REGIONAL JOB PRECINCT

ALBURY

TECHNICAL REPORT

LAND USE CONSIDERATIONS

DEPARTMENT OF REGIONAL NSW

PREPARED FOR: **Department of Regional NSW**

DOCUMENT NO: **21617-RP-005**
REVISION: **2**
DATE: **25-Aug-2023**

Document number: 21617-RP-005
Revision: 2
Revision date: 25-Aug-2023
File name: 21617-RP-005 Rev 2

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DOCUMENT REVISION RECORD

Rev	Date	Description	Prepared	Checked	Approved	QA	Method of issue
A	25-Mar-2022	Issued to Client for review	G. Peach V. Tran	S. Chia	S. Chia	M. Braid	Email PDF
0	17-Jun-2022	Issued to Client for review	G. Peach V. Tran	S. Chia	S. Chia	M. Braid	Email PDF
1	15-Aug-2022	Issued for use – updated figures and minor text revisions	G. Peach	S. Chia	S. Chia	G. Peach	Email PDF
2	25-Aug-2023	Re-issued for use	G. Peach	S. Chia	S. Chia	O. Alim	Email PDF

RELIANCE NOTICE

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ABBREVIATIONS

AAMC	Australian Advanced Manufacturing Council
APA	Australia's Pipeline Network
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations
CBD	Central Business District
CHP	Combined Heat and Power
DCP	Development Control Plan
DG	Dangerous Goods
DRNSW	Department of Regional NSW
EP&A	Environmental Planning and Assessment
ERPG	Emergency Response Planning Guide
FHA	Final Hazard Assessment
HIPAP	Hazardous Industry Planning Advisory Paper
HSE	Health, Safety and Environment
kPa	Kilopascals
LNG	Liquified Natural Gas
LPG	Liquified Petroleum Gas
MHF	Major Hazard Facility
MIPA	Monoisopropyl Amine
MSR	Methane Steam Reforming
NSW	New South Wales
PHA	Preliminary Hazard Analysis
PV	Photovoltaic
RJP	Regional Job Precinct
SDF	Sunny Day Flood
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
STP	Sewage Treatment Plant
UK	United Kingdom
US	United States
WHS	Work Health and Safety

TERMINOLOGY

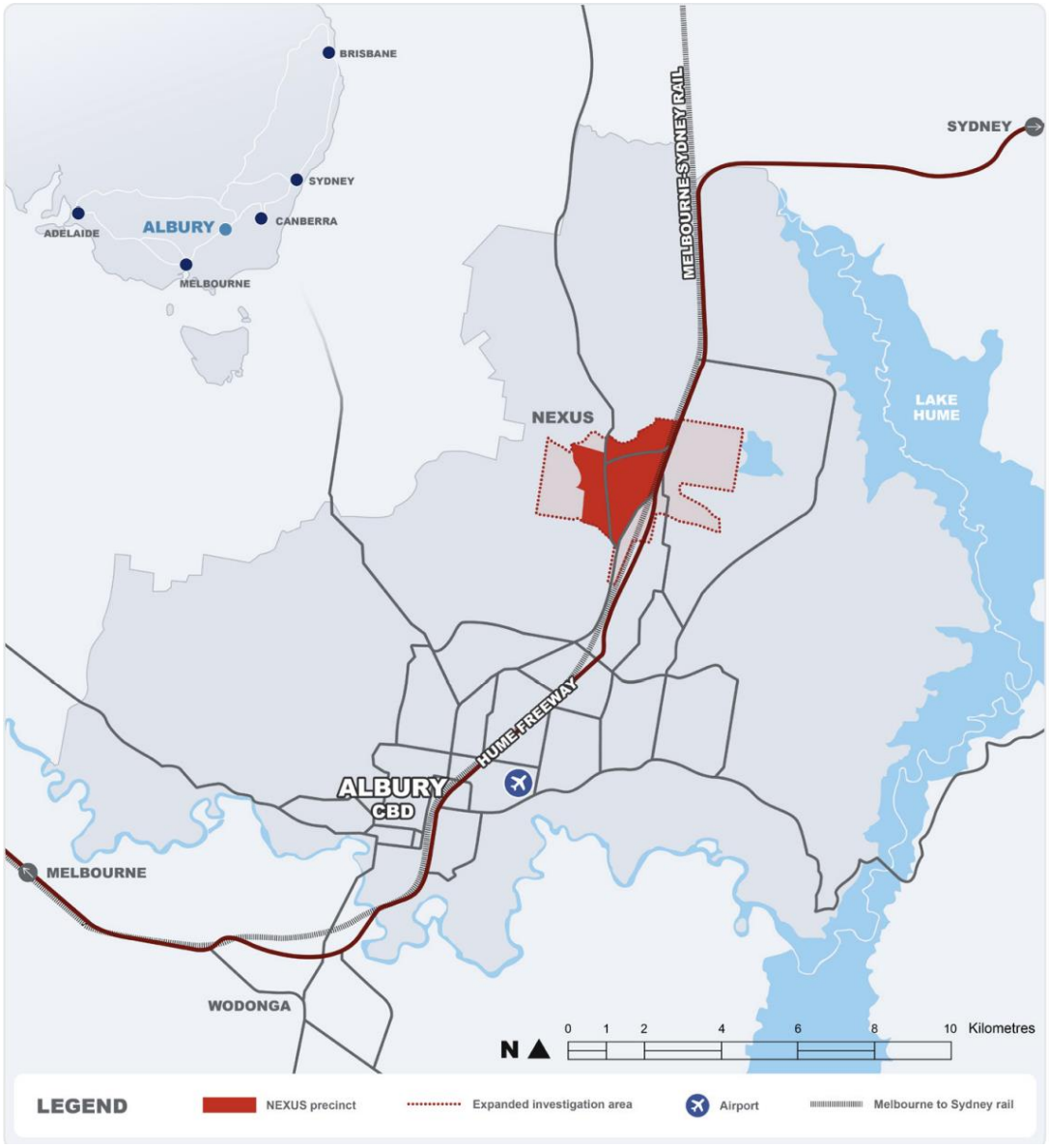
Term	Definition
Active land use	Sporting complexes and active open space.
Buffer zone	An area surrounding a facility or between areas designated for certain types of developments to minimise the potential for land use safety conflicts. Beneficial activities, typically with low density populations, intermittent 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.
Populous area	In the context of model aircraft and CASA, a populous area is defined as an area in relation to the operation of an unmanned aircraft that has a sufficient density of population for some aspect of the operation, or some event that might happen during the operation (in particular, a fault in, or failure of, the unmanned aircraft) to pose an unreasonable risk to the life, safety or property of somebody who is in the area but is not connected with the operation.
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 (HIPAP)	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. The Albury RJP intends to leverage off the NEXUS Industrial Hub, grow advanced manufacturing, circular economy and recycling, agribusiness, freight and logistics services and create more jobs for the region[1]. The Albury RJP is located approximately 8 km north of the Albury Central Business District (CBD) (Figure 1.1).

Figure 1.1: Location of the Albury RJP



[1] Albury Regional Job Precinct - Community Newsletter (nsw.gov.au)

1.2. Scope

This document is the Technical Report into Land Use Consideration for the Albury 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 a preferred RJP development option. The assessment uses a set of representative developments to determine if the preferred option will support development of employment opportunities in the RJP whilst avoiding land use safety conflict.

1.4. Preferred option

This report analysed the Albury RJP preferred development option. Figure 1.2 shows the preferred option with full details of land use sub-precincts, Figure 1.3 is a simplified figure with alternate shadings to highlight the different land uses more clearly. This figure is used as a reference basis for the discussion sections in the report. Figure 1.3 includes an area to the north of the Ettamogah Rail Hub marked for future expansion. The area is not within the RJP boundary and is included for illustrative purposes only.

The preferred option recognises the current Visy operation in the RJP whilst presenting opportunities to develop the RJP in a staged process. The option has the flexibility to retain or modify some or all of the current Visy operations in the RJP, it is not intended to indicate that changes will occur in Visy operations. The preferred option identifies areas for development as:

- Higher Intensity Industrial
- Lower Intensity Industrial
- Productivity Hub
- Ettamogah Rail Hub
- Service Station.

This report assumes there will be no development with land use safety potential in the following areas:

- Conservation
- Public recreation.

Figure 1.2: Preferred Masterplan

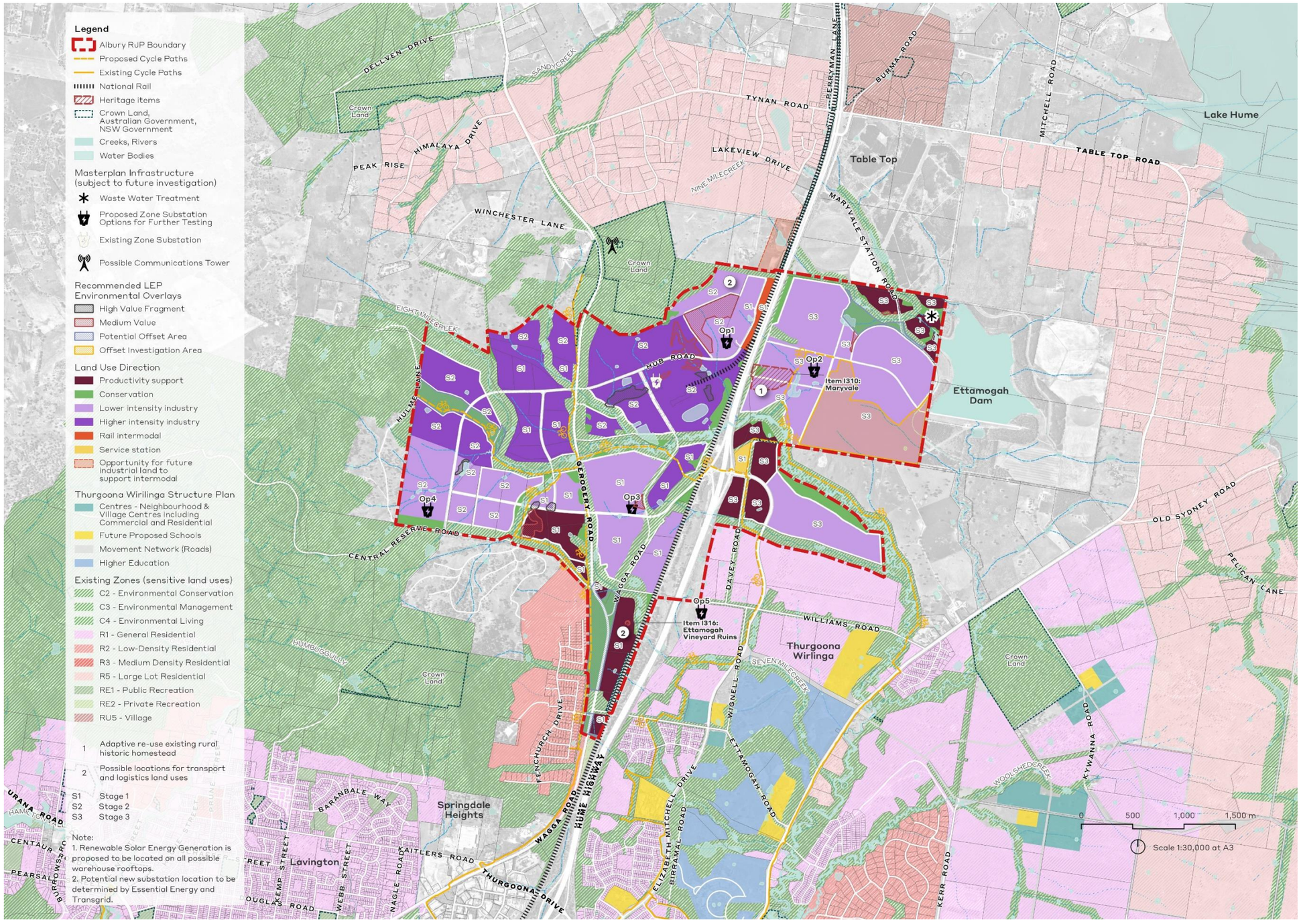
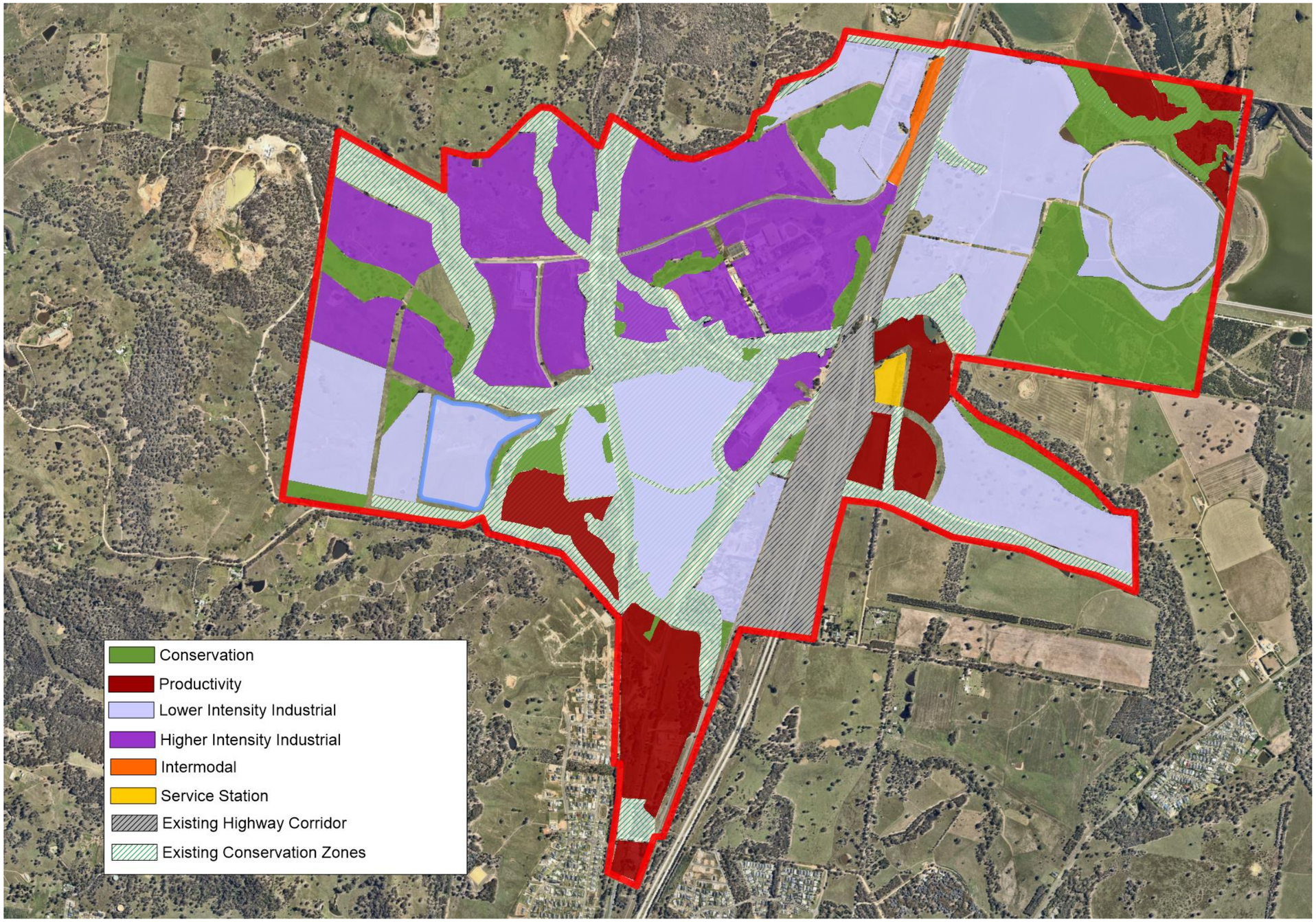


Figure 1.3: Simplified preferred Masterplan



1.5. Conclusions

1.5.1. Development assessment framework

To avoid inadvertently prohibiting or allowing an inappropriate development, the hazard assessment process detailed in State Environmental Planning Policy (Resilience and Hazards) 2021, Ref [1], Chapter 3: Hazardous and Offensive Developments (referred to in the document as the Resilience SEPP) should be applied when assessing any development application in the RJP.

The potentially offensive aspects of the Resilience SEPP are addressed in other studies covering air, noise, odour and environmental considerations.

