



Penrith Rural Lands and Villages Study

Final

Prepared by City Plan Strategy & Development P/L
on behalf of Penrith City Council

AUGUST 2019

REPORT REVISION HISTORY

Revision	Date Issued	Revision Description				
02	09/08/19	Draft for client review (updated formatting)				
		Prepared by			Verified by	Signed
		Jess Veenhuyzen <i>Project Planner</i>	Sonny Embleton <i>Senior Associate</i>	Amanda Wetzel <i>Director</i>	Juliet Grant <i>Executive Director</i>	<i>Grant</i>
03	14/08/19	Final Draft for Exhibition				
		Prepared by			Verified by	Signed
		Jess Veenhuyzen <i>Project Planner</i>	Sonny Embleton <i>Senior Associate</i>	Amanda Wetzel <i>Director</i>	Juliet Grant <i>Executive Director</i>	<i>Grant</i>
04	26/08/19	Final – minor edits				
		Prepared by			Verified by	Signed
		Jess Veenhuyzen <i>Project Planner</i>	Sonny Embleton <i>Senior Associate</i>	Amanda Wetzel <i>Director</i>	Juliet Grant <i>Executive Director</i>	<i>Grant</i>

Disclaimer

This report has been prepared by City Plan Strategy & Development P/L with input from a number of other expert consultants (if relevant). To the best of our knowledge, the information contained herein is neither false nor misleading and the contents are based on information and facts that were correct at the time of writing. City Plan Strategy & Development P/L accepts no responsibility or liability for any errors, omissions or resultant consequences including any loss or damage arising from reliance on information in this publication.

Copyright © City Plan Strategy & Development P/L
 ABN 58 133 501 774

All Rights Reserved. No material may be reproduced without prior permission.

City Plan Strategy & Development P/L
 Suite 6.02, 120 Sussex St, Sydney NSW 2000
 P +61 2 8270 3500
CITYPLAN.COM.AU

TABLE OF CONTENTS

Executive Summary	1
PART A: OVERVIEW.....	2
1. Introduction	2
1.1. Background	3
1.2. Objective	4
1.3. Approach.....	4
1.3.1. Background research, review and investigations	4
1.3.2. Consultation with key stakeholders	5
1.4. Structure of this Report	5
2. Place Based Approach	6
PART B: PLANNING AND DEVELOPMENT FACTORS	8
3. Planning policy-driven influences.....	9
3.1. Broad visions for Penrith.....	10
3.2. Metropolitan Rural Area	15
3.3. Western Sydney Aerotropolis.....	17
3.4. Western Sydney Employment Area	19
3.5. Major transport network improvements.....	20
3.6. Sydney's Green Grid.....	21
4. Natural features and resources	23
4.1. Water.....	23
4.2. Soils.....	27
4.3. Mineral resources.....	31
4.4. Biodiversity	33
4.4.1. Local Biodiversity Legislation.....	35
4.4.2. Federal and State Biodiversity Legislation	36

4.4.3. NSW Landscapes Biodiversity Framework	38
4.4.4. IBRA Biodiversity Framework	39
4.4.5. Biodiversity recommendations	39
4.5. Scenic and visual amenity	40
4.6. Hazards – bushfire, flooding and heatwaves	43
5. Rural enterprises and non-residential uses	46
5.1. Agriculture	46
5.1.1. Egg and poultry production	47
5.1.2. Vegetables and market gardening	48
5.1.3. Nurseries, cut flowers & cultivated turf	49
5.2. Mining & quarrying	52
5.3. Tourism & recreation	54
5.4. Other uses	57
5.4.1. Animal boarding and training	57
5.4.2. Truck keeping	58
5.4.3. Home businesses and home industries	58
6. Rural communities	60
6.1. Method	61
6.2. Culture and heritage	62
6.2.1. Aboriginal heritage	62
6.2.2. European heritage	62
6.2.3. Cultural diversity of Penrith today	63
6.3. Social and economic snapshot	65
6.4. Demographic profiles	66
6.4.1. Rural North West	66
6.4.2. Rural North East	67
6.4.3. Rural South West	68
6.4.4. Rural South East	69

6.5. Housing	71
6.5.1. Current housing stock	71
6.5.2. Housing for an aging population	72
6.5.3. Rural residential living	73
7. Infrastructure	74
7.1. Transport	74
7.1.1. Existing Road Network	74
7.1.2. Public Transport	74
7.2. Waste management	75
7.3. Water supply	76
7.4. Wastewater	77
7.5. Cemeteries & Crematoria	77
7.6. Emergency response	78
7.7. Community facilities and services	79
PART C: PLACED-BASED CONSIDERATIONS	82
8. Rural North West	83
8.1. Precinct-wide considerations	83
8.2. Agnes Banks	83
8.3. Londonderry	84
8.4. Castlereagh	84
8.5. North Cranebrook	85
8.6. Deferred lands	85
9. Rural North East	86
9.1. Precinct-wide considerations	86
9.2. Berkshire Park	86
9.3. Llandilo	86
10. Rural South West	87
10.1. Precinct-wide considerations	87

10.2. Mulgoa	87
10.3. Wallacia	87
10.4. Mulgoa Valley	87
11. Rural South East	88
11.1. Precinct-wide considerations	88
11.2. South Creek Corridor	89
PART D: CONCLUSION	90
12. Summary	90
13. Recommended actions	91
ABBREVIATIONS	97
References	98

FIGURES

Figure 1: Current mapped LEP controls to protect character in Penrith	6
Figure 2: Recommended place-based framework for Penrith	7
Figure 3: Metropolitan-level growth influencing change in Penrith’s rural areas	9
Figure 4: Displacement of rural land uses and activities is expected in the Rural South East	16
Figure 5: Proposed Western Sydney Aerotropolis	17
Figure 6 Western Sydney Employment Area	19
Figure 7 Proposed transport connections	20
Figure 8: Land with supportive zonings, as a basis for enhancing the Green Grid	21
Figure 9 Penrith LGA Green Grid Opportunities	22
Figure 10 Key watercourses in the Penrith LGA	23
Figure 11. Soil landscapes of Penrith (Source: State Government of NSW and Office of Environment and Heritage (OEH) 1990)	27

