

**REGIONAL JOB PRECINCT**

**SOUTH JERRABOMBERRA**

**TECHNICAL REPORT**

**LAND USE CONSIDERATIONS**

**DEPARTMENT OF REGIONAL NSW**

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## ABBREVIATIONS

AAMC	Australian Advanced Manufacturing Council
ACT	Australian Capital Territory
CAP	Competent Authorities Panel
CoP	Code of Practice
DG	Dangerous Goods
DRNSW	Department of Regional NSW
EI	Energy Institute
ERPG	Emergency Response Planning Guide
FHA	Final Hazard Assessment
HIPAP	Hazardous Industry Planning Advisory Paper
LEP	Local Environmental Plan
LNG	Liquified Natural Gas
LPG	Liquified Petroleum Gas
MHF	Major Hazard Facility
NSW	New South Wales
PHA	Preliminary Hazard Assessment
RJP	Regional Job Precinct
SEPP	State Environmental Planning Policy

## TERMINOLOGY

<b>Term</b>	<b>Definition</b>
Active land use	Sporting complexes and active open space.
Buffer zone	An area surrounding a facility or between areas designated for certain types of developments to minimise the potential for land use safety conflicts. Beneficial activities, typically with low density populations, intermittent use or lower risk, may be permitted in buffer zones to minimise sterilisation of land.
Commercial land use	Commercial developments including retail centres, offices and entertainment.
Offsite	Areas extending beyond the facility boundary.
Onsite	Areas within the facility boundary.
Residential land use	Residential, hotels, motels, tourist resorts.
Risk	The likelihood of a specified undesired event occurring within a specified period or in specified circumstances, it may be either a frequency (the number of specified events occurring in unit time) or a probability (the probability of a specified event following a prior event), depending on the circumstances.
Sensitive land use	Hospitals, schools, child-care facilities, old age housing.
Separation distances	Separation distances are used in this report to describe the distance between a source of risk and a receptor. They are a function of the configuration of the RJP and surrounding land uses.
State Environmental Planning Policy No.33 (SEPP33)	SEPP33 has been wholly incorporated without change into the Resilience and Hazards SEPP which came into effect in March 2022. Reference to SEPP33 in this document means SEPP33 as adopted in the Resilience and Hazards SEPP.
The HIPAP 10 performance objective to 'protect residential amenity and health'	In the context of risk to people, amenity is concerned with nuisance type issues such as noise and odour. Amenity is not assessed in this study and 'health' is taken to mean safety due to acute effects of incidents for potentially hazardous facilities.



## 1. SUMMARY

### 1.1. Background

The Regional Job Precinct (RJP) program is an initiative of the New South Wales (NSW) Government to provide planning support to help fast-track approvals to drive growth, investment, and development opportunities within regional NSW. An RJP has been announced for South Jerrabomberra (Figure 1.1) to leverage opportunities in the area to create a hub of defence, space, cyber-security, information technology and scientific research sectors<sup>1</sup>, zoning is also envisaged to develop housing, recreation, sport and a range of industrial and commercial activities.

### 1.2. Scope

This document is the Technical Report into Land Use Consideration for the South Jerrabomberra RJP. It addresses land use **safety** planning matters, i.e., risk arising from potentially hazardous industries due to loss of containment of hazardous materials that could lead to fires, explosions or toxic releases with acute consequences. Other technical packages cover potentially offensive and amenity issues (i.e., air, noise and odour, contamination and environmental constraints).

### 1.3. Objective

The high-level objective of this report is to support orderly, efficient and streamlined development within the RJP by minimising the potential for land use safety conflict during future development approval processes.

The objective is achieved by conducting a technical analysis of the South Jerrabomberra Master Plan. The analysis uses representative developments to determine if the Master Plan will support development of employment opportunities in the RJP whilst avoiding land use safety conflict.

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<sup>1</sup> [South Jerrabomberra Regional Job Precinct | NSW Government](#)

Figure 1.1: South Jerrabomberra RJP boundary

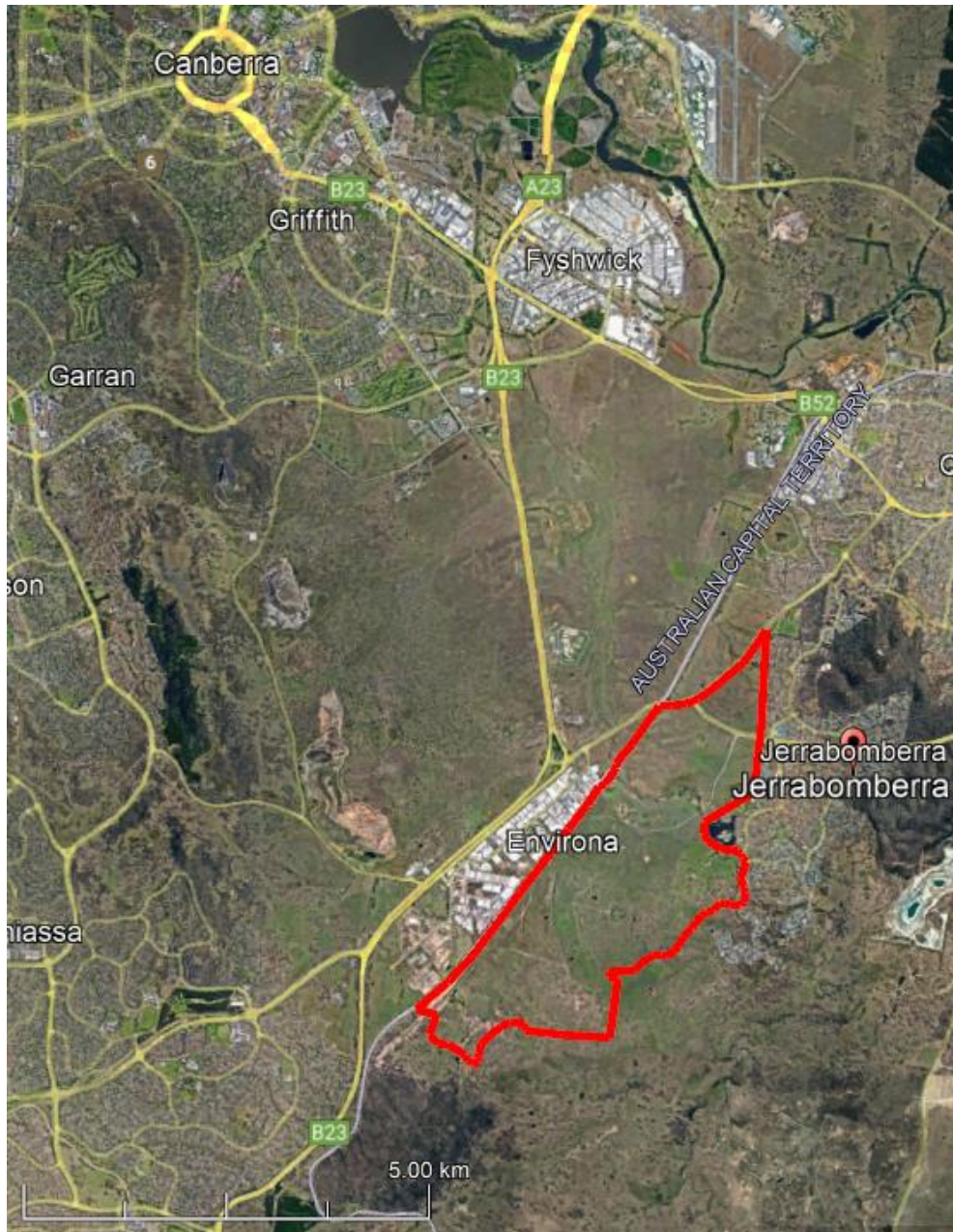
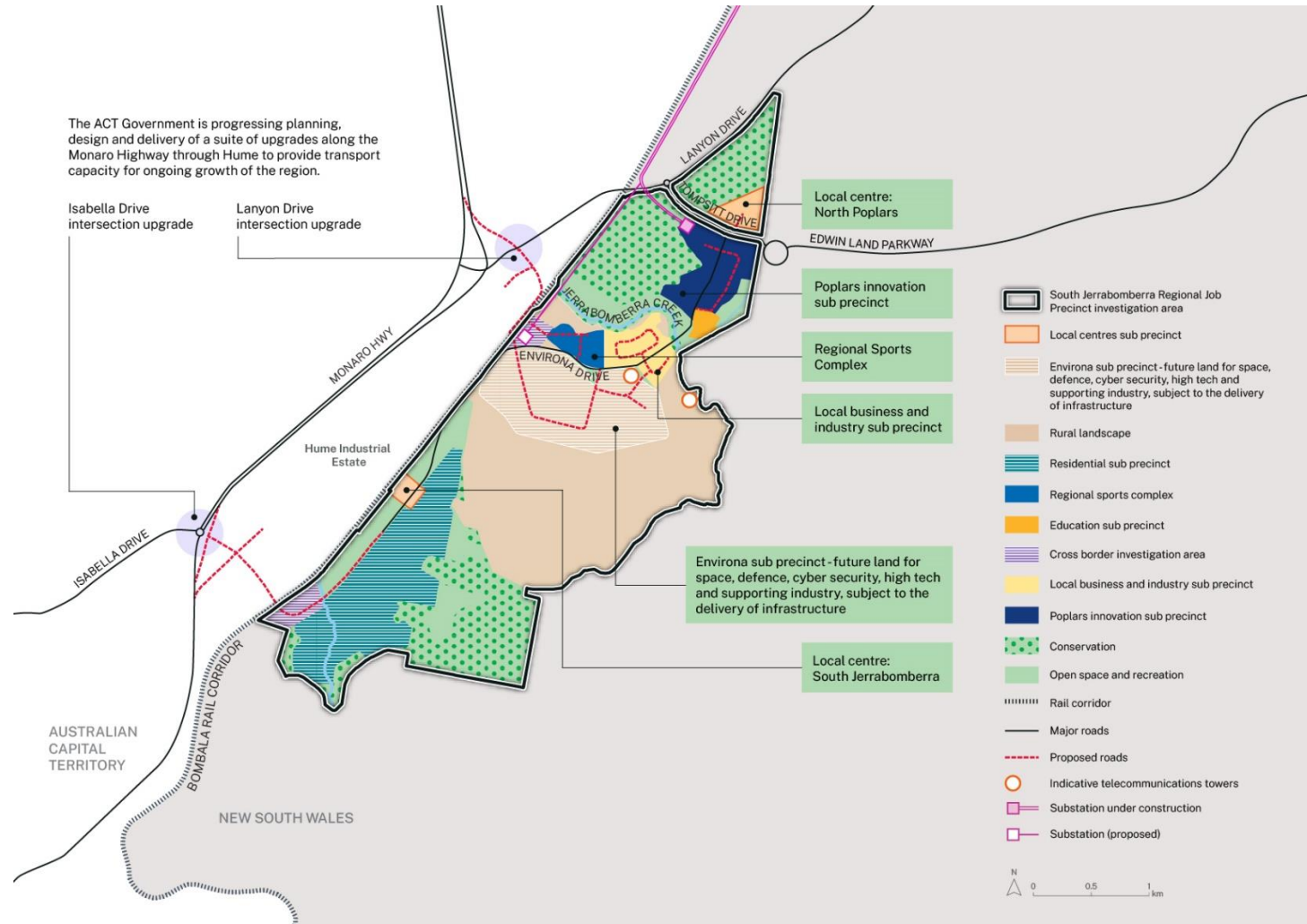


Figure 1.2: Master Plan



## 1.4. Master Plan

### 1.4.1. RJP zoning

This report analysed the South Jerrabomberra RJP preferred development option.

The Master Plan recognises current activities in and around the RJP whilst presenting opportunities to develop the RJP in a staged process. It is not intended to indicate changes to existing operations will occur or that developments will proceed.

The Master Plan is described in Table 1.1 and shown in Figure 1.3. The description provides a high-level view of the expectations for the developments in an area.

When reading this table and figure, it is noted that in the figure the code for the area is 'Land Use Zone-XX', where XX is a unique identifier to differentiate between different land parcels with the same zoning.

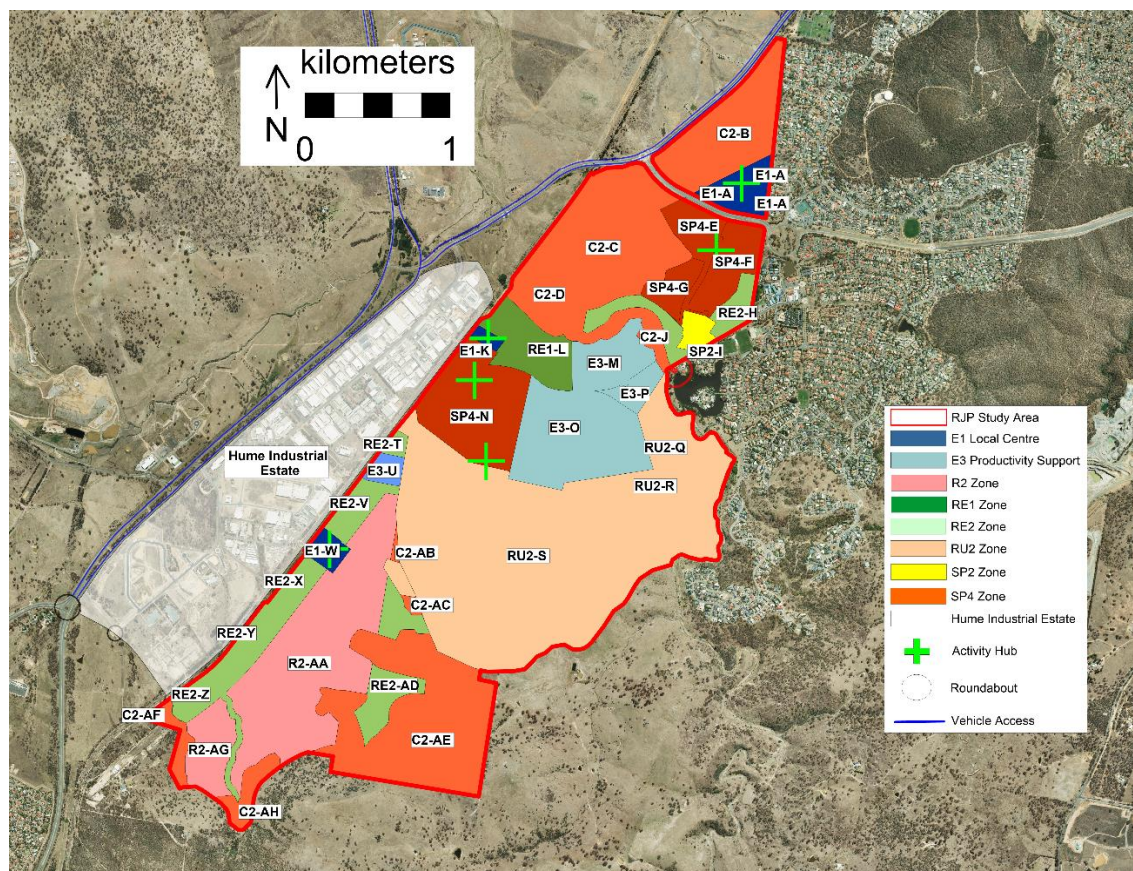
**Table 1.1: Development areas and character**

Area	Parcels (Figure 1.3)	Land use planning zone	Character
Poplars North	A	E1 Local Centre	Public access, retail, and commercial activities.
Poplars Innovation	E – Stage 1 F – Stage 2 G – Stage 3	SP4 Enterprise	Innovation precinct, technology and enterprise, data centres. Links with school and higher education facilities.
North Tralee	M and P	E3 Productivity Support	Productivity Support, provide for light industry and commercial/office developments.
Sport and recreation centre	L	RE1 Public recreation	Sports and recreation fields, sports administration offices and associated health services.
Environa Drive	K	E1 Local Centre	Health and wellness hub.
Environa Enterprise	N	SP4 Enterprise	Provides for development and land uses that support enterprise and productivity. For example, defence, space, technology, advanced manufacturing, research, offices, data centres, business hubs, cafes, conference and function centres.
Environa productivity	O	E3 Productivity Support	Productivity Support, provide for light industry and commercial/office developments.
Business/professional hub	U	E3 Productivity support	Conference facility, consulting rooms, office and small business
South Tralee Hub	W	E1 Local Centre	Community centre, parks, café and restaurants, visitor area, speciality retail and offices.