Developments that exceed thresholds set in the Resilience SEPP are potentially hazardous and require a Preliminary Hazard Analysis (PHA) to demonstrate that land use safety risk levels are acceptable.

It is necessary to apply the Resilience SEPP as:

- there is no relationship between the land uses defined in the RJP and the nature and scale of land use safety conflicts arising from developments that may be permissible in the sub-precincts,
- 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 process accounts for the unique nature of hazards and controls associated with developments that are not recognised by the broader land use zoning approach. It triggers a process of assessment and approval against defined risk criteria with a mechanism for regulatory oversight.

1.5.2. Potential for development in the RJP

Whilst recognising the general requirement to follow the Resilience SEPP, this report concludes that the RJP will support a range of land uses that maximise the opportunity for development and likelihood of avoiding land use safety conflict as follows:

- Potentially hazardous developments are likely to be appropriate in areas designated as **Higher Intensity Industrial**. The separation distance to sensitive receptors maximises the potential for risks levels to be acceptable.
- Potentially hazardous developments (excluding those that handle or store toxic gases) in the **Lower Intensity Industrial** area may be appropriate but will require detailed assessment to determine the level of risk and are likely to require the operator to implement controls to manage risk levels.
- Potentially hazardous developments that store or handle toxic gases above the Resilience SEPP screening level in the **Lower Intensity Industrial** area are unlikely

to be acceptable due to the potential for offsite consequences that impact the productivity area and/or residential areas.

- Potentially hazardous developments in the **Productivity Hub** have the potential to lead to land use safety conflict both within the RJP and to areas immediately outside the RJP. To provide certainty in the development application process and avoid land use safety conflict, development of potentially hazardous facilities in the Productivity Hub is not recommended.
- Development of the **Ettamogah Rail Hub** to handle Dangerous Goods (DG) is likely to be acceptable with the exception of storage and handling of toxic substances (e.g., chlorine or ammonia). Toxic substances, including ammonia use in a cold store refrigeration circuit, are likely to require the operator to implement additional controls to manage risk levels.
- A **service station** for general public access vehicle and truck refuelling including electric vehicle charging located at the junction on the Hume Highway is an appropriate development.
- In March 2022 the NSW, Victoria and Queensland governments announced a collaboration on a renewable hydrogen refuelling network for transport and logistics along the eastern seaboard. The work will commence with Victoria and New South Wales each providing $10 million to build at least four renewable hydrogen refuelling stations between Sydney and Melbourne. The funding will also provide grants for the country's first long-haul hydrogen fuel cell electric freight trucks[2]. Given the uncertainty in hydrogen generation, storage and dispensing technology, any hydrogen refuelling facility will require a specific assessment. However, the proposed service centre location provides buffers of 250 m to future residential areas maximising the potential for an acceptable outcome for a hydrogen refuelling station.
- 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 unlikely to result in efficient use of land in the RJP.
- Warehouses that handle DGs above the Resilience SEPP screening thresholds may be acceptable at and adjacent to the **Ettamogah Rail Hub**. Any warehouse associated with the Productivity Hub or Lower Intensity Industrial areas should be limited to below the Resilience SEPP thresholds to avoid land use safety conflict with the adjacent residential areas.
- Development adjacent to the Australia's Pipeline Network (APA) gas transmission pipeline corridor will be constrained within the pipeline measurement length (104 m from the pipeline). Industrial developments will require assessment of risk to and

[2] Hydrogen highways to link Australia's East Coast | NSW Environment and Heritage

from the pipeline but are likely to be acceptable based on normal design processes. Development of sensitive uses within 104 m of the pipeline will require detailed assessment and are likely to require additional controls to manage the risk to an acceptable level.

1.5.3. Performance based criteria

Land use safety planning is managed by a risk-based process. The key risk drivers are:

- Hazards (defined by the type and quantity of dangerous goods and proposed activities at a development).
- Controls in place to manage the likelihood of an accident and the extent of any consequence.
- The separation distance to receptors.

At the strategic land use planning stage there is a need to balance the limited information on the types of developments and associated controls while establishing land use planning controls that maximise the efficient use of land and manage potential land use safety risks.

This has been achieved in the RJP by managing:

- The risk to sensitive receptors (e.g., schools, hospitals and residential areas) by proposing potentially hazardous developments are located with sufficient separation to manage the more credible scenarios.
- The risk between industrial and commercial development through the application of the land use safety planning risk criteria that take account of specific hazards and controls.

Types of development have been grouped based on the Resilience SEPP screening criteria as:

- Potentially hazardous (including toxics), up to 10% MHF threshold
- Potentially hazardous (excluding toxics), up to 10% MHF threshold
- Not potentially hazardous.

The types of development are related to the land use sub-precincts in Table 1.1. The table provides commentary on the likelihood of acceptability of a type of development in a sub-precinct.

The term ‘advise against’ reflects the fact that while the development may be able to demonstrate compliance, and hence would be permissible under the Resilience SEPP, it is likely to require detailed assessment that is not compatible with a streamlined planning process.

In all cases a PHA is still required if the Resilience SEPP threshold is exceeded, the level of PHA can be determined based on the risk associated with the development. Further guidance on selecting the level of PHA will be developed in the planning framework in consultation with identified stakeholders.

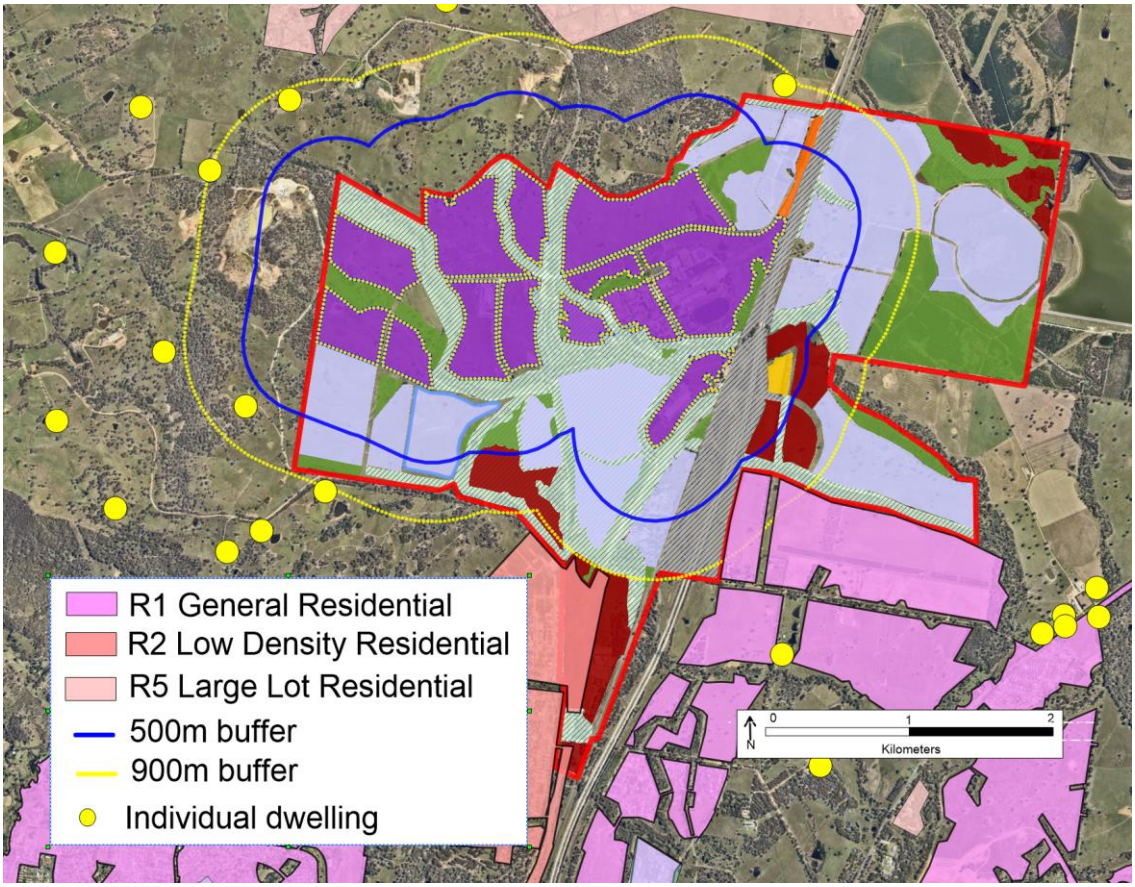
Table 1.1: Land use by SEPP screening level

Sub-precincts	Potentially hazardous including toxic gas	Potentially hazardous excluding toxic gas	Not potentially hazardous
Higher Intensity Industrial	Likely to be acceptable for a typical installation up to 10% of MHF threshold.		
Lower Intensity Industrial	Advise against	Likely to be acceptable for a typical installation up to 10% of MHF threshold.	
Productivity precinct	Advise against		Likely to be acceptable for a typical installation
Rail hub/intermodal	May require additional controls or limits on operations	Likely to be acceptable for a typical installation up to 10% of MHF threshold.	
Service station	Advise against	Likely to be acceptable for a typical installation up to 10% of MHF threshold.	

The implications of restricting toxic inventories to Higher Intensity Industrial areas is illustrated in Figure 1.4. Assessment of typical toxic inventories in this study indicates that separation distances ranging from 300 m to 600 m for ammonia and chlorine injury and fatality risk to 800 m (typical toxic chemical evacuation zone) and 900 m (irritation risk) will manage the risk of the more likely credible release scenarios.

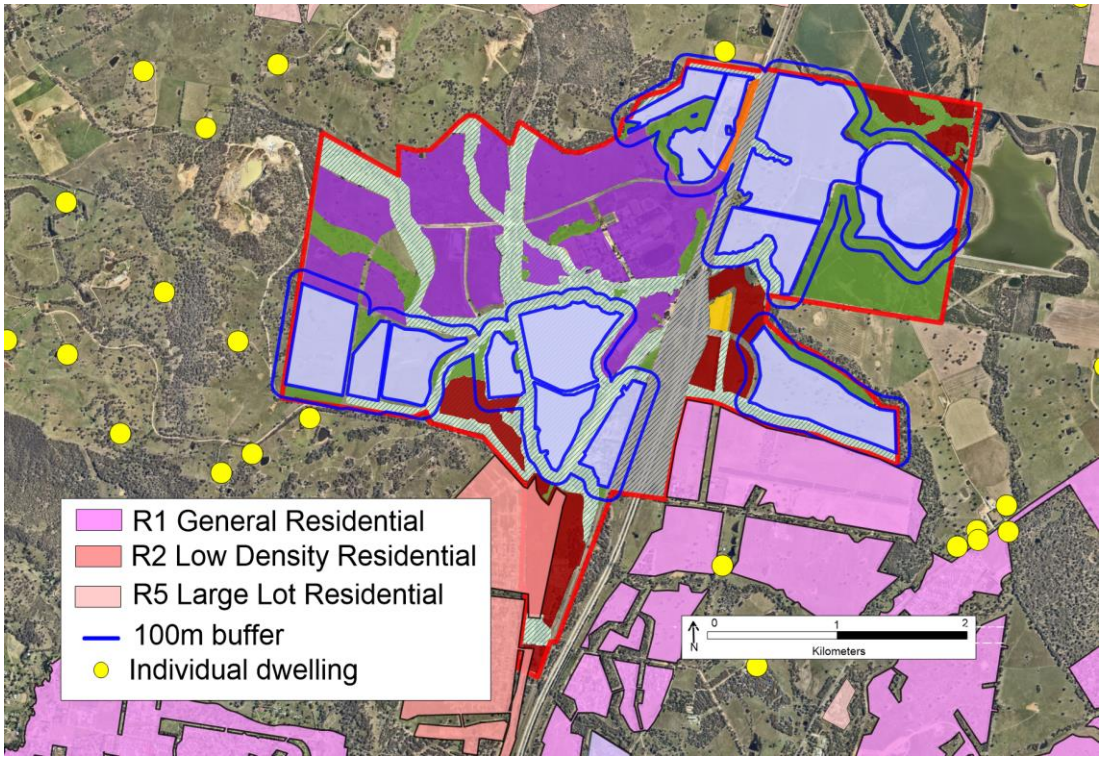
Figure 1.4 shows a 500 m and 900 m buffer around the Higher Intensity Industrial zones. Except for the Overall Forge area, a 900 m buffer can be achieved to all residential and sensitive use areas, including the majority of individual dwellings.

Figure 1.4: Toxic buffer from Higher Intensity industry



The implications of allowing flammable goods to be stored and handled in the Lower Intensity Industrial zones is shown in Figure 1.5. The figure shows that a 100 m buffer around the Lower Intensity Industry areas will limit the potential for fires to impact residential and sensitive land uses.

Figure 1.5: Flammable buffer for Lower Intensity industry



1.5.4. Uncertainty

There is uncertainty around the following issue:

- Visy operational risk profile.

The technical study has assumed that current Visy operations meet land use safety planning criteria with no current land use safety conflict issues. Future development at the Visy site would be managed under the RJP planning framework and be subject to the constraints set out in section 1.5.2.

2. CONTEXT

The study has been conducted on the basis that the NSW land use safety policy for resilience and hazards (which adopts the repealed State Environmental Planning Policy (SEPP33) unchanged as chapter 3:)[3] and supporting processes [embodied in the NSW Hazardous Industries Planning Advisory Papers (HIPAPs)] will be applied in the RJP.

The technical report applies criteria from Hazardous Industry Advisory Paper No.10: Land Use Safety Planning (HIPAP 10) to determine the potential for developments to result in land use safety conflict as follows:

- A performance objective to protect residential safety[4]
- Societal risk (the cumulative risk of developments effecting a population)
- Individual risk (the cumulative risk of developments effecting an individual at a location) taking into account the sensitivity of the receptor.

The basis of the assessment is:

- the preferred option for the RJP
- existing land uses and developments
- representative development options in the RJP.

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

2.1. Overview

The RJP is located north of Albury, NSW (Figure 1.1). The Visy paper mill is in the centre of the RJP with Visy also owning surrounding land (Figure 2.2). Engagement activities with Visy by the RJP team were ongoing at the time of this report.

Other operations within the RJP, as of March 2022, are:

- Overall Forge
- Ettamogah Rail Hub
- Circular Plastics Australia PET Recycling Plant Metal shed manufacturer.

The southernmost point of the RJP is located approximately 8 km from the Albury CBD, however, there are receptors located closer to the RJP as detailed in Table 2.1 and shown on Figure 2.1.

[3] SEPP33 has been adopted, unchanged into the Resilience and Hazards SEPP. See Fact sheet - Resilience and Hazards SEPP (nsw.gov.au)

[4] Derived from the HIPAP 10 performance objective to protect residential amenity and health.