Figure 12. Strategic agricultural land (Source: Department of Planning and Environment 2014)	28
Figure 13. Salinity potential in Penrith LGA.....	30
Figure 14. OEH recommended 'Priority Investment Areas', showing proposed 'core areas', 'corridors', and existing reserves	33
Figure 15. Broad-scale vegetation communities mapping (Source: Council)	34
Figure 16. Penrith LGA showing NSW Landscapes boundaries.....	38
Figure 17 Penrith LGA showing IBRA sub-regional boundaries	39
Figure 18. Areas currently identified as valuable for Scenic and Landscape reasons (Source: Council's DCP)	42
Figure 19: Bushfire Risk for Penrith's rural lands	43
Figure 20: Identified Flood Areas - Hawkesbury-Nepean Valley Flood Risk Management Strategy 2017.....	44
Figure 21: Flood evacuation routes Hawkesbury-Nepean Valley Flood Risk Management Strategy 2017	45
Figure 22 Vulnerability to heatwaves (Source Western City District Plan)	45
Figure 23 Population of Penrith's rural lands	60
Figure 24 Population growth in Penrith's rural lands.....	60
Figure 25 Dwelling growth in Penrith's rural lands	60
Figure 26 Dwelling vacancy in Penrith's rural lands.....	60
Figure 27 Housing types (based on 2016 ABS data accessed via idProfile).....	71
Figure 28: Proportion of persons over 50 years of age in Penrith's rural areas.....	72
Figure 29 Existing Major Roads	74
Figure 30: Existing waste management facilities	75
Figure 31: Reticulated water in Penrith's rural lands.....	76
Figure 32: Location of community and recreation facilities	79
Figure 33: Recommended framework for preparing place-based intent statements	82

TABLES

Table 1: Soil mapping relevant to rural areas.....	29
Table 2. Summary of MNES within Penrith LGA.....	37
Table 3. Economic value of agricultural commodities in Penrith 2015/2016 (Source: ABS 2018a, ABS 2018b).....	46
Table 4. Mining & quarrying permissibility under the Mining SEPP and Penrith LEP 2010.....	53
Table 5. Tourism experiences and accommodation in rural areas of Penrith (Source: The Stafford Group & Penrith City Council 2015, high level internet search).....	54
Table 6. Permissibility of short-term accommodation under the Penrith LEP 2010.....	56
Table 7. Cultural and linguistic diversity of residents living in rural areas, Penrith LGA, 2016 (id. the population experts 2018).....	63
Table 8 Community facilities within character precincts and places.....	81

EXECUTIVE SUMMARY

The rural lands of Penrith are an important part of the City and the wider Western City District. Penrith's rural lands bring together agricultural activities, scenic rural landscapes, native vegetation, biodiversity corridors and rural lifestyle areas.

The draft Penrith Rural Lands and Villages Study identifies needs, guiding principles and strategic directions for the future growth and management of Penrith's rural areas. It has been prepared using a place and evidence-based approach to analyse and understand the current environmental, social and economic issues and needs to establish future directions for a sustainable and prosperous future for Penrith's rural areas. It is recognised that there are numerous and often interrelated issues, opportunities and needs for any local government at any point in time. This Study aims to identify high priority issues to provide a focus for addressing issues of critical importance and impact.

This Study is the first step in identifying needs and guiding principles for the future growth and management of Penrith's rural areas. The recommendations of this Study will input into the Rural Land and Villages Strategy being prepared by Council. This Study describes the desired future outcomes for Penrith's rural lands, provides statements of character and significance that can be used as a basis for long-term planning, plan-making and development assessment purposes. The study will inform Council's Local Strategic Planning Statement and a broader review of the Local Environmental Plan and Development Control Plan, which is a key step in the implementation of the NSW Department of Planning and Environment's Western City District Plan.

A key priority is to protect Penrith's rural landscapes and activities. Extensive open space areas, the backdrop of the Blue Mountains escarpment and access to fresh local food and farm produce are key values held by local communities. The agricultural activities and use of rural lands make a valuable contribution to the economy of the Western City District, through employment, tourism and agricultural production. Penrith City Council is cognisant of the opportunity to build on these strengths in guiding the future of Penrith's rural areas.

Rural Penrith is at the threshold of significant generational change, which is being driven by a number of major infrastructure and land use initiatives associated with the future Western Sydney Airport and the Aerotropolis as well as associated urban growth, employment and agribusiness

opportunities and transport improvements. These emerging opportunities will significantly influence how Penrith's urban and rural lands are used. With the majority of rural lands in the south eastern areas of the Penrith LGA earmarked for transition towards urban (residential and employment) uses, there will be a need to ensure sufficient capacity in Penrith's agricultural lands to accommodate displaced agricultural uses as well as emerging employment and agribusiness opportunities including intensive agriculture and food production.

As delivery of the NSW Government's vision for the Western City District gathers pace, Penrith's rural lands will face numerous challenges, requiring careful consideration and management of land use transition, as well as the protection and enhancement of the agricultural, scenic, cultural and biodiversity values that define Penrith's unique character. Part of managing transition will be to identify what values are worthy of protection and finding effective ways of preserving these values through sequential planning, development and decision-making processes.

This Rural Lands and Villages Study considers the existing evidence base and provides directions to respond to these challenges. It aims to build on existing strengths and to protect the unique scenic and biodiversity values of Penrith's rural lands. To achieve this, the study takes a place-based approach to consider relevant circumstances and issues facing the unique character areas of Penrith's rural lands and enable strategic directions to be tailored to meet the specific needs of each localised area and the villages and places within them.



PART A: OVERVIEW

1. INTRODUCTION

The rural lands of Penrith are an important part of the city and the wider Western City District, providing social, economic, scenic, recreational and environmental benefits to the community.

While there is no commonly accepted definition of 'rural' for the purposes of planning, it is generally accepted that rural areas have smaller population sizes and lower development densities (e.g. larger lots and greater separation between buildings) when compared to their urban counterparts.

Preserving land to protect rural values, and balancing outcomes within rural areas relies on an integrated approach employing land use planning instruments (e.g. land zoning and subdivision controls through Council's LEP) as well as measures to conserve and manage land and water, which can be applied through Council's DCP or other supporting mechanisms.

This Report presents the findings and recommendations of the Penrith Rural Lands and Villages Study (this Study), which aims to define and describe the rural areas within the Penrith Local Government Area (LGA).

This Study draws on existing information to consider current environmental, social and economic issues in relation to rural areas across the LGA. It was undertaken in conjunction with the Penrith Scenic and Cultural Landscapes Study (2019), which specifically considers scenic and visual impacts relevant to the LGA.

The purpose of this Study and the Penrith Scenic and Cultural Landscapes Study is to provide a contemporary understanding of the planning considerations relevant to rural areas within the LGA. Collectively, these studies respond to strategic planning requirements in the implementation of Sydney Metropolitan Planning program, including directions specified in the Western City District Plan.

The combined findings and recommendations of this Study and the Penrith Scenic and Cultural Landscapes Study will inform the preparation of the Penrith Rural Lands and Villages Strategy (hereafter, the Rural Strategy), which will be the basis for long term planning and plan-making. These studies may also inform other strategic planning initiatives undertaken by Penrith City Council (Council), or other State and Regional bodies tasked with land use planning and development assessment in the LGA.