Area	Parcels (Figure 1.3)	Land use planning zone	Character
Environmental conservation	B, C, D, J, AB, AC, AE, AF and AH	C2 Environmental conservation	Areas northwest, south and Jerrabomberra creek.
Rural landscape	Q, R and S	RU2 Rural landscape	Concentrated in the Environa area, envisaged to continue with limited residential land use and activities such as grazing.
Residential	AA and AG	R2 Low density residential	South Tralee (under development) and area in the south of the RJP (future development).
Recreational	H, T, V, X, Y, Z and AD	RE2 Private recreation	Private recreation, adjacent to residential areas in South Tralee.
High school	I	SP2 Infrastructure	High school.

**Figure 1.3: RJP Land Parcels**



### 1.4.2. Residential and sensitive land uses

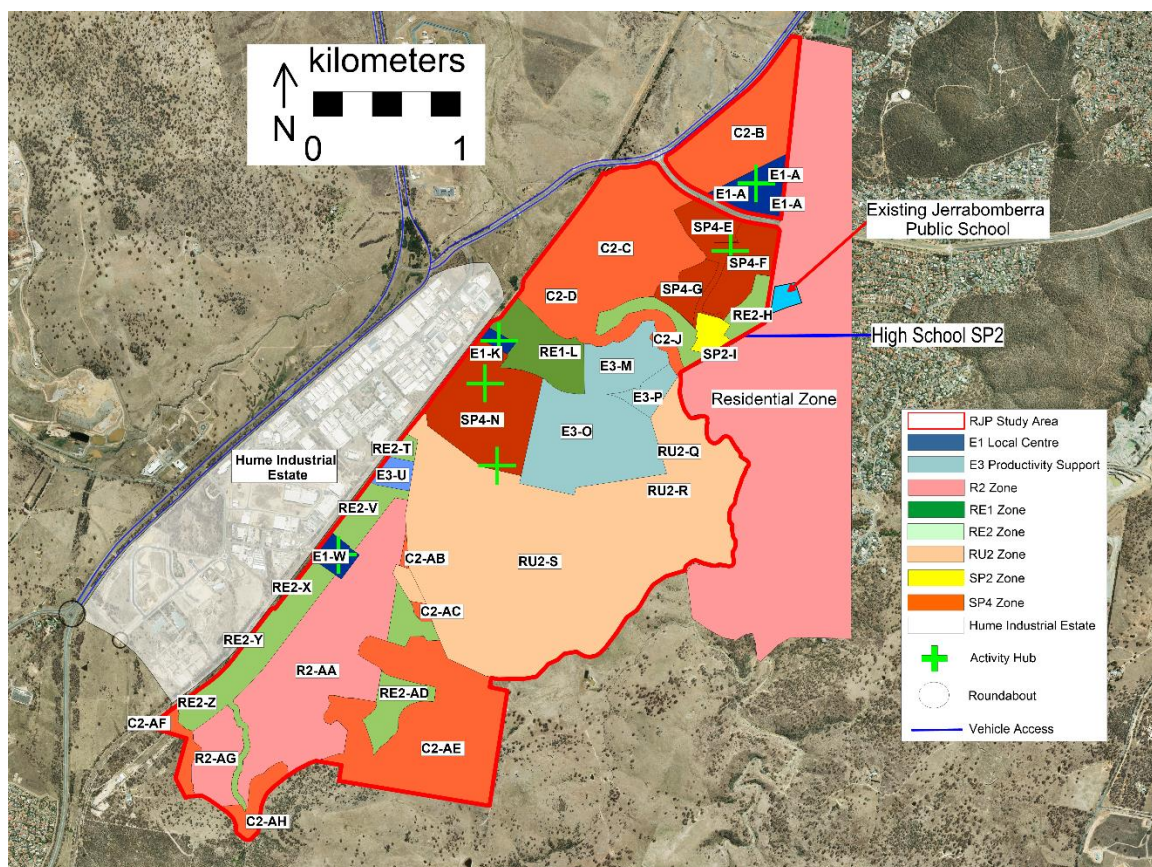
The land uses proposed and assessed within the RJP take account of current and proposed residential and sensitive land uses shown in Figure 1.4 and are summarised as:

- existing Jerrabomberra residential area,
- existing public school, and
- proposed high school.

Introduction of sensitive land uses that have not been accounted for in the study will have the potential to lead to land use safety conflict. Sensitive land uses are not compatible with efficient and effective development of employment zones as:

- making a provision for a sensitive development in an employment zone would require setting aside land for buffers that would otherwise be used for employment opportunities, and
- beneficial uses in the buffers that provide employment opportunities will be limited and there will be a disincentive as developments would need to achieve order of magnitude risk reduction (with associated cost) compared to if they were developed in areas not zoned for sensitive land uses.

**Figure 1.4: Residential and sensitive receptors**





## 1.5. Development assessment framework

To avoid inadvertently prohibiting or allowing a development, the land use safety planning framework relating to potentially hazardous developments detailed in the Resilience and Hazards SEPP [1] (Resilience SEPP) should be applied. The potentially offensive aspects of the Resilience SEPP are addressed in other studies covering air, noise, odour and environmental considerations.

It is necessary to apply the Resilience SEPP as:

- there is no relationship between the land use zones defined in the RJP and the nature and scale of land use safety conflicts arising from developments that may be permissible in the zones,
- the set of developments analysed in this technical report are a representation only and cannot take account of the specific hazards and controls for a proposed development. The Resilience SEPP accounts for the unique nature of hazards and controls associated with developments that are not recognised by permissible activities in a land use zone, and
- the Resilience SEPP triggers a process of assessment and approval against defined risk criteria with a mechanism for regulatory oversight.

## 1.6. Key findings

Whilst recognising a general requirement to follow the Resilience SEPP, this report concludes that based on the proposed zoning, the RJP can support a range of land uses that maximise the opportunity for employment, whilst minimising the potential for land use safety conflict.

The following key points are noted:

- Development of a Major Hazard Facility (MHF) may technically be acceptable in the RJP, however there is the potential for land use safety conflict within and external to the area. MHFs require specific detailed assessment to prevent land use safety conflict and are likely to result in inefficient use of land in the RJP.
- The general layout of zones intended to encourage employment opportunities (E1, E3 and SP4), recreation (RE1 and RE2) and environmental conservation/rural landscape (C2 and RU2) provide buffers to residential areas.
- The study identified the need to maintain the buffer between the Hume Industrial Estate and residential development and to manage development in the buffer zone to avoid land use safety conflict.
- The RJP intent is to attract advanced manufacturing, technology, and defence to the RJP. The high degree of uncertainty over the nature and risk profile of any future

developments is appropriately dealt with through the Resilience SEPP where any unique hazards, risks and controls can be taken into consideration.

The output of the assessment is summarised in the following tables as constraints on developments in the relevant zones. Table 1.2 summarises the specific findings for developments in the Hume to South Tralee buffer, and Table 1.3 summarises the findings for all zones.

The constraints in the tables relate to developments that would otherwise be permitted with or without consent in the zone under current Queanbeyan Local Environmental Plan (LEP) [2].

The term ‘advise against’ is used in this report. It reflects the fact that while the development may be able to demonstrate compliance with NSW land use planning risk criteria, and hence would be permissible under the Resilience SEPP, it:

- is likely to require detailed assessment,
- may lead to future land use conflict or sterilisation of land, and
- is not compatible with a streamlined planning process.

In all cases, a Preliminary Hazard Assessment (PHA) is required if the Resilience SEPP threshold is exceeded.

**Table 1.2: Advised against developments in the Hume to South Tralee buffer.**

<b>Currently permitted with consent in E1, E3 or RE2</b>	<b>Recommended to be advised against in the RJP Master Plan</b>
Boarding houses	Yes
Centre-based child care facilities	Yes
Hotel or motel accommodation	Yes
Medical centres	Yes
Education facilities	Yes
Respite day care centres	Yes
Shop top housing	Yes
Recreation facilities (major)	Yes
Camping grounds	Yes
Caravan parks	Yes
Health consulting rooms	Yes

The ‘advised against’ developments are either:

- Sensitive receptors, being populations that are vulnerable due to the health of occupants or difficulty in managing evacuation; or



- Residential/long term occupancy receptors, where individuals may be exposed for extended periods of time to the risk; or
- Large populations, such as major recreation facilities. Where a rare event would not be acceptable to society if it had an acute effect on a large population.

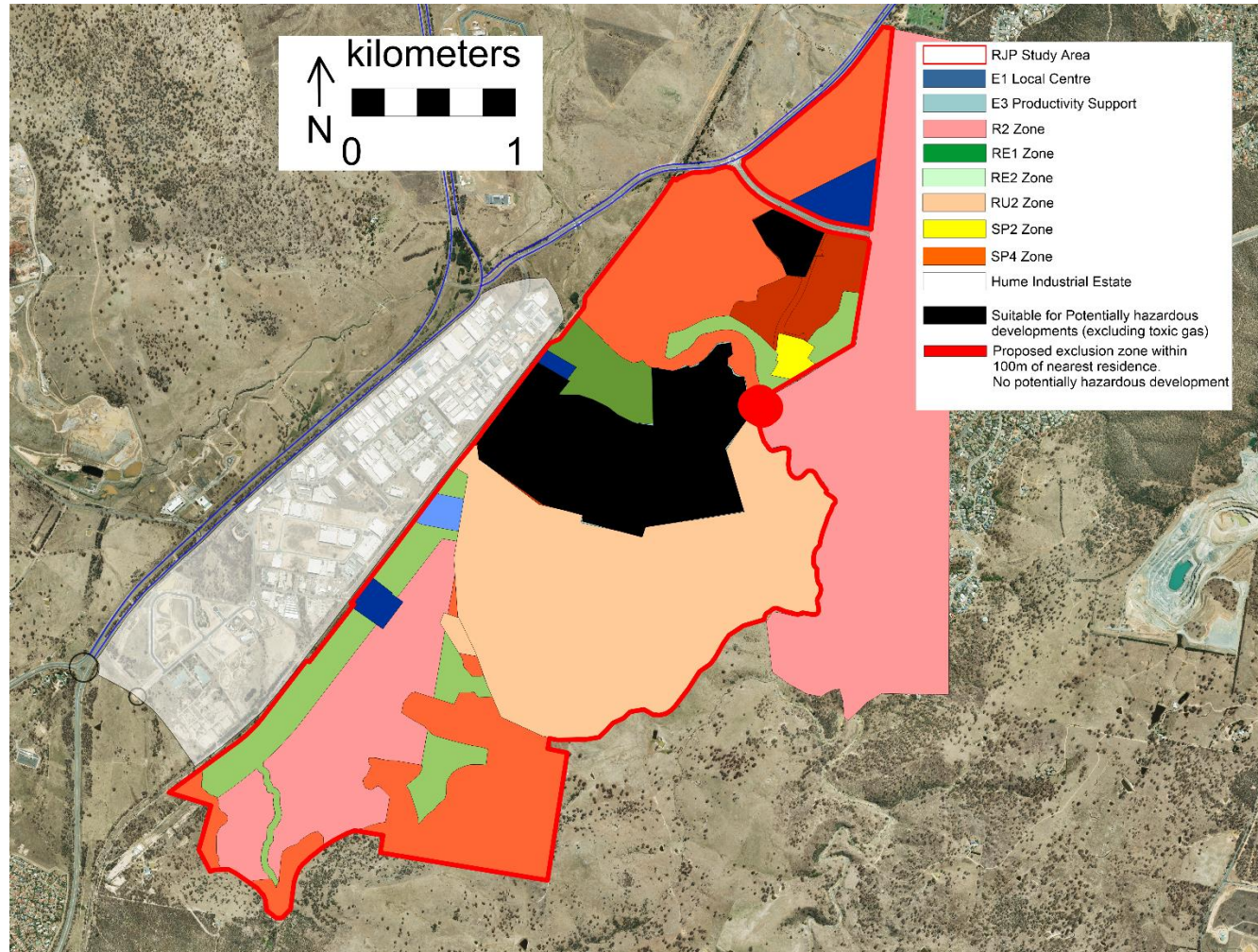
‘Advised against’ does not prohibit a development. Under the NSW risk-based planning framework a proponent may submit a development application for an ‘advised against’ industry which may be acceptable if it demonstrates risk will be managed to an acceptable level. It is intended to provide guidance on the types of development that are likely to be acceptable under the Master Plan.

**Table 1.3: Planning constraint summary**

Land use planning zone	Description	Commentary on currently permitted (with and without consent) activities:	Potentially hazardous development including toxic gas storage	Potentially hazardous development excluding toxic gas storage	Not potentially hazardous development
E1	Local Centre	As detailed in Table 1.2.	Advise against		Likely to be acceptable
E3	Productivity support	As detailed in Table 1.2. See proposed exclusion zone in Figure 1.5 for development within 100m of nearest Jerrabomberra residential area.	Advise against	Likely to be acceptable for typical installation up to 10% of MHF threshold, provided more than 100m separation distance to residential or sensitive land uses.	
C2	Environmental conservation	<b>Advise against</b> – new or intensification of use of home business/occupation, farm stay accommodation, home based child care or bed and breakfast accommodation in land within 100m of E3 or SP4 zone.	Advise against		Likely to be acceptable
RU2	Rural landscape	<b>Advise against</b> – Bed and breakfast and farm stay accommodation, child care, dwellings or secondary dwellings in the RU2 area that is within 100m of the E3 and SP4 areas.	Advise against		Likely to be acceptable
R2	Low density residential	No additional constraints.	Advise against		Likely to be acceptable
RE1	Public recreation	<b>Advise against</b> – Camping and caravan parks (that may attract long term residents), child care facilities, respite day care centres.	Advise against		Likely to be acceptable
RE2	Private recreation	As detailed in Table 1.2.	Advise against		Likely to be acceptable
SP2	Infrastructure	No additional constraints.	Advise against		Likely to be acceptable

Land use planning zone	Description	Commentary on currently permitted (with and without consent) activities:	Potentially hazardous development including toxic gas storage	Potentially hazardous development excluding toxic gas storage	Not potentially hazardous development
SP4	Enterprise (Environa area)	Weapons testing is unlikely to be compatible with a streamlined planning process. Detailed assessment will be required noting the potential to sterilise land with the buffers required for explosive storage.	Advise against	Likely to be acceptable for typical installation up to 10% of MHF threshold	
SP4	South Poplars – NW sector	The NW sector has sufficient buffer to residential and sensitive uses to accommodate potentially hazardous developments with the exception of toxic gas.	Advise against	Likely to be acceptable for typical installation up to 10% of MHF threshold	Likely to be acceptable
SP4	South Poplars – all areas except NW sector	Proximity to sensitive and residential land uses will limit development to not potentially hazardous.	Advise against		Likely to be acceptable

Figure 1.5: Areas suitable for potentially hazardous developments (excluding toxic gas storage)



## 2. CONTEXT

This study has been conducted on the basis that the NSW land use safety policy [State Environmental Planning Policy (SEPP) Resilience and Hazards [1] Chapter 3: Hazardous and Offensive Development]<sup>2</sup> and supporting processes [embodied in the NSW Hazardous Industries Planning Advisory Papers (HIPAPs) and published guidance on applying SEPP33] will be applied in the RJP.

The study applies criteria from HIPAP No.10: Land Use Safety Planning (HIPAP 10) [3] to determine the potential for developments to result in land use safety conflict as follows:

- A performance objective to protect residential safety<sup>3</sup>
- Societal risk (the cumulative risk of developments effecting a population)
- Individual risk (the cumulative risk of developments effecting an individual at a location) considering the sensitivity of the receptor.

The basis of the assessment is:

- the Master Plan for the RJP,
- existing land uses and developments,
- representative development options in the RJP, and
- external factors.

The assessment is qualitative with some quantification of consequences to inform distance buffers. The level of assessment and conclusions reflects uncertainty in the nature and scale of developments that may be proposed for the RJP.

### 2.1. Overview

The South Jerrabomberra RJP is located to the south of Jerrabomberra, bordering the Australian Capital Territory (ACT). A Master Plan for the development of the RJP has been prepared (Figure 1.3). The Master Plan identifies parcels of land for development assigned to NSW land use zoning.

The land use zones are used to inform both the types of development and risk receptors that may be present in a zone.

### 2.2. RJP areas

The development areas and their envisaged character are detailed in Table 1.1. The table should be read in conjunction with Figure 1.3.

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<sup>2</sup> SEPP33 has been adopted, unchanged into the Resilience and Hazards SEPP. See [Fact sheet - Resilience and Hazards SEPP \(nsw.gov.au\)](#)

<sup>3</sup> Derived from the HIPAP 10 performance objective to protect residential amenity and health.

## 2.3. Receptors

### 2.3.1. Definitions

The NSW HIPAPs define risk criteria based on the categories in Table 2.1. Examples and commentary are provided as the HIPAP categories do not directly relate to land use zoning referenced in the RJP.