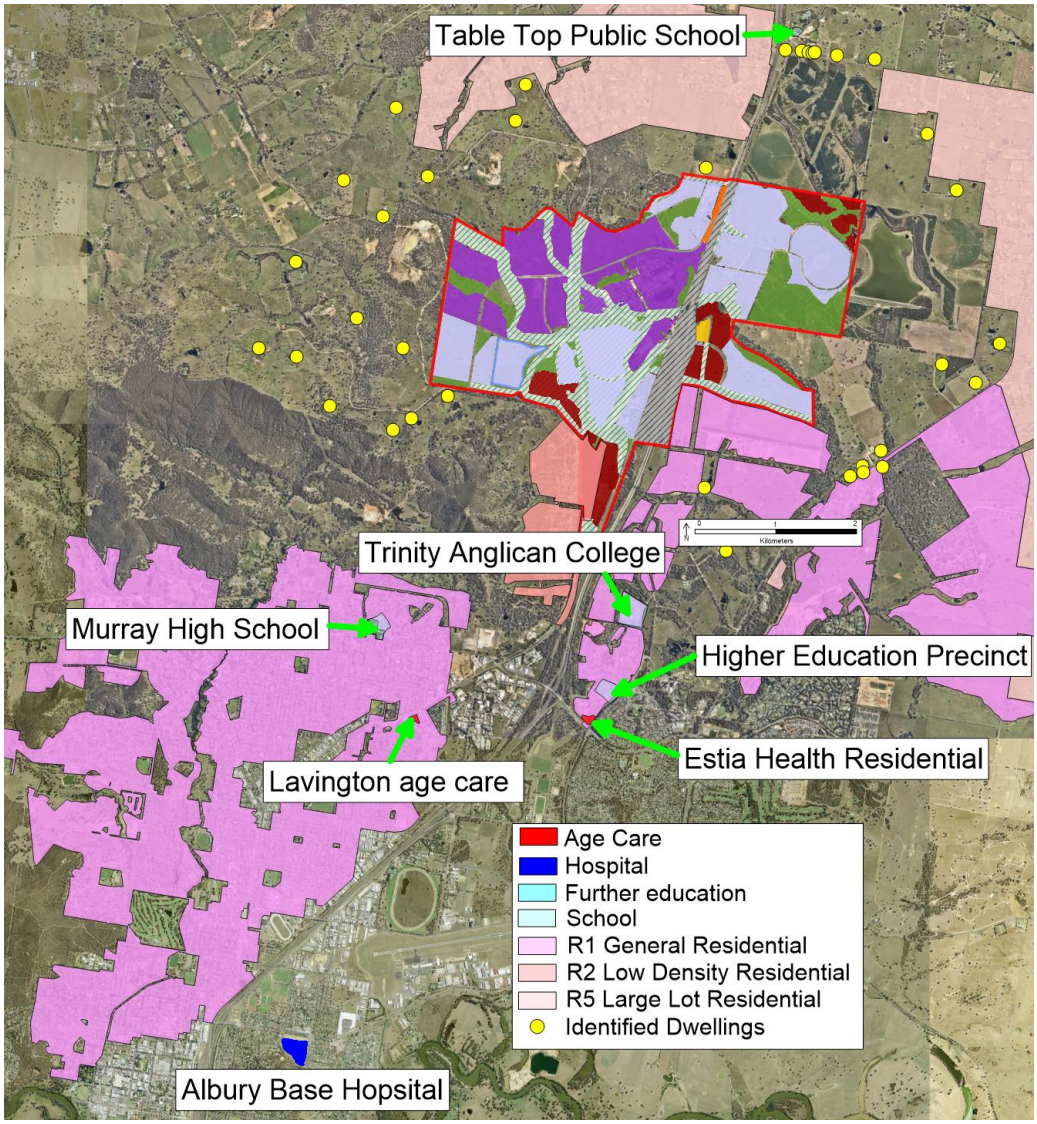
Table 2.1: RJP separation distance to receptors

Receptors	Separation distance	Commentary
Residential	On the southern boundary of the RJP	Current development on Windsor Avenue Area between Williams Road and the RJP is zoned residential but not currently developed.
School	900 m	Southern tip of RJP to nearest building at Trinity Anglican College
Commercial/Industrial	1.4 km	Corner of Wagga Road and Thurgoona Drive
Aged care facility	2 km	Southern tip of RJP to Estia Health assisted living
Commercial	3.8 km	Lavington
Hospital	7 km	Albury base hospital
Commercial	8 km	Albury CBD

In addition to the residential zoning, the RJP Air, Noise and Odour Master Plan Report – Albury (Todoroski Air Sciences), Ref [2], identified individual dwellings in and adjacent to the RJP.

To the north of the RJP there is a 500 m separation to land zoned for residential development and a 2 km separation to the Table Top public school.

Figure 2.1: RJP with residential and sensitive receptors



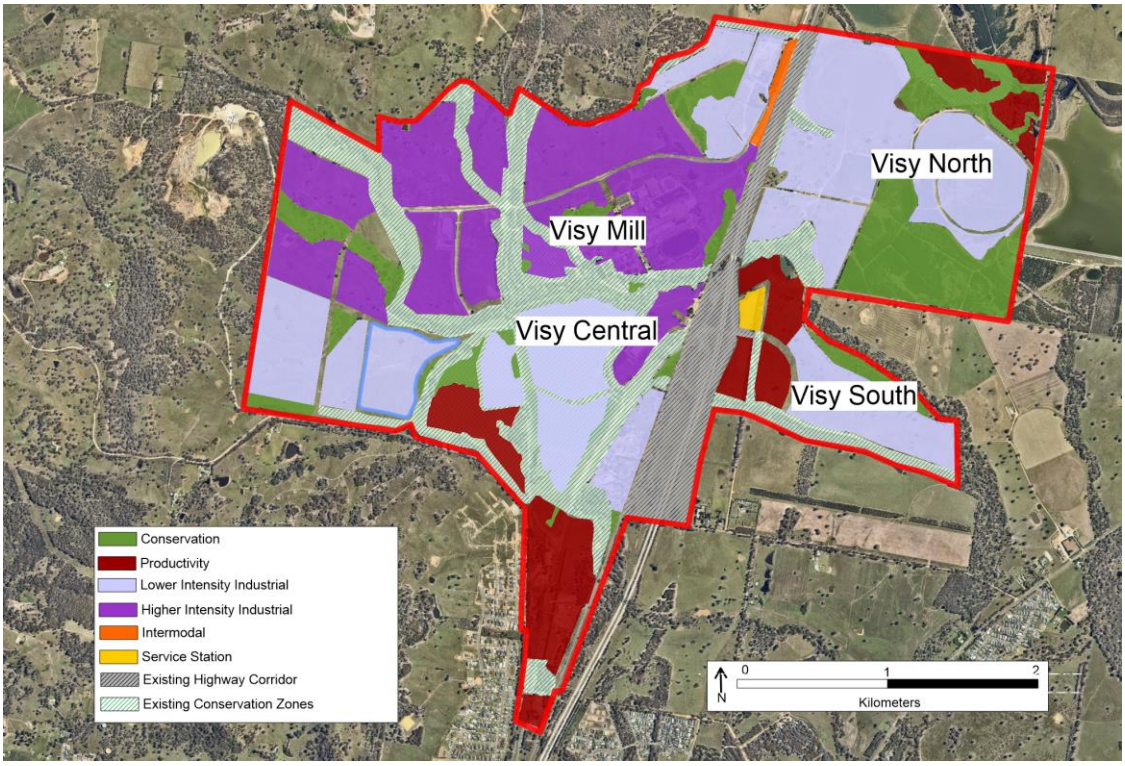
2.2. Key aspects

The key aspects of the RJP are summarised in the following sections.

2.2.1. Visy operations and land holdings

Visy operates a paper mill located in the centre of the RJP and has land holdings as shown on Figure 2.2. The areas have been identified as north, central and south for ease of discussion in this report.

Figure 2.2: Visy mill land holdings



Planning approvals documentation provided by Albury City Council were reviewed. The Statement of Environmental Effects (SEE) for the Revised Treatment of Process Water Management Strategies list the chemicals used at the mill and states that they are stored in accordance with the Dangerous Goods Act 1975 and the Dangerous Goods Storage and Handling (General) Regulation 2000.

The chemical list includes chlorine, sodium hydroxide, hydrogen peroxide, sulphuric acid and phosphoric acid. These chemicals have the potential for offsite safety impact either due to a release or due to accidental mixing of incompatible chemicals. However, the document does not provide any details of quantities stored or handled on site and does not provide an offsite safety risk profile for the facility.

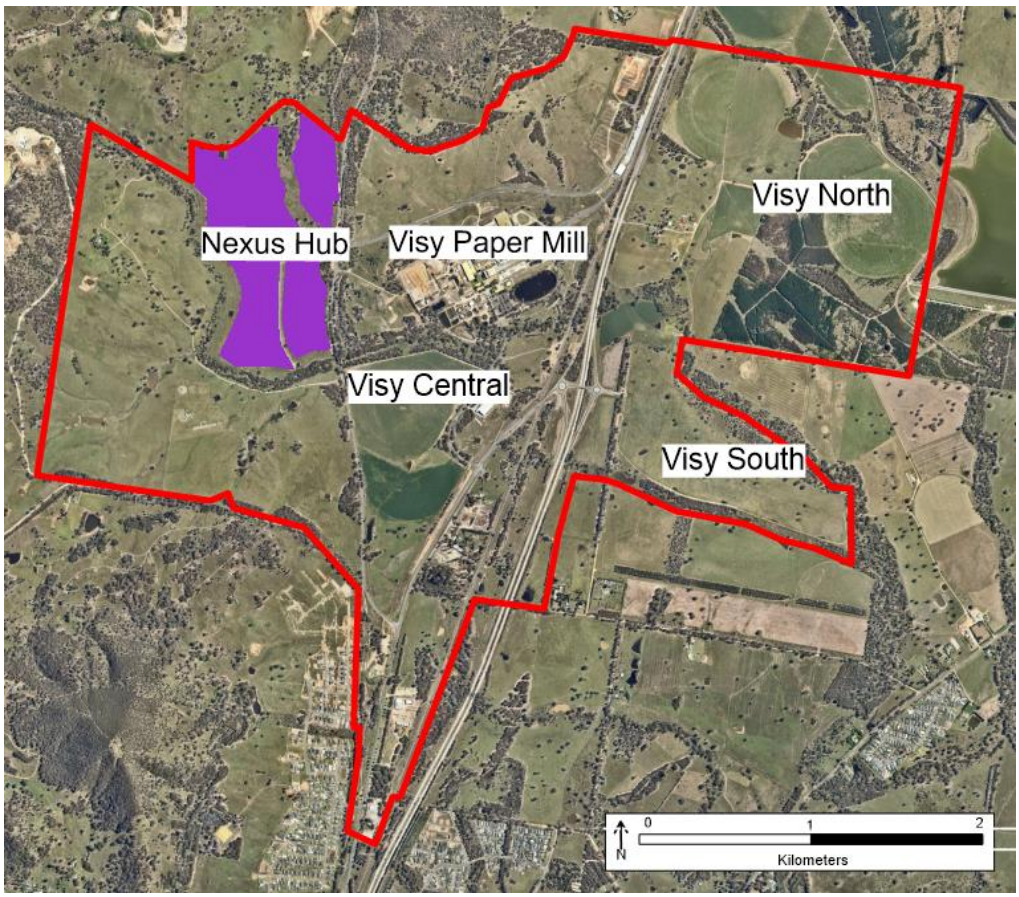
This study has been undertaken on the basis the current operations meet all relevant land use safety planning risk criteria and changes to operations will follow relevant land use safety planning framework including SEPP33 supported by a PHA if required.

The body of water to the east of the Visy north operations (the Ettamogah Dam) is a registered dam (under NSW legislation) managed by Visy operating under a documented risk assessment. The risk assessment, Ref [3], was reviewed and it was found that the current risk levels are acceptable, and the Sunny Day Flood (SDF) level would not result in inundation in the RJP.

2.2.2. NEXUS Industrial Hub

NEXUS Industrial Hub corresponds to the areas marked for Higher Intensity Industrial centred on Knowles Road and Maclaurin Road (Figure 2.3). The area is currently being developed with mixed industrial uses.

Figure 2.3: NEXUS Hub



The NEXUS Industrial Hub (referred to in early documentation as the Albury Industrial Hub) has a stated design principle to:

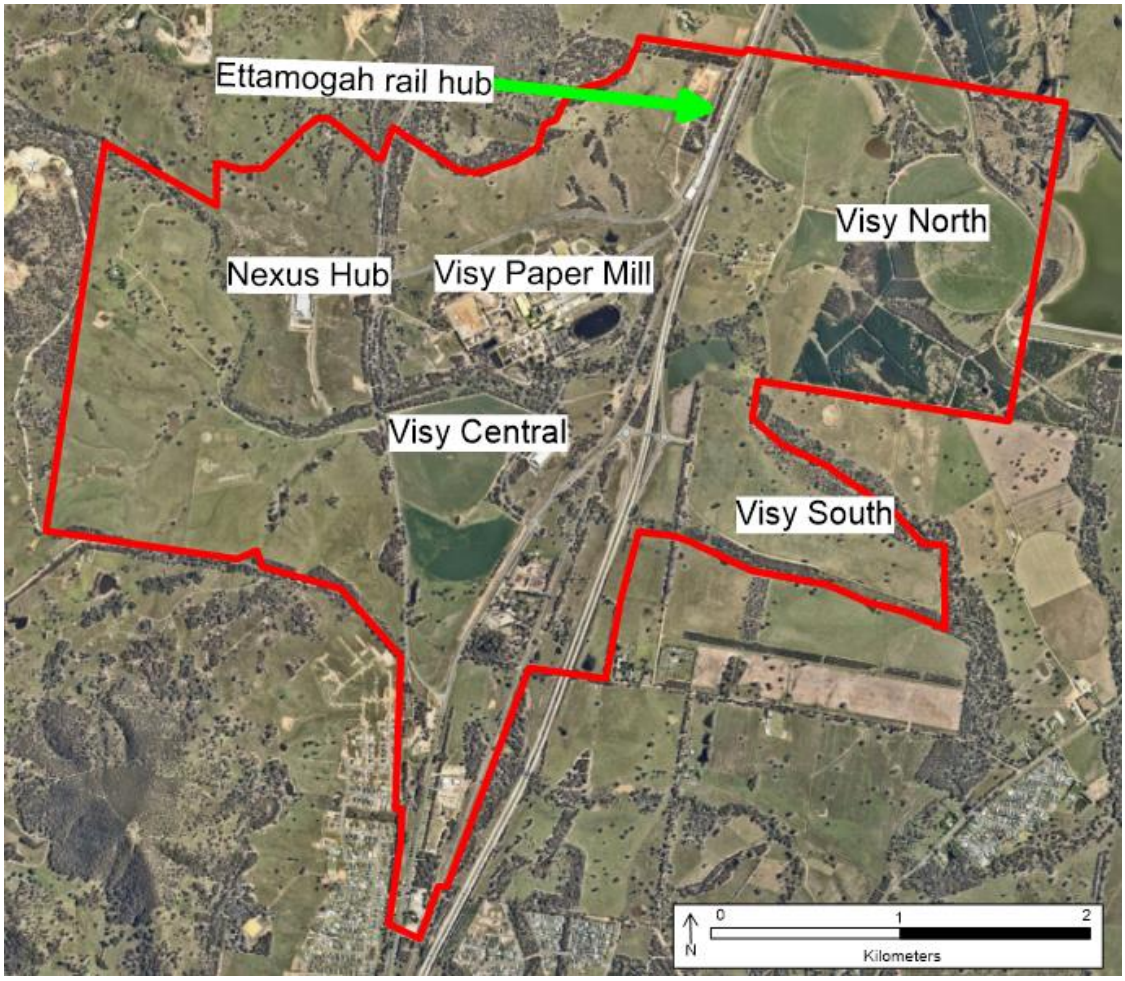
> *'Ensure that all proposed development operates at acceptable levels of risk and hazard to ensure the safety of persons or property on within [sic] the development area, or in surrounding areas, Ref* [4]*.'*

This has been interpreted in this assessment as a requirement to apply State Environmental Planning Policy No. 33 (SEPP33) Hazardous and Offensive Development Application Guidelines, Ref [5], where an acceptable level of risk is determined based on an assessment against the criteria in the Hazardous Industry Planning Advisory Paper No.4 (HIPAP 4) Risk Criteria for Land Use planning, Ref [6].

2.2.3. Ettamogah Rail Hub operations

The Ettamogah Rail Hub is an intermodal facility currently operating in the north of the RJP (Figure 2.4).

Figure 2.4: Rail hub



The following are under consideration for the rail hub area:

- expanding the rail hub
- developing cold storage facilities
- developing e-waste recycling facilities.

2.3. Development opportunities

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

- MHFs [under the NSW Work Health and Safety (WHS) Act and Regulation based on the quantity of substances on site exceeding Schedule 15 quantities]
- Designated developments under the NSW Environmental Planning and Assessment (EP&A) Act
- Potentially hazardous developments (under Resilience SEPP)
- Non-hazardous developments.

MHFs are the highest hazard facilities that require detailed consideration of hazards and control of risks to manage offsite land use safety conflict. An MHF is typically a large scale DG manufacturing, handling or storage facility. Areas allocated for Higher Intensity Industrial are likely to have sufficient separation distances from an MHF to sensitive, residential and commercial receptors outside of the RJP. However, they are likely to require buffers to adjacent industrial developments resulting in sterilisation of land and inefficient use of the RJP.

In the absence of development applications, a set of industries was identified for consideration in the technical study types (Table 2.2).

