

Chapter 21

Hazards

21 Hazards

This chapter provides an assessment of the potential hazards as a result of this proposal, and identifies mitigation measures to minimise these impacts.

21.1 Overview

The design development process for the proposal has aimed to avoid or minimise potential hazards.

Potential temporary environmental hazards during construction associated with the on-site storage, use and transport of chemicals, fuels and materials would be managed to acceptable levels through the implementation of mitigation measures, including the storage and management of all hazardous substances in accordance with the *Work Health and Safety Act 2011*, the *Work Health and Safety Regulation 2017*, the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005) and *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011).

Potential temporary environmental hazards and risks would be associated with:

- On-site storage, use and transport of dangerous goods and hazardous substances
- On-site handling and transport of contaminated soil and hazardous wastes
- Potential impacts to utilities.

21.2 Legislative and policy context

The Secretary's Environmental Assessment Requirements relating to hazards, and where these requirements are addressed in this Environmental Impact Statement, are outlined in Appendix A.

The following guidelines inform or respond to the regulatory framework and have been applied to the assessment of this proposal:

- *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011a)
- International Standard (ISO/IEC 31010: 2009) Risk Management – Risk Assessment Techniques
- *Work Health and Safety Act 2011* (NSW) and *Work Health and Safety Regulation 2017* (NSW)
- *Australian Code for the Transport of Dangerous Goods by Road and Rail* (edition 7.7) (National Transport Commission, 2020)
- *Code of Practice: How to manage and control asbestos in the workplace* (Safework Australia, 2019)
- *Code of Practice: How to Safely Remove Asbestos* (Safework NSW, 2016)
- *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover, 2005) (noting this Code is a guide for processes and controls to manage risks and is not to be relied upon to ascertain requirements under the *Work Health and Safety Regulation 2017*)
- *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* (Department of Planning, 2011b)
- Australian Standard AS2885 Pipelines – Gas and liquid petroleum
- Australian Standard AS4964-2004 Method for the qualitative identification of asbestos in bulk samples
- Australian/ New Zealand Standard 3833:2007 The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers
- *Multi-Level Risk Assessment* (Department of Planning and Infrastructure, 2011)
- Bushfire prone land mapping developed and published by the relevant local councils.

21.2.1 Dangerous goods and hazardous materials

Dangerous goods are substances that, because of their physical, chemical (physico-chemical) or acute toxicity properties, present a risk to people, property, animals, or the environment. They are classified according to their physical or chemical effects, such as fire, explosion, corrosion and poisoning. Types of dangerous goods include flammable liquids and gases, corrosives, and chemically reactive or acutely (highly) toxic substances. The *Australian Dangerous Goods Code* applies to dangerous goods specified in the code.

Many dangerous goods are also classed as hazardous substances. Hazardous materials are those that meet the classification criteria specified by the Work Health and Safety Regulation 2017 and the Globally Harmonised System of Classification and Labelling of Chemicals (an internationally agreed system of chemical classification). The thresholds in Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (Department of Planning, 2011) represent the maximum quantities of hazardous materials that can be stored or transported without causing a significant off-site risk. State Environmental Planning Policy No. 33 - Hazardous and Offensive Development (SEPP 33) is not applicable to State significant infrastructure projects. However, the guidelines have been applied to inventories of dangerous goods likely to be stored at construction sites to assess the potential risk of this proposal to the environment and to public safety.

21.3 Assessment methodology

A desktop assessment was carried out to identify activities with the potential to cause environmental hazards or involving dangerous goods or hazardous materials, in the carrying out of this proposal. The assessment focused on hazards with the potential to adversely affect the quality of the surrounding environment, land uses and communities and included:

- Identification of the types of activities included in this proposal that may generate potential hazards
- Consideration of the relevant regulatory framework and guidelines
- Identification of the potential environmental impacts associated with the potential hazards
- Identification of mitigation measures to address potential hazards.

Other work, health and safety hazards are not specifically considered in this Environmental Impact Statement. These issues would be addressed by the relevant construction contractor by consideration of the Construction Environmental Management Framework (Appendix C) and the specific mitigation and management measures described in Section 21.6.

21.4 Avoidance and minimisation of impacts

The design development process for this proposal aimed to avoid or minimise potential hazards. This included selecting construction sites that are not located within two kilometres of major hazard facilities and are not located within bushfire prone land.

21.5 Potential impacts

21.5.1 Potential hazards

Potential hazards that could occur as a result of the proposal would be temporary and associated with:

- The on-site storage, use and transport of dangerous goods and hazardous substances
- The on-site handling and transport of contaminated soil and hazardous wastes
- Potential impacts to utilities
- Potential interaction with major hazard facilities
- Potential bushfire risks.

These hazards are described further in the following sections.

21.5.2 On-site storage, use, handling and transport of dangerous goods and hazardous substances

Construction sites would be planned so that hazardous materials are stored appropriately and at a suitable distance from sensitive receivers, in accordance with the thresholds established under *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011). If minimum buffers cannot be maintained, either due to space constraints, the close proximity of sensitive receivers, or a requirement to store volumes of hazardous materials in excess of storage thresholds, a risk management strategy would be developed on a case-by-case basis.