**Table 2.1: HIPAP land use categories**

HIPAP Category	Examples	Commentary
Sensitive	Hospitals, aged care facilities and schools.	Populations that are more sensitive than residential by virtue of pre-existing health conditions, requirement for co-ordinate evacuation or societal risk/public perception issues.
Residential	Any area zoned residential.	There is no differentiation on density of residential populations.
Commercial	Includes retail centres, offices and entertainment centres.	Generally differentiated from industrial developments by the virtue of being open to the public or offices.
Sporting complexes and active open spaces	Parks, sports grounds, swimming pools, golf courses.	Areas open to the public for recreational sports or non-organised outdoor activities.
Industrial	Factories, warehouses that are not open to the public, processing facilities.	Industrial and commercial may co-exist in an area. In general, industrial developments are not open to the public.

### 2.3.2. Location of receptors

The area in and around the RJP was reviewed to identify the location of the following receptors:

- Hospitals and aged care facilities
- Schools and education facilities
- Residential zones and individual residences
- Sporting complexes and parks.

The location of the receptors is used as an input to the assessment.

## 2.4. Development opportunities

A broad range of industries may be attracted to the RJP. These include:

- Major Hazard Facilities (MHFs) (under the NSW WHS Act and Regulation MHFs are determined based on the quantity of substances on site exceeding Schedule 15 quantities notification quantities),
- Designated developments under the NSW EP&A Act,



- Potentially hazardous developments (under the Resilience SEPP), and
- Non-hazardous developments.

MHFs are the highest hazard facilities and require detailed consideration of hazards and control of risks to manage offsite land use safety conflict. They are typically a large-scale Dangerous Goods (DG) manufacturing, handling and/or storage facility. MHFs are likely to require buffers to adjacent industrial developments, resulting in sterilisation of land and inefficient use of the RJP.

## 2.5. Land use zones and developments

The documents listed in Table 2.2 were used to identify types of development that may be permitted in a zone under current planning instruments. For each land use planning zone, the documents list developments that are:

- Permitted without consent,
- Permitted with consent, and
- Prohibited.

**Table 2.2: Land use zones and planning documents**

Document	Commentary
Queanbeyan-Palerang Regional Local Environmental Plan (2022) [2]	Applies to RJP area
Standard Instrument (LEP)_Amendment (Land Use Zones) Order 2021, Ref [4]	Defines the 'E' – enterprise zones that replace the 'B' – business zones used in the Queanbeyan LEP.

The zones used in this study are listed in Table 2.3.

**Table 2.3: Land use zones adopted in the study**

Zone	Description	Character
E1	Local centre	Facilitate a range of retail, business and community uses.
E3	Productivity support	Light industries, warehouses, offices with support services and facilities.
C2	Environmental conservation	Protect, manage and restore areas of high ecological, scientific cultural or aesthetic values.
RU2	Rural landscape	Encourage sustainable primary industry, maintain rural landscape.
R2	Low density residential	Meet housing needs of a community with low density residential houses with services that support day to day resident's needs.
RE1	Public recreation	Public open space or public recreation.
RE2	Private recreation	Private open space or private recreation.
SP2	Infrastructure	For the purposes of the RJP, the area is allocated for a new high school.

Zone	Description	Character
SP4	Enterprise	For the purpose of the RJP, the area is allocated for enterprise and productivity including innovation and advanced manufacturing with support services and facilities.



### 3. BACKGROUND

#### 3.1. Requirement for study

The Department of Regional NSW (DRNSW) is coordinating a planning process that will culminate in a planning framework that supports employment opportunities in the South Jerrabomberra RJP.

DRNSW has engaged a master planner and a set of technical specialists to provide input and to support the development of the framework.

Sherpa Consulting Pty Ltd (Sherpa) has been retained to undertake the land use considerations study. The scope of the study is land use **safety** considerations. Other specialists have been engaged for environmental, air, noise, odour, contamination and heritage studies.

#### 3.2. Technical report

The RJP has the potential to accommodate a wide range of developments including those that may be determined as *potentially hazardous* under the Resilience SEPP. The purpose of this study is to ensure that the acute safety issues associated with potentially hazardous developments are assessed during the RJP planning stage.

The study has been conducted on the basis that:

- the current land use safety policy [Hazards and Resilience SEPP and supporting processes, embodied in the NSW Hazardous Industries Planning Advisory Papers (HIPAPs)] will be applied in the RJP.
- a facility or development that exceeds the MHF notification threshold would not be considered eligible for any simplified or streamlined planning process.

#### 3.3. Strategic land use safety planning

Strategic land use planning balances the threats and opportunities associated with developing land to maximise utility whilst managing land use conflicts and avoiding unnecessary sterilisation of land. To achieve this balance, strategic planning assesses a range of factors and issues including but not limited to threats to the natural environment, noise and air pollution.

Strategic land use **safety** planning provides the opportunity to put in place controls that eliminate or minimise land use safety conflicts through a combination of separation distances, buffer zones and limits on certain types of industries, associated activities and quantities of hazardous materials.

This study is limited to land use **safety** planning. It takes into consideration acute risks to people living or working in and around the RJP. It should be noted that other factors may result in controls that are over and above any requirements identified in this study.

### 3.4. Limitations

The limitations in Table 3.1 apply to the study.

**Table 3.1: Limitations**

Item	Scope Area	Exclusion/assumption/limitation
1	Level of assessment	The study is a qualitative assessment of potential land use conflicts and preferred locations for typical generic developments. It is not a substitute for individual assessment of specific developments.
2	Reliance on existing studies and experience	The assessment is based on land use planning safety studies available in the public domain and experience from assessments of similar facilities. Studies in the public domain have not been verified for accuracy and completeness.
3	Application of results	The output of the study will be guidance on land use in the RJP. The study results will not be appropriate for determining if a specific development proposal meets the NSW land use safety planning criteria.
4	Potentially offensive developments	The study assessed land use safety considerations only. The study excludes potentially offensive (under the Resilience SEPP) and environmental considerations.
5	DG Transport Route Selection	The study has not assessed transport (road, rail or pipeline) of DGs to and from the RJP.
6	Threshold quantities	The assessment covers potentially hazardous developments (under the Resilience SEPP) but excludes the assessment of potential and existing MHFs.

## 4. PLANNING CONTEXT

### 4.1. Assessment framework

The assessment was guided by the documents listed in Table 4.1. The scope and relationship between the documents are discussed in the following sections.

**Table 4.1: NSW land use planning documents**

Ref	Document	Level	Use in study
[1]	Hazard and Resilience SEPP – chapter 3 Hazardous and Offensive Development and the supporting application guidelines (Applying SEPP33).	Primary	Established the threshold for potentially hazardous facilities.
[3]	DPIE HIPAP No. 10 – Land Use Safety Planning	Primary	Established the principles, framework and criteria for the assessment.
[5]	DPIE HIPAP No. 4 – Risk Criteria for Land Use Planning	Supporting	Provides land use safety criteria.
[6]	DPIE HIPAP No. 6 – Preliminary Hazard Assessment	Supporting	Provides assessment guidance.
[7]	NSW Work Health and Safety Act (and supporting regulation)	Supporting	Establishes threshold quantities for an MHF.
[8]	Australian Emergency Response Guide Book 2021.	Supporting	Provides extent of evacuation and distances requiring protection.

### 4.2. Resilience SEPP

The Resilience SEPP [1] provides a mechanism to determine if a facility is potentially hazardous. Below defined thresholds of DGs and subject to other general considerations outlined in guidance documents, developments may be determined to be not potentially hazardous and can be developed with no specific land use safety consideration.

If a facility exceeds screening thresholds, there is a requirement to undertake a Preliminary Hazard Assessment (PHA) to determine if the risk associated with the development can be managed to an acceptable level. The PHA recognises that not all hazards and controls may be known at the development application stage. Prior to commencing activities, the PHA is updated to a Final Hazard Assessment (FHA) to reflect the hazards and adopted controls of the final design and layout.

If the risk cannot be managed to an acceptable level at the PHA stage, the development is considered hazardous and cannot proceed.

HIPAP 6 details the requirements of a PHA and HIPAP 4 details the criteria to determine if the risk associated with a development is managed to an acceptable level.

This risk-based approach to land use planning avoids prohibiting a beneficial development based on an extremely unlikely but potentially catastrophic incident. The

approach reflects that as a society we accept certain risks based on a balance of risk and reward.

### **4.3. HIPAP 10 Land Use Safety Planning**

#### **4.3.1. General**

HIPAP 10 [3] describes land use safety planning as a mechanism for dealing with actual or potential conflicts between sources of risk, such as potentially hazardous developments and surrounding land uses. HIPAP 10 focuses on the impacts of industrial hazards, in particular ‘those arising from loss of containment of hazardous materials leading to fires, explosions and toxic releases’.

As presented in HIPAP 10, the aim of strategic land use safety planning is the avoidance or minimisation of land use conflicts by considering issues as early as possible in the planning cycle, with four factors that should be taken into consideration:

1. permissibility of the proposed land use
2. the need to avoid environmentally sensitive areas<sup>4</sup>
3. compatibility with nearby land uses; and
4. results of initial site investigations as to the fundamental suitability of the site.

This land use safety consideration study focusses on avoiding impacts to existing and proposed land uses and the compatibility of nearby land uses, in the context of acute safety impacts to people.

The above factors are supported by four general principles:

- the avoidance of avoidable risks
- the risk from a major hazard should be reduced wherever practicable, even where the likelihood of exposure is low
- the effects of significant events should, wherever possible, be contained within the site boundary; and
- where the risk from an existing installation is already high, further development should not pose incremental risk.

#### **4.3.2. Strategic land use planning criteria**

HIPAP 10 provides guidance on integrating land use safety considerations into a strategic plan and land use safety performance objectives. Table 4.2 summarises how the HIPAP 10 factors are taken into consideration in this study and summarises how the factors are used to determine land use safety conflicts and separation distances.

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<sup>4</sup> From a land use safety planning perspective as per HIPAP 10 ‘environmentally sensitive’ includes areas close to sensitive land uses such as schools, nursing homes and hospitals.

The HIPAP 10 performance objective (summarised in Table 4.3) to ‘protect residential amenity and health’ was used to frame the assessment of impact at residential and sensitive land uses. In the context of risk to people, amenity is concerned with nuisance type issues such as noise and odour. Amenity is not assessed in this study and ‘health’ is taken to mean safety due to acute effects of incidents from potentially hazardous facilities.

**Table 4.2: HIPAP 10 strategic land use planning factors**

Factor	HIPAP 10 consideration	Use in study
Permissibility of land use	Determine which types of development are permissible in an area.	The study assesses the implications of locating types of proposed development in the RJP. The assessment is based on developments that are permitted or permitted with consent under the LEPs listed in Table 2.2.
Avoid environmentally sensitive areas	Lists examples of environmentally sensitive areas which includes areas close to sensitive land uses such as schools, nursing homes and hospitals.	The study assesses the potential impact of proposed development types on schools, nursing homes and hospitals. This is extended to commercial, active open spaces and sporting facilities.
Compatibility with land uses	Provision of buffer zones including the identification of beneficial land uses which can form a buffer between potentially hazardous industries and sensitive land uses such as residential areas.	The study assesses the need for and extent of buffer zones to sensitive land uses including beneficial use of land in buffer zones.
Initial site investigation	The purpose of the initial site investigation is to provide an early indication of the suitability of a proposed site.	Given the generic nature of the case studies under consideration and the lack of any formal development applications, the site level assessment was limited to likely compliance with risk criteria.

**Table 4.3: HIPAP 10 performance objective in the context of acute risk to people**

Land Use	Performance Objective	Factor for determining appropriate separation distances in HIPAP 10	Adopted in study
Residential areas, hospitals or schools	Protect residential, hospital and school safety.	What is the likelihood of the performance objective being achieved by the mitigation measures alone?	Assessment based on possible type and quantity of DGs on site. The Resilience SEPP guidelines are applied based on consequence. Likelihood considered for large toxic releases.
		What is the likelihood of the mitigation measure failing?	
		What is the likelihood of an incident which will result in a failure to meet the performance objectives?	
		What back up mitigation measures are available?	
		What is the likely geographic extent of the impacts if mitigation measures fail or an incident occurs?	Yes

Land Use	Performance Objective	Factor for determining appropriate separation distances in HIPAP 10	Adopted in study
		What separation distances are required to achieve the performance objective: <ul style="list-style-type: none"> <li>• Under normal operational and mitigation performance conditions</li> <li>• If mitigation measures fail or an incident occurs.</li> </ul>	Yes

#### 4.3.3. Consequence criteria

The consequences (acute impact) of incidents from potentially hazardous developments were assessed against the criteria in Table 4.4. Where quantitative data was available, the results were used to inform the assessment.

**Table 4.4: Consequence criteria**

Impact	Qualitative criteria	Quantitative criteria
Heat radiation	Heat radiation reaches target	Incident heat flux radiation: <ul style="list-style-type: none"> <li>• at a residential and sensitive use areas does not exceed 4.7 kW/m<sup>2</sup> (injury)</li> <li>• at neighbouring hazardous installation does not exceed 23 kW/m<sup>2</sup> (escalation potential).</li> </ul>
Explosion overpressure	Explosion overpressure of concern reaches target	Incident explosion overpressure at a residential and sensitive use areas should not exceed 7 kPa (significant effect to people and property damage). Incident explosion overpressure at 21 kPa at industrial facility to cause escalation.
Toxic exposure	Emergency response guideline distances met	Toxic concentrations in residential and sensitive areas should not exceed a level which would be seriously injurious to sensitive members of the community following a relatively short period of exposure [Emergency Response Planning Guide (ERPG 2) or 1% fatality level].

#### 4.3.4. Individual and societal risk criteria

Individual and societal risk criteria are presented in HIPAP 10.

Given the uncertainty in the nature, scale and controls and the number of proposed developments, individual risk and societal risk were not assessed quantitatively. Developments were qualitatively assessed for their potential to result in individual risk at receptors or impact on populated areas with the potential to result in land use safety conflict.

#### 4.4. Uncertainty

A key aspect of this assessment is the uncertainty in the nature, scale, number and location of developments.

The above criteria were used to frame a discussion of the types and locations of development in the RJP. The assessment adopted a precautionary approach when assessing the potential outcomes of hazardous incidents.

The report is not a substitute for application of the Resilience SEPP in the development approval process.

#### 4.5. Hazard and risk potential

Table 4.5 provides guidance on the relative hazard and risk potential of different types of development that are referred to in this study.

**Table 4.5: Relative hazard and risk potential**

Type	Defined by	Commentary
Designated MHF	DG inventory exceeds 100% of the aggregate MHF threshold value in Schedule 15 of the WHS regulations, or a notifiable MHF that is determined to be an MHF following notification. Requires a Safety Case to operate as a licensed MHF.	High hazard industry not recommended for streamlined planning process and is likely to require significant buffers and sterilise land in the RJP.
Notifiable MHF	DG inventory exceeds 10% of the aggregate MHF threshold value in Schedule 15 of the WHS regulations. Requires notification to SafeWork NSW. SafeWork can elect to determine the facility as an MHF based on risk considerations.	Not recommended for streamlined planning process. Likely to require buffers and sterilise land in the RJP.
Potentially hazardous development	Exceeds the DG threshold in the Resilience SEPP or triggers a PHA under the general considerations in applying SEPP 33 [9]. Requires a PHA to demonstrate that risk levels can be managed to acceptable levels. If risk is not acceptable, the development is potentially hazardous and would be prohibited.	May require separation distances to ensure risk is acceptable at offsite receptors. Requires PHA assessment as a minimum to demonstrate risk is acceptable.
Not potentially hazardous	Below the DG threshold in the Resilience SEPP and does not trigger a PHA based on general considerations in the Resilience SEPP.	Potential land use conflict is managed through low inventory or sufficient separation distance to the site boundary.

## 5. RECEPTORS

### 5.1. Definitions

The NSW HIPAP documents define risk criteria based on the land uses in Table 2.1. Examples and commentary are provided as the HIPAP criteria do not directly relate to land use zoning.