Table 2.2: Developments for consideration

Industry	Commentary
Freight, logistics and warehousing	Associated with the rail hub and the proximity to the rail hub and regional road network Associated with the logistic location
Rail hub expansion	Expansion of current Ettamogah Rail Hub
Food and beverage	Abattoir, food and drink preparation and packaging, cold storage facility
Micro grid power generation	Decentralised power generation and distribution in the RJP
Wastewater treatment recycling/reuse	Precinct scale waste water treatment, including options for sewage treatment and trade waste.
Recycling	Circular economy and waste management
Advanced manufacturing	A broad term generally referring to innovation, and often involved from the design and technology development phase of a product through to its branding and marketing[5].
Road transport and service station	Located at the Hume Highway junction in the RJP to provide road haulage and a service station for use by the public
Health care	Medical and health service providers

2.4. Constraints

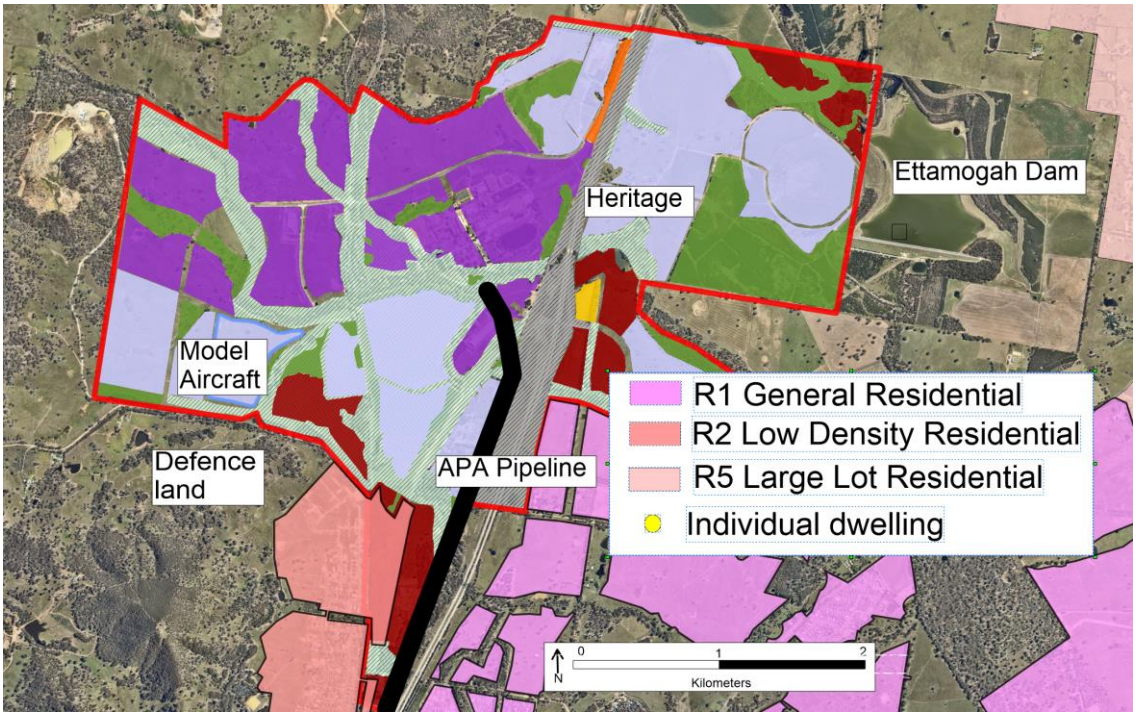
In addition to the current activities the following land use safety constraints (Figure 2.5) were identified:

- residential zoned land on the southern border of the RJP
- a section of low density residential zoning in the southern section of the RJP
- rural residential development to the north and west of RJP
- heritage area within the RJP
- a model aeroplane club
- a gas transmission pipeline supplying Visy and the industrial area of the RJP

[5] What is Advanced Manufacturing? - AAMC

- a registered dam (Ettamogah Dam)
- defence land
- future land uses on the north and east of the RJP identified as ‘Future urban expansion’ in the rural land strategy.

Figure 2.5: Constraints



2.4.1. Unknowns

The RJP and any additional constraints should be reviewed when information on Visy operational risk profile is available.

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 RJP.

DRNSW has engaged a master planner (Ethos Urban) 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 Albury RJP has the potential to accommodate a wide range of developments including those that may be determined as *potentially hazardous industry* 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 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 though 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	Issue	Remarks
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 existing land use planning safety studies and experience from assessments. Existing studies have not been verified for accuracy and completeness and study basis may not match the proposed case studies.
3	Application of results	The output of the study will be guidance on land use considerations 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 facilities (under the Resilience SEPP) but excludes the assessment of potential and existing MHFs.
7	Visy operations and future plans	No details were available on the current Visy risk profile or future plans for the Visy owned areas.

4. METHODOLOGY

4.1. Assessment framework

The assessment was guided by the documents 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
[5]	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
[6]	DPE HIPAP No. 4 – Risk Criteria for Land Use Planning	Supporting	Provides land use safety criteria
[7]	DPE HIPAP No. 6 – Hazard Analysis	Supporting	Provides assessment guidance
[8]	DPE HIPAP No. 10 – Land Use Safety Planning	Primary	Established the principles, framework and criteria for the assessment
[9]	DPE HIPAP No. 12 – Hazards Related Conditions of Consent [6]	Supporting	Provides guidance on conditions of consent based on risk level
[10]	NSW Work Health and Safety Act (and supporting regulation)	Supporting	Supported guidance on threshold quantities for a MHF
[11]	Australian Emergency Response Guide Book 2021	Supporting	Provides extent of evacuation and distances requiring protection.

4.2. Resilience SEPP and PHA

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

If a development is determined to be potentially hazardous, there is a requirement to undertake a 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. As a society we accept certain risks based on a balance of risk and reward. The risk-based approach in land use planning prevents prohibiting a beneficial development based on an extremely unlikely but potentially catastrophic incident.

[6] SEPP33 has been consolidated into a new SEPP (March 2022). See Fact sheet - Resilience and Hazards SEPP (nsw.gov.au)

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

4.3. HIPAP 10 Land Use Safety Planning

4.3.1. General

HIPAP 10 describes land use safety planning as a mechanism for dealing with actual or potential conflicts between sources of risk, such as potentially hazardous industrial 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[7]
3. compatibility with nearby land uses; and
4. results of initial site investigations as to the fundamental suitability of the site.

This baseline strategic 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 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

[7] 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 factors are taken into consideration in this study and summarises how the factors are used to determine land use safety conflicts and separation distances.

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.
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 the quantity of DGs on site. SEPP33 guidelines 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
		What separation distances are required to achieve the performance objective: Under normal operational and mitigation performance conditions If mitigation measures fail or an incident occurs.	Yes

4.3.3. Consequence criteria

The consequences (acute impact) of incidents from potentially hazardous facilities were assessed against the criteria in Table 4.4. Where quantitative data was available for the case studies, 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: At a residential and sensitive use areas does not exceed 4.7 kW/m^2 (injury). • At neighbouring hazardous installation does not exceed 23 kW/m^2 (escalation potential).
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.

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 or impact on populated areas with the potential to result in land use safety conflict.

4.4. HIPAP 12 Hazards related conditions of consent

HIPAP 12 sets out a fit for purpose framework for setting conditions of consent. The intention is set conditions of consent to ensure there is an appropriate level of regulatory oversight based on the risk of non-imposition of a particular condition. The framework provides options for conditions of consent based on risk. The options and requirements are summarised in Table 4.5.

Table 4.5: HIPAP 12 summary

Risk level	HIPAP 12 condition	Summary of requirements
Very low	May not need condition	Analogous to not potentially hazardous – hazard related conditions of consent may not add value.
Low	Option 1	Relatively low worst-case conditions. Qualitative assessment unless there is a sensitive receptor (e.g. school or hospital) in which case option 2 is suggested.
Medium	Option 2	Potential for major accident, with low risk. Semi-quantitative assessment.
High	Option 3 or 4	Potential for major accidents with higher complexity and controls. Quantitative assessment. Option 4 for major projects and potential MHFs.
Very high	Option 3 or 4	

4.5. 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. However, it does provide guidance on areas where potentially hazardous facilities will have the least impact on sensitive receptors and hence the best potential for approval under the Resilience SEPP framework.

5. RECEPTORS

5.1. Definitions

The NSW HIPAP documents define risk criteria based on the land use descriptions in Table 5.1. Examples and commentary are provided as the HIPAP criteria do not directly map to land use zoning.

Table 5.1: 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.	Areas that are open to the public.
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.

5.2. Location of receptors

The area in and around the RJP was reviewed to identify and map the following receptors (Figure 5.1):

- hospitals, aged care, schools and higher education facilities
- residential.

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

5.3. Planning considerations

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

- areas zoned residential border the south of the RJP
- the RJP contains an area zoned residential
- rural residential development to the north and west of RJP
- the nearest schools are Trinity Anglican College (850 m south of the RJP boundary) and Table Top Public School (2 km to the north of the RJP boundary)

- the nearest aged care facility is Estia Health (2 km to from the south of the RJP)
- the Local Strategic Planning Statement, Ref [12], identifies land in and around the RJP for future urban expansion (grey hatched area centred on the dam in Figure 5.2).

Figure 5.1: Hospitals, aged care facilities and schools

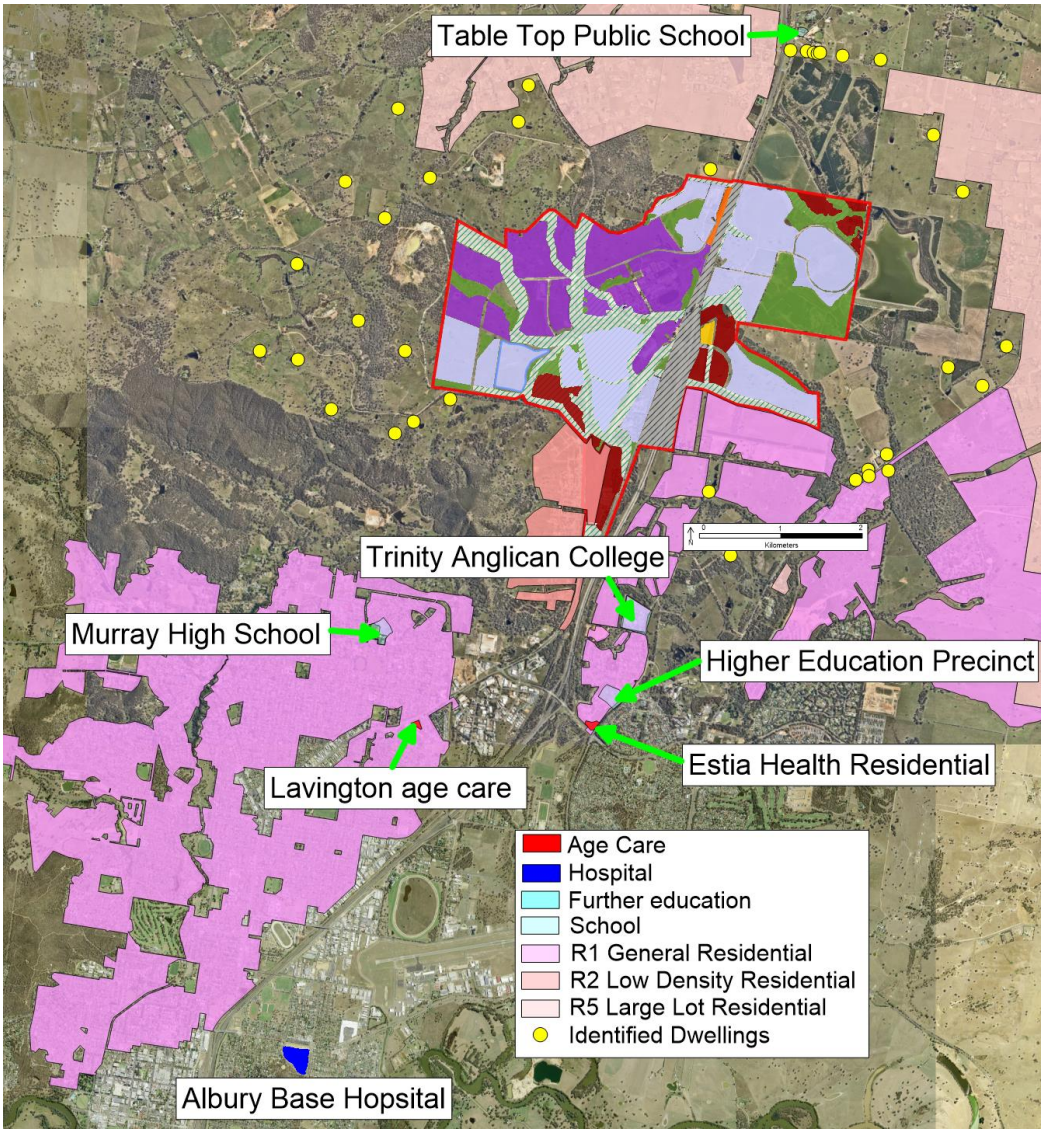
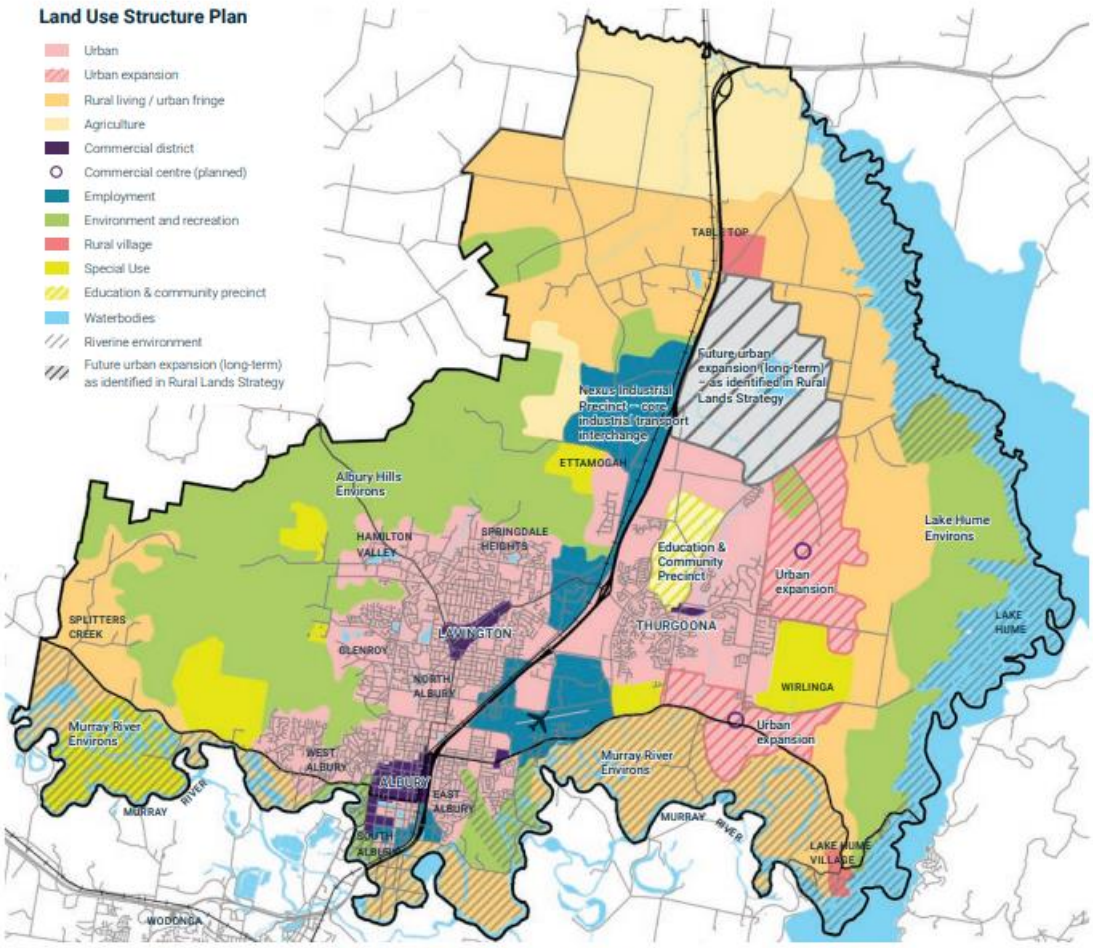


Figure 5.2: Local Strategic Planning Statement vision (extract)



Land Use Structure Plan – indicative broad-scale mapping (not zoning) based on existing land use strategies and plans (e.g. Albury Land Use Strategy 2007, Albury Local Environmental Plan 2010, Thurgoona Wirlinga Precinct Structure Plan, Rural Lands Strategy 2015).