1.1. Background

The rural lands of Penrith have long been recognised as an important resource for the LGA and the wider Sydney metropolitan region, noting Council's longstanding vision is one of a:

*Sustainable and prosperous region with harmony of urban and **rural** qualities with a strong commitment to environmental protection and enhancement.*

*It would offer both the cosmopolitan and cultural lifestyles of a mature city and the casual character of a **rural** community.*

Council last broadly reviewed considerations and planning controls for its rural areas over 10 years ago, including through the preparation of the Penrith Rural Lands Strategy (adopted in 2003) and Penrith Landscape Character Strategy (adopted in 2006). The directions of these strategies formed the basis for the preparation of Council's current Local Environmental Plan (LEP), which came into force in 2010.

In recent years, Penrith's rural areas have experienced pressures arising from demands for urban expansion, changes in rural lifestyle preferences, and changes in rural industries and land management practices. The LGA has also been identified as the preferred location for considerable metropolitan-level growth, with proposed land use changes outlined in the Greater Sydney Region Plan - A Metropolis of Three Cities (2018) and described in more detail in the Western City District Plan (2018).

The broadscale consequence of these proposals has seen a major shift in the Metropolitan Rural Area (MRA) boundary in the context of the Penrith LGA. This will result in significant land use changes within and adjoining the LGA's rural areas. Some areas that are characteristically rural today, are proposed to be characteristically urban within the next decade. These broadscale changes are expected to affect rural areas and communities throughout the LGA.

1.2. Objective

The objective of this Study is to identify and analyse the strategic and legislative context and the values and issues affecting Penrith's rural areas. The Study is intended to provide an 'evidence base' for informing and guiding the direction of subsequent planning.

Specially, this Study aims to support the goals set out in the Penrith City Strategy (2013) to:

1. Protect the City's agreed urban and rural boundaries;
2. Protect and enhance the City's rural landscapes, natural areas and character;
3. Promote diverse agricultural opportunities in the City's rural areas, support existing rural activities and encourage new rural enterprises;
4. Ensure rural and agricultural activities play a key part in the City's economic development; and
5. Ensure rural communities are healthy and aware of available community services.

1.3. Approach

This Study establishes a comprehensive evidence base for a place-based approach to considering thematic issues. This will guide the formulation of strategic directions for planning and plan-making in rural areas.

1.3.1. Background research, review and investigations

This Study is underpinned by research and investigations that considered the current situation and likely future influences affecting the ongoing use of Penrith's rural lands. This included:

- Review of reference documents and preceding studies to understand the intent and effectiveness of existing planning controls;
- Review of current documents describing the future intentions of land use and development in rural areas to consider future opportunities and challenges; and
- Site inspections, carried out over 2 days, to better understand the landscape, use of land, visual and cultural values and to identify wider opportunities and constraints.

1.3.2. Consultation with key stakeholders

Information presented in this Report was informed by consultation with stakeholders to identify and further explore key issues relevant to planning and plan-making in rural areas. Key interactions included:

- Council ‘in-house’ days, (21 and 31 January 2019) involving Council staff across several service areas to discuss the following themes:
 - Development Assessment
 - Place Management
 - Scenic and Cultural Landscapes
 - Economic Development and Tourism
 - Infrastructure and Development Engineering
 - Emergency Management
 - Housing Strategy
 - Environment
 - Community and Cultural Development
 - Flooding
 - Waste Management
- Meeting with the Deerubbin Local Aboriginal Land Council (DLALC) (18 February 2019), as one of the largest landowners in the LGA, to discuss strategic planning matters relating to their landholdings.
- Councillor Briefing (18 February 2019) where the ‘place-based framework’ was presented and feedback was provided.
- An interdepartmental workshop with Council staff (14 March 2019) to gain feedback on initial findings and overarching strategic principles.

The outcomes of these discussions assisted in shaping the focus areas of this Study and to confirm critical issues and needs for Penrith’s rural areas.

1.4. Structure of this Report

This report has been structured as follows:

- **PART A: Introduction and methodology** – setting a precinct and place basis for investigations, evidence base and recommendations;
- **PART B: Planning and Development Factors** – thematically describing the findings of the Study investigations to form an evidence base for future planning; and
- **PART C: Place-Based Considerations** – consolidating the thematic considerations to describe the recommended planning outcomes for localised areas.
- **PART D: Conclusion** – setting a basis for preparing a Rural Strategy based on the findings of this Study and the associated Penrith Scenic and Cultural Landscapes Study.

2. PLACE BASED APPROACH

A place-based approach to planning provides a tangible understanding of the environmental, socio-cultural and economic influences that are relevant to an area. This assists with the long-term planning process by allowing broadscale or thematic constraints and opportunities to be considered in the context of an area's unique characteristics. It relies on establishing a common understanding of an area's unifying characteristics.

In practice across NSW, a place-based approach has typically been reflected at the local level through some (but not all) Development Control Plans. The Penrith Development Control Plan currently makes provisions for 'rural character' broadly across the whole of the LGA. This tends to relate only to visual qualities and is not articulated for any individual place. Council's LEP provides mapped controls to protect scenic character and landscape values, and vistas to heritage items, with mapping relating largely to characteristically rural areas, as shown in Figure 1. These controls are not strongly supported by statements of the characteristics in need of protection, which has proven to be a shortcoming in the assessment of development proposals.

The NSW Government is working to enhance controls available to protect local character by supporting place-based planning in several ways. This approach is reflected in the sequential structure of long-term plans for the Sydney Metropolitan area, with the Greater Sydney Region Plan being supported by a series of District Plans. More recently, the NSW Government released a Local Character planning circular (PS18-001), supported by an interim Local Character and Place Guideline. A discussion paper considering the introduction of a Local Character Overlay as a Standard Instrument provision highlights the intention to unify the strategic planning approach and strengthen these controls.