### 5.2. Location of receptors

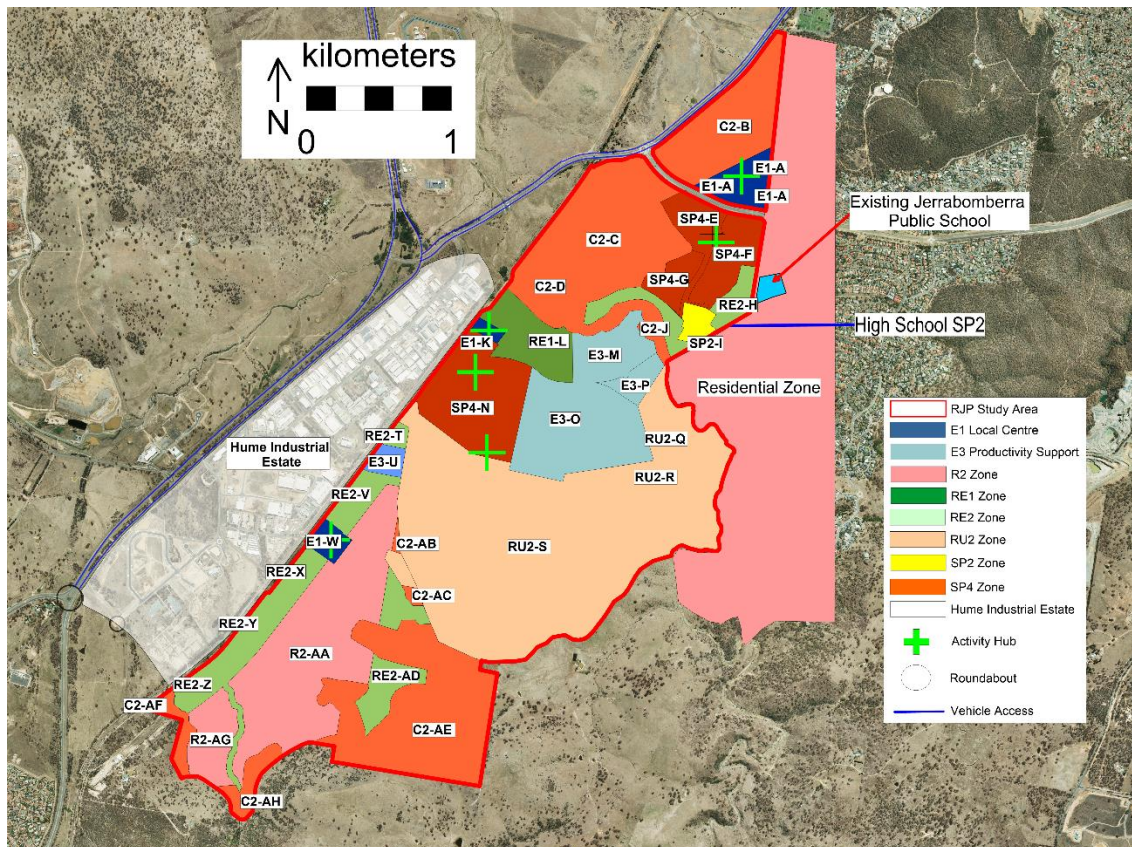
The area in and around the RJP was reviewed to identify and map the nearest receptors with the results summarised in Table 5.1.

**Table 5.1: Receptor locations**

HIPAP Category	Examples	Commentary
Sensitive	Hospital	More than 3km away in Queanbeyan
	Aged care facilities	More than 3km away in Queanbeyan
	Schools	Within (proposed new high school) and adjacent (existing school) to the RJP (see Figure 5.1)
Residential	External	Jerrabomberra residential areas border the east of the RJP
	Internal	Residential development in the southwest of the RJP
Commercial	Retail	Retail development in Poplars North, potential development in other zones discussed by zone in this study.
Sporting complexes and active open spaces	External	Playing fields east of the RJP
	Internal	Sports facilities in North Tralee
Industrial	External	Hume Industrial Estate
	Internal	Potential developments discussed by zone in this study.



Figure 5.1: Jerrabomberra Public school



### 5.3. Planning considerations

#### 5.3.1. Current and proposed

Based on the initial identification of receptors, the following points are noted for planning consideration:

- the RJP contains an area zoned residential and borders existing residential areas
- the RJP contains an area proposed for a school and borders an existing school
- the RJP contains an area proposed for a sports complex and borders existing playing fields; and
- the RJP contains an area proposed for retail and service centre which will attract the public in the north of the RJP.

#### 5.3.2. Future

Introduction of sensitive land uses that have not been accounted for in this study will have the potential to lead to land use safety conflict.

Sensitive land uses are defined under the NSW Hazardous Industry Land Use Planning Policy No 4 (HIPAP 4). They are considered sensitive due to:

- vulnerability of the population (for example due to age or health); and
- difficulty in coordinating evacuation.

Additionally, society has a lower appetite for risks that lead to fatalities in vulnerable populations.

Employment zones are intended to attract employment opportunities and will include a range of developments including commercial and industrial land uses. These are less sensitive land uses as populations tend to be more robust, evacuation can be managed, and people have an element of choice when working or travelling to the area.

As shown in Figure 5.2 (extract from HIPAP 4) the risk tolerability increases by a factor of 10 for commercial and 100 for industrial developments.

**Figure 5.2: Individual risk criteria (HIPAP 4)**

**Table 2: Individual Fatality Risk Criteria**

Land Use	Suggested Criteria (risk in a million per year)
Hospitals, schools, child-care facilities, old age housing	0.5
Residential, hotels, motels, tourist resorts	1
Commercial developments including retail centres, offices and entertainment centres	5
Sporting complexes and active open space	10
Industrial	50

The implication of the different criteria is that land utilisation can be maximised by co-locating commercial and industrial developments in employment zones. The higher risk criteria allowing for smaller or no buffers between developments.

Sensitive land uses are not compatible with efficient and effective development of employment zones as:

- making a provision for a sensitive land use in an employment zone would require setting aside land for buffers that would otherwise be used for employment opportunities, and
- beneficial uses in the buffers that provide employment opportunities will be limited and there will be a disincentive as developments would need to achieve order of magnitude risk reduction (with associated cost) compared to if they were developed in areas not zoned for sensitive land uses.

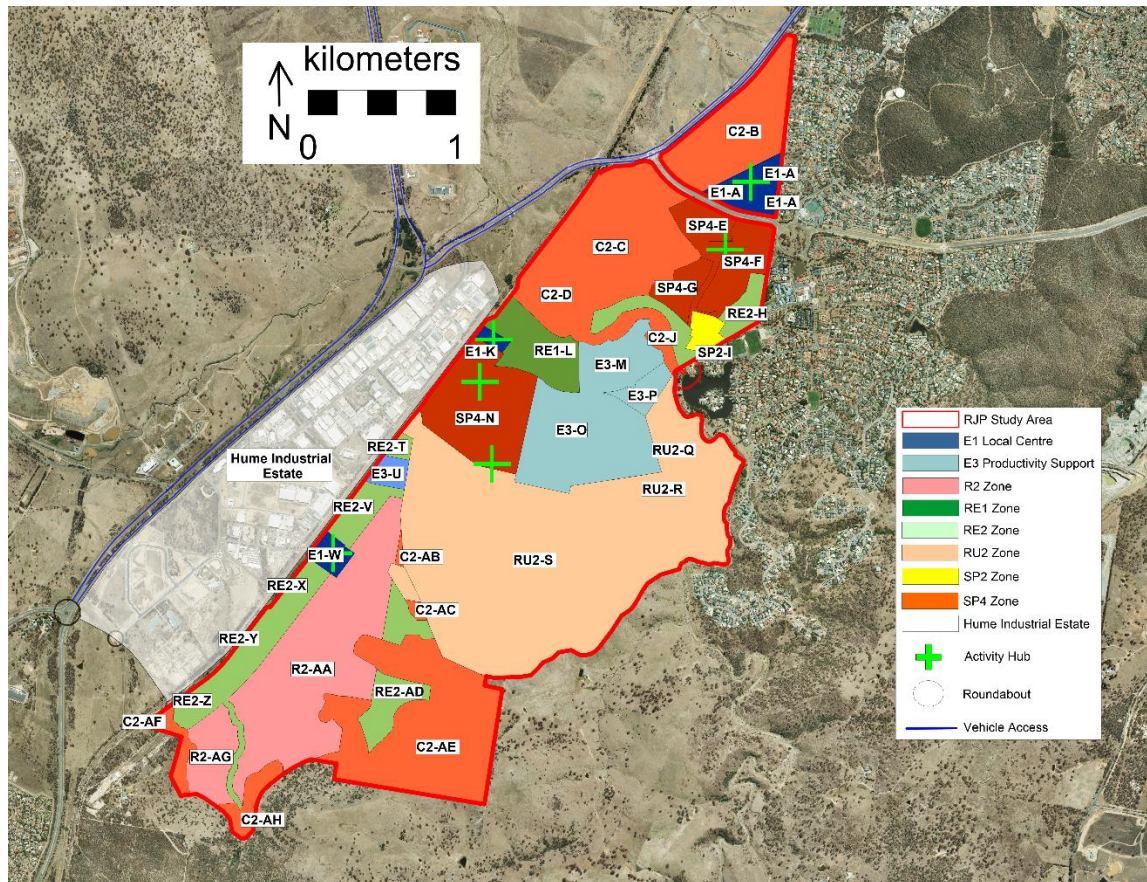


## 6. RJP DEVELOPMENT

### 6.1. Background

The overall layout and areas within the RJP are shown in Figure 6.1.

Figure 6.1: RJP areas



### 6.2. Current activities

In the context of land use safety planning, the key features of the RJP that are currently in use/occupied are:

- Retail and service centre, located in North Poplars (area E1-A); and
- Residential, located in South Tralee (area R2-AA).

### 6.3. Potential development

To assess the potential for future land use safety conflict, it is necessary to identify a set of development options. The list of options in Table 6.1 is based on a review of available documentation and discussions during development of the Master Plan.

**Table 6.1: Potential developments**

Industry	Commentary	Considered in land use zone(s)
Data centre	Development of data centres are under consideration.	SP4
Freight, logistics and warehousing	To support local manufacturing and distribution.	E3
Innovation	The innovation precinct aims to attract businesses in the defence, space, cyber security and high-tech manufacturing spaces <sup>5</sup> . There is a cross over with Advanced Manufacturing. For the purposes of this assessment, innovation is considered to be prototype development whilst advanced manufacturing is commercial scale manufacturing.	SP4 or E3
Advanced manufacturing	A broad term generally including the design and technology development phase of a product through to its branding and marketing <sup>6</sup> .	SP4 or E3
Regional sports hub	Including playing fields and indoor areas, facilities suitable for regional sporting events. Sports administration offices and support services such as physiotherapy and rehabilitation facilities.	RE1
Weapons testing	Potential for underground weapons testing discussed during development of Master Plan.	SP4
Residential	Housing developments are under construction in South Tralee with discussion of development extending into Forest Morrison and Walsh.	R2
Support services	Support services such as childcare, food and beverage outlets, retail.	E1, SP4, RU2, E3, RE1, RE2 or R2.
High school	Provision for a new high school with links to innovation area and existing school.	SP2

#### 6.4. Surrounding features

Key features of the RJP that are taken into consideration in the assessment are:

- border with the ACT and the Hume Industrial Estate; and
- border with Jerrabomberra residential areas.

<sup>5</sup> [Overview – Poplars](#)

<sup>6</sup> [What is Advanced Manufacturing? - AAMC](#)

## 7. RJP EXISTING DEVELOPMENT ASSESSMENT

### 7.1. General

The following existing developments within the RJP are assessed in this section to identify land use safety conflict:

- Retail and service centre, located in North Poplars; and
- Residential, located in South Tralee.

### 7.2. Retail and service centre

Retail, food outlet and a service centre have been developed in North Polars (Figure 7.1).

**Figure 7.1: North Poplars retail and service centre**



Retail and food activities are unlikely to be a source of risk, but they will be a risk receptor as they attract the public to the RJP. Locating the retail and food area adjacent to existing residential areas is an appropriate location to minimise land use safety conflict as it will provide a buffer to any potentially hazardous industries.



A service centre is located in North Poplars. The location and required separation distances for petrol/diesel/LPG service stations are well understood, from a land use safety perspective they are managed by codes and standards. For example:

- AS1940:2017 – The storage and handling of flammable and combustible material
- DPE guideline for Liquefied Petroleum Gas (LPG) automotive retail outlets for separation distances
- AS/NZS60079 set of documents for hazardous areas
- AS3961:2017 the storage and handling of liquefied natural gas (LNG); and
- ISO 16924:2106 LNG stations for refuelling vehicles.

The growth of electric charging infrastructure is unlikely to result in land use safety conflict but may require larger service station footprints to accommodate separation distances from flammable gas and liquids to ignition sources.

The development of hydrogen refuelling facilities is discussed in the following section.

### 7.2.1. Assessment

Current service centre layouts and footprints reference codes and standards for layout and overall configuration. Through the use of vapour barriers and application of separation distances, the risk can be managed within the footprint of a retail facility.

There is currently no agreed standard for hydrogen storage system, with options ranging for 200bar to 700bar compressed gas systems and cryogenic (approx. -250°C liquid hydrogen storage). Additionally, there is no mandated guidance in Australia on separation distances for hydrogen refuelling station. A range of international standards are available and included in Table 7.1.

**Table 7.1: Examples of hydrogen separation distances for appliances**

Document	Exposure location	Distance (m)
European Industrial Gases Association, Doc 15/21 – Gaseous Hazardous Installations (stations)	Site boundary	8
FM Global Property Loss Prevention Data Sheets, Hydrogen 7-91 – Gaseous systems	Combustible building	Up to 15
FM Global Property Loss Prevention Data Sheets, Hydrogen 7-91 – Liquid systems	Combustible building	Up to 30
NFPA 2 Hydrogen technologies code	Numerous detailed requirements	In line with FM global standard
ISO 19880-1:2020 Gaseous Hydrogen – Fuelling Stations. Part 1: General requirements	Equipment and boundary separation	Up to 10m

Resource Safety and Health Queensland released a draft Code of Practice (CoP) for hydrogen [10] in August 2022. The draft CoP notes that Standards Australia will adopt the ISO 19880 series and not NFPA 2.

Detailed quantitative assessment of hydrogen refuelling stations has been undertaken in Norway following an explosion at a hydrogen refuelling station in 2019. The station produced hydrogen by electrolysis (solar PV supplemented by grid supplied power) which was compressed and used to refuel vehicles. Whilst there were no major injuries, debris was ejected from the site and property damage occurred. The incident prompted a pause on hydrogen refuelling station roll out in Norway until the risks were better understood.

The result of the assessment presented a range of planning zones. Initial work reported distances of 64-100m, subsequent updates present ranges from 15-30m for a compressed gas system.

Review of a PHA for a hydrogen refuelling station indicated offsite consequence range from 50-100m and this would seem appropriate for planning purposes given the uncertainty in technology and regulation.

The risk of multi-fuel type service stations also requires careful consideration with potential interactions between petrol, diesel, LPG, hydrogen and electric car charging stations requiring larger footprints to segregate hazards.

### **7.2.2. Planning implications**

Development of food and retail is appropriate in the E1 zoned area.

Given the range of fuel types, technologies, storage pressures and liquid versus gaseous storage it is not possible to provide a single assessment and recommendations for a service station offering multiple fuel types.

The greatest uncertainty is around hydrogen refuelling and the effect on layout. The ability to add hydrogen to an existing service station whilst meeting land use planning risk criteria has not been demonstrated in Australia. Guidance documents are available (e.g. Energy Institute (EI) *Guidance on hydrogen delivery systems for refuelling of motor vehicles, co-located with petrol filling stations*, [11]) to aid assessment of any specific development application.

In general, the lower hazard and risk option for hydrogen is production using electrolysis from local PV arrays, or grid connection with battery energy storage system. Hydrogen inventory storage is minimised and generally supplied directly to a customer as it is produced. For planning purposes, separation distances or buffer zones of 50 to 100m to sensitive and residential offsite receptors should be considered for hydrogen generation from electrolysis and direct use.