6. RJP DEVELOPMENT

6.1. Current activities

In the context of land use safety planning, the key features of the RJP with industries/ developments that are currently (June 2022) operational:

- Visy paper mill (previously owned by Norske Skog and marked as such on some referenced documents)
- Overall Forge
- Circular Plastics recycling and pelletising facility
- Ettamogah Rail Hub (intermodal), in operation with consideration for expansion
- NEXUS Industrial Hub, currently advertising to attract clients
- licensed natural gas pipeline (APA) pipeline supplying Visy area of the RJP
- model aircraft club including associated infrastructure (e.g. model scale runway)
- metal shed manufacturer.

6.2. Potential development

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

Table 6.1: Potential developments

Industry	Commentary
Freight, logistics and warehousing	Associated with the rail hub and the proximity to the rail hub and regional road network. Associated with the logistic location.
Rail hub expansion	Expansion of current Ettamogah Rail Hub
Food and beverage	Abattoir, food and drink preparation and packaging, cold storage facility.
Micro grid power generation	Decentralised power generation and distribution in the RJP.
Wastewater treatment recycling/reuse	Precinct scale waste water treatment, including options for sewage treatment and trade waste.
Recycling	Circular economy and waste management.
Advanced manufacturing	A broad term generally referring to innovation, and often involved from the design and technology development phase of a product through to its branding and marketing[8].
Road transport and service station	Located at the Hume Highway junction in the RJP to provide road haulage and a service station for use by the public.
Health care	Medical and health service providers.

[8] What is Advanced Manufacturing? - AAMC

6.3. Surrounding features

In addition to surrounding populated areas discussed in section 5, the Ettamogah Dam (associated with Visy operations) and a parcel of Defence land to the south of the RJP are noted for discussion in the study (Section 9).

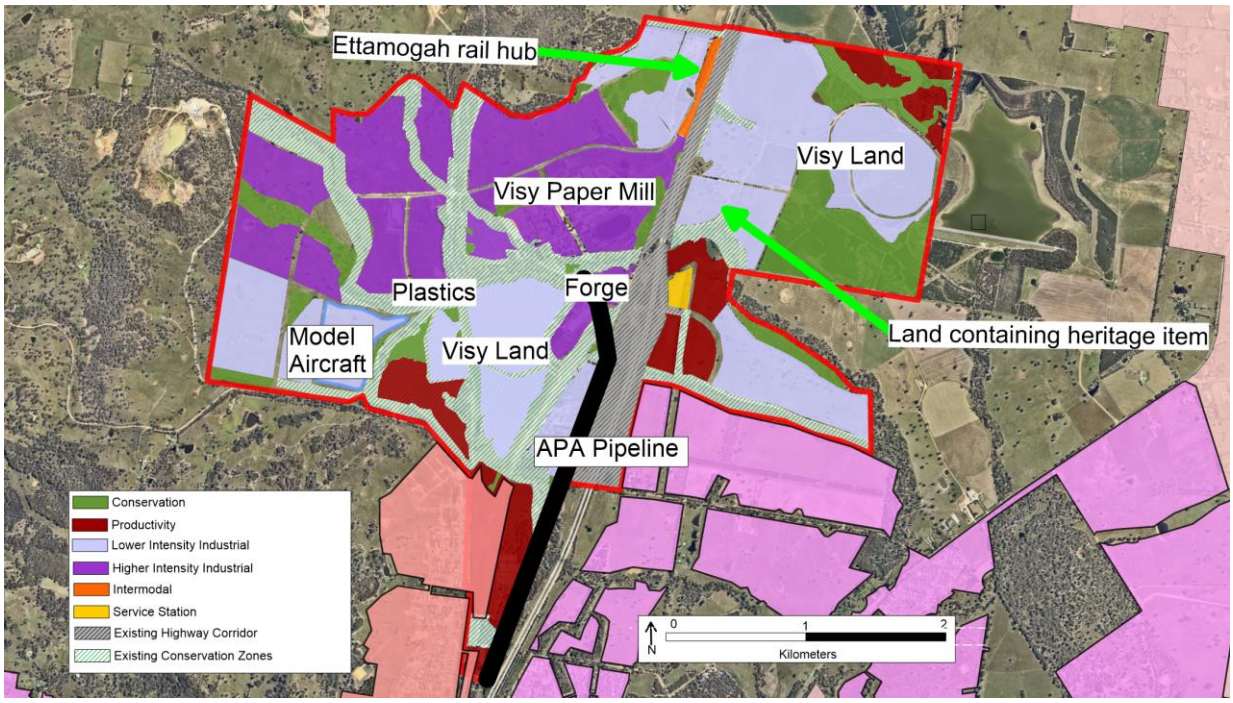
7. EXISTING DEVELOPMENT ASSESSMENT

7.1. General

Existing developments are assessed in this section to identify land use safety conflict. The following existing developments are shown in the context of the RJP in Figure 7.1:

- Visy paper mill and Visy owned land
- Overall Forge (Forge)
- Circular Plastics located in NEXUS (Plastics)
- Ettamogah Rail Hub
- Gas pipeline
- Model aircraft club
- Heritage area.

Figure 7.1: Existing developments



7.2. Visy paper mill

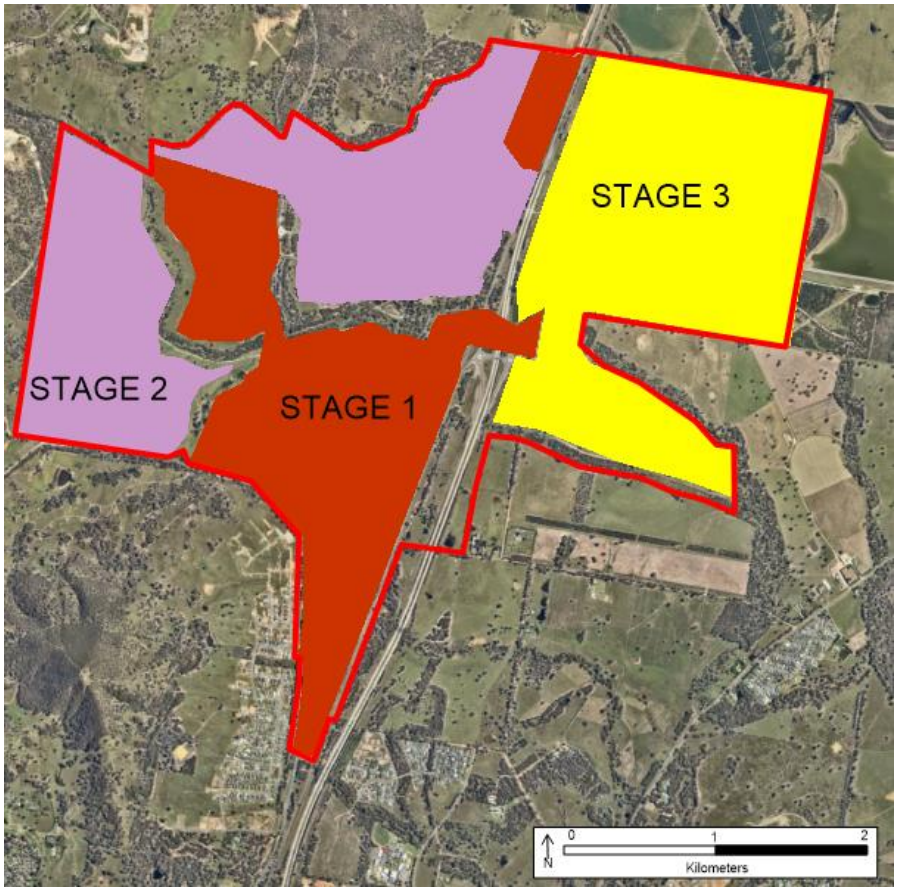
7.2.1. Background

The Visy paper mill is an established operation in the proposed RJP located approximately 2 km from the nearest general residential area. Separation distances from the Visy paper mill to operations within the RJP are detailed in Table 7.1.

Table 7.1: Visy paper mill separation distances

Area	Distance measured from operational facility (approximate)	Commentary
Overall forge	400 m	Operational
Ettamogah Rail Hub	600 m	Operational
Circular Plastics recycling and pelletising	600 m	Operational
Stage1	700 m	Under development
Stage2	120 m	Future
Stage 3	1.3 km	Future
Transport hub	600 m	Future

Figure 7.2: Stage Areas



7.2.2. Assessment

No details were available on the quantities of DGs or hazardous materials stored or used at the facility.

The United Kingdom (UK) Health Safety and Environment (HSE) Guide to Managing Health and Safety in Paper Mills (1996), Ref [13], lists several localised hazards but also includes the potential for toxic gas to be generated during the pulping process.

This potential was realised in 2018 (when the facility was owned by Norske Skog) when two workers were killed in what was reported as a release of toxic gas that was likely to be hydrogen sulphide[9] during routine maintenance activities.

In addition to the potential for the generation of toxic gas in the paper making process, the facility has a water treatment facility that may use chlorine, chemicals that may evolve chlorine (e.g., sodium hypochlorite) and other DGs in the production process.

Apart from the area located to the north of the paper mill, separation distances of 400 m and greater are likely to limit the potential for land use safety conflict to manageable risk levels.

Further details are required on the type and quantity of DGs and the potential for the process to generate toxic gas releases to assess the potential for land use safety conflict to land to the north of the paper mill and broader RJP.

Development approvals and the 2021 Hazard Audit, Ref [14], for the Visy Tumut paper mill were reviewed. Whilst it is not possible to draw direct conclusions, the Hazard audit shows that Visy has in place design and operation controls to ensure offsite hazards and risks associated with the Tumut facility are being managed to acceptable levels.

7.3. Overall Forge

7.3.1. Background

Overall Forge is a fully integrated forge company that undertakes sawing, forging (open dies, pressed and rolled), heat treatment, machining, testing and certification of products up to 25 tonnes. Information on the Albury City Council website includes development applications from 2005 and an expansion/modification in 2011. Overall Forge converts nickel alloy, ingot into billet for oil and gas aerospace operations. The facility also manufactures steel shapes for the mining sector.

7.3.2. Assessment

There are no details on DGs or hazardous materials stored or used at the forge.

The hazards associated with handling hot metal are typically localised, for example direct contact with hot surfaces, stream explosions in the event of hot/molten metal coming into contact with water, or release of fuel gas.

[9] Albury paper mill gas leak kills two Norske Skog workers, third in critical condition - ABC News

Fumes may be generated during the forging process. These should be identified and managed as occupational health and safety hazards which will result in managing offsite risk.

The separation distance of 200 m from the Overall Forge to the proposed transport/service centre and NEXUS is likely to be sufficient to manage any offsite risk from the forge to surrounding areas.

7.4. Plastic recycling facility

7.4.1. Background

Circular Plastics Australia Pty Ltd (Circular Plastics) submitted a Statement of Environmental Effects (SEE), Ref [15], to develop a plastic recycling facility in the NEXUS area.

7.4.2. Assessment

The SEE identified that the facility would store and use the following DGs:

- Caustic soda
- Sulphuric acid.

Based on the proposed quantities the SEE concludes the following:

> *The proposal is not affected by the State Environmental Planning Policy No.33 – Hazardous and Offensive Development (SEPP33) as no dangerous good storage or transportation threshold will be exceeded … therefore the Proposal is not considered potentially hazardous and a preliminary hazard analysis (PHA) is not required.*

In addition to the storage of DGs, the following hazard may also be present (based on Figure 1 in the SEE):

- Stockpiles of waste plastic material and finished goods including resins with the potential for a stockpile or resin fire.

Stockpile and warehouse fire risks can typically be managed onsite through the application of codes and standards in design.

On this basis, the risk associated with the plastic recycling facility is likely to be managed to avoid land use safety conflict.

7.5. Ettamogah Rail Hub

7.5.1. Background

The Ettamogah Rail Hub is a container handling, intermodal transport facility located in the north of the RJP. The facility offers road access for rail/road transfers, container

handling and storage services. In addition, the facility offers rail services including maintenance and repairs. The facility is in operation.

7.5.2. Assessment

The potential for land use safety conflict associated with a rail hub is dependent on the types of material handled or stored. In general, the risk is likely to be managed to an acceptable level with no offsite conflict if the facility does not handle toxic (e.g., bulk chlorine or ammonia) oxidisers of explosives (e.g., grades of ammonium nitrate) and highly reactive substances (e.g., sodium cyanide associated with mining activities).

7.6. Natural gas pipeline

7.6.1. Background

A natural gas pipeline services the Visy paper facility and the NEXUS Industrial Hub. The pipeline is buried and follows a route (shown approximately on Figure 7.3) along the rail corridor before crossing under Wagga Road in the vicinity of the proposed transport and service station and entering the Visy paper mill area.

The pipeline is operated by APA and is licensed to transport natural gas (License number PL-501).

7.6.2. Assessment

The pipeline operator has advised that the measurement length for the pipeline is 104 m.

The measurement length sets the distance for consultation with the pipeline operator. Based on APA requirements, development of sensitive land uses within the measurement length are likely to trigger the need for additional controls to manage the risk from the pipeline. Sensitive uses are defined by APA as:

- schools which includes colleges
- hospitals
- aged care facilities such as nursing homes, elderly people's homes
- prisons and jails
- convalescent homes
- sheltered housing
- buildings with five or more stories
- large community and leisure facilities, large open air gatherings
- day care facilities
- other potentially difficult to evacuate facilities
- other structures as defined by relevant local councils.

The risk associated with gas transmission pipelines can typically be managed to acceptable levels for commercial and industrial receptors up to the pipeline easement.

The pipeline alignment and any specific requirements from the pipeline operator should be included in the planning controls for the area to ensure there is no encroachment on the pipeline easement and risks associated with construction adjacent to the pipeline.

The new Transport and Infrastructure SEPP NSW incorporates the repealed Infrastructure SEPP 2007 and provides details on requirements for development adjacent to licensed pipelines.

APA has published planning and landscape guidelines for development adjacent to pipeline corridors that should be referenced for further detail.[10]

The area defined by the pipeline measurement length impacts on:

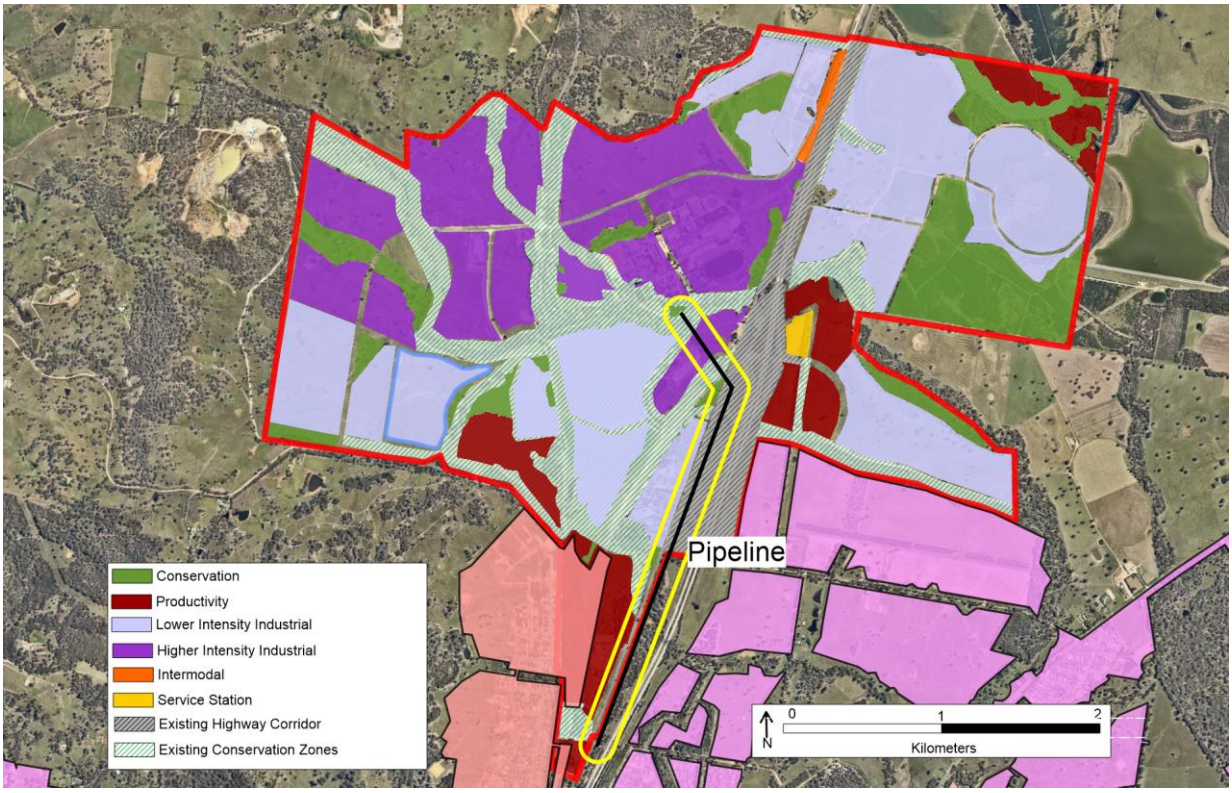
- Higher Intensity Industrial
- Lower Intensity Industrial; and
- Productivity zones.

