

# Preliminary Risk Screening

## Hazard and Risk Report

Aurizon Operations Limited

27 September 2022

→ The Power of Commitment



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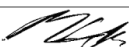

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# Contents

<b>Terms and Abbreviations</b>	<b>1</b>
<b>1. Introduction</b>	<b>2</b>
1.1 Background and Project Overview	2
1.2 Purpose of this report	2
1.3 Limitations	2
<b>2. Legislative and policy context</b>	<b>3</b>
2.1 State Environmental Planning Policy (Resilience and Hazard)	3
2.2 Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning	3
2.3 Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis	3
2.4 Multi-Level Risk Assessment	3
<b>3. Methodology</b>	<b>4</b>
3.1 Approach to assessment	4
3.1.1 SEPP (Resilience and Hazard) screening	4
3.1.2 Hazard identification	4
3.1.3 Preliminary Hazard Analysis	4
<b>4. Existing Environment</b>	<b>6</b>
<b>5. Hazard and Risk Assessment</b>	<b>7</b>
5.1 Dangerous goods storage	7
5.2 Amenity Screening	8
5.3 Hazard Identification and Management	8
<b>6. Conclusion</b>	<b>10</b>
<b>7. References</b>	<b>11</b>

## Table index

Table 5.1	Summary of materials on-site	7
Table 5.2	Hazard identification list	8

## Figure index

Figure 3.1	Applying SEPP 33 screening process	5
Figure 4.1	Aurizon Site Layout	6

# Terms and Abbreviations

Abbreviation	Description
ADG	Australian Dangerous Goods Code
APSN	Aurizon Port Services NSW
AS	Australian Standard
AS/NZS	Australian and New Zealand Standard
Cu	Copper
DG	Dangerous Goods
EPA	Environmental Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environmental Protection Licence
GHD	GHD Pty Ltd
HIPAP No 4	Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning
HIPAP No 6	Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis
NSW	New South Wales
O <sub>3</sub>	Ozone
Pb	Lead
PHA	Preliminary Hazard Analysis
PPE	Personal Protective Equipment
PoN	Port of Newcastle
SEE	Statement of Environmental Effects
SEPP	State Environment Planning Policy
SDS	Safety Data Sheet
SWMS	Safe Work Method Statements
Zn	Zinc

# 1. Introduction

## 1.1 Background and Project Overview

Aurizon Operations Limited (Aurizon) is a bulk handling facility that receives, stores and loads minerals concentration for export in the Port of Newcastle lease area within the suburb of Carrington.

Aurizon is seeking approval to expand their operations by increasing their storage capacity of Zinc, Copper and Lead and include storage and handling of mineral sands. The expansion works will be undertaken via the Aurizon Port Services Capacity Increase and Mineral Sands Project Development Application (DA), submitted on 17 November 2020, in accordance with Section 4.15 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The DA includes:

- Increasing the loading and unloading (ships – Dyke 2)/ trains from the adjacent rail line to 1.5 million tonnes per annum.
- Increasing storage (within the on-site shed) by an additionally 60,000 tonnes (maximum storage at any one time) in addition to existing storage capacity of 70,000 tonnes maximum storage – to provide for a total storage capacity at the facility of 130,000 tonnes (maximum storage at any one time).
- Extending the existing shed by up to 100 meters to account for the increase in storage and throughput.

## 1.2 Purpose of this report

GHD Pty Ltd (GHD) was commissioned by Aurizon to prepare a preliminary risk screening in accordance with *State Environment Planning Policy (Resilience and Hazard)*. This report will support the DA and the proposed Statement of Environmental Effects (SEE) to be submitted to the Department of Planning, Industry and Environment.

As such, this report focuses on the impact of potential hazards associated with the use of dangerous goods and hazardous substances that may arise during the construction and operation of the project. Specifically, this report:

- Describes the existing environment with respect to the project.
- Screens the quantities of dangerous goods expected during construction and operation of the project.
- Assesses the impacts of construction and operation specific to dangerous goods and other hazardous substances.
- Recommends measures to mitigate the impacts identified.