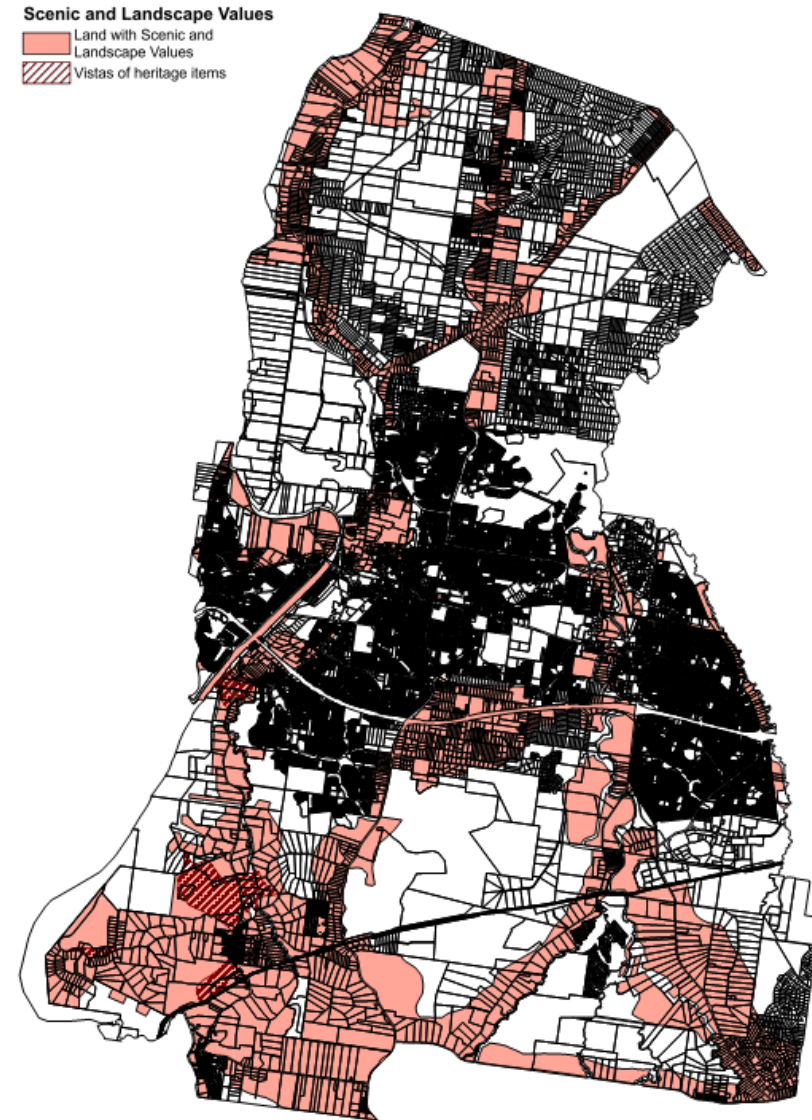


Figure 1: Current mapped LEP controls to protect character in Penrith

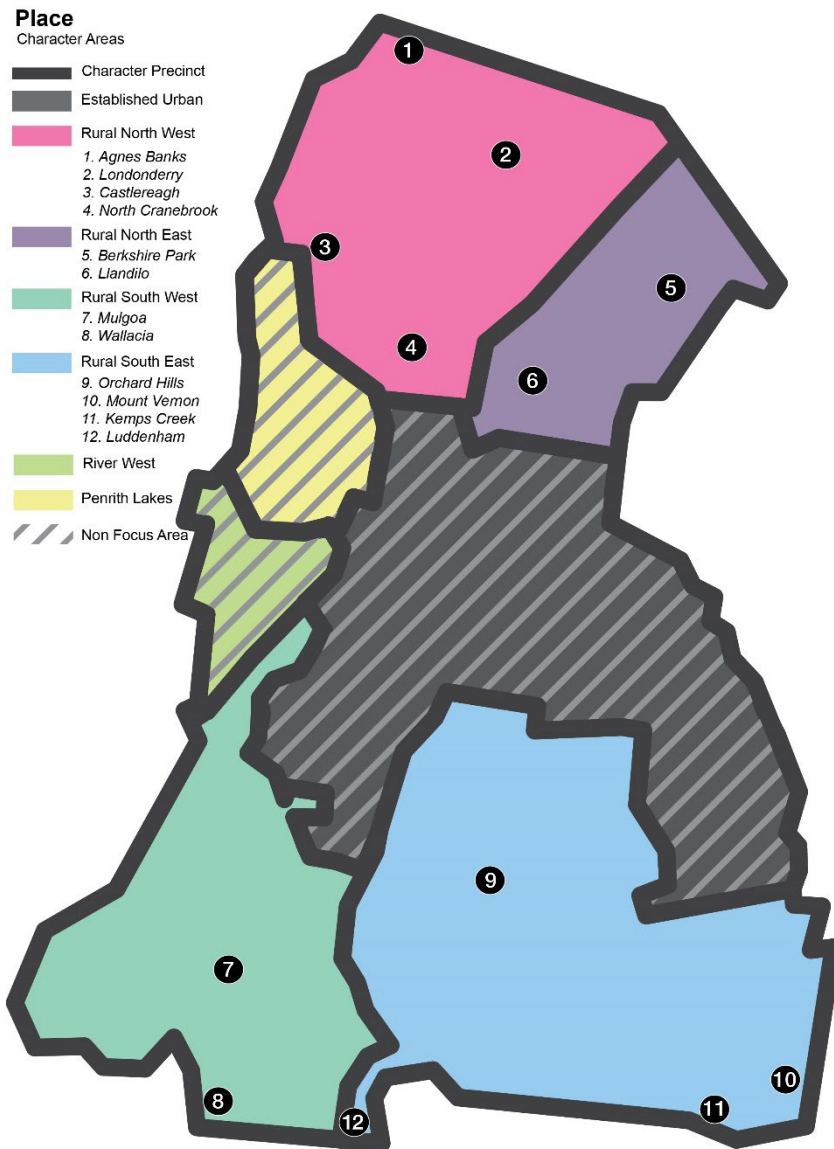


Figure 2: Recommended place-based framework for Penrith

This Study establishes a place-based framework that can be used to underpin the Rural Strategy as a basis for long-term planning, in line with what is emerging as common practice in NSW. The culmination of this is illustrated in Figure 2.

The recommended place-based framework defines a series of 'Precincts', covering the whole of the Penrith LGA. Each Precinct is distinguished by its unique land use, environmental, topographical and scenic characteristics.

This Study focused predominantly on establishing a common understanding and evidence base for those four Precincts that are most characteristically rural. However, it is worth noting that other precincts may contain some pockets of rural characteristics. These typically relate to land where development is heavily constrained by environmental or other locational factors such as flooding, biodiversity conservation, or mining and quarrying, including buffers to these areas. This is particularly relevant in the northern parts of the River West Precinct, where the extent of flood liability and co-location of several uses, including a quarry and correctional facility, preclude any substantial urban development.

The established urban parts of Penrith and the Penrith Lakes Precinct were specifically excluded from this Study.

Each of the rural Precincts contains one or more localised areas, referred to as 'Places', that were the focus of more detailed investigation and site-based assessments as part of this Study. These Places typically reflect the rural villages and centres that people are familiar with, which attract a higher-level of social or economic activity, and which have historically formed the basis for planning.

It is recommended that this place-based framework is applied to develop 'statements of intent' for planning relevant to each of the Rural Precincts and the Places they contain, as a supporting document to the Rural Strategy. Draft statements could be prepared to bring together the findings of this Study's research, which would begin to describe the current characteristics and changes expected to occur within each area. It is recommended these are used as a basis for working with local communities to finalise, and to use them as a basis for informing future strategic planning and development assessment.

PART B: PLANNING AND DEVELOPMENT FACTORS

This Part outlines the strategic planning 'factors' that will influence decision-making around land use and development outcomes in Penrith's rural lands in the coming years. They generally relate to:

- Implementing policy-driven change associated with metropolitan or local-level planning initiatives;
- Protecting valuable natural features and resources located within rural areas;
- Facilitating rural enterprises and other non-residential uses that rely on rural lands;
- Addressing the needs of rural communities; and
- Providing the infrastructure required to service both rural and urban areas.