Environmental hazards associated with the on-site storage, use and transport of chemicals, fuels and materials would be managed through standard mitigation measures to be developed as part of the construction environmental management documentation. These measures would include the storage and management of all dangerous goods and hazardous substances in accordance with the *Work Health and Safety Act 2011*, the *Work Health and Safety Regulation 2017*, the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005) and *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011).

An indicative list of the types of dangerous goods and potentially hazardous materials anticipated to be used, stored and transported during construction of this proposal is provided in Table 21-1, along with the relevant storage and transport thresholds established under the *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011).

Typically, low volumes of potentially hazardous materials would be stored on site, except for The Bays tunnel launch and support site, where larger volumes of materials would be required to support tunnel construction. The volume required to be stored on site would largely depend on the anticipated rates of consumption, with deliveries of dangerous goods coordinated to match consumption rates. This could be about one delivery per day if needed to minimise volumes stored on-site to reduce the potential for exceedances of the storage thresholds outlined in the *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011).

Dangerous goods would be transported to and from construction sites using the routes identified in Chapter 6 (Transport and traffic). Transport of dangerous goods would be in accordance with the *Dangerous Goods (Road and Rail Transport) Act 2008* and *Dangerous Goods (Road and Rail Transport) Regulation 2014*, and extended routes would avoid areas (such as road tunnels) prohibited by NSW Road Rule 300-2 (carriage of dangerous goods in prohibited areas).

Table 21-1 Indicative list of hazardous materials potentially required during construction and applicable storage/transport thresholds

Material	Australian Dangerous Good Code Class	Storage locations	Storage method	Applying SEPP 33 thresholds		
				Storage volume	Minimum storage distance from sensitive receivers	Transport (weekly)
Diesel	C1; 3 PG III ²	All sites	5,000 litre drums	Greater than 5 tonnes, if stored with other Class 3 flammable liquids	5 metres	Not applicable if not transported with Class 3 dangerous goods
Petrol	C1; 3 PG III ²	All sites	500 litre drums	Greater than 5 tonnes, if stored with other Class 3 flammable liquids	5 metres	Not applicable if not transported with Class 3 dangerous goods
Lubricating and hydraulic oils and greases	C2	All sites	45 gallon drums	N/A	N/A	Not applicable if not transported with Class 3 dangerous goods
Industrial grade oxygen	2.2	All sites	Cylinders (up to 55 kilograms) in rack	N/A	N/A	Not subject to Applying SEPP 33 transport thresholds
Acetylene	2.1	All sites	Cylinders (up to 55 kilograms) in rack	Greater than 0.1 tonnes (100 kilograms)	15 metres	2 tonnes; 30 times per week
Cement	N/A	All sites	Bags/pallets in a container	N/A	N/A	Not subject to Applying SEPP 33 transport thresholds

Material	Australian Dangerous Good Code Class	Storage locations	Storage method	Applying SEPP 33 thresholds		
				Storage volume	Minimum storage distance from sensitive receivers	Transport (weekly)
Premix concrete	N/A	All sites	Bags/pallets in a container	N/A	N/A	Not subject to Applying SEPP 33 transport thresholds
Concrete curing compounds	N/A	All sites	20 litre drums	N/A	N/A	Not subject to Applying SEPP 33 transport thresholds
Concrete retardant	3 PG III	All sites	205 litre drums	Greater than 5 tonnes	5 metres	10 tonnes; 60 times per week
Shotcrete accelerator	3 PG II	All sites	1,000 litre intermediate bulk container	Greater than 5 tonnes	5 metres	3 tonnes; 45 times per week
Epoxy glue	3 PG III	All sites	Small container	Greater than 5 tonnes	5 metres	10 tonnes; 60 times per week
Coagulants	N/A	All sites	1,000 litre intermediate bulk container	N/A	N/A	Not subject to Applying SEPP 33 transport thresholds
Acids	8 PG II	All sites	1,000 litre intermediate bulk container	Greater than 25 tonnes	N/A	2 tonnes; 30 times per week
Bases	8 PG II	All sites	1,000 litre intermediate bulk container	Greater than 25 tonnes	N/A	2 tonnes; 30 times per week
Disinfectant	8 PG III	All sites	500 litre intermediate bulk container	Greater than 50 tonnes	N/A	2 tonnes; 30 times per week
Anti-scalent	N/A	All sites	100 litre drums	N/A	N/A	Not subject to Applying SEPP 33 transport thresholds
Membrane preservative	8 PG III	All sites	10 litre drums	Greater than 50 tonnes	N/A	2 tonnes; 30 times per week
De-bonding agents	N/A	All sites	Drums	N/A	N/A	Not applicable
Paint	N/A	All sites	20 litre drums	N/A	N/A	Not subject to Applying SEPP 33 transport thresholds

Note 1: Classified as C1 if not stored with other Class 3 flammable liquids.

Note 2: Classified as 3PGIII if stored with other Class 3 flammable liquids.