## 1.3 Limitations

This report: has been prepared by GHD for Aurizon Operations Limited and may only be used and relied on by Aurizon Operations Limited for the purpose agreed between GHD and Aurizon Operations Limited as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Aurizon Operations Limited arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible. The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared. The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Aurizon Operations Limited and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

## **2. Legislative and policy context**

### **2.1 State Environmental Planning Policy (Resilience and Hazard)**

The NSW Department of Planning and Environment consolidated the state environmental planning policies (SEPPs) in December 2021, for introduction in March 2022. As a result, the previously named SEPP 33 – hazardous and offensive development provisions have been transferred to the SEPP (Resilience and Hazard). No policy changes have been made. The SEPP consolidation does not change the legal effect of the SEPPs being repealed and section 30A of the *Interpretation Act 1987* applies to the transferred provisions, meaning the transfer does not affect the operation or meaning of the SEPP provisions. SEPP (Resilience and Hazard) provides a process for identifying a potentially hazardous development should storage and transport screening thresholds be exceeded.

The Department of Planning and Environment, NSW, 2011 guideline, “*Applying SEPP 33: Hazardous and Offensive Development Application Guidelines*” continues to provide the process for assessing if developments are potentially hazardous or offensive, including threshold levels that trigger the potentially hazardous or offensive status. *Applying SEPP 33* is the main guidance document that has been followed for this assessment.

### **2.2 Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning**

The Department of Planning’s, NSW, 2011, *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning* (HIPAP No 4) sets out risk criteria for industries that are considered hazardous. This document is only used if SEPP (Resilience and Hazard) indicates a development is potentially hazardous.

### **2.3 Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis**

The Department of Planning’s, NSW, 2011, *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (HIPAP No 6) lists the process required for preliminary hazard analysis (PHA). This document is only used if SEPP (Resilience and Hazard) indicates a development is potentially hazardous.

### **2.4 Multi-Level Risk Assessment**

The Department of Planning’s, NSW, 2011, *Multi-level Risk Assessment* lists the process required for completing a risk assessment at a qualitative, semi-quantitative or fully quantitative level of detail. This document is only used if SEPP (Resilience and Hazard) indicates a development is potentially hazardous and a PHA is required.

## 3. Methodology

This section describes the methodology used to undertake the hazard and risk study.

### 3.1 Approach to assessment

#### 3.1.1 SEPP (Resilience and Hazard) screening

SEPP (Resilience and Hazard) applies to any project which falls under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'. If not controlled appropriately, some activities within these industries may create an offsite risk or offence to people, property or the environment thereby making them potentially hazardous or potentially offensive. The purpose of this report is to determine if the project is potentially hazardous using the SEPP (Resilience and Hazard) risk screening process or potentially offensive considering expected discharge requirements. If the screening indicates that the project is potentially hazardous, then a PHA is required. The overall risk screening process, as outlined in *Applying SEPP 33* is summarised in Figure 3.1. If the project is potentially offensive, after considering the quantity and nature of any discharges and the significance of the offence likely to be caused, having regard to surrounding land use and the proposed controls, then additional controls are required.

The risk screening process typically concentrates on the storage of specific dangerous good (DG) classes that have the potential for significant offsite effects. Specifically, the assessment involves the identification of classes and quantities of all DGs to be used, stored or produced on-site with an indication of storage locations. The quantities of DGs are then assessed against the SEPP (Resilience and Hazard) threshold quantities. If any of the SEPP (Resilience and Hazard) threshold quantities are exceeded, then a PHA is required.

#### 3.1.2 Hazard identification

Following screening and during the final assessment of the project, a determination of whether the project poses significant risk or offence is required. Hazard identification highlights any risks associated with the interaction of the project (as a whole) with the surrounding environment. This is a systematic process to identify any potential offsite impacts. The aim of the hazard identification process is to show the project does not pose any significant risk or offence.