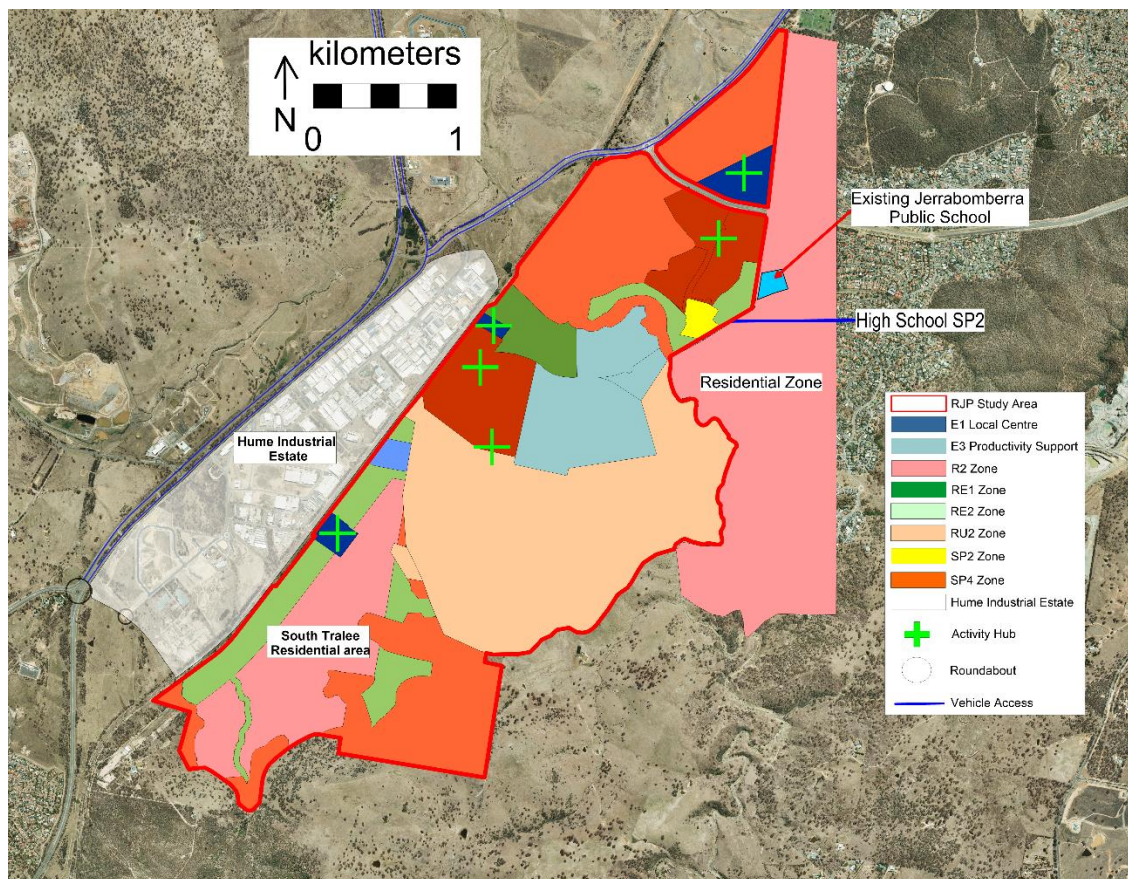
Other fuel types are covered by codes and standards and are typically retained on the footprint of a retail facility.

### 7.3. South Tralee Residential

Residential developments are unlikely to be a source of risk, but they will be a risk receptor.

The residential area closest to the Hume Industrial estate in South Tralee (Figure 7.2) is zoned residential with construction and occupation of houses and a town centre underway. Buffer distances were included in the zoning to provide separation between the Hume Industrial Estate and residences. Parks, communal facilities, and open areas are zoned for in the buffer zone. The Hume Industrial Estate and South Tralee buffer is discussed further in Section 9.

**Figure 7.2: South Tralee residential area**





## 8. PROPOSED DEVELOPMENTS

### 8.1. General

Proposed developments in the RJP may involve the storage, handling and use of DGs with the scope for developments to be potentially hazardous.

Given unknowns in potential developments and the range of possible activities in the RJP, it is not possible to undertake a detailed assessment of the potential land use safety conflict. The following sections provide general guidance on industries listed in Table 8.1 in the context of land use safety planning. The industries were identified during the development of the RJP as being under consideration by a developer or desirable.

**Table 8.1: Assessed industries**

Industry	Commentary	Land use zone
Data centre	Development of data centres are under consideration.	SP4
Freight, logistics and warehousing	To support local manufacturing and distribution.	E3
Innovation	The innovation precinct aims to attract businesses in the defence, space, cyber security and high-tech manufacturing spaces <sup>7</sup> . There is a cross over with Advanced Manufacturing. For the purposes of this assessment, innovation is considered to be prototype development whilst advanced manufacturing is commercial scale manufacturing.	SP4 or E3
Advanced manufacturing	A broad term generally including the design and technology development phase of a product through to its branding and marketing <sup>8</sup> .	SP4 or E3
Regional sports hub	Including playing fields and indoor areas, facilities suitable for regional sporting events. Sports administration offices and support services such as physiotherapy and rehabilitation facilities.	RE1
Weapons testing	Potential for underground weapons testing discussed during development of Master Plan.	SP4
Residential	Housing developments are under construction in South Tralee with discussion of development extending into Forest Morrison and Walsh.	R2
Support services	Support services such as childcare, food and beverage outlets, retail.	E1, SP4, RU2, E3, RE1, RE2 or R2.
High school	Provision for a new high school with links to innovation area and existing school	SP2

The term ‘advise against’ is used in the assessment. This reflects the fact that while the development may be able to demonstrate compliance with NSW land use planning risk criteria, and hence would be permissible under the Resilience SEPP, it:

<sup>7</sup> [Overview – Poplars](#)

<sup>8</sup> [What is Advanced Manufacturing? - AAMC](#)

- is likely to require detailed assessment
- may lead to future land use conflict or sterilisation of land; and
- is not compatible with a streamlined planning process.

In all cases a Preliminary Hazard Assessment (PHA) is required if the Resilience SEPP threshold is exceeded and a pathway may be proposed for 'advised against' developments to be determined as acceptable subject to appropriate risk assessment.

## 8.2. Data Centre

Data centres are under consideration for development in the South Poplars SP4 zone.

### 8.2.1. Assessment

In March 2021 a fire destroyed the OVH data centre in France. Images of the fire (Figure 8.1) show a fully developed building fire. Fire brigade intervention was required to prevent fire spread to adjacent buildings. While such a fire would have a significant impact on adjacent operations, SP4 areas are sufficiently separated from residential and sensitive land uses to prevent direct fire impact. Building fires typically take time to develop, allowing evacuation of surrounding areas as required.

The other potential hazard for data centres is the backup power supply. Diesel fuelled generators typically have small inventories of diesel and any fire would be localised. Battery storage systems have battery management systems and fires are typically localised.

**Figure 8.1: OVH data centre fire (March 2021)**



### **8.2.2. Planning implications**

Development of data centres is unlikely to result in land use safety conflict. Design to codes and standards with consideration of emergency service access in the event of fire should manage the risk to acceptable levels.

### **8.3. Freight, logistics and warehousing**

The primary land use safety considerations for freight, logistics and warehousing are associated with the types and quantities of DGs stored or handled. Such facilities may be proposed in the RJP E3 zones.

#### **8.3.1. Assessment**

Releases of toxic substances (such as chlorine or ammonia) or toxic products of combustion are the worst credible hazards associated with freight, logistics and warehousing.

Incompatibility is managed through application of standards on storage and handling of DGs which specifies segregation requirements between different classes and application of codes as standards for specific materials and overall building design.

A warehouse fire is a credible scenario which may involve large volumes of smoke and heat from the seat of the fire. Typically, heat radiation may extend 50-100m from a fully developed warehouse with downwind evacuation dependent on the prevailing weather conditions.

Repackaging, dilution, or mixing has the potential to introduce additional hazards and increase the risk of land use safety conflict.

#### **8.3.2. Planning implications**

Storage facilities should be screened under the Resilience SEPP to determine if they are potentially hazardous. In general, the risk of land use safety conflict can be limited to the localised effects of heat radiation from a warehouse fire to 50-100m. Toxic products of combustion can be managed through emergency response processes.

To limit the risks, facilities should be limited to storage and handling of closed containers and packages to avoid increases in risk associated with handling of open packages.

Storage of toxic material above the Resilience SEPP screening thresholds should be advised against.

### **8.4. Innovation hub**

Innovation is a broad term generally applied to the process of identifying, developing, and introducing new techniques or applying new processes to create value. Poplars has identified the following target industries for their innovation precinct<sup>9</sup>:

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<sup>9</sup> [Overview – Poplars](#)

- defence
- space
- cyber security; and
- high-tech manufacturing (assessed under advanced manufacturing).

#### 8.4.1. Assessment

In the absence of defined developments and industries, it is not possible to undertake a detailed assessment. The following general issues are noted:

- Innovation activities generally start as knowledge based with the potential for limited small scale laboratory experiments or proof of concept prototype manufacturing. Whilst such activities may present occupational health and safety risk to the persons undertaking the work, the offsite risk is generally managed by application of codes and standards in design and segregation of small quantities of DGs.
- There is the potential for hazards to be introduced or risks to increase as theory moves into experiments or prototypes are scaled up with a shift into manufacturing processes (e.g., elevated pressure and temperatures) or storage and handling of increasing quantities of DGs.

#### 8.4.2. Planning implications

Initial developments of industries in the innovation precinct should be restricted to below the Resilience SEPP screening threshold and should also be assessed against the general requirements of Appendix 3 of the Hazardous and Offensive Development Application Guidelines [9] (covering industries and sources of hazard that are below the thresholds but may still fall within the Resilience SEPP definition of potentially hazardous). This will allow co-location of office and administration activities in the innovation precinct and control developments adjacent to the education precinct (SP2).

Change in use and increase in hazards or risk should be managed through notification and monitoring activities. This is of particular relevance to developments adjacent to the education precinct where there is the potential for incremental changes in risk to result in cumulative risk at the sensitive land use exceeding tolerable criteria.

#### 8.5. Advanced manufacturing

Advanced manufacturing is a broad term generally used to refer to newer, innovative manufacturing processes. The Australian Advanced Manufacturing Council (AAMC) defines advanced manufacturing as:

*a family of activities that (a) depend on the use and coordination of information, automation, computation, software, sensing, and networking, and/or (b) make use of cutting edge materials and emerging capabilities enabled by the physical and biological sciences, for example*

*nanotechnology, chemistry, and biology. This involves both new ways to manufacture existing products, and especially the manufacture of new products emerging from new advanced technologies.*<sup>10</sup>

Given this broad definition and a lack of any current advanced manufacturing development applications in the RJP, a general assessment is presented.

#### **8.5.1. Assessment**

Advanced manufacturing activities may introduce hazards and risks that are not related to the quantity of DGs stored or handled at a facility.

#### **8.5.2. Planning implications**

In the absence of details on advanced manufacturing proposals, it is recommended that guidance on applying the Resilience SEPP is followed including consideration of factors beyond screening against DG thresholds detailed in Appendix 3 of the Hazardous and Offensive Development Application Guidelines [9]. Change in use and increase in hazards or risk should be managed through notification and monitoring activities. This is of particular relevance to developments adjacent to the education precinct.

### **8.6. Regional sports precinct**

The RJP plan includes development of a regional sports precinct in the west section of North Tralee. It is proposed to develop the precinct with playing fields and indoor venues as well as sport administration offices, physiotherapy and rehabilitation clinics.

#### **8.6.1. Assessment**

The sports precinct is adjacent to the North Tralee industrial estate (E3), Environa precinct (SP4), a local centre (E1) and the Hume Industrial estate. It will not be a source of risk, but it will be a risk receptor, with the potential for large gatherings of people at peak periods.

NSW land use planning risk criteria limit the risk at sporting complexes to between residential and industrial levels (i.e., acceptable risk is less than at an industrial neighbour but higher than a residence).

While the storage and handling of flammable material below the MHF notification threshold in areas adjacent to the sports complex are unlikely to result in events with significant offsite risk, storage of toxic material may result in unlikely but large consequence events that could result in societal risk being exceeded.

#### **8.6.2. Planning implications**

Storage and handling of toxic material above the Resilience SEPP screening thresholds in E3, SP4 and E1 is advised against to manage the risk of land use safety conflict.

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<sup>10</sup> [About Us - AAMC](#)

## **8.7. Weapons testing**

Care is required with any proposed defence and weapons testing land uses. Given the uncertainty in the nature and scale of such activities, it may not be possible to apply a streamlined planning process to any activities that involve explosive or toxic materials.

To manage the potential for land use safety conflict, proposed uses that exceed the Resilience SEPP Dangerous Goods (DG) threshold are advised against. Weapons testing should be assessed on a case by case basis but has the potential to lead to land use safety conflict within and outside the SP4 area.

## **8.8. Residential developments**

The RJP includes residential development in the southern section. Development is underway in South Tralee with the option to extend development into South Jerrabomberra (also referred to as Forest Morrison and Walsh). The residential areas are bounded by Environa, Hume Industrial Estate (ACT) and land zoned RU2, C2, RE2 and E1.

The residential areas will be risk receptors.

### **8.8.1. Assessment**

See section 9 for an assessment of the Hume Industrial Estate buffer.

### **8.8.2. Planning implications**

The buffer zones between the Hume Industrial Estate and residential development should be applied to future residential zoning.

## **8.9. Support services**

Residential areas and employment/commercial hubs attract support services such as:

- childcare
- food and beverage outlets
- retail; and
- office administration.

Whilst these activities do not introduce sources of risk, they are receptors. If such developments are not planned and controlled, that may prevent future developments near to an established support service.

The layout and location of the RJP provides an opportunity to locate non-hazardous support services in the south and southeast adjacent to areas that are zoned residential and separated from areas where potentially hazardous industries may be developed.



### **8.10. High school**

There is an area zoned SP2 (southern area of Poplars) for a proposed high school. The high school is unlikely to be a source of risk, but it will be a risk receptor.

The high school will constrain development of the adjacent lots of South Poplars (SP4) and North Tralee (E3). Lots that border the SP2 should be limited to industries that are below the Resilience SEPP potentially hazardous thresholds.

### **8.11. General buffer**

A 100m buffer is proposed between residential zones and developments that are above the Resilience SEPP potentially hazardous development screening thresholds. This will minimise the potential for land use safety conflict from fire scenarios at industrial developments and residential areas.

## 9. EXTERNAL CONSIDERATIONS

### 9.1. Hume buffer

An existing 250m buffer between the Hume Industrial Estate and residential development in South Tralee is incorporated in the Master Plan. The buffer was established during the planning process for the South Tralee residential development to balance residential amenity (including, but not limited to, land use safety) and developments in the Hume Industrial Estate.

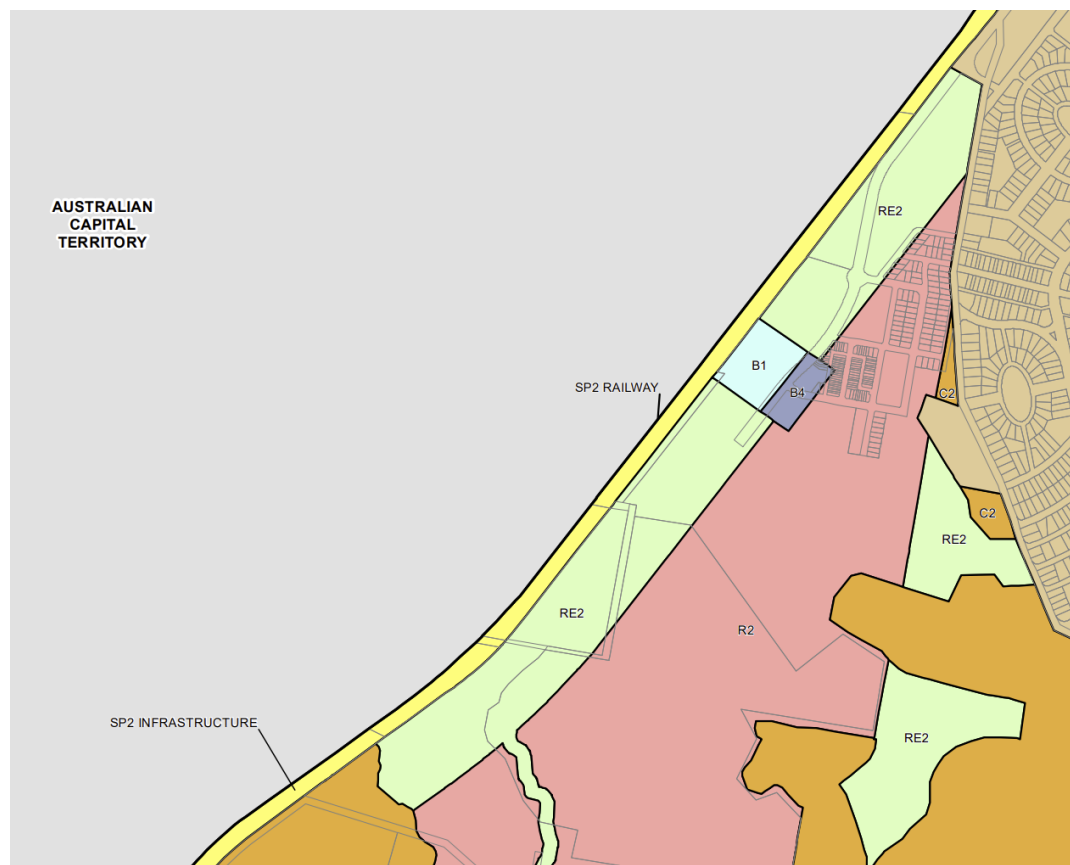
Current zoning, including permitted with consent developments in the buffer are taken from:

- Queanbeyan-Palerang Regional LEP (2022) [2] (Queanbeyan LEP)
- NSW Department of Planning Standard Instrument (Local Environmental Plans) Amendment (Land Use Zones) Order 2021 [4]

The buffer serves to protect residential amenity and to manage the vulnerability of established business in the Hume Industrial Estate to complaints from newly established, more sensitive land uses (commonly referred to as reverse sensitivity).