The factors discussed in this Part were identified through research and engagement. They are expected to be the main drivers for change occurring within Penrith's rural areas.

The factors presented in this Part are not intended to be exhaustive, noting that there may be other existing or emerging factors that will warrant consideration when reviewing and updating planning controls. Instead, the focus of this section is on the major influences expected to lead to transformational outcomes within Penrith's rural areas.

3. PLANNING POLICY-DRIVEN INFLUENCES

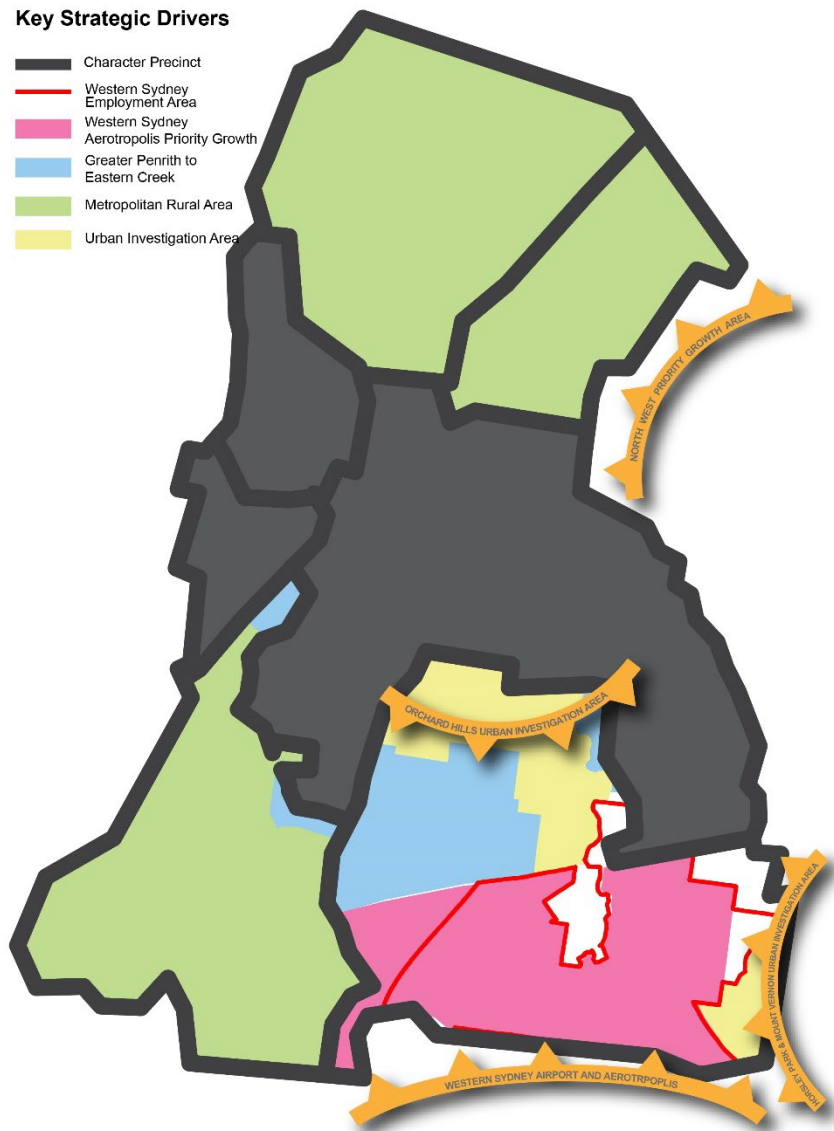


Figure 3: Metropolitan-level growth influencing change in Penrith’s rural areas

Initiatives to implement long-term planning policy objectives will lead to transformational change within Penrith’s rural areas. These predominantly include actions being undertaken to achieve outcomes described:

At the Metropolitan level in:

- The Greater Sydney Region Plan - A Metropolis of Three Cities prepared by the Greater Sydney Commission (GSC) and adopted by the NSW Government in 2018; and
- The Western City District Plan (2018) which provides more localised detail and sets a vision for the emerging Western Parkland City.

At the LGA level in:

- The Penrith Community Plan adopted by Council in 2017, outlining broad strategies to guide Penrith’s future and build its resilience over a 20-year period; and
- The Penrith City Strategy adopted by Council in 2013, which pre-dates metropolitan-level planning, but is the most up-to-date description of Council’s long-term intention for land use and development.

Collectively, these documents seek to balance social, economic and environmental considerations through the application of land use planning and development assessment frameworks. They each rely on or are otherwise associated with a range of initiatives that are already underway or are expected to be undertaken to support decision-making. These may include anything from broadscale policy-related research and environmental assessments to the preparation of site-specific studies, strategies or plans.

The major policy-driven planning initiatives influencing growth and change in Penrith’s rural areas are shown in Figure 3.

3.1. Broad visions for Penrith

3.1.1 Greater Sydney Region and Western City District

The *Greater Sydney Region Plan - A Metropolis of Three Cities* was prepared by the Greater Sydney Commission (GSC) and was adopted by the NSW Government in 2018. It is a 20-year plan to manage growth and change and is built on a 40-year vision where the people of Greater Sydney live within 30 minutes of their jobs, education and health facilities, services and great places. This vision is consistent with 10 key Directions as follows:

- A city supported by infrastructure.
- A collaborative city.
- A city for people.
- Housing the city.
- A city of great places.
- A well-connected city.
- Jobs and skills for the city.
- A city in its landscape.
- An efficient city.
- A resilient city

Within the *Greater Sydney Region Plan* these Directions are presented via the three cities concept, with the cities being the Western Parkland City, Central River City and Eastern Harbour City. District Plans have been developed to support the three cities concept at a sub-regional level. Penrith LGA is located within the Western City District which supports the Western Parkland City.

The *Greater Sydney Region Plan* includes objectives and strategies to protect scenic and cultural landscapes, and to protect and enhance the environmental, social and economic values of the 'Metropolitan Rural Area' (MRA). The Plan also recognises maintaining and enhancing the distinctive character of each rural village within the MRA as a high priority.

The *Western City District Plan* sets out a 20-year vision for the emerging Western Parkland City. The District Plan contains a range of planning priorities and actions, which are to be implemented by Council through the development of a local strategic planning statement, updates to the LEP and DCP, and the assessment of planning proposals. The District Plan aims to establish the Western Parkland City as a 'City in its Landscape'. Penrith already has recognisable scenic, parkland and biodiversity strengths to support the Region Plan's objectives for:

- The coast and waterways are protected and healthier
- A cool and green parkland city in the South Creek corridor
- Biodiversity is protected, urban bushland and remnant vegetation is enhanced
- Scenic and cultural landscapes are protected
- Values in rural areas are protected and enhanced
- Urban tree canopy cover is increased
- Public open space is accessible, protected and enhanced
- The green grid links parks, open spaces, bushland and walking and cycling paths

The District Plan reflects recent announcements by the NSW State and Federal Governments that are game-changing catalysts for development and transformational change within Penrith.