The hazard identification is a desktop qualitative assessment and involves documenting possible events that could lead to a possible off-site incident. The assessment then lists potential causes of the incident, as well as identification of operational and organisational safeguards to prevent the incidents from occurring or to mitigate their impact. The hazard identification is conducted for both construction and operation of the project.

#### 3.1.3 Preliminary Hazard Analysis

For development projects classified as 'potentially hazardous industry', a PHA is completed to determine the risk to people, property and the environment at the proposed location and in the presence of controls. Criteria of acceptability are used to determine if the development project is classified as a 'hazardous industry'. If this is the case, the development project may not be permissible within most industrial zonings in NSW.

The PHA will identify potential hazards, analyse these hazards in terms of their impact to people and the environment and their likelihood of occurrence, quantify the resultant risk to surrounding land uses and assess the risk to demonstrate that the project will not impose an unacceptable level of risk.

*Applying SEPP 33* (2011) identifies three levels of PHA. If a PHA is required, a judgement of the level of risk associated with the project is determined using the results of the screening and hazard identification stages. The three levels of PHA are:

- Level 1 – if significant but not serious potential for harm is identified, a qualitative PHA is completed
- Level 2 – if medium potential for harm is identified, a semi-quantitative PHA is completed
- Level 3 – if high potential for harm is identified, a quantitative PHA is completed







## 4. Existing Environment

The facility is within the Port of Newcastle (PoN). The existing site consists of an enclosed unloading pad, ore concentrate pit and tippler building, administration building, above ground diesel storage tank, rail corridor and product storage shed. Figure 4.1 shows the site layout of Aurizon. Storage, unloading and loading of concentrate and mineral sands would be undertaken 24 hours, 7 days a week.