Figure 9.1 is an extract from the land use zone maps from the Queanbeyan LEP [2] showing the buffer zoned as RE2, B1 and B4.

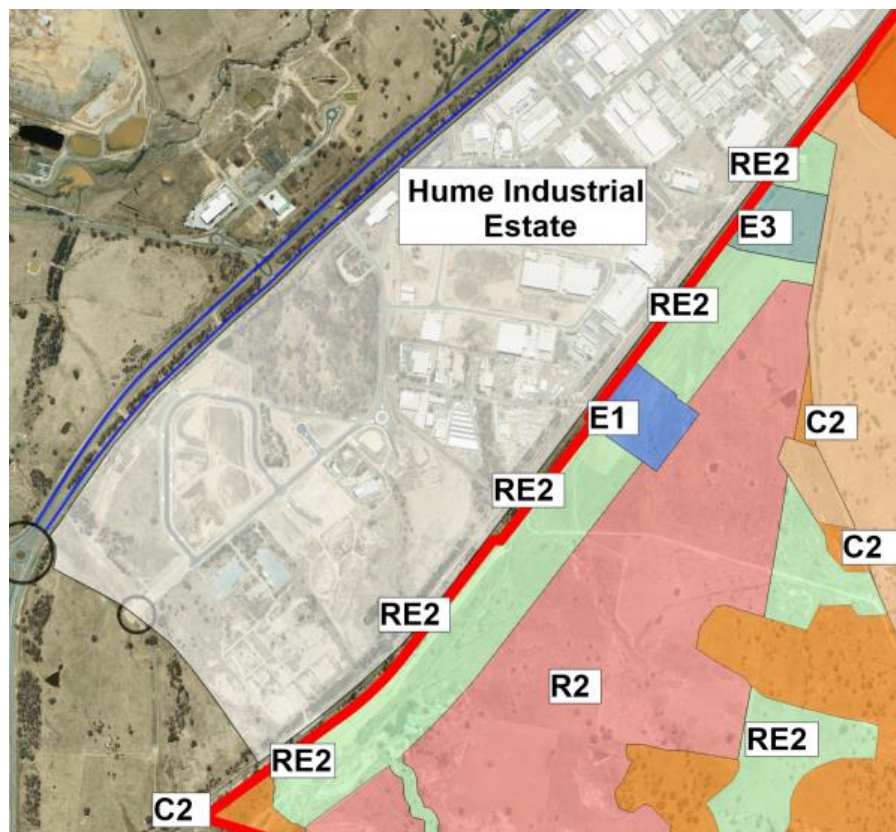
**Figure 9.1: Buffer and land uses (extract from maps developed under [2])**



In the RJP Master Plan, land within the buffer is re-zoned to reflect the most recent NSW land use categories (Figure 9.2) as a mix of:

- E1 – Local centre
- E3 – Productivity support
- RE2 – Private recreation

**Figure 9.2: Master Plan buffer with zones**



### 9.1.1. Existing buffer

The Hume Industrial Estate is located in the ACT and is zoned IZ1 – General Industrial. The objectives of the zoning are detailed in the Territory Plan 2008. IZ1 General Industrial as to:

- facilitate investment in a wide range of industrial and related activities, with efficient land utilisation and provision of infrastructure
- encourage the clustering of industrial activities
- make provision for manufacturing, warehouse and transport land uses requiring large land areas accessible to main interstate road and rail connections; and

- ensure that the use of the land for predominantly industrial purposes is not jeopardised by the uncontrolled development of higher rent commercial uses such as retailing and offices.

Types of development with the potential for land use safety conflict that are permitted under this zoning include:

- hazardous industry
- hazardous waste industry
- incineration facility
- liquid fuel depot
- warehouse.

These types of permitted industries have the potential for fires, explosions and toxic releases that can lead to land use safety conflict. For example, toxic releases may extend several hundred meters (e.g., 600 to 800m) to areas requiring evacuation.

The established 250m buffer to areas zoned residential (R2) in the RJP Master Plan is appropriate to manage land use safety risk given:

- the nature and potential scale of permissible development in the Hume Industrial Estate
- the separate jurisdictions and hence planning framework and controls between the source of risk (ACT) and the receptors (NSW); and
- the potential for reverse sensitivity if incompatible development is allowed near to the Hume Industrial Estate.

### 9.1.2. Developments in the buffer as risk receptors

Developments that would be permitted with consent in the proposed Zones E1, E3 [4] and RE2 [2] under current LEPs include sensitive and residential receptors.

Developments that would be permitted with consent but are recommended to be advised against by this study to manage land use safety conflict with the Hume Industrial Estate are summarised in Table 9.1.

**Table 9.1: Advised against developments in the buffer zone.**

<b>Currently permitted with consent in E1, E3 or RE2</b>	<b>Recommended to be advised against in the RJP Master Plan</b>
Boarding houses	Yes
Centre-based child care facilities	Yes
Hotel or motel accommodation	Yes
Medical centres	Yes

Currently permitted with consent in E1, E3 or RE2	Recommended to be advised against in the RJP Master Plan
Education facilities	Yes
Respite day care centres	Yes
Shop top housing	Yes
Recreation facilities (major)	Yes
Camping grounds	Yes
Caravan parks	Yes
Health consulting rooms	Yes

The 'advised against' developments are either:

- Sensitive receptors, being populations that are vulnerable due to the health of occupants or difficulty in managing evacuation; or
- Residential/long term occupancy receptors, where individuals may be exposed for extended periods of time to the risk; or
- Large populations, such as major recreation facilities. Where a rare event would not be acceptable to society if it had an acute effect on a large population.

'Advised against' reflects the NSW risk-based planning framework where a proponent may submit a development application where they can demonstrate risk will be managed to an acceptable level allowing an assessment of the specifics of the development.

### 9.1.3. Developments in the buffer as sources of risk

To manage the potential for a development in the buffer creating a source of risk to residential developments in South Tralee, it is recommended that any development in the buffer (E1, E3 or RE2) is limited to inventories of dangerous goods that are below the Resilience SEPP potentially hazardous development thresholds.

### 9.1.4. Permitted with consent developments in the buffer

The following tables list developments that could remain permitted with consent in the buffer zone provided they are below the Resilience SEPP potentially hazardous development thresholds.

**Table 9.2: E1 Permitted with consent**

Permitted with consent	Advise against
Amusement centres	No
Commercial premises	No
Community facilities	No
Entertainment facilities	No



Permitted with consent	Advise against
Function centres	No
Information facilities	No
Local distribution premises	No
Mortuaries	No
Oyster aquaculture	No
Places of public worship	No
Public administration buildings	No
Recreation facilities (indoor)	No
Registered clubs	No
Restricted premises	No
Service stations	No
Tank-based aquaculture	No
Veterinary hospitals	No

**Table 9.3: Zone E3 permitted with consent**

Permitted with consent	Advise against
Animal boarding or training establishments	No
Boat building and repair facilities	No
Business premises	No
Community facilities	No
Depots	No
Function centres	No
Garden centres	No
Hardware and building supplies	No
Industrial retail outlets	No
Industrial training facilities	No
Information facilities	No
Landscaping material supplies	No
Light industries	No
Local distribution premises	No
Markets	No
Mortuaries	No
Neighbourhood shops	No

Permitted with consent	Advise against
Office premises	No
Oyster aquaculture	No
Passenger transport facilities	No
Places of public worship	No
Plant nurseries	No
Recreation areas	No
Recreation facilities (indoor)	No
Recreation facilities (outdoor)	No
Research stations	No
Rural supplies	No
Service stations	No
Specialised retail premises	No
Storage premises	No
Take away food and drink premises	No
Tank-based aquaculture	No
Timber yards	No
Vehicle body repair workshops	No
Vehicle repair stations	No
Vehicle sales or hire premises	No
Veterinary hospitals;	No
Warehouse or distribution centres;	No
Wholesale supplies	No

**Table 9.4: Zone RE2 permitted with consent [2]**

Permitted with consent	Advise against
Aquaculture	No
Building identification signs	No
Business identification signs	No
Car parks	No
Community facilities	No
Entertainment facilities	No
Environmental facilities	No
Environmental protection works	No

Permitted with consent	Advise against
Flood mitigation works	No
Information facilities	No
Kiosks	No
Markets	No
Recreation areas	No
Recreation facilities (indoor)	No
Recreation facilities (outdoor)	No
Registered clubs	No
Restaurants or cafes	
Roads	No
Take away food and drink premises	
Water recreation structures	No
Water recycling facilities	

## **10. LAND USE ZONING ASSESSMENT**

The proposed land use zones have been assessed in the context of their location in the RJP and development options to identify planning considerations to address potential land use safety issues.

The assessment balances what is permitted in an area (based on zoning) and the implications of permitting certain activities in the context of the hazards and risks identified in this report.

The results for each land use zone are presented in this section.

### **10.1. E1 Local Centre**

#### **10.1.1. Objective and character**

The objectives of the Local Centre (E1) zone, as defined in the NSW Department of Planning Standards Instrument Amendment 2021 [4], is to facilitate a range of retail, business and community uses that serve the needs of people who live, work or visit the area. This includes enabling residential development that contributes to a vibrant and active local centre.

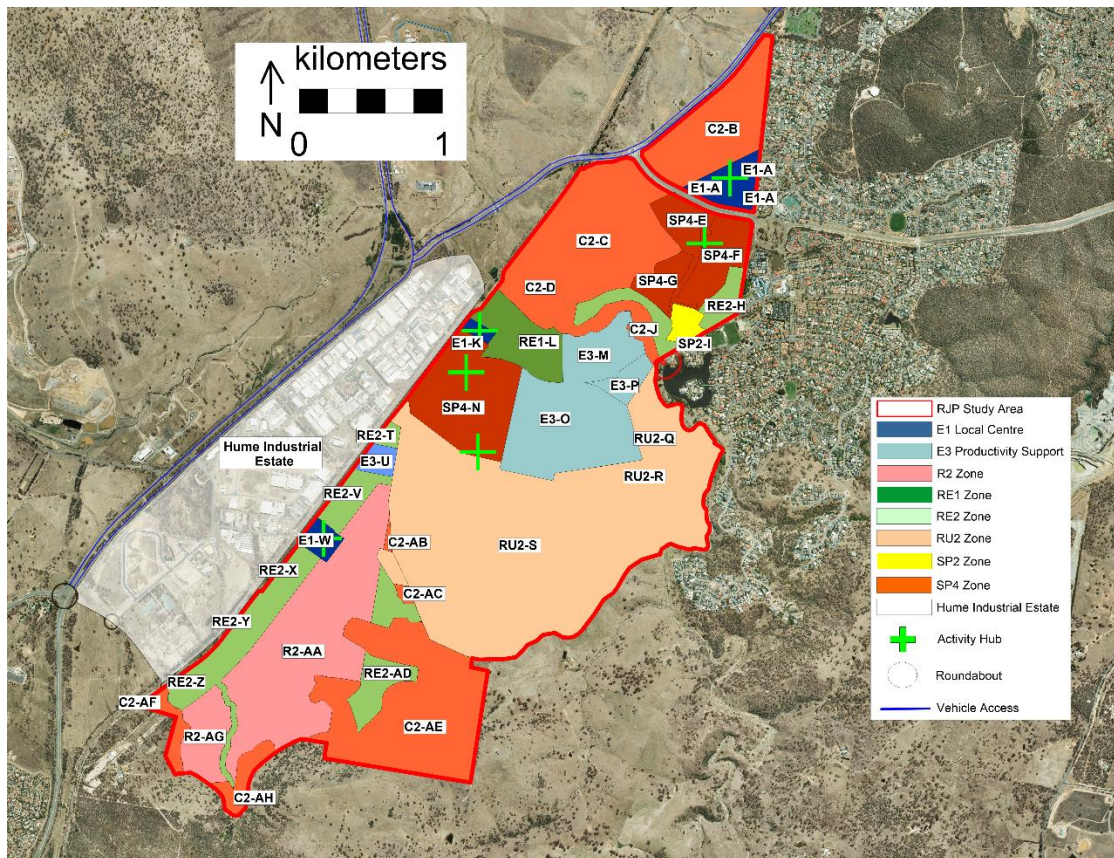
#### **10.1.2. Assessment**

The Master Plan proposes E1 zoning in the North Poplars area and in 2 locations adjacent to the Hume Industrial Estate (Figure 10.1).

Development in the Hume buffer is assessed in section 9.1. The assessment recommended that the types of development listed in Table 9.1 are advised against in E1 zones in the Hume Industrial buffer due to risk from the Hume Industrial Estate.

The RJP proposes areas in North Poplars be zoned E1. If the recommendations for planning controls in SP4 zones are adopted (Table 10.7) then the risk of land use safety conflict is unlikely.

Figure 10.1: E1 Local Centre



## 10.2. C2 Environmental conservation

### 10.2.1. Objective and character

The objectives of the C2 Environmental conservation area are taken from the Queanbeyan LEP [2]:

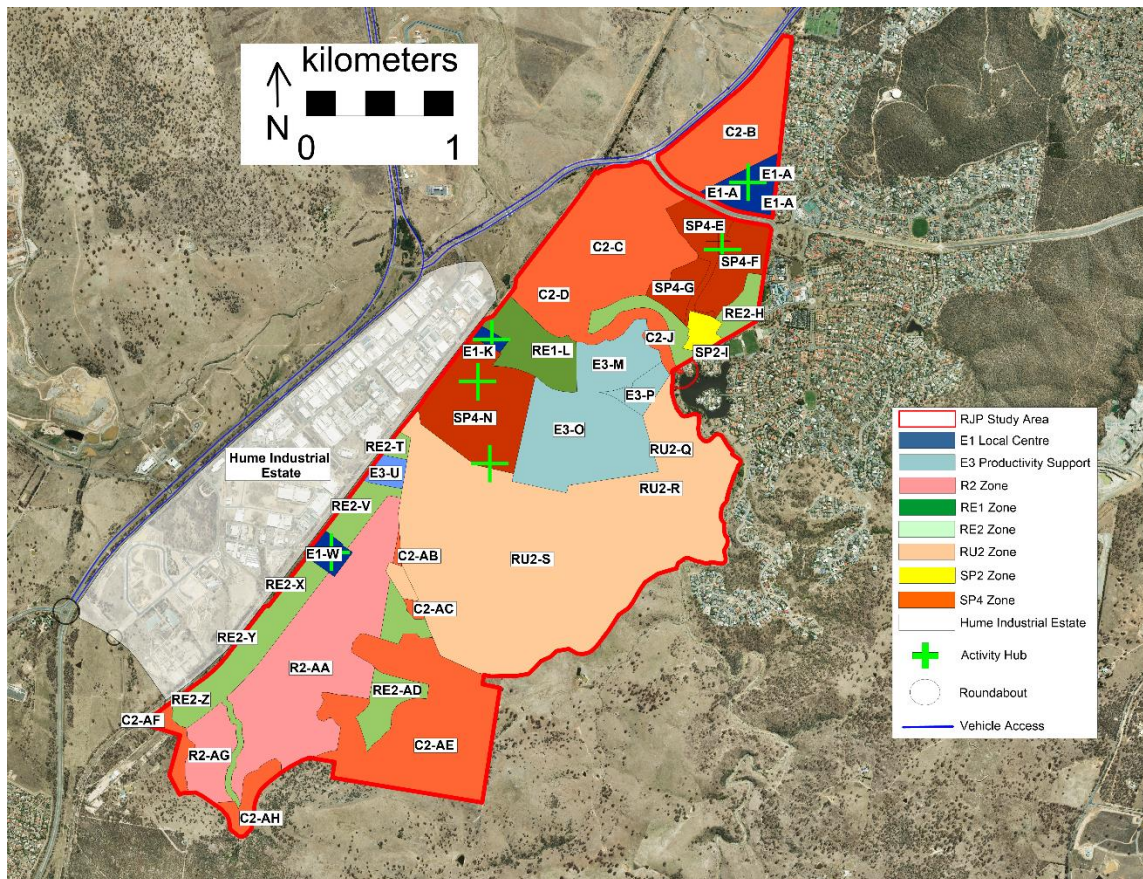
- To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.
- To prevent development that could destroy, damage or otherwise have an adverse effect on those values.
- To encourage rehabilitation and regeneration of ecosystems.
- To provide for a limited range of development and land use activities that support environmental conservation outcomes.
- To identify and protect escarpment areas that enhance the visual amenity of Queanbeyan and possess special aesthetic or conservational value.
- To protect water quality by preventing inappropriate development within catchment areas.



### 10.2.2. Assessment

The Master Plan proposes C2 zoning along the Jerrabomberra Creek line, adjacent to North Poplars and adjacent to South Tralee residential areas (Figure 10.2).