This Study considered the following Planning Priorities as a basis for identifying likely future change as well as future needs and guiding directions for Penrith's rural areas.

Planning Priority W8 - Leveraging industry opportunities from the Western Sydney Airport and Badgerys Creek Aerotropolis

This gives effect to Greater Sydney Plan:

- Objective 20: Western Sydney Airport and Badgerys Creek Aerotropolis are economic catalysts for Western Parkland City.
- Objective 24: Economic sectors are targeted for success.

It is underpinned by:

- Action 35: Protect and support agricultural production and mineral resources (in particular, construction materials) by preventing inappropriately dispersed urban activities in rural areas.
- Action 38: Create capacity for tourist accommodation in appropriate locations through local environmental plans.

Planning Priority W14 - Protecting and enhancing bushland and biodiversity

This gives effect to Greater Sydney Plan:

- Objective 27: Biodiversity is protected, urban bushland and remnant vegetation is enhanced.

It is underpinned by:

- Action 72: Protect and enhance biodiversity by supporting landscape-scale biodiversity conservation and the restoration of bushland corridors.

Planning Priority W16 - Protecting and enhancing scenic and cultural landscapes

This gives effect to Greater Sydney Plan:

- Objective 28: Scenic and cultural landscapes are protected.

It is underpinned by:

- Action 76: Identify and protect ridgelines, scenic and cultural landscapes, specifically the Scenic Hills, Mulgoa Valley and the escarpments of the Blue Mountains.

Planning Priority W17 Better managing rural areas

This gives effect to Greater Sydney Plan:

- Objective 29: Environmental, social and economic values in rural areas are protected and enhanced.

It is underpinned by:

- Action 78: Maintain or enhance the values of the Metropolitan Rural Area using place-based planning to deliver targeted environmental, social and economic outcomes.
- Action 79: Limit urban development to within the Urban Area, except for the investigation areas at Horsley Park, Orchard Hills, and east of The Northern Road, Luddenham.

Planning Priority W20 - Adapting to the impacts of urban and natural hazards and climate change

This gives effect to Greater Sydney Plan:

- Objective 36 People and places adapt to climate change and future shocks and stresses.
- Objective 37 Exposure to natural and urban hazards is reduced.
- Objective 38 Heatwaves and extreme heat are managed.

It is underpinned by:

- Action 88: Avoid locating new urban development in areas exposed to natural and urban hazards and consider options to limit the intensification of development in existing urban areas most exposed to hazards.
- Action 90: Respond to the direction for managing flood risk in the Hawkesbury-Nepean Valley as set out in Resilient Valley, Resilient Communities – Hawkesbury-Nepean Valley Flood Risk Management Strategy.

3.1.2 Penrith's Role in the Western City District

Penrith is one of eight LGA's that form the Western City District. Each LGA has its own unique characteristics, opportunities, and role to play in delivering the 20-year vision for the emerging Western Parkland City. Penrith LGA's focus will be to expand on our economic strengths and deliver new employment, transport and housing opportunities to benefit the broader Western City District.

Specifically, Penrith LGA's role within the Western City District is described below.

With an economic catchment of over 1.5 million people and the northern gateway to an international airport, Penrith is a central hub for many including western NSW, and connecting the north west and south west growth centres, as well as Blacktown, Liverpool and Wollondilly.

We are uniquely positioned to serve our economic catchment being at the centre of the north-south and east-west economic corridors, our economic strengths in health, education and retail provide jobs and services for those near and far, mostly through our growing centres in Greater Penrith, St Marys and our specialised health and education precinct 'The Quarter'.

As our economy evolves and matures, this presents new opportunities to leverage new investment off the Western Sydney Airport in agribusiness, manufacturing, freight and logistics providing new and diverse jobs for our district. New transport connections will deliver faster and more accessible connections for passengers, visitors and businesses, unlocking further opportunities for the creation of new places and neighbourhoods to live, work and play.

Penrith has strong links to our neighbours, connecting with the arts, culture, and tourism opportunities. Nestled between the rural landscape and heritage of Hawkesbury and the green backdrop of the Blue Mountains, we are an international tourism destination in our own right. We are the adventure capital of NSW, host major recreation events, and are the accommodation base for visitors.

Building on our diverse housing options, future rail-based opportunities will expand our range of living and lifestyle opportunities for people of all ages and cultures. Protecting our heritage and local character, our new communities will be built on the principles of sustainability and innovation. By doing things differently, Penrith will be a leader in dealing with challenges including cooling our city and managing flood risk.

Our rivers and creeks are a defining feature and contribute to our celebrated natural assets. The protection of these values and the health of our ecosystems will need to be carefully maintained and enhanced as we manage and balance our districts growth.

3.1.3 Penrith Community Plan

In developing the Penrith Community Plan (2017), Council drew heavily on community inputs to establish strategies that will guide Penrith's future and build its resilience over a 20-year period. The community's vision was for a sustainable and prosperous Regional City with a harmony of urban and rural qualities.

The strategies described in Penrith Community Plan are underpinned by the following 7 aspirational outcomes, which have been recognised in undertaking this Study.

Working close to home

- Attract investment to grow the economy and increase the range of businesses operating in the region.

Planning for Future Growth

- Facilitate development in the City that considers the current and future needs of our community.
- Protect the City's natural areas, heritage and character.
- Ensure services, facilities and infrastructure meet the changing needs of our City.

Getting around the city

- Work with partners to improve public transport.
- Provide a safe and efficient road and pathway network.
- Improve passenger and freight transport connections in the region.

Safe, vibrant places

- Work with our communities to improve wellbeing and infrastructure in their neighbourhoods.

Caring for the environment

- Protect and improve the environment of our City.
- Minimise risks to our community from natural disasters and a changing climate.

Healthy and sharing strong community spirit

- Provide opportunities for our community to be healthy and active.
- Help build resilient, inclusive communities.
- Enhance the cultural vitality of the City.

Confidence in Council

- Give our community the chance to have a say in decisions that affect them.
- Invest in our people.

3.1.4 Penrith City Strategy

The Penrith City Strategy seeks to build a sustainable future for Penrith and outlines how Council will respond to key issues over the next 10-20 years. The Penrith City Strategy examines the long-term issues facing Penrith and its community and provides directions for the City's future over a 20-year period. It outlines objectives, strategies and actions to build a sustainable future for Penrith and the future of its community. The Strategy is structured on the following themes:

- Housing
- Jobs and Economy
- Transport and Access
- Infrastructure Delivery
- Community Wellbeing
- Environment
- Places

While the Penrith City Strategy pre-dates the Greater Sydney Region Plan - A Metropolis of Three Cities and Western City District Plan, it remains reflective of Council's long-term aspirations. The following policy responses have been considered within the context of State and Metropolitan-level planning.