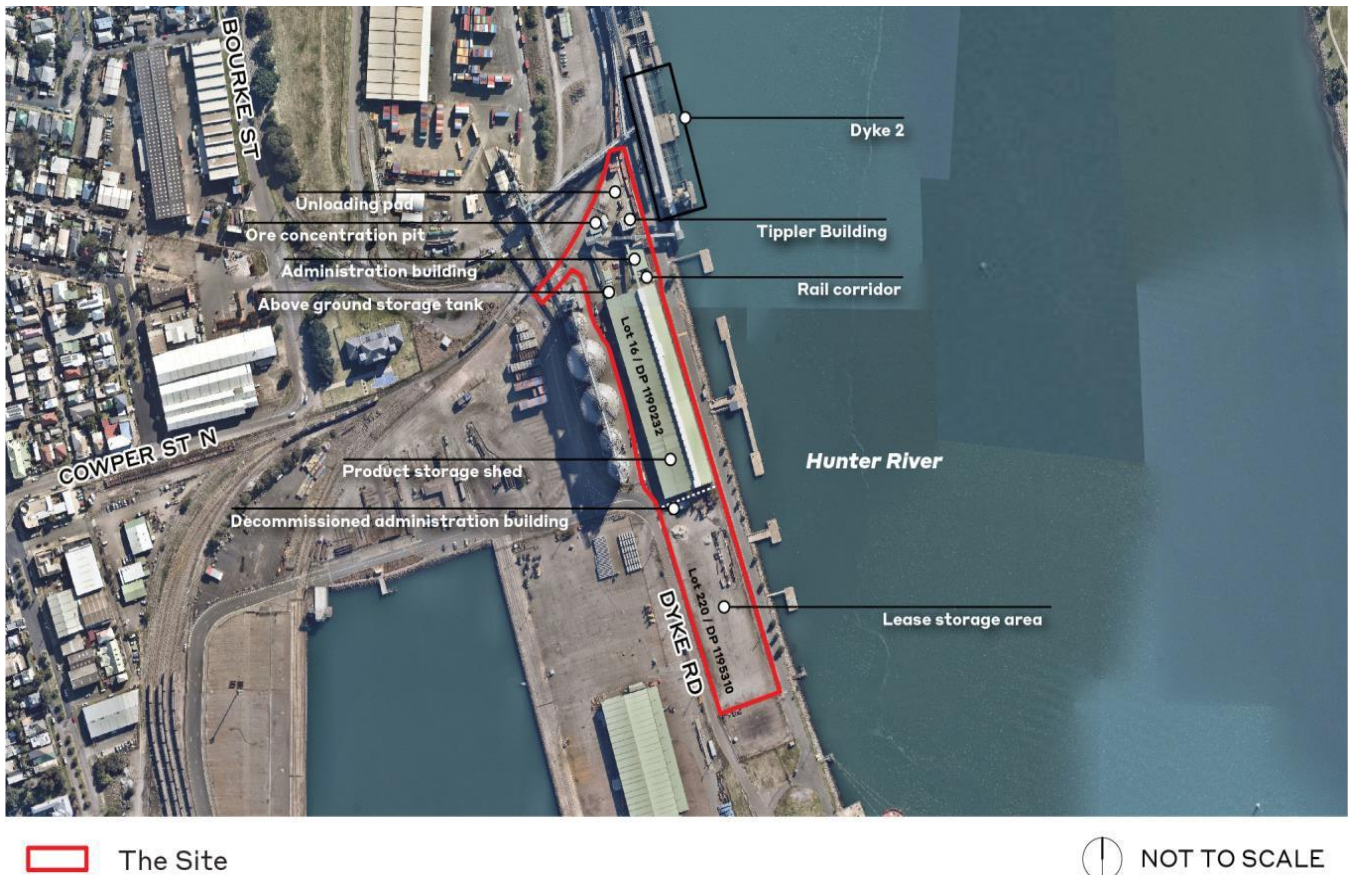


Figure 4.1 Aurizon Site Layout

The Site is accessed by vehicle from Bourke Street from the north, from train on the PoN rail corridor from the east and by ship on the neighbouring berths, further east (on the Hunter River). The nearest residential areas are located within Carrington (approximately 400 metres west of the Site) and Stockton (approximately 750 metres east across the Hunter River).

The Site is located within Zone SP1 Special Activities which includes objectives to maintain and strengthen the port, freight and bulk storage, industrial and maritime industrial land uses to support the on-going efficiency of operations the Port of Newcastle, under the SEPP (Transport and Infrastructure).

## 5. Hazard and Risk Assessment

### 5.1 Dangerous goods storage

The expansion project involves the increase in handling and storage of the following materials:

- Zinc (Zn) concentrate
- Copper (Cu) concentrate
- Lead (Pb) concentrate

Additionally, the project will introduce the handling and storage of mineral sands.

The metal concentrates and the mineral sands are not classified as dangerous goods [Ref 0 and 0].

As an existing operational site, Aurizon already manage a small inventory of dangerous goods, specifically, diesel, lubricants, waste oil, acetylene and weed poison [Ref. 0]. The quantity of these products remains unchanged as a result of the expansion project. Table 5.1 shows the expected maximum quantity of materials to be stored at the completion of the expansion project.

We recommend Section 1.1 and 5.1 of the Hazards Assessment Report be amended so that it is clear the proposal seeks an additional 60,000 tonnes of storage which will result in a total of 130,000 tonnes on the site. Section 1.1 of their report could use similar language as included in Section 1 of the attached report.

