0</u> 1.0	mg/m ³	1 hour rolling	Dry, 273K, 101.3kPa

Unplanned, short term incidents of less than a few hours, such as standstill traffic due to a breakdown, have the potential to exceed the 1mg/m³ limit. This would trigger the notification, reporting and options analysis to prevent recurrence as required under condition E13 of the approval.



3. Strategic Context

The NorthConnex project has been designed to provide a safer and more efficient link between the M1 Pacific Motorway and the Hills M2 Motorway by relieving traffic congestion along Pennant Hills Road. The approved project contributes towards the national objective of connecting Melbourne to Brisbane via a duplicated highway.

NorthConnex was identified as an Urban Roads priority project in Sydney and supports the implementation of a key Urban Road priority identified in the State Infrastructure Strategy 2021 – 2032. The construction of the NorthConnex project is also identified as a medium to long-term priority in Sydney's Motorway network, which is a critical link in NSW Long Term Transport Masterplan 2012.

The modified approval remains consistent with these strategic policy documents.



4. Statutory Context

4.1 Scope of Modification

In accordance with section 5.25 *Environmental Planning and Assessment Act 1979* (EP&A Act), a Proponent may request the Minister for Planning and Public Spaces (the Minister) to modify the approval for State significant infrastructure. The Minister's approval for a modification is not required if the infrastructure as modified will be consistent with the existing approval. The amendment to the VOC limit from 1mg/m³ to 4mg/m³ is not considered consistent with the existing approval. Consequently, modification of the Minister's approval under s.5.25 of the EP&A Act is required.

4.2 Delegated Authority

The Minister will be the approval authority under s.5.25 of the EP&A Act unless the Minister has delegated his determination functions to the Department. As a total of 183 submissions objecting to the modification were received from the public, the Minister's determination functions cannot be delegated, and the Minister remains the approval authority.



5. Engagement

5.1 Department's Engagement

Under section 5.28(1)(g) of the EP&A Act, the Planning Secretary is required to make requests for modification of approvals determined by the Minister publicly available. Accordingly, the Department made the modification request publicly available and exhibited the modification for 14 days, from 30 August 2019 until 12 September 2019, on its website. Hard copies of the modification application were placed at:

- Ku-ring-gai Council
- Turramurra Library
- The Hills Shire Council
- Baulkham Hills Library
- Hornsby Shire Council
- Hornsby Shire Library & Information Service
- Pennant Hills Branch Library and Community Centre
- Epping Branch Library.

The modification request was referred to the following agencies and councils:

- NSW Environment Protection Authority (EPA)
- NSW Health
- Office of the NSW Chief Scientist and Engineer
- The Hills Shire Council
- Hornsby Shire Council
- Ku-ring-gai Council.

5.2 Summary of Submissions

During the exhibition period, a total of 199 submissions were received, including two from public authorities and 197 submissions from the public and interest groups. The public submissions included 183 objections to the project, 12 submissions of comment and two of support. No submissions were received from council.

5.3 Key Issues – Government Agencies

Two submissions were received from State government agencies: EPA and the Office of the NSW Chief Scientist and Engineer. Neither agency objected to the modification request and did not raise any issues.

5.3.2 Public and Interest Groups

The Department received 197 public submissions including five from interest groups. Details of the issues raised in the submissions are addressed in **Chapter 6** and are summarised below.

- Request for the ventilation outlets to be filtered
- The proposed increase in VOC limit is a substantial (4 fold) increase
- The proximity of the ventilation outlets to schools and residential areas
- The proposed increase in VOC limit has the potential to increase acute and long-term health impacts
- The proposed increase is not a transcription error.

5.4 Response to Submissions

Following completion of the public exhibition period, the Department directed the Proponent to prepare a response to the submissions received. The Proponent's Response to Submissions was made publicly available on the Department's website on 7 November 2019.



6. Assessment

6.1 Air Quality and Public Health

Issue

Short term incidents such as break downs or collisions have the potential to bring traffic movement to a standstill for less than a few hours, until cleared. While unlikely, these events can exceed the approved VOC limit of 1 mg/m^3 over a short period of time. This exceedance would trigger the notification and reporting requirements of condition E13 of the approval. However, under expected traffic conditions while traffic is free flowing, the concentration levels will be lower than the 1 mg/m^3 limit assessed.

Submissions

The submissions received from the community raised concerns in relation to the following:

- The proposed increase in VOC limits, in particular the four-fold increase and that 2 mg/m^3 could be a reasonable compromise
- Requested that ventilation outlets to be filtered
- Potential human health impacts on surrounding schools and residents
- No safe levels of exposure of VOC emissions.

Consideration

The Department notes the values presented in the EIS / Submissions and Preferred Infrastructure Report (SPIR) of the approved project are based on free-flowing traffic volumes, which equates to approximately half of the tunnel's maximum operational capacity. The design criteria for the approved project focussed on nitrogen dioxide (NO_2) and carbon monoxide (CO), with the maximum CO concentration predicted being 15 mg/m^3 . As VOC limits are generally calculated at 10% of CO emissions, a maximum VOC concentration outlet would therefore be 1.5 mg/m^3 , if the tunnel is operating at maximum physical capacity. This did not take into consideration unplanned, short term incidents, which can briefly increase VOC emissions.

The Department understands tunnel ventilation outlets are constantly emitting pollutants; however, the concentration of all pollutants is variable throughout the day, depending on changing traffic volumes, speeds, and the overall vehicle activity throughout the tunnel. The Department notes that the compliance limit for VOCs should be based on this availability (i.e. tunnel operating at maximum capacity), including the ability to manage short term incidents. A VOC limit of 4 mg/m^3 as proposed by the modification, provides an appropriate margin for compliance if the tunnel is significantly congested, or an incident occurs.