Protect the scenic and natural landscape values and the productive capacity of the City's rural lands as well as contribute to the wellbeing of rural communities.

Council aims to achieve this via the following goals:

- Protect the City's agreed urban and rural boundaries.
- Protect and enhance the City's rural landscapes, natural areas and character.
- Promote diverse agricultural opportunities in the City's rural areas, support existing rural activities and encourage new rural enterprises.
- Ensure rural and agricultural activities play a key part in the City's economic development.
- Ensure rural communities are healthy and aware of available community services.

Protect the native biological diversity of the City.

Council aims to achieve this via the following goals:

- Protect and improve priority conservation areas and flora and fauna corridors.
- Retain and manage native vegetation by landowners

Support Penrith's communities in responding to natural hazards; protect assets and infrastructure in a changing climate; and manage flood prone land effectively to minimise risk to people and property.

Council aims to achieve these via the following goals:

- Minimise risks to our communities of bushfires, heatwaves, flooding and storm events.
 - Reduce impact of flooding through implementation of appropriate development and building controls, flood mitigation works and other measures detailed in a Floodplain Risk Management Plan.
 - Manage human occupation and use of the flood plain via strategies underpinned by risk management principles.
 - Ensure flood compatible uses are not unreasonably restricted, as flood prone lands are an important resource for the City.
-

3.2. Metropolitan Rural Area

The Greater Sydney Region Plan acknowledges the Metropolitan Rural Area (MRA) is of specific importance for poultry, eggs, vegetables including mushrooms, nurseries, cultivated turf and cut flowers, all of which are notable strengths of Penrith's rural lands. The Plan seeks to retain as well as increase opportunities for agricultural and horticultural uses to keep fresh foods available locally.

The westward expansion of the Sydney metropolitan area as well as the expansion of Penrith's urban areas has resulted in adjustments to the MRA boundary in and around the Penrith LGA. These are broadly illustrated in Figure 3, and are expected to see:

- Within Penrith's Rural North East, affirmation of the MRA boundary to align with the LGA's boundary as new urban areas emerge within the North West Growth Area; and
- Within Penrith's Rural South East, substantive encroachment of urban development into what are currently rural lands within the LGA, mostly associated with the Western Sydney Aerotropolis, Greater Penrith to Eastern Creek Growth Area, and Western Sydney Employment Area, all of which converge in this Precinct.

North West Growth Area: The North West Growth Area includes the suburbs of Riverstone, Vineyard, Schofields, Marsden Park and Colebee. It is part of a major strategic land release area that extends from St Marys east into Blacktown. It includes the majority of the North West Growth Area around Marsden Park as well as Richmond and Windsor. This will result in the urbanisation of land to the north east of the Penrith LGA to accommodate new housing and employment.

Greater Penrith to Eastern Creek Growth Area: A growth area that will consider opportunities for new land release areas for suitable sites in the Penrith local government area, including Orchard Hills.

Western Sydney Aerotropolis: A significant area of land in the Rural South East Precinct identified to accommodate employment uses in Luddenham, Badgerys Creek and Kemps Creek associated with the Western Sydney Growth Area and Aerotropolis. A significant portion of this land is located in the Western Sydney Employment Area. This area will seek to create new employment opportunities that build on existing agricultural strengths such as intensive agricultural production.

Western Sydney Employment Area: The Western Sydney Employment Area (WSEA) will become one of Western Sydney's major employment areas. It is evident that the Rural South East Precinct will experience significant transition over coming years to accommodate new employment uses. This will result in displacement of existing agricultural uses, emergence of new industries, a reduction in the MRA and increased demand for remaining agricultural land.

Urban Investigation Areas: Potential future urban areas identified due to their proximity to existing urban areas, Western Sydney Airport and committed transport initiatives and include the following:

- Orchard Hills, north of the Defence Establishment Orchard Hills and west of St Clair
- East of The Northern Road at Luddenham between the Western Sydney Airport Growth Area and the water pipeline.
- Horsley Park and Mount Vernon, east of Mamre Road.

It is anticipated that these areas will transition from rural to urban (residential) uses over time, subject to future investigation and planning processes.

While planning for most of these transitional areas has yet to be resolved in specific detail, the NSW Government has set a clear framework for significant change to occur and for rural land uses to transition to urban. Collectively, these changes will dramatically alter the current landscape and character of the Rural South East precinct in the coming decade and will bring new challenges and opportunities across the wider Penrith LGA.

A key implication of the pressures that will result from major strategic State Government initiatives will be the displacement of existing rural and agricultural land uses in the Rural South East precinct. This presents challenges in accommodating planned employment uses in the Rural South East in a manner that minimises land use conflict and allows for the migration of existing agricultural uses where possible as well as the continuation of essential uses and facilities such as waste management. Increased demand in rural areas outside of the Rural South East precinct will also lead to challenges in accommodating emerging businesses and agricultural opportunities associated with the Aerotropolis and Agribusiness hub.

Noting the significant scenic, and biodiversity values of the Rural South West precinct (i.e. Mulgoa and Wallacia) there is less capacity in this precinct to accommodate change. However, capacity does exist in the northern rural areas for increased agricultural productivity, which is likely to result in significant pressures on the northern rural lands to accommodate new agricultural activities in the coming years, noting that these effects will also occur on rural lands outside of the Penrith LGA. Figure 4 illustrates these pressures and expected transitions on a strategic level.

The availability of agricultural land in the Rural North West and Rural North East precincts to accommodate increased agricultural activity and the rural urban boundary are key considerations for the future of Penrith's rural lands, as well as lands outside of the Penrith LGA suitable for ongoing agricultural use. This has implications for key planning matters such as land use zoning and minimum lot sizes for Penrith's rural lands.

The impacts of major strategic drivers as well as matters of local importance in relation to identified character precincts is briefly described below for each initiative as it is currently understood.