**Table 5.1** Summary of materials on-site

Chemical/ product	DG Class	UN Number	Maximum storage quantity (litres – unless otherwise stated)	SEPP storage quantity threshold	SEPP annual transport movement threshold	Exceedance of SEPP thresholds
Waste oil	9 – III	3082	100	None (excluded)	> 1,000	No
Lubricants	9 – III	1791	250	None (excluded)		No
Diesel Fuel	9 – III	3082	5,000	None (excluded)		No
Acetylene	2.1	1001	4 standard size bottles (40 kg total)	100 kg	> 500	No
Weed killer	N/A	–	5	Not applicable	Not applicable	No
Zinc Concentrate	N/A	–	Combined 60,000 tonnes increase to provide for a total storage capacity at the facility of 130,000 tonnes (maximum storage at any one time)	Not applicable	Not applicable	No
Copper Concentrate	N/A	–				
Lead Concentrate	N/A	–				
Mineral sands	N/A	–				

The results of the SEPP (Resilience and Hazard) screening indicate that none of the storage threshold quantities are exceeded. Additionally, the interaction between the new and existing materials will not have an adverse impact or accumulative effect on the site expansion.

Given the low volumes of dangerous goods stored on site during operation, the dangerous good transportation movements will be minimal. The site will not exceed the annual cumulative vehicle movement thresholds for dangerous goods.

As a result, the project is not considered to be ‘potentially hazardous’ and a PHA is not required.

## 5.2 Amenity Screening

Aurizon currently has an Environmental Protection Licence (EPL 1431) with New South Wales (NSW) Environmental Protection Authority (EPA). The final amenity level on-site will comply with EPA requirements as levels will be mitigated and managed appropriately to reduce the potential for impacts to the surrounding area. For example, air quality will be monitored and maintained under condition O3 of the EPL to minimise the amount of dust emissions leaving the site.

Whilst there are no noise and vibration EPA licence conditions, the site will comply with Noise Policy for Industry. All noises and vibrations on-site will be managed, as recommended in the *Noise Impact Assessment Report* (SLR, 2022).

The air quality and noise and vibrations levels have been assessed separately by others. Further details can be found in the associated specialist report or the SEE. By complying with the licence conditions and relevant policies and implementing reasonable and feasible mitigation measures, the proposed expansion project is not considered “offensive”.

## 5.3 Hazard Identification and Management

The results of the hazard identification are provided in Table 5.2. The hazard identification was conducted as a desktop study and focussed specifically on both construction and operation activities of the project. Safeguards are also outlined in Table 5.2 and are required to ensure the identified risk scenarios are contained or at least controlled to an acceptable level.

**Table 5.2** Hazard identification list

Hazard scenario	Causes	Consequence	Further assessment to assess potential off-site impacts	Existing safeguards
Natural hazards	Flooding, earthquake, lightning, storm surge	Personal injury Plant shut down Possible fire	No	<ul style="list-style-type: none"> <li>– Infrastructure designed to appropriate codes and standards</li> <li>– Housekeeping standards</li> <li>– Stormwater Management infrastructure</li> <li>– Emergency Response plan</li> </ul>
External fire (adjacent to site)	Fire or explosion from adjacent land users	Asset damage Plant shut down Personal injury	No	<ul style="list-style-type: none"> <li>– Site fuel management</li> <li>– Buildings designed to appropriate codes</li> <li>– Fire protection systems (e.g. fire hose, extinguishers etc)</li> <li>– Housekeeping standards</li> <li>– Emergency Response plan</li> </ul>
Handling of mineral sand	Not familiar/inexperienced with material	Personal injury	No	<ul style="list-style-type: none"> <li>– Safety Data Sheet (Safety Data Sheet)</li> <li>– Operator Training</li> <li>– Personal Protective Equipment (PPE)</li> </ul>
Contact with materials	Zinc concentrate Copper concentrate Lead concentrate Mineral sands	Personal irritation	No	<ul style="list-style-type: none"> <li>– Transfer and handling procedures</li> <li>– Safe Work Method Statements (SWMS)</li> <li>– Safety showers and eye wash stations</li> <li>– PPE</li> </ul>