Sensitive land uses (as defined by APA) should be set back from the pipeline by 104 m. Industrial developments should be outside of the pipeline easement.

The pipeline operator should be consulted for any development application within 104 m of the pipeline, this area should be clearly defined in planning control documents.

[10] APA Site Planning and Landscape National Guidelines

Figure 7.3: Natural gas pipeline with 104m buffer



7.7. Model aircraft club

A model aircraft club operates in the southern section of the RJP (Figure 7.1). The club facilities are unlikely to be a source of risk but flying may constrain additional population in the area.

Operation of remotely operated aircraft is managed by the Civil Aviation Safety Authority (CASA) under the Civil Aviation Safety Regulations (CASR). Of relevance to change in land use in the area there are general requirements:

- not to fly a remotely operated aircraft within 30 m of a person not involved in the activity and
- not to fly over populous area.

A populous area is defined in the CASR as an area with *'…sufficient density of population. [where a fault in operation could] …pose an unreasonable risk to the life, safety or property of somebody who is in the area but is not connected with the operation'*.

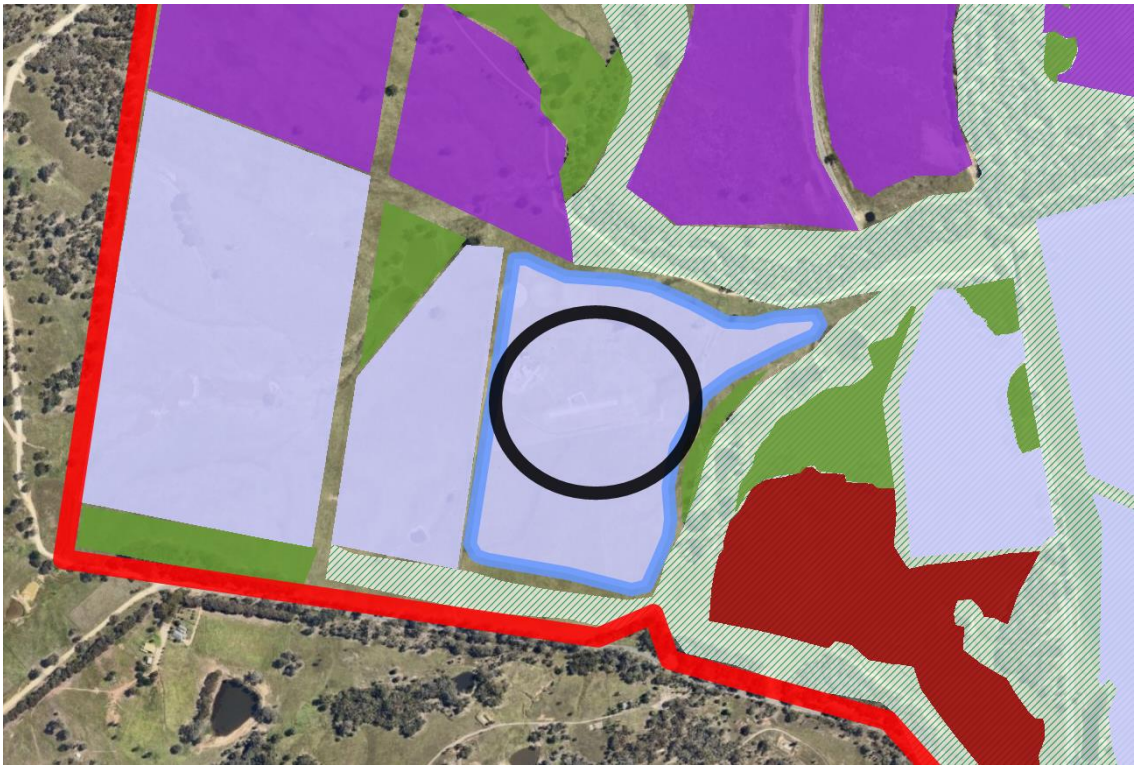
Development of the surrounding areas for Lower Intensity Industry may also impose a risk on any population at the model aircraft club.

An alternative location may need to be considered based on the risk of flying operations and the risk to the club from surrounding land uses.

If the club remains in this location (indicated by circle in Figure 7.4):

- flying operations will need to be reviewed in the context of introducing people nearer to the club; and
- it is likely to limit development in the area bounded in blue to below Resilience SEPP threshold (i.e., equivalent to the productivity zones), any future development in the adjoining zones areas would require assessment to meet the Resilience SEPP.

Figure 7.4: Model aircraft club location (circled)



8. POTENTIAL DEVELOPMENT ASSESSMENT

8.1. General

Developments in the RJP may involve the storage, handling and use of DGs. There is also the potential for developments to process DGs at elevated temperatures and pressure or to repackage, dilute or formulate chemicals.

Such developments have the potential to result in land use safety conflict between developments in the RJP and to receptors outside the RJP.

8.2. Developments assessed

At the strategic land use planning stage there are unknowns in:

- potential tenants
- range of possible activities and associated hazards
- controls that may be adopted and hence the risk profile of each development.

Hence, it is not possible to undertake a detailed assessment of the potential for land use conflict.

The following sections provide general guidance on developments listed in Table 8.1 in the context of strategic land use safety planning.

Table 8.1: Assessed developments

Industry	Commentary
Freight, logistics and warehousing	Associated with the rail hub and the proximity to the rail hub and regional road network. Associated with the logistic location.
Rail hub expansion	Expansion of current Ettamogah Rail Hub
Food and beverage	Abattoir, food and drink preparation and packaging, cold storage facility
Micro grid power generation	Decentralised power generation and distribution in the RJP.
Wastewater treatment recycling/reuse	Precinct scale waste water treatment, including options for sewage treatment and trade waste.
Recycling	Circular economy and waste management
Advanced manufacturing	A broad term generally referring to innovation, and often involved from the design and technology development phase of a product through to its branding and marketing[11].
Road transport and service station	Located at the Hume Highway junction in the RJP to provide road haulage and a service station for use by the public.
Health care	Medical and health service providers

[11] What is Advanced Manufacturing? - AAMC

8.3. Rail hub expansion

The following are under consideration for the rail hub area:

- expanding the rail hub
- developing cold storage facilities
- developing e-waste recycling facilities.

Based on other intermodals in NSW, activities or developments could include a range of DGs including those listed in Table 8.2.

Table 8.2: Typical intermodal DGs

DG Class	Material	Consequence	Potential for use in the RJP	In transit
2.1	Ethylene	Vapour cloud explosion	No. Unlikely to be shipped in sufficient quantities for other developments being assessed.	Possible
2.3	Chlorine	Toxic	Yes. May be used for water recycling or treatment facility.	Possible
2.3	Ammonia	Toxic and flammable	No. Unlikely to be shipped in sufficient quantities for other developments being assessed.	Possible
5.1	Ammonium Nitrate	Explosion	No. Unlikely to be transported by rail.	No. Unlikely to be transported by rail.
6.1	Sodium Cyanide	Evolution of toxic gas	No. Associated with gold mine operations, no current demand in the area.	Possible

Whilst rail transport of petrol, diesel and Liquified Petroleum Gas (LPG) are possible, it is not a common approach in NSW and would require dedicated offloading facilities.

Intermodals also attract warehouse and logistics operations including DG stores. These may in turn result in more people working in the area.

8.3.1. Assessment

Given the range of materials and quantities that could be handled it is not possible to define a risk profile for the intermodal. The following assessment is therefore general.

The potential consequences of a release from a typical transport package were used to inform the assessment. The largest effects distance was for a release of chlorine with a downwind concentration to cause a 1% fatality of approximately 600 m.

The Australian Emergency Response Guide Book (2021), Ref [11], specifies downwind distances requiring protection of people for a small spill of chlorine up to 1.4 km. For large spills (e.g., from a rail car) the downwind distance, under low wind speed to protect people is reported as '+11km'.

There are a range of refrigerants available for a cold store including ammonia (toxic and flammable) and propane (flammable). Proposed developments using these DGs as the refrigerants may result in land use safety conflict.

E-waste stockpiles may include batteries (fire risk) and other potentially hazardous materials. E-waste recycling will require an assessment of the types of material and processes being proposed. In the event of a stockpile fire, heat radiation effects are generally localised with the main offsite risk being toxic products of combustion.

8.3.2. Planning implications

The current rail hub location is approximately:

- 2 km to the closest sensitive land use (school) in Table Top
- 1 km to nearest rural/residential properties
- 500 m to land zoned for large lot residential (R5)
- 2 km to the nearest residential zoned area.

Based on the location and types of users in the area, it is assumed that the requirement to handle or store DGs will be limited to minor quantities with the bulk of material handled being non-dangerous goods.

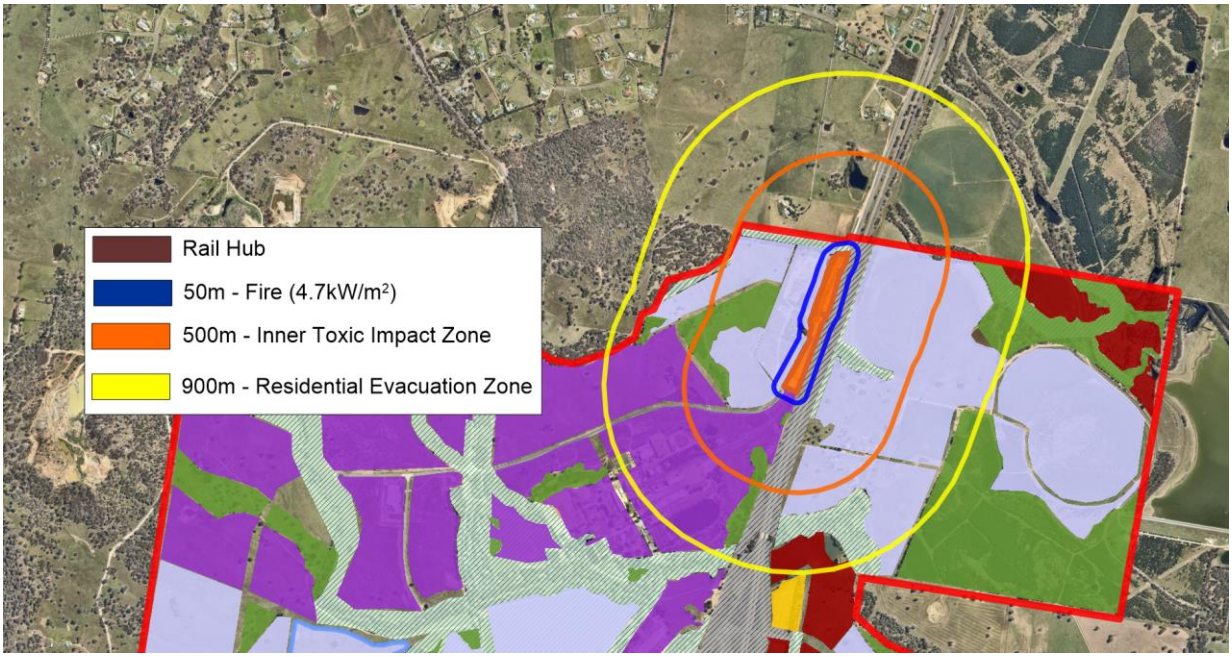
If the hub handles non-dangerous goods or DGs limited to flammable or combustible materials, packaged and containerised then the potential for land use safety conflict can be managed. A fully developed fire would have an offsite impact of the range of 50 m.

Providing separation distances of over 11 km to manage the consequences of the largest toxic releases would result in significant sterilisation of land. Such scenarios are more appropriately managed on a risk basis.

If the hub handles DGs above the Resilience SEPP threshold, then additional assessment would be required. For example, for bulk handing of ammonia or chlorine, a typical separation distance of 500 – 900 m would be required to manage offsite consequences to the ERPG level 2 for offsite populations. On the basis that controls would be in place to manage handling of DGs and the likely low frequency of transit of substances such as chlorine, the risk profile of the intermodals should be tolerable.

The extent of the impacts are shown on Figure 8.1. The figure includes the potential rail hub expansion for information only.

Figure 8.1: Rail hub



8.4. 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 leveraged off an expanded rail hub, transport hub and proximity to the national transport network.

8.4.1. 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. A toxic release may occur due to a release of material or from mixing of incompatible materials.

Incompatibility is managed through application of guidance 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.

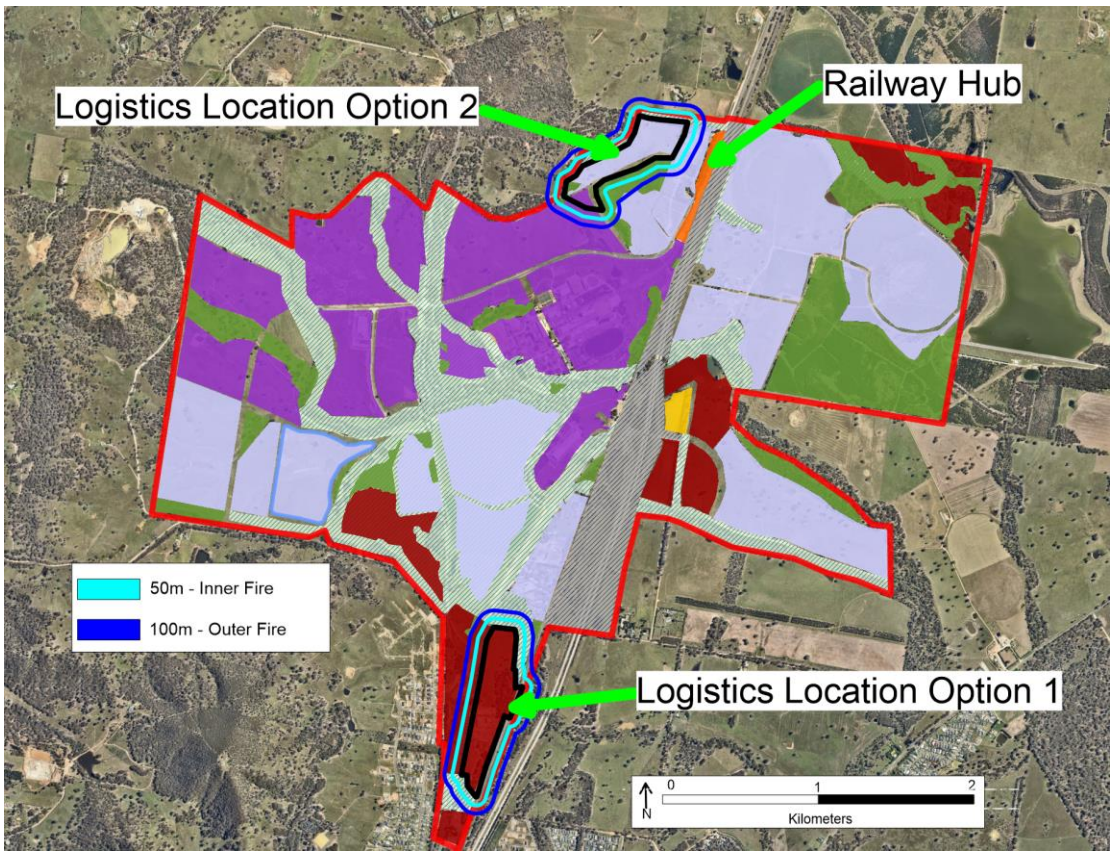
A warehouse fire is a credible scenario which may involve large volumes of smoke and heat from the seat of the fire. Typically heat radiation may extend 50 – 100 m from a fully developed warehouse with downwind evacuation dependent on the prevailing weather conditions.