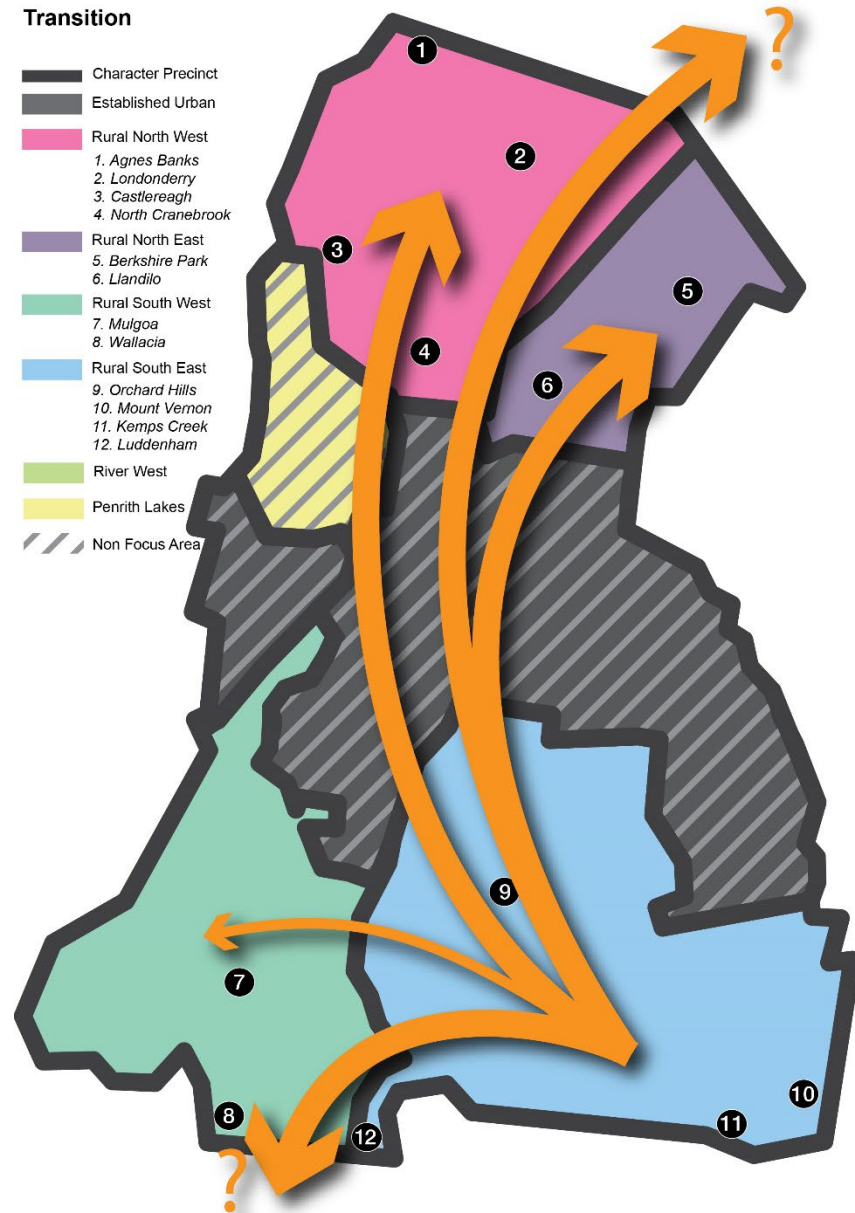


Figure 4: Displacement of rural land uses and activities is expected in the Rural South East

3.3. Western Sydney Aerotropolis

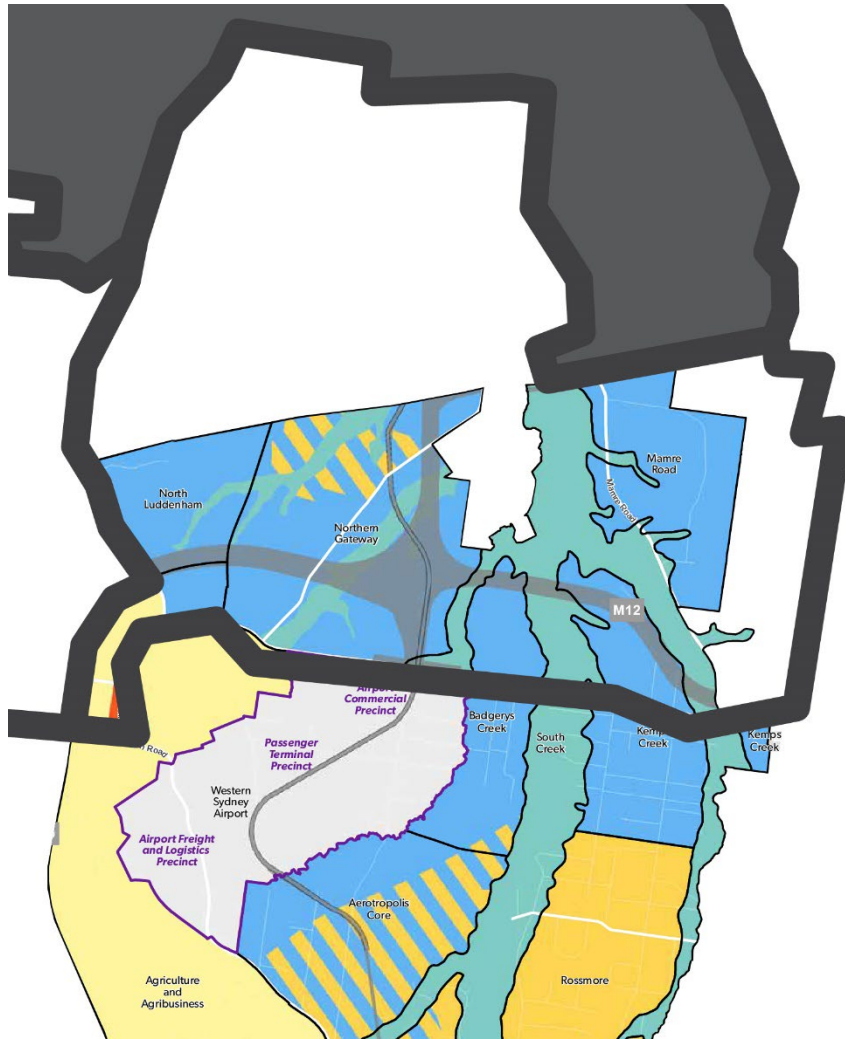


Figure 5: Proposed Western Sydney Aerotropolis

The future Western Sydney Airport will be located south of Elizabeth Drive in Badgerys Creek. It will be the focal point of the planned Western Sydney Aerotropolis. Together, these initiatives will result in significant population growth and create 200,000 new jobs in the Western Parkland City.

The structure plan for the proposed Aerotropolis is provided as Figure 5, and illustrates the initial Aerotropolis land use precincts identified to occur for the southern areas of the LGA, particularly in the Rural South East Precinct.

Figure 5 demonstrates that a significant area of land in the Rural South East precinct (i.e. land south of the Sydney Water Pipeline in Luddenham, Badgerys Creek and Kemps Creek) will form critical land use components of the Aerotropolis. These areas will provide employment-based land uses that will underpin the establishment of the Western Parkland City, support the operation of the Western Sydney Airport and associated employment and tourism-based uses, and accommodate land uses that build on the existing strengths of Penrith's rural land uses.

The DPE's *Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan Stage 1 Initial Precincts (2018)* identifies the following three initial precincts, which are located within, and adjacent, the Penrith LGA and the Rural South East Precinct identified in this Study. It is envisaged that these precincts will include education, defence/ aerospace, high technology, logistics, health services and research and development associated with food production and processing. Changes already underway include The Sydney Science Park within the Western Sydney Employment Area in the centre of the Precinct, which is a major transformation from the existing rural character to technology-based industries. This is expected to catalyse further strategic development in the locality.

Aerotropolis Core: a 24-hour, global centre for workers