Hazard scenario	Causes	Consequence	Further assessment to assess potential off-site impacts	Existing safeguards
Exposure to Dust/ Air quality	Concentrate materials deliveries Mineral sand transfer	Health risk Third party complaints	Considered separately in SEE	<ul style="list-style-type: none"> <li>– Dust extractor (HEPA filters)</li> <li>– PPE</li> <li>– Maintenance of equipment</li> <li>– Fogging system</li> <li>– Routine Vacuum/ housekeeping</li> <li>– Materials are handled and stored in fully enclosed area</li> <li>– Tipper operates with a negative pressure and curtain system</li> </ul>
Noise	Excessive noise during construction Excessive noise during operations	Personal Injury Third party complaints	Considered separately in specialist report (SLR, 2022)	<ul style="list-style-type: none"> <li>– Construction environmental management plan</li> <li>– Operational management environmental plan</li> <li>– Use sound dampening equipment where possible</li> <li>– Appropriate hearing protection on site</li> <li>– Complaint management procedure</li> <li>– PPE</li> <li>– Maintenance of equipment</li> </ul>
Engulfment	Storage of mineral sand Storage of metal concentrate	Personal Injury/ Fatality	No	<ul style="list-style-type: none"> <li>– Site induction</li> <li>– Barricading if possible</li> <li>– Trained and competent personnel</li> <li>– Job planning</li> <li>– Fitness for work procedure</li> <li>– SWMS</li> </ul>
Fall from heights	Working at height	Personal Injury/ Fatality	No	<ul style="list-style-type: none"> <li>– Working at heights procedures</li> <li>– Working at heights training</li> <li>– Fall prevention equipment</li> <li>– Guarding where practical</li> </ul>
Manual handling	Inappropriate lifting of objects or repetitive work activities	Personal injury	No	<ul style="list-style-type: none"> <li>– Site induction</li> <li>– Trained and competent personnel</li> <li>– Job planning</li> <li>– Fitness for Work Procedure</li> <li>– SWMS</li> </ul>
Water Quality	Pollution of water	Environmental Impact	No	<ul style="list-style-type: none"> <li>– Environmental Management Plan</li> </ul>

## 6. Conclusion

This report includes a preliminary risk screening of the expansion project in accordance with the requirements of SEPP (Resilience and Hazard). As there are no new dangerous goods proposed to be used on-site due to the expansion project, the screening thresholds are not exceeded. As a result, the project is not deemed a 'potentially hazardous industry' and there is no requirement for a PHA.

Aurizon has an environmental protection licence (EPL 1431) with NSW EPA. All noise, vibration and air quality will be monitored and managed appropriately. The air quality and noise and vibrations levels have been assessed separately by others. By complying with the licence conditions and relevant policies, and implementing reasonable and feasible mitigation measures, the proposed expansion project is not considered "offensive".

While a PHA is not required, a desktop qualitative hazard identification study was completed as a systematic way to identify any other potential offsite impacts. The hazard identification study did not identify any hazards with the potential for significant offsite impact that would not be suitably controlled. Safeguards (as defined in Table 5.2) are required to ensure the risk scenarios that were identified are controlled to an acceptable level.

It is recommended that existing management procedures be updated to incorporate new expansion project practices to prevent or mitigate potential risk scenarios occurring through:

- Minimising build-up of dust on-site from the increase transportation of additional materials in accordance with the existing EMP and EPL
- Familiarising operators with mineral sands through updated SWMS and operational procedures

Any changes to the assumption used in this report should result in a review of the screening report and update as required.

## 7. References

Department of Planning, NSW, (2011), Applying SEPP 33: Hazardous and Offensive Development Application Guidelines

Department of Planning, NSW, (2011), Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning

Department of Planning, NSW, (2011), Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis

Department of Planning, NSW, (2011), Multi-level Risk Assessment Guideline

Doral (2018), Leucoxene L70 Safety Data Sheet

Tronox, (2019), Ileminte Safety Data Sheet

Aurizon Port Services, NSW (2021), Environmental Management Plan: Operations

Aurizon Port Services, NSW (2021), Aurizon Port Services NSW Expansion – Hazards and Risk

SLR, NSW (2022), Aurizon Port Services NSW Expansion, Noise Impact Assessment