**Figure 10.2: C2 Environmental conservation**



Permitted and permitted with consent uses in C2 [2] are shown in Table 10.1.

**Table 10.1: Currently permitted in C2 that are advised against [2]**

Development	With/without consent	Recommended to be advised against in the RJP Master Plan
Home business	Without	Advise against new or intensification of use for existing within 100m of SP4 and E3.
Home occupation	Without	
Bed and breakfast	With	
Farm stay accommodation	With	
Home-based child-care	With	

The 100m distance will minimise land use safety conflict with potentially hazardous developments in zones SP4 and E3.

### 10.2.3. Planning implications

The land use planning implications for the C2 Environmental conservation zone are summarised in Table 10.2.

**Table 10.2: C2 Planning implications**

Land use planning zone	Area	Commentary on currently permitted (with and without consent) activities:
C2 Environmental conservation	Environmental conservation	<b>Advise against</b> new or intensification of existing–home business, home occupations, bed and breakfast accommodation, farm stay accommodation and home based child care within 100m of E3 or SP4 zone.

### 10.3. RU2 Rural landscape

#### 10.3.1. Objective and character

The objectives of the RU2 Rural landscape zone are as follows [2]:

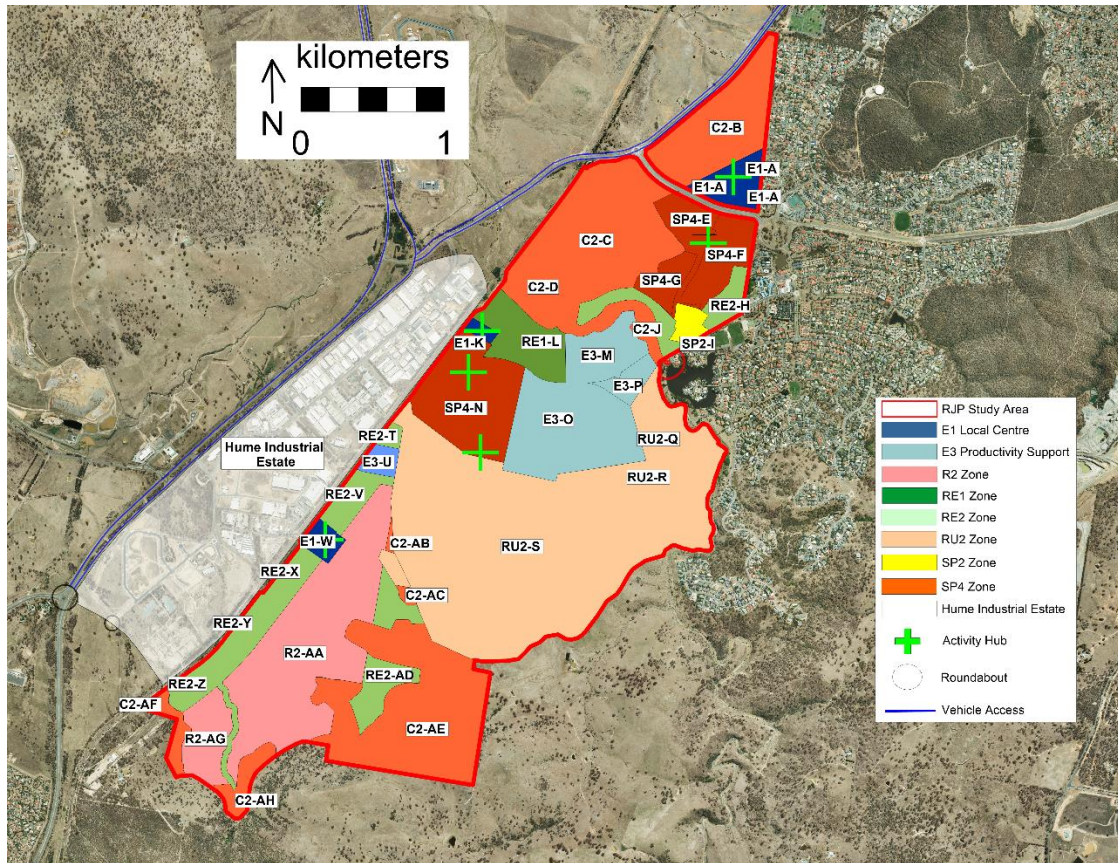
- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To maintain the rural landscape character of the land.
- To provide for a range of compatible land uses, including extensive agriculture.

#### 10.3.2. Assessment

The Master Plan proposes RU2 zoning in the Environa area (Figure 10.3).



Figure 10.3: RU2 Environmental conservation



Permitted and permitted with consent uses in RU2 have been reviewed. The listed uses are broadly compatible with meeting the objectives of the zone and managing land use safety. However, RU2 zones are adjacent to SP4 and E3. The following currently permitted with consent developments are advised against in RU2 within 100m of the SP4 and E3 zones:

- Home based child care (permitted without consent)
- Community facilities
- Dwelling houses; and
- Bed and breakfast and farm stay accommodation.

### 10.3.3. Planning implications

The land use planning implications for the RU2 Environmental conservation area are summarised in Table 10.3.

**Table 10.3: RU2 Planning implications**

Land use planning zone	Area	Land parcel (Figure 1.3)	Commentary on currently permitted (with and without consent) activities:
RU2 Rural landscape	Rural landscape	-	<b>Advise against</b> – Bed and breakfast and farm stay accommodation, child care, dwellings or secondary dwellings in the RU2 area that is within 100m of the E3 and SP4 areas.

## 10.4. E3 Productivity Support

### 10.4.1. Objective and character

The objectives of the E3 Productivity Support zone are defined under the standard instrument [4] as follows:

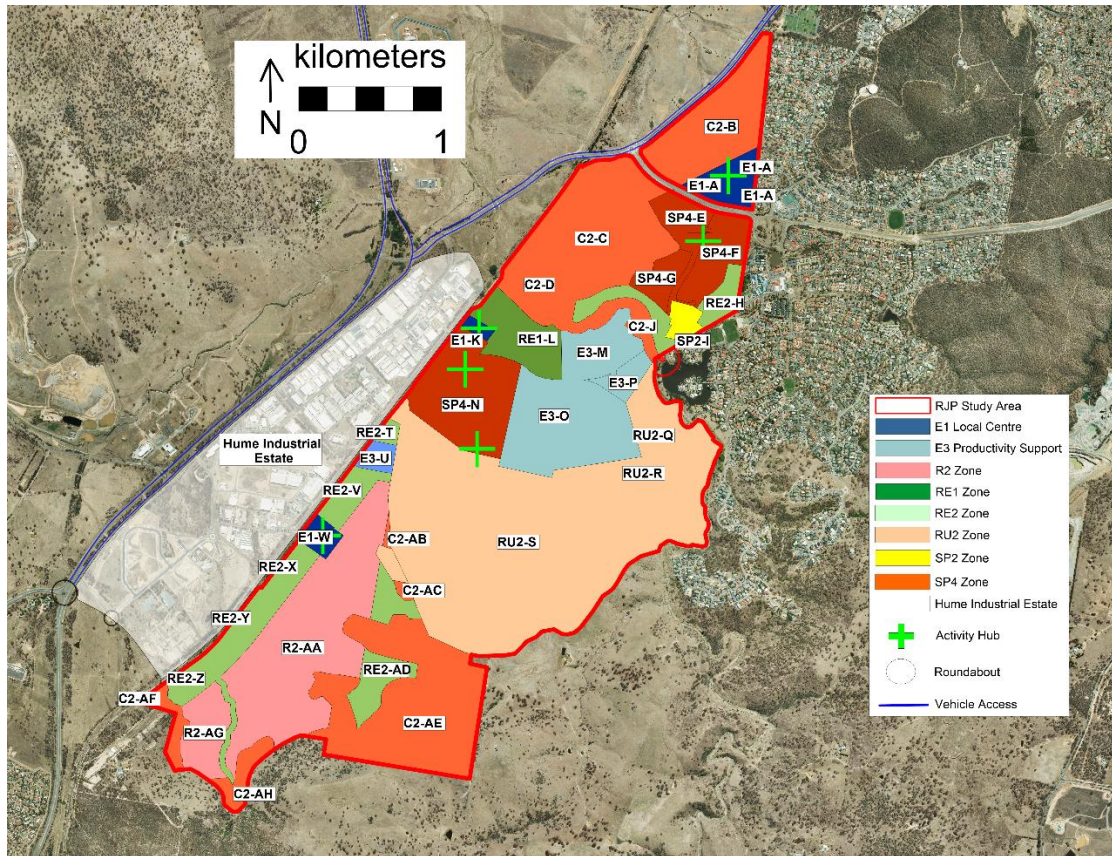
- To provide a range of facilities and services, light industries, warehouses and offices.
- To provide for land uses that are compatible with, but do not compete with, land uses in surrounding local and commercial centres.
- To maintain the economic viability of local and commercial centres by limiting certain retail and commercial activity.
- To provide for land uses that meet the needs of the community, businesses and industries but that are not suited to locations in other employment zones.
- To provide opportunities for new and emerging light industries.
- To enable other land uses that provide facilities and services to meet the day to day needs of workers, to sell goods of a large size, weight or quantity or to sell goods manufactured on-site.

### 10.4.2. Assessment

The Master Plan proposes E3 zoning in the central area (Figure 10.4).



Figure 10.4: E3 Productivity Support

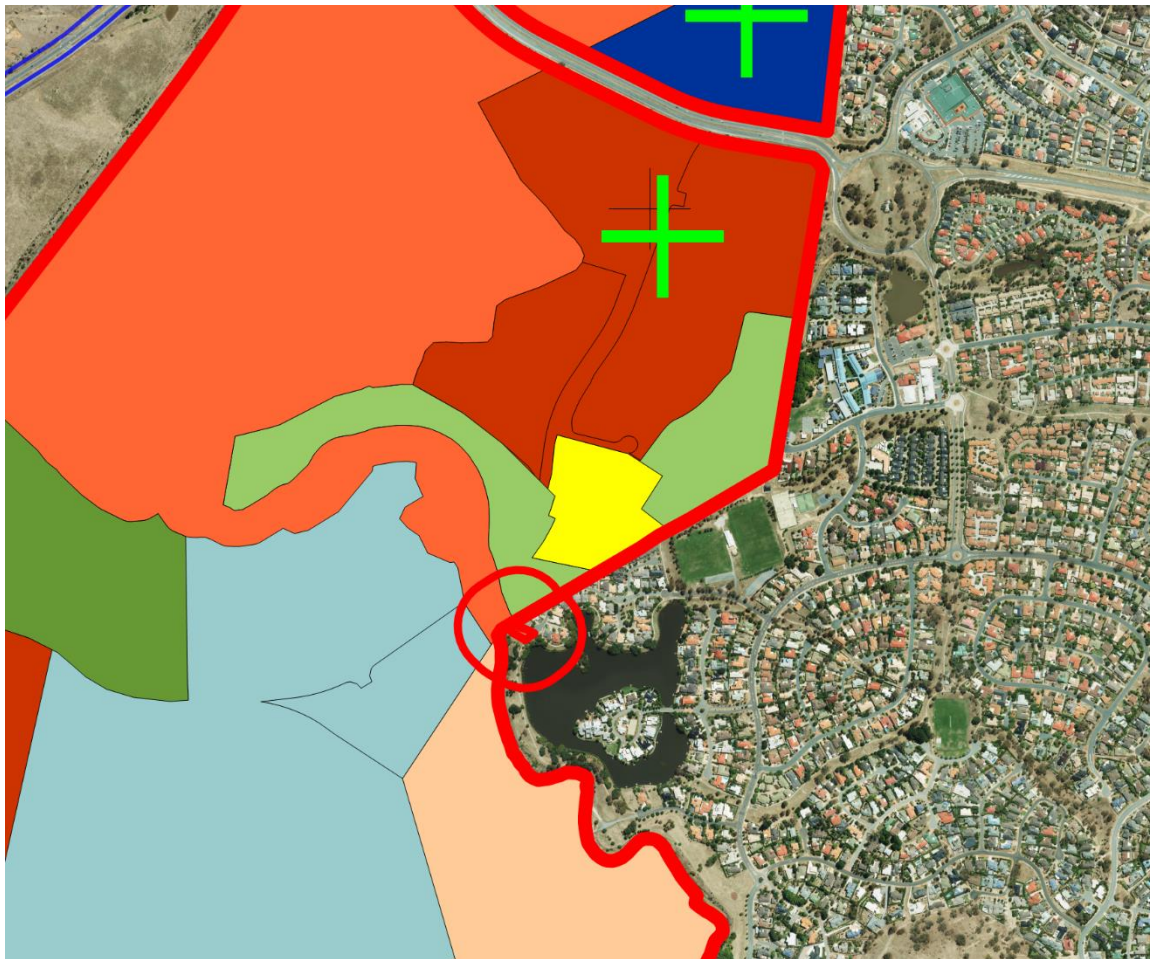


Permitted and permitted with consent uses in E3 have been reviewed. The listed uses are broadly compatible with meeting the objectives of the zone and managing land use safety as the area is intended to support light industry and other developments that are not potentially hazardous. However, E3 may include potentially hazardous developments such as warehousing.

Figure 10.5 shows a 100m buffer around the nearest residence to the E3 zone. To avoid land use safety conflict, it is recommended that a 100m buffer is provided around the residential area to potentially hazardous developments.



Figure 10.5: 100m buffer around nearest residence to E3



The following are advised against in E3 to avoid land use safety conflict:

- Any development that exceeds the Resilience SEPP toxic gas screening threshold.

#### 10.4.3. Planning implications

The land use planning implications for E3 Productivity Support are summarised in Table 10.4.

Table 10.4: E3 Planning implications

Land use planning zone	Commentary on currently permitted (with and without consent) activities:
E3 Productivity Support	<p><b>Advise against</b> – facilities that exceed the Resilience SEPP screening levels for toxic gases.</p> <p><b>Advise against</b> – potentially hazardous developments within 100m of residential areas.</p>

## **10.5. R2 Low density residential**

### **10.5.1. Objective and character**

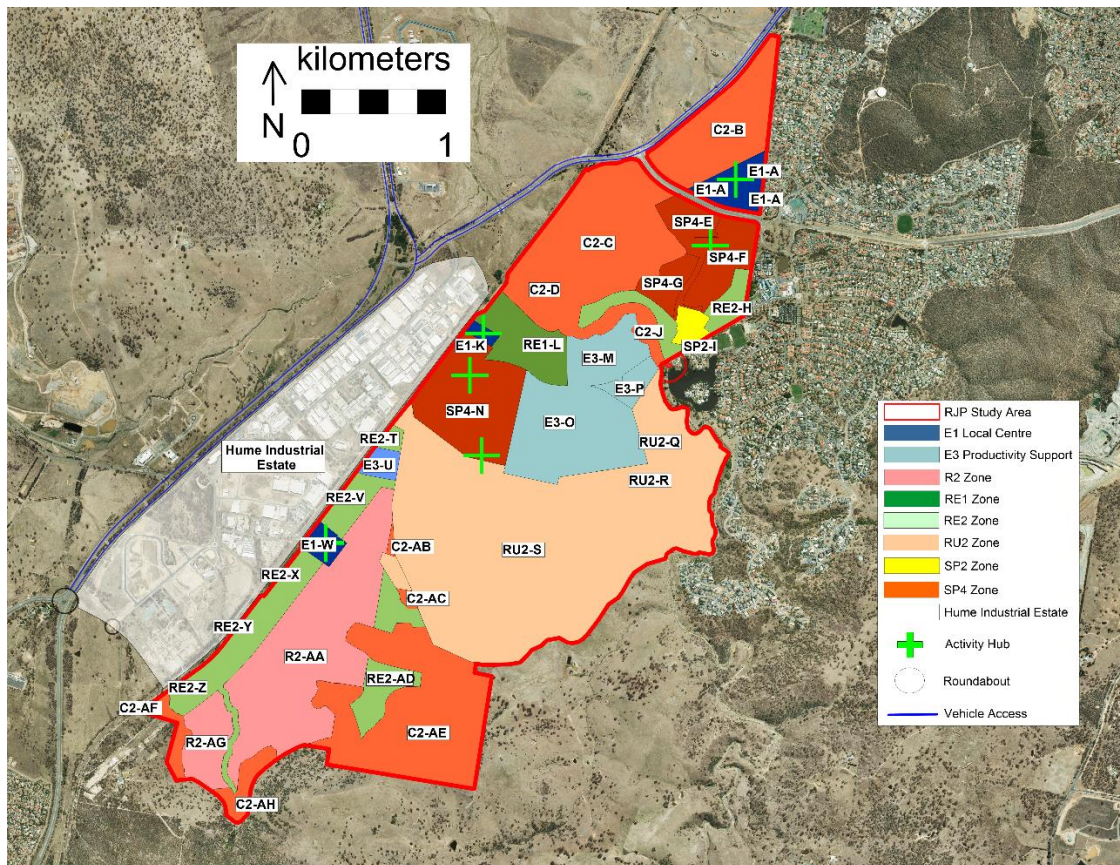
The objectives of the R2 low density residential zone are defined in the Queanbeyan LEP [2] as follows:

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To ensure new development complements the scale, density and form of existing development.
- To encourage development that is consistent with the low density amenity of existing and future residents.
- To encourage development that is designed to recognise the bushland character of the locality, where appropriate, and to minimise the impact of urban development, particularly on the edge of the urban area.