21.5.3 On-site handling and transport of contaminated soil and hazardous wastes

In addition to the materials listed in Table 21-1, this proposal may require the handling and transport of contaminated soil, hazardous waste and asbestos waste. The handling, transport and management of contaminated soils, hazardous waste and asbestos waste would be adequately managed by the measures identified in the following chapters:

- Chapter 15 (Soils and surface water quality)
- Chapter 16 (Contamination)
- Chapter 20 (Spoil, waste management and resource use).

21.5.4 Impacts to utilities

The potential risk associated with utility related hazards would be minimised by carrying out utility checks (such as dial before you dig searches and non-destructive digging) and consulting with the relevant utility providers. If required, construction methodologies for construction work near high pressure gas pipelines would be developed to comply with relevant standards in consultation with utility providers to minimise environmental hazards.

A program of ongoing consultation is being established and implemented to further assess requirements for utilities as outlined in Chapter 5 (Project description).

In the case of damage, rupture and/or failure to shut down, isolate or otherwise appropriately manage underground utilities during construction activities, this would have the potential to result in the following environmental hazards:

- Release of untreated sewage and/or gas from a sewer main
- Release of natural gas from a gas main
- Release of large electrical currents through the ground surface from an underground electricity cable (known as earth potential rise)
- Release of high pressure gas products from pipelines.

Key utilities which would present a potential hazard or risk where located close to construction sites include:

- High voltage power lines (both aboveground and underground) located throughout the construction footprint
- High pressure gas main along Hunter Street, adjacent to the Hunter Street Station (Sydney CBD) eastern construction site
- Gas distribution lines near all construction sites
- Sewer
- Water mains
- Stormwater systems
- Communications lines.

21.5.5 Interaction with major hazard facilities

The construction of this proposal would not interact with any major hazard facilities. There are no active major hazard facilities within two kilometres of this proposal.

The closest active major hazard facility is Viva Energy Australia's Gore Bay Terminal (identified as a major hazard facility under the Work Health and Safety Regulation 2011) which is located over two kilometres away from the nearest construction site, The Bays tunnel launch and support site.

21.5.6 Bushfire risks

This proposal would be in a highly developed urban environment that lacks substantial areas of bushland. A review of bushfire prone land mapping developed and published by relevant local councils indicated that none of the proposed construction sites would be located on or near bushfire prone land. Therefore, bushfire risks would be negligible.

21.5.7 Cumulative impacts

The approach to assessment and the other projects considered are described further in Appendix G (Cumulative impacts assessment methodology).

No cumulative impacts in relation to hazards are likely during this proposal. All potential hazards during construction would be managed to acceptable levels through the implementation of the mitigation measures described in Section 21.6.

21.6 Mitigation and management measures

The Construction Environmental Management Framework (Appendix C) describes the approach to environmental management, monitoring and reporting during construction. Specifically, it lists the requirements to be addressed by the construction contractor in developing the Construction Environmental Management Plans, sub-plans, and other supporting documentation for each specific environmental aspect.

The environmental management approach for the project is detailed in Chapter 23 (Synthesis of the Environmental Impact Statement). Under these broad frameworks and as outlined within the Concept assessment, a series of performance outcomes have been developed to define the minimum environmental standards that would be achieved during construction of the proposal (refer to Section 21.6.1), and mitigation measures that would be implemented during construction to manage potential identified impacts (refer to Section 21.6.2).

21.6.1 Performance outcomes

Construction performance outcomes were developed for the proposal as part of the Concept assessment. Performance outcomes for the proposal identify measurable, performance-based standards for environmental management. The identified performance outcome in relation to hazards is that dangerous goods are to be transported, stored and used so as to not cause a hazardous event. Chapter 23 (Synthesis of the Environmental Impact Statement) describes how the proposal addresses this performance outcome. Potential hazards associated with the on-site storage, use and transport of chemicals, fuels and materials used during the proposal would be managed in accordance with the Construction Environmental Management Framework (Appendix C), *Work Health and Safety Act 2011*, the *Work Health and Safety Regulation 2017*, the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005) and *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011).

21.6.2 Mitigation measures

Mitigation measures that would be implemented to address potential hazards are listed in Table 21-2.

Table 21-2 Summary of potential hazards and management measures

Reference	Impact	Mitigation measure	Applicable location(s)
HA1	Impacts on underground utilities	Dial before you dig searches and non-destructive digging would be carried out to identify the presence of underground utilities.	All
HA2	Impacts on underground utilities	Ongoing consultation would be carried out with utility providers for high pressure gas pipelines to identify appropriate construction methodologies to be implemented. Any interaction with high pressure gas pipelines would comply with the relevant standards, including AS 2885 Pipelines – Gas and Liquid Petroleum.	All

21.6.3 Interactions between mitigation measures

Mitigation measures in other chapters that are relevant to the management of potential hazards include:

- Chapter 20 (Spoil, waste management and resource use) – Specifically measures which addresses the identification and disposal of hazardous materials.

Together, these measures would minimise the potential hazards of this proposal. A full list of mitigation measures is presented in Chapter 23 (Synthesis of the Environmental Impact Statement).