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

8.4.2. 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 – 100 m. Toxic products of combustion can be managed through emergency response processes and are not generally managed by setting buffer distances (Figure 8.2). The potential rail hub expansion is shown to the north of the rail hub for information only.

Figure 8.2: Warehouse offsite consequences



Warehouses that handle DGs above the Resilience SEPP screening thresholds may be acceptable at the rail hub (location option 2). Any storage associated with the logistics location option 1 (Productivity Hub) should be limited to below the Resilience SEPP thresholds to avoid land use safety conflict with the residential area.

8.5. Food and beverage

The primary land use safety considerations for food and beverage facilities, including an abattoir are associated with:

- ammonia in refrigeration circuits
- carbon dioxide for drinks
- chemicals and food additives

- cryogenic (liquified gases) for snap freezing
- bulk storage of flammable (alcohol) or combustible (oils) liquids
- fuel sources (natural gas, diesel or LPG).

8.5.1. Assessment

Ammonia typically has the largest offsite risk potential associated with food and beverage industries. Ammonia refrigeration circuits are closed circuits with compressors, accumulators, pressure let down, chillers and return circuit. Leaks from the high-pressure system have the potential for offsite impact with injury and irritation up to 4 km from the facility.

However, the risk of an ammonia leak and offsite impact is generally managed on a risk basis.

Typical hazard management for food and beverage are summarised in Table 8.3.

Table 8.3: Food and beverage hazard management

Material	DG classification	Scenario	Hazard management	Offsite impact
Ammonia	2.3 (toxic and flammable)	Release, fire or toxic	Application of codes and standards in design. Risk assessment in design and operations.	Up to 4 km injury/irritation contour managed on a risk basis. Fires localised to plant.
Carbon Dioxide	2.2	Release, simple asphyxiant, cold burns	Codes and standards, risk assessment ventilation	Limited potential
Chemicals and food additives	Mixed. Not all are DGs	Spill or inadvertent mixing	Operational controls	Limited potential
Cryogenic	Mixed. Not all are DGs	Release, cold burn asphyxiation	Codes and standards and risk assessment	Limited potential
Flammable and combustible liquids	Class 3 and Combustibles	Fire	Codes and standards and risk assessment	Heat radiation from large storage area may extend 50-100 m offsite
Fuel sources	Class 3 or Class 2.1 (LPG)	Fire or explosion	Codes and standards and risk assessment	Heat radiation from large fire extend 50-100 m offsite
Warehouse fires	Mixed. Not all are DGs	Fire	Codes and standards and risk assessment	Heat radiation from large warehouse fire extend 50-100 m offsite. Fumes may require evacuation downwind.

8.5.2. Planning implications

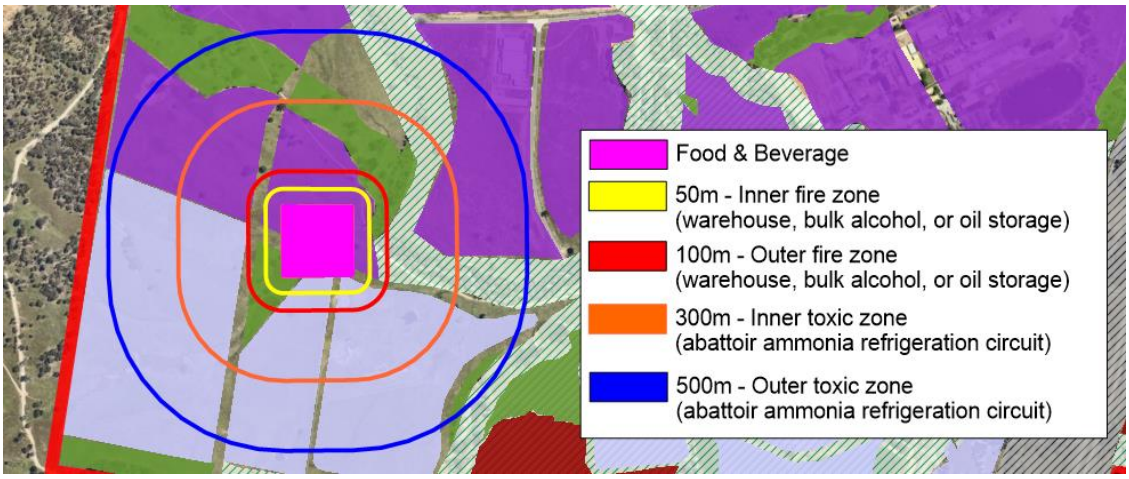
Apart from ammonia in a refrigeration circuit and chlorine for water treatment, land use safety risks associated with food and beverage are likely to be localised.

There is an opportunity to differentiate between higher hazard industries (e.g., ammonia refrigeration circuits and chlorine water treatment), medium hazard (e.g., alcohol or other DG bulk storage) and low risk (no DG) in the RJP to encourage development in the appropriate area.

For developments that include ammonia (toxic gas) storage and use (e.g., an abattoir) the potential for land use safety conflict at more sensitive land uses, such as the Productivity Hub area (commercial or mixed business use) and residential is likely to extend to 300 m (Productivity hub) to 500 m (residential and sensitive) with irritation risk levels at 900 m.

Figure 8.3 shows the extent of potential offsite impact.

Figure 8.3: Food and beverage offsite impact



8.6. Energy

Development of a co-generation facility is proposed in the Albury Industrial Hub (now NEXUS) NEXUS master plan, Ref [4]. Co-generation plants, also called Combined Heat and Power (CHP) plants, typically burn gas to generate electricity. Waste heat from the exhaust and machine cooling is captured, typically in a water/steam circuit. The steam is then either used to generate electricity via a steam driven turbine or distributed to local businesses that require heat.

The advantage of the system is an increase in efficiency with the downside that the generator may be required to run 24/7 to provide a constant heat supply to customers.

A microgrid may also be established in the RJP to distribute locally generated electricity [solar photovoltaic (PV)] within the RJP.

8.6.1. Assessment

Co-generation would require a high-pressure gas pipeline, gas conditioning (drying and filtering) and pressure regulation with associated risks of a loss of containment of natural gas.

Heat transfer is likely to require steam circuits with the potential for loss of containment of high-pressure steam.

Separation distances from equipment containing high pressure gas will be required to prevent land use safety conflict. Typically, these would be limited to 25 – 50 m from the equipment.

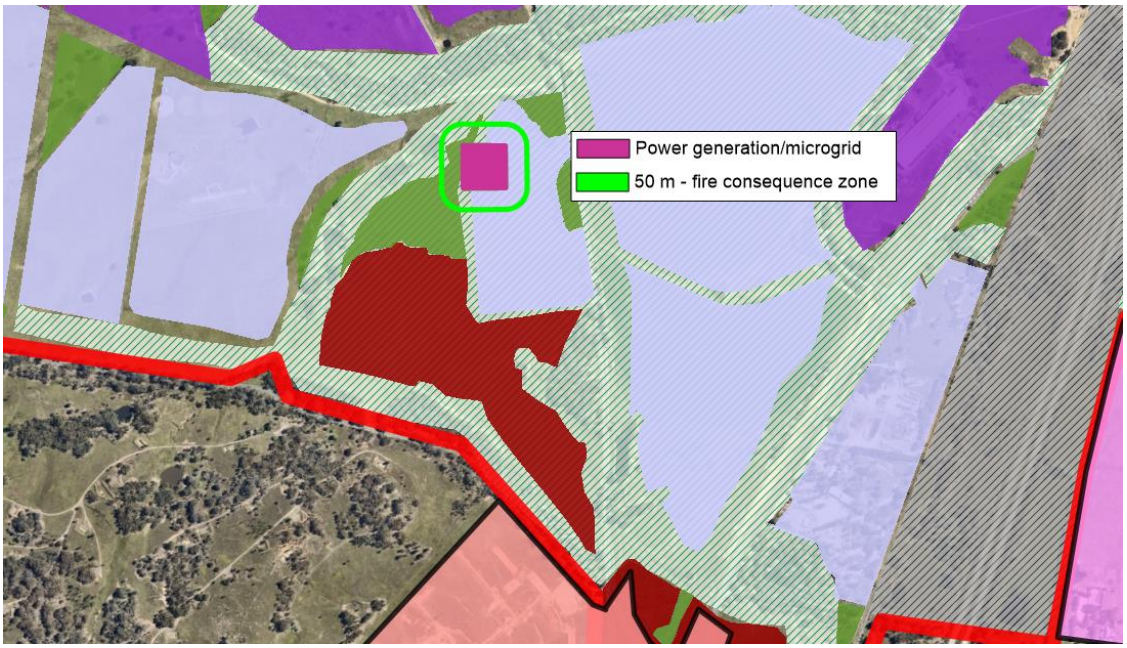
Risks around steam releases are typically limited to the immediate area of the pipes. Consideration would need to be given to the method of distributing heat to businesses.

Microgrids present limited land use safety conflict with any risks limited to transformer or battery fires. Whilst battery fires are possible, effects are typically limited to 50 m with separation distances between batteries and transformers incorporated into facility layouts.

8.6.2. Planning implications

Land use safety conflict can be managed for a co-generation or microgrid facility with the provision of small (25 – 50 m) buffers around high pressure gas equipment or battery storage and transformers. Risk to adjacent developments is likely to be managed to an acceptable risk.

Figure 8.4: Microgrid consequences



8.7. Wastewater treatment, recycling/reuse

Wastewater treatment, reuse, recycling and disposal is discussed in the Albury Industrial Hub (now NEXUS) NEXUS master plan, Ref [4], and is a general consideration for the precinct in three broad areas:

- wastewater collection, treatment and recycling
- trade-waste collection, treatment and disposal
- a sewage treatment plant.

It is noted there are no current development proposals or commitments to develop any of the treatment options.

The NEXUS master plan discusses either a centralised waste water treatment and recycling shared facility or individual developments providing their own facilities. The discussion concludes that:

> *'Since a shared facility would need to be operational before the industries came on site, it may be more feasible to require the new industries to supply their own treatment. This would provide the most flexibility on the site.'*

The Visy paper mill has extensive water recycling and treatment facilities including ponds and the Ettamogah Dam. Visy operations are discussed separately in this document.

Trade-waste facilities would collect liquid waste streams for treatment and disposal at a centralised facility. An abattoir is an example of a large-scale facility requiring trade-waste facilities.

The RJP includes an option for a sewage treatment plant in the north-east (Stage 3) area.

8.7.1. Assessment

This assessment looks at the land use safety risks associated with wastewater treatment facilities. Any requirements for sites to manage water usage or conditions around beneficial uses of treated wastewater, such as irrigation, are outside the scope of the assessment.

The potential for land use safety conflict will be a function of the chemicals used in the wastewater treatment processes, the storage of dried biosolids or storage of material recovered in the trade waste treatment process:

- Chemicals may include water treatment chemicals (e.g., chlorine, hypochlorite, biocides) or equipment cleaning chemicals (e.g., acids and neutralising chemicals for cleaning filters). The type and quantity of chemicals varies with the plant inputs and the plant performance requirements.
- Stockpiles of dried biosolids may catch fire and burn as a stockpile fire.

- Trade waste treatment may result in flammable or combustible liquids and generation of flammable gas during the process.

In the context of offsite land use safety conflict, the use of chlorine in water treatment facilities poses the greatest potential for offsite safety impact. The two most common options for chlorine storage and use at a wastewater facility are:

- Gaseous chlorine, stored under pressure as a liquid with drawn down and pressure reduction to provide a gaseous stream which is injected into the water treatment process.
- Hypochlorite salt in solution which is injected into the water treatment process.

A release of chlorine from storage has the potential to result in offsite injury and irritation consequences several kilometres from the plant depending on the release scenario and the weather conditions. However, industry standard controls typically limit the injury/irritations effects to local to the site.

Mixing of incompatible chemicals has the potential to lead to a chlorine release. Whilst having the potential for significant onsite consequences, the quantity of chlorine released is generally small.

If developments provide their own wastewater treatment facilities, it is likely they will be small scale packaged systems with minimal operator intervention. Such facilities typically avoid the use of chlorine and rely on batching of chemicals from small packages.

If a centralised wastewater treatment facility is developed for the RJP then chlorine may be stored in bulk and injected into the process.

Buffers to sewage treatment plants are typically defined by odour and amenity rather than safety considerations.

8.7.2. Planning implications

Any water treatment facility should be screened using the Resilience SEPP but it is likely that land use safety conflict will be managed through application of package systems that do not use chlorine and stockpiles of combustible biosolids or flammable/combustible liquids are not held on site.

If chlorine is selected as a disinfection medium, then engineering controls are capable of limiting offsite impact to acceptable levels but require specific assessment.

Biosolids are typically handled as sludges, stored in bins/containers and regularly removed from wastewater treatment plants. If biosolids are stockpiled and allowed to dry, then there is the risk of a stockpile fire. The heat radiation from stockpile fires is normally limited to the immediate area of the fire.

Flammable or combustible liquids may be incinerated as they are produced or transferred offsite in small batches.

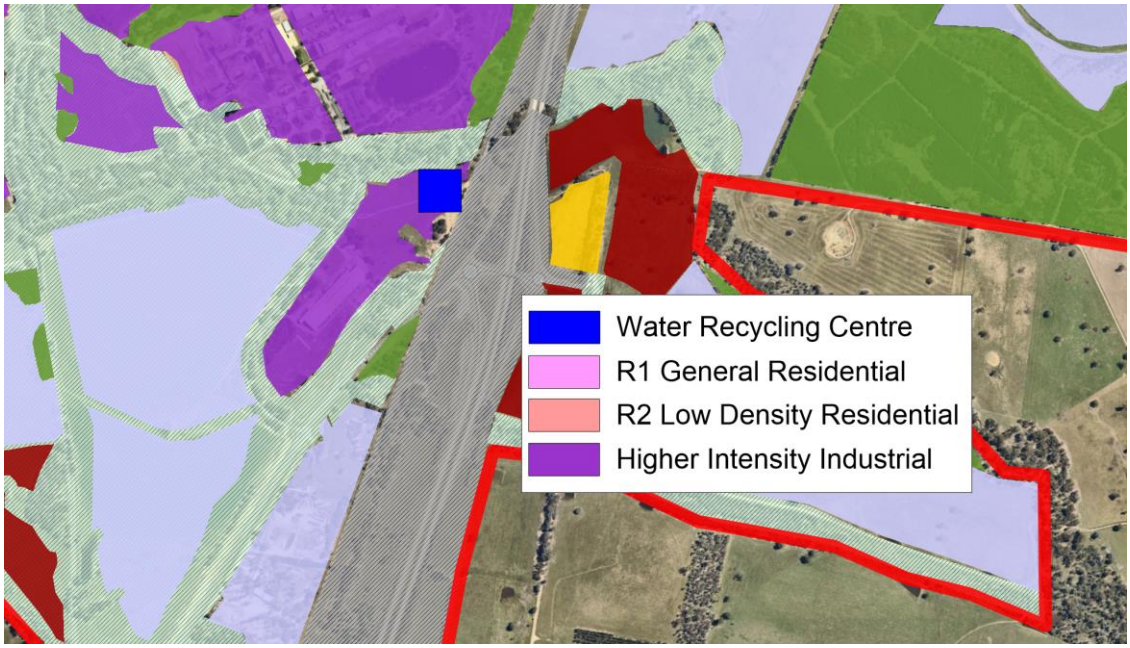
This proposed water treatment and recycling location is in close proximity to the Productivity Hub and the RJP boundary. Any use of chemicals in the process would require careful consideration to avoid land use safety conflict.

Locating a sewage treatment facility in the RJP is unlikely to result in buffers over and above those imposed by air, noise and odour constraints.

Changes to the paper mill wastewater system have occurred (2009) under approved development applications. The applications were reviewed and no hazards related conditions or consent or safety issues were identified.

The NEXUS master plan indicates a 'water recycling collective' with onsite treatment at the location shown on Figure 8.5. This is an appropriate location given the potential for some chemical use in the plant.

Figure 8.5: Possible water treatment location



8.8. Recycling

The land use planning safety risks associated with recycling facilities are a function of the types of materials being recycled.

8.8.1. Assessment

Solid waste recycling hazards, for example metal, plastic and rubber are likely to be associated with stockpile or equipment fires. Whilst such fires may produce large amounts of smoke, the risks are typically managed by responding to the fire. Heat radiation will be localised to the stockpile or warehouse with limited potential for land use safety conflict during planning.