### **10.5.2. Assessment**

The Master Plan proposes R2 zoning in the south of the RJP (Figure 10.6).

Figure 10.6: R2 Low density residential



Permitted and permitted with consent uses in R2 have been reviewed. The listed uses are compatible with meeting the objectives of the zone and managing land use safety within the RJP.

There is potential for land use safety conflict between the R2 area and the Hume Industrial area. The conflict is being managed with a buffer containing a mix of RE2 and E1 uses (see section 9.1).

### 10.5.3. Planning implications

R2 development is appropriate based on maintaining the buffer to the Hume Industrial Estate with the restrictions detailed in section 9.1.

## 10.6. RE1 Public recreation

### 10.6.1. Objective and character

The objectives of the RE1 Public recreation are taken from the Queanbeyan LEP [2] as follows:

- To enable land to be used for public open space or recreational purposes.

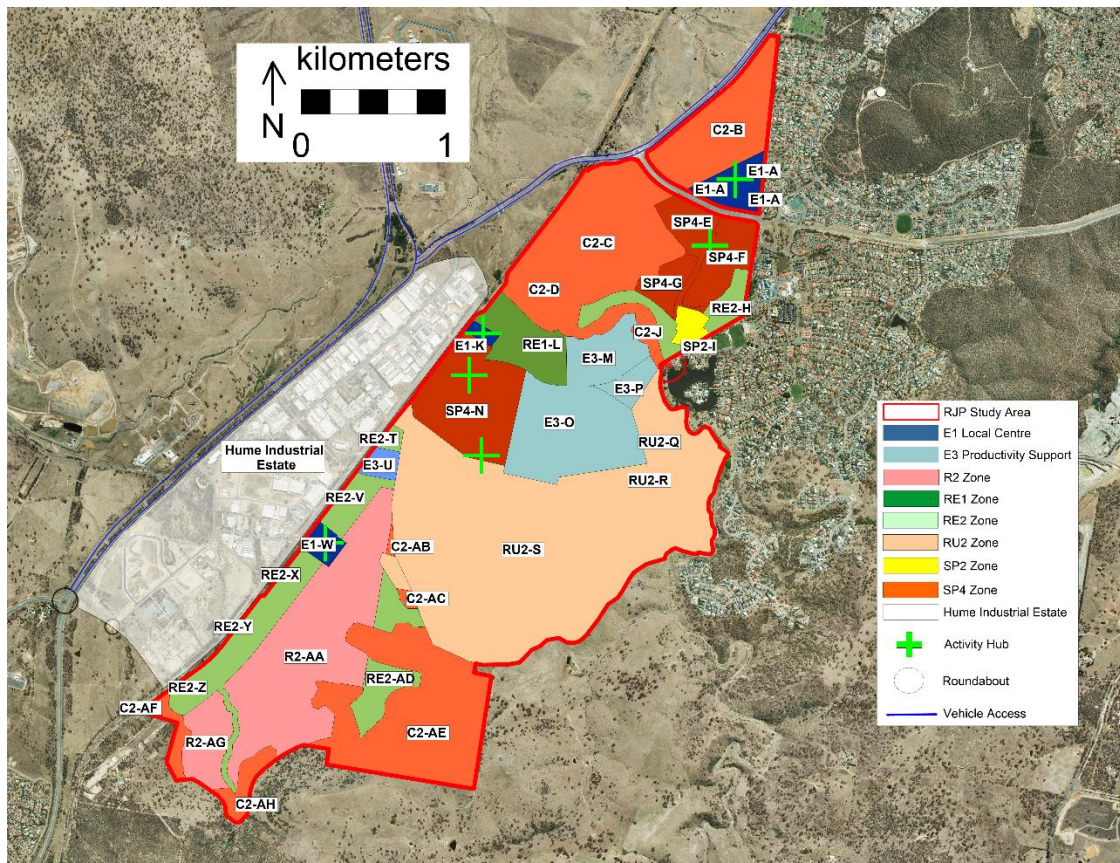


- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- To protect and enhance the environment generally.
- To ensure areas of high ecological, scientific, cultural or aesthetic value are protected, managed and restored.

### 10.6.2. Assessment

The Master Plan proposes a sports and recreation centre zoned RE1 (Figure 10.7).

**Figure 10.7: RE1 Public recreation**



Permitted and permitted with consent uses in RE1 have been reviewed. The listed uses are broadly compatible with meeting the objectives of the zone and managing land use safety. However, E3, SP4 and the Hume Industrial area may include potentially hazardous activities.

The following are advised against in RE1 to avoid land use safety conflict:

- Camping and caravan parks (that may attract long term residents)
- Child care facilities; and

- Respite day care centres.

### 10.6.3. Planning implications

The land use planning implications for RE2 are summarised in Table 10.5

**Table 10.5: RE1 planning implications**

Land use planning zone	Area	Commentary on currently permitted (with and without consent) activities:
RE1 Public recreation	Sport and recreation centre	<b>Advise against</b> – Camping and caravan parks (that may attract long term residents), child care facilities, respite day care centres.

## 10.7. RE2 Private recreation

### 10.7.1. Objective and character

The objectives of the RE2 Public recreation are taken from the Queanbeyan LEP [2] as follows:

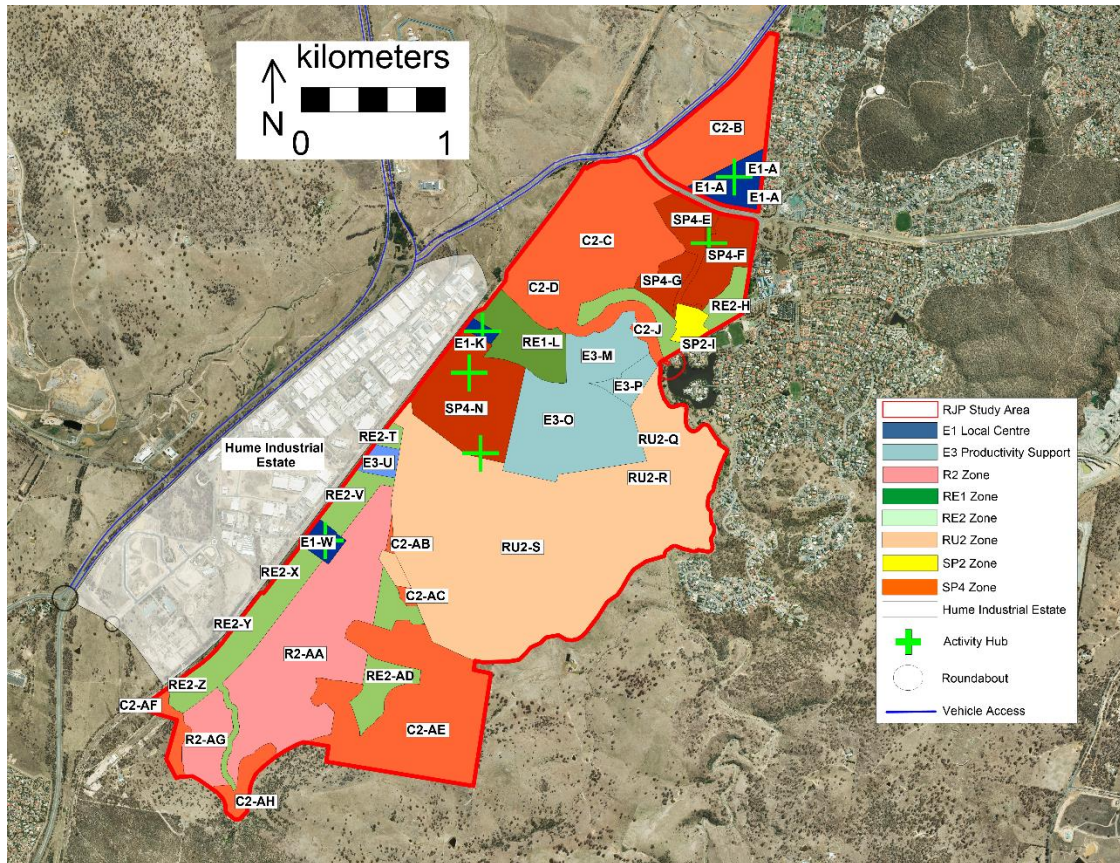
- To enable land to be used for private open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- To protect and enhance the scenic and environmental resources of the land.
- To ensure the scale and character of development is compatible with the established land uses of the locality.

### 10.7.2. Assessment

The Master Plan proposes RE2 land in the buffer to the Hume Industrial area and to the east of the R2 (Figure 10.8).



Figure 10.8: RE2 private recreation



Permitted and permitted with consent uses in RE2 have been reviewed. The listed uses are broadly compatible with meeting the objectives of the zone and managing land use safety. However, the Hume Industrial area may include potentially hazardous activities.

### 10.7.3. Planning implications

Developments in the Hume buffer are assessed in section 9.1. To avoid land use safety conflict with the Hume Industrial Area, developments listed in Table 10.6 are advised against.

Table 10.6: Advise against in RE2 (Hume buffer)

Advise against in Hume buffer RE2 zones
Centre-based child care facilities
Education facilities
Respite day care centres
Camping grounds
Caravan parks

Zoning of RE2 to the east of the South Tralee residential development is appropriate for the developments permitted and permitted with consent in the Queanbeyan LEP [2].

## 10.8. SP2 Infrastructure

Development of a high school is appropriate based on the 'advise against' provisions and application of the Resilience SEPP to developments in the SP4 areas.

## 10.9. SP4 Enterprise

### 10.9.1. Objective and character

The objectives of the SP4 Enterprise zone are taken from the Department of Planning and Environment employment zones [4]<sup>11</sup> as follows:

- To provide for development and land uses that support enterprise and productivity.

The Master Plan for the RJP identifies the following desired activities in the SP4:

- Defence, research and manufacturing
- Defence maintenance
- Underground weapons testing
- Space manufacturing and testing
- AI, IT, technology and cyber security related industries
- Advanced manufacturing and research (R&D); and
- Offices.

### 10.9.2. Assessment

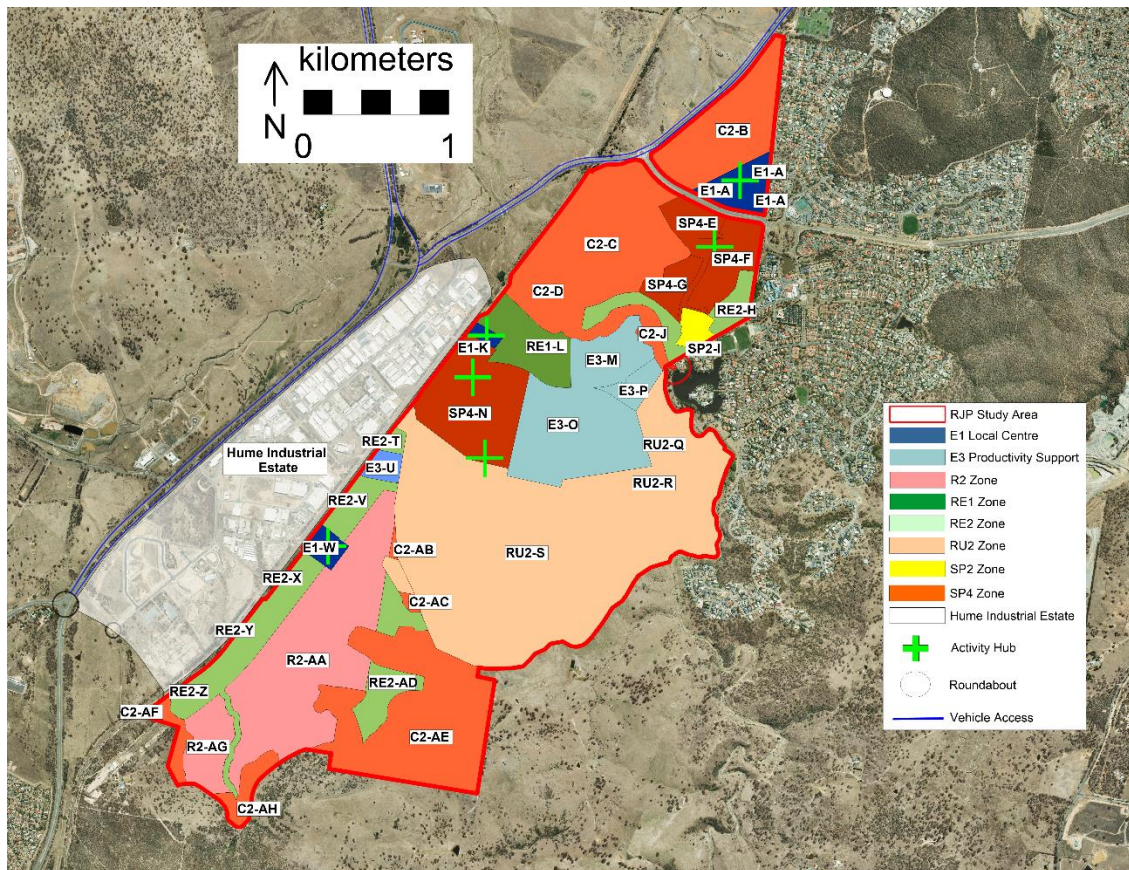
The Master Plan proposes SP4 zoning in the South Poplars area and adjacent to the E3 Productivity Support area in North Tralee.

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<sup>11</sup> SP4 is not defined in any Queanbeyan LEP.



Figure 10.9: SP4 Enterprise



The permitted with consent uses defined in the Department of Planning and Environment employment zones [4] are minimum inclusions only and are limited to building identification, building signs, food and beverage.

Based on a review of the desired activities, the following are recommended to be advised against as having the potential to result in land use safety conflict in SP4 zones:

- child care
- school age educational establishments; and
- respite day care centres.

The desired activities have been reviewed in the context of surrounding land uses with the following findings:

- Weapons testing is unlikely to be compatible with a streamlined planning process. Detailed assessment will be required noting the potential to sterilise land with the buffers required for explosive storage.

- Storage and use of toxic DGs above the Resilience SEPP threshold has the potential to result in land use conflict with other developments in SP4 area and adjoining zones.
- Special consideration is required for SP4 areas in the southern section of Poplars. Potentially hazardous developments in SP4-F and SP4-G (Figure 10.9) are not compatible with the SP2 (school) and residential area.

### 10.9.3. Planning implications

The land use planning implications for SP4 productivity are summarised in Table 10.7.

**Table 10.7: SP4 planning implications**

Land use planning zone	Commentary on planning considerations
SP4 Enterprise	<p>Weapons testing is unlikely to be compatible with a streamlined planning process. Detailed assessment will be required noting the potential to sterilise land with the buffers required for explosive storage.</p> <p><b>Advise against</b> inventories of toxic DGs above the Resilience SEPP screening thresholds.</p> <p><b>Advise against</b> potentially hazardous developments in SP4-G and SP4-F.</p>

## APPENDIX A. REFERENCES

- [1] NSW Department of Planning, “Resilience and Hazards SEPP,” 2022.
- [2] Queanbeyan-Palerang Regional Council, “Queanbeyan-Palerang Regional Local Environmental Plan,” 2022.
- [3] NSW Department of Planning, “Hazardous Industry Planning Advisory Paper No 10 - Land Use Safety Planning,” 2011.
- [4] NSW Department of Planning, Standard Instrument (Local Environmental Plans) Amendment (Land Use Zones) Order, 2021.
- [5] NSW Department of Planning, “Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning,” 2011.
- [6] NSW Department of Planning, Hazardous Industry Planning Advisory Paper No. 6 - Preliminary Hazard Assessment, 2011.
- [7] NSW Government, Work Health and Safety Regulation 2017, 2017.
- [8] Competent Authorities Panel (CAP), 2021 Australian Emergency Response Guide Book, 2021.
- [9] NSW Department of Planning, “Hazardous and Offensive Development Application Guidelines, Applying SEPP33,” 2011.
- [10] Resources Safety and Health Queensland (Petroleum and Gas Inspectorate), “Hydrogen Safety Code of Practice,” August 2022.
- [11] Energy Institute, “Guidance on hydrogen delivery systems for refuelling of motor vehicles co-located with petrol filling stations,” March 2017.