The Department notes that the criteria for in-tunnel air quality is not proposed to be changed. As in-tunnel air quality influences ventilation emissions, the requirements for the tunnel operator to maintain effective ventilation during normal operations are not diminished.

The potential human health impacts arising from the proposed modification have been considered. It is noted that the Proponent consulted with the EPA, which indicated that it does not raise any objection to the increase in VOC emission limit. The EPA also noted that the increase in VOC limit would not result in adverse air quality impacts and is satisfied with the information provided. NSW Health, in response to the Proponent's own consultation, agreed with the EPA's analysis. Additionally, the Department notes the NSW Chief Scientist and Engineer did not raise any objections to the proposal.

The Department has also reviewed other approved tunnelled motorway projects to compare the previously approved VOC emission limits to the approved NorthConnex project. The approved VOC outlet limit for similar Sydney motorway tunnel projects such as the now operational WestConnex M4 East project is 4 mg/m³.

The Department acknowledges the communities' support for filtration of tunnel air for the purposes of improving external air quality outcomes. Based on the modification not impacting on air quality and health impacts, filtration is not required as a result of this proposed change. The Department also notes that condition E12 of the approval states that the ventilation outlet criteria detailed in condition E11 shall be reviewed on a five-yearly basis, with the potential for the limits to be lowered in anticipation of future improvements in vehicle emissions.

The Department also notes the communities' desire to locate the approved ventilation outlets at alternate locations and that the locations of the approved ventilation outlets have resulted in heightened community concern due to their placement adjacent to schools and established residential areas. The modification does not propose any changes to the location of the ventilation outlets, however it is expected that the project (as modified) will continue to meet relevant ambient air quality goals within the vicinity of the approved ventilation outlets.

The Department is satisfied that the proposed modification would not result in additional exceedances of ambient air quality goals or standards and provides appropriate scope for incidents to be managed by the Proponent consistent with other motorway projects.

The Department is satisfied that the proposed modification would not result in additional exceedances of air quality goals or standards and provides appropriate scope for incidents to be managed by the Proponent, consistent with other motorway projects.

6.2 Transcription Error

Issue

As part of the Proponent's justification for the proposed modification, it was stated that the current 4 mg/m³ VOC limit was a transcription error.

Submissions

The submissions received from the community raised concerns in:

- Lack of confidence in other technical aspects of the project due to the Proponent identifying the proposal as a 'transcription error'
- The possibility that the original assessment was incorrect.

Consideration

A review of the EIS and SPIR of the approved project confirms that the VOC limit was assessed at 1 mg/m³.

Additional dispersion modelling was undertaken by the Proponent in 2015, following approval of the project. The purpose of the additional modelling was to guide the detailed design of the project to ensure that the ventilation outlets complied with the conditions of approval. The modelling identified the potential for non-compliance with the approved 1 mg/m³ VOC limit due to short term incidents in the tunnels.

The modelling included congested traffic and breakdown condition scenarios which, while possible, are unlikely to last for longer than a few hours. The scenarios modelled also demonstrated that operation of the tunnels would ensure acceptable air quality to surrounding receivers. This additional modelling provided the basis for the request to increase the VOC limit from 1 mg/m³ to 4 mg/m³ in order to achieve compliance with the condition E11.



7. Evaluation

The Department has reviewed the Modification Report, community and government agency submissions, and the Proponent's Response to Submissions and assessed the key issues arising from the proposed changes to the approved project.

The key issues associated with the proposed modification include the potential adverse effects to air quality and public health impacts, and the proposed modification categorised as a transcription error.

The Department considers the proposed amendment to the VOC outlet limit from 1 mg/m³ to 4 mg/m³ would not result in any substantial changes to the air quality associated with the operation of NorthConnex. The modification provides the tunnel operator with the ability to manage short-term traffic incidents without the need to report on every incident that would have previously been triggered under the requirements of condition E13.

A review of the EIS and SPIR of the approved project confirms that the VOC limit was assessed at 1 mg/m³. Additional modelling noted that the potential for non-compliance with the approved 1 mg/m³ VOC limit due to short term incident in the tunnels. As a result, the Proponent sought to modify the approved limit to maintain compliance with condition E11.

The Department has considered the key issues included in the submissions from the public and the comments from government agencies regarding the proposal. The Department considers that the proposed increase in VOC outlet emissions will not have adverse air quality or public health impacts and will allow the tunnel to be appropriately operated. Therefore, the Department recommends that the VOC limit be amended from 1 mg/m³ to 4 mg/m³.



8. Recommendation

It is recommended that the Minister for Planning and Public Spaces:

- **considers** the findings and recommendations of this report;
- **determines** that the request, Mod 3 – Amendment to VOC outlet Limit (SSI-6136-Mod-3), falls within the scope of s.5.25 of the EP&A Act;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to grant approval to the request;
- **agrees** with the key reasons for approval listed in the draft notice of decision;
- **modifies** the approval SSI-6136; and
- **signs** the attached Notice of Modification.

Recommended by:

Glenn Snow

Director

Transport Assessments

Recommended by:

David Gainsford

Executive Director

Infrastructure Assessment



9. Determination

The recommendation is: **Adopted** ~~Not Adopted~~ by:

The Hon. Rob Stokes, MP

Minister for Planning and Public Spaces



Appendices

Appendix A – Modification Request

<https://www.planningportal.nsw.gov.au/major-projects/project/13681>