Liquid hydrocarbon recycling facilities, for example waste oil, transformer oil, cooking oil, may be potentially hazardous based on the type of material and the recycling process. Waste oil recycling facilities may require buffer distances around storage tanks or elevated temperature processes. Typical buffer distances of 50 – 100 m for large storage tanks or elevated temperature (above material flash point) processes are likely to be sufficient to manage land use safety conflict.

8.8.2. Planning implications

There is an opportunity to differentiate between low hazard recycling (such as solid waste) and higher hazard recycling (liquid waste streams processed above their flash point).

Resilience SEPP screening criteria should be applied to manage the risk associated with recycling facilities.

8.9. Advanced manufacturing

Advanced manufacturing is a broad term generally used to refer to newer, innovative manufacturing processes. The Australian Advanced Manufacturing Council (AAMC) quotes the United States (US) definition of 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.*[12]*'*

Given this broad definition and a lack of any current advanced manufacturing processes only a general assessment can be made.

8.9.1. Assessment

Development of new and innovative manufacturing processes may introduce hazards and risks that are not related to the quantity of DGs stored or handled at a facility. To manage this risk, guidance on applying SEPP33 was updated in 2011 to includes a *'fuller discussion on the factors that can cause a development to be potentially hazardous even when screening thresholds are not exceeded'*, Ref [5].

8.9.2. Planning implications

In the absence of details on advanced manufacturing proposals, it is recommended that the guidance on applying SEPP33 is followed including consideration of factors beyond screening against the Resilience SEPP thresholds.

[12] About Us - AAMC

8.10. Agribusiness

Agribusiness is an overarching term used to cover all businesses associated with agriculture. This includes equipment and supplies, farming activities, harvesting, processing, packaging, distribution and export.

Processing and packaging are covered under the food and beverage assessment, distribution and export are covered under the rail and transport hub assessments.

In general, the farming activities do not present land use safety conflict and can be used to provide buffers between industries and populated areas. The residual risk assessed in this section relates to the agricultural chemicals and supplies.

8.10.1. Assessment

The general processes for agricultural chemical production and storage are as follows:

1. Synthesising, where the active ingredients are produced
2. Formulating, where the active ingredient is sent to the formulators to mix the correct amount with a carrier medium. The formulation is packaged for distribution, usually in a concentrated form and may be a liquid or powder.
3. Diluting, where the formulation is stored and may be diluted and repackaged before distribution or distributed in a concentrated form for the end user to dilute to create the amount of pesticide/herbicide required.

Typical hazardous materials are listed by DG class in Table 8.4.

Table 8.4: Agricultural chemicals

Material	DG classification	Scenario	Hazard management	Offsite impact
MIPA - Monoisopropyl Amine (highly flammable but also highly odorous and irritating)	Class 3.1 PGI	Flammable liquid	Dependent on layout, heat radiation effects may extend offsite but likely to be limited to immediate area of facility.	Limited potential
Paraquat (herbicide), diquat (pesticide), cypermethrin (insecticide)	Class 6.1 PG III	Toxic	Toxic exposure to spill localised to area. Toxic products of combustion in a fire event may extend offsite.	Limited potential
Phosphoric acid, hydrochloric acid	Class 8 Varies with concentration but up to PGII	Corrosive	Effects of a spill likely to be localised.	Limited potential
For solid formulation there may be a risk of dust explosion	Other	Dust explosion	Effects of dust explosions are typically localised.	Limited potential

It is credible that the mitigation controls at a chemical facility may fail resulting in a fire involving a Class 6.1 (toxic material) or loss of containment of product formulations that are toxic.

Given the uncertainty in the chemical facility, chemicals used, quantities and the variables involved in predicting the evolution and dispersion of toxic products of combustion, the general guidance on emergency response contained in the Emergency Response Guide Book, Ref [11], was used to inform the assessment.

Guide 151 Toxic (non-combustible) recommends an initial evacuation distance of 800 m in all directions for a fire. The values are not based on quantities but are for general advice.

The 800 m distance was taken as a worst-case credible consequence for an incident at a chemical manufacturing facility for planning purposes.

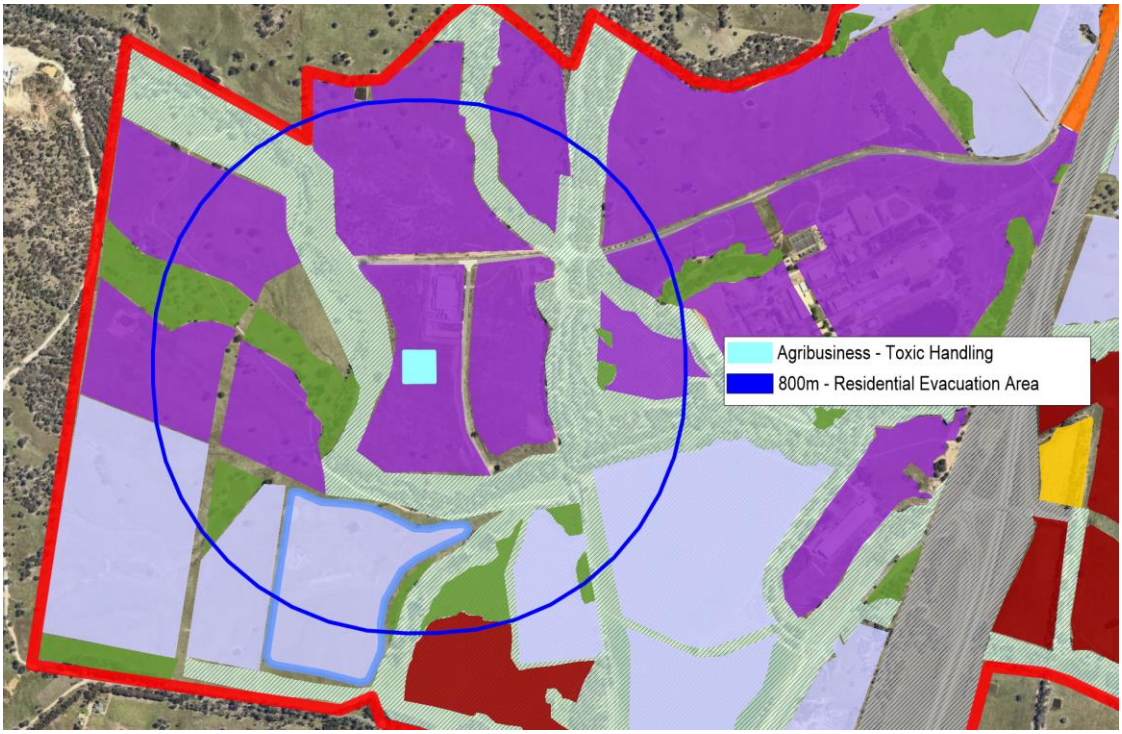
8.10.2. Planning implications

Apart from toxic release or toxic products of combustion, land use safety risks associated with agricultural chemical industries are likely to be localised.

The location of the RJP provides the opportunity to ensure an 800 m evacuation area does not reach residential or sensitive land uses.

There is an opportunity to differentiate between higher hazard industries (e.g., synthesising toxic or of DG chemicals), medium hazard (e.g., formulation, mixing, dilution and repackaging) and low risk (package stores) in the RJP to maximise buffers to commercial or sensitive areas.

Figure 8.6: Agribusiness toxic



8.11. Health care

Health care businesses are unlikely to be sources of risk, however, they may draw populations to the area. There is an opportunity to configure the RJP to locate health care businesses away from higher hazard industries by locating in the Productivity Hub.

8.12. Service centre

There is the opportunity to develop a road transport hub and service station at an expanded Hume Highway/Wagga Road junction. The area to the west of the junction is constrained by the railway line, natural gas pipeline and is closer to Overall Forge and the Visy paper mill. This area may be more appropriate for truck and road freight operations.

The area to the east of the junction borders land zoned residential and would be more appropriate for a service station (fuel, food and small-scale retail) open to the public.

The location and required separation distances for 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
- DPIE guideline for LPG automotive retail outlets for separation distances
- AS/NZS 60079 set of documents for hazardous areas
- AS3961:2017 the storage and handling of liquefied natural gas (LNG)

- 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 form flammable gas and liquids to ignition sources.

Growth of hydrogen refuelling may require additional buffers and should be considered in the allocation of an area for a service centre.

8.12.1. Assessment

Current service centre layouts and footprints apply codes and standards to determine the overall layout and separation distances/buffers. Vapour barriers and application of separation distances manage the risk to profile to within the footprint of a retail facility.

There is currently no agreed standard or preferred technology for hydrogen production and storage system.

Common production options are:

- Methane Steam Reforming (MSR) where the hydrogen in methane is released using high pressure/temperature steam
- Electrolysis where water is split into hydrogen and oxygen using electricity, with electricity sourced from the grid or generated locally.

Storage options include:

- 200 to 700 bar compressed gas systems
- cryogenic (approximately -250°C liquid hydrogen storage)
- conversion to ammonia with a mix of refrigerated and pressurised storage options.

For a passenger vehicle refuelling station, it is likely that the technology will be on site hydrogen production by electrolysis on demand, with a small storage buffer to manage peak charging rates. Heavy vehicle/truck refuelling may require bulk storage to manage the higher peak demand rates.

There is no published guidance in Australia on separation distances for hydrogen refuelling stations. A range of international standards are available and included in Table 8.5.

Table 8.5: 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

Document	Exposure location	Distance (m)
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

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 sub-precincts. Initial work reported distances of 64 – 100 m, subsequent updates present ranges from 15 – 30 m for a compressed gas system.

Review of a PHA for a hydrogen refuelling station indicated offsite consequence range from 50 – 100 m 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.

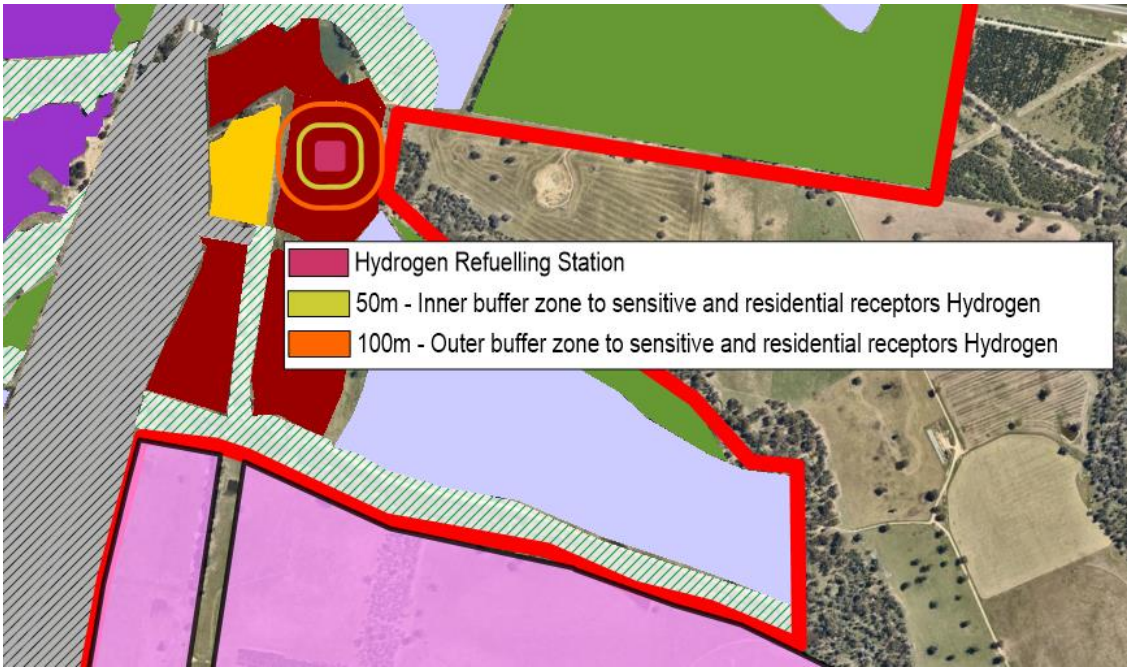
8.12.2. Planning implications

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.

In general, the lower hazard and risk option is hydrogen production using electrolysis from grid supply or local PV arrays with optional 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 100 m 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.

Figure 8.7: Hydrogen refuelling station



8.13. Support services

Business and industrial hubs attract support services such as:

- child care
- food and beverage outlets
- retail
- office administration.

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

The technical assessment has considered these services may be located in the Productivity Hub. This leads to the recommendation that potentially hazardous activities are not located in the Productivity Hub to avoid land use safety conflict.

9. EXTERNAL CONSIDERATIONS

9.1. General

The following features were identified as external considerations for the assessment:

- Ettamogah Dam
- defence land to the south of the RJP
- areas external to the RJP.

9.2. Ettamogah Dam

The Ettamogah Dam is a registered dam regulated by Dam Safety NSW and operates under an approved risk assessment. The dam risk assessment has been reviewed and it is noted that the 'sunny day flood' inundation does not impact the RJP.

9.3. Defence land

Department of defence owns a parcel of land that adjoins the RJP. Consultation will be required with the Department of Defence to understand current and planned use for the land to avoid future land use safety conflict. This includes identifying potential for unexploded ordinance.

9.4. Areas external to RJP

The Albury City Council Local Strategic Planning Statement, Ref [12], identifies the area marked as Visy North (Figure 2.2) and land surrounding the dam as long term 'Future urban expansion'.

Development of the north-east of the RJP as a Productivity Hub is compatible with developing the surrounding land as future urban expansion. Any constraints associated with a Sewage Treatment Plant (STP) in this area would be determined by air, noise and odour considerations and not land use safety.

APPENDIX A. SCENARIO ASSESSMENT SUMMARY

The basis for the scenario assessment and conclusions are summarised in the following table.

Hazard	Industries in RJP	Effect	Assessment basis	Assessment outcome
Chlorine	Water treatment Some manufacturing processes Storage/intermodal	Toxic gas	Chlorine drum (920kg) in transit.	**600 m** distance to 1% fatality level. Taken as the limit of injury/irritation.
Ammonia	Refrigeration (food production or abattoir) Some manufacturing processes Storage/intermodal	Toxic gas	Typical refrigeration circuit liquid ammonia release	Approximately 300-500 m to the sensitive land use injury/fatality risk criteria contour **900 m** to the irritation risk contour.
Agri-chemicals	Storage/intermodal Manufacturing	Toxic gas	Packaged store – Emergency Response Guide 151 Toxic	Initial evacuation zone defined at **800 m**.
Hydrogen	Refuelling station (including storage and compression)	Flammable gas	Typical refuelling station with gas at 400 to 700barg	International standards would require approximately 30 m to offsite receptors, modelling indicates consequences up 100 m. **100 m** selected for strategic planning study.
Liquid fuel (atmospheric pressure)	Fuel storage associated with developments. Liquid waste streams	Flammable liquid	Typical above ground storage tanks in a regional fuel depot.	50-100 m to injury from a fire. **100 m** selected for strategic land use.
Warehouse	Warehouse storing flammable dangerous goods	Flammable liquid or gas	Typical warehouse fire	50-100 m to injury from a fire. **100 m** selected for strategic land use.
Natural gas	APA transmission pipeline	Flammable gas	Measurement length provided by APA	**104m** provided by APA.
Power generation	Power plant	Flammable gas Battery or transformer fire	Low pressure gas supply to a turbine, battery storage, transformers	25-50 m for typical low pressure gas fire or battery/transformer fire. 50 m selected for strategic land use planning.

APPENDIX B. REFERENCES

[1] NSW Department of Planning, “State Environmental Planning Policy (Resilience and Hazards),” 2021.

[2] Todoroski Air Sciences, “Regional Job Precinct Air, Noise and Odour Master Plan Report - Albury,” 25 March 2022.

[3] AECOM, “Lake Ettamogah Winter Storage Dam - 2019 Type 1 Surveillance Report,” 2019.

[4] AECOM, “Albury Industrial Hub Master Plan,” 2010.

[5] NSW Department of Planning, “Hazardous and Offensive Development Application Guidelines - Applying SEPP 33,” 2011.

[6] NSW Department of Planning, “Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning,” 2011.

[7] NSW Department of Planning, Hazardous Industry Planning Advisory Paper No. 6 - Hazard Analysis, 2011.

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[10] NSW Government, Work Health and Safety Regulation 2017, 2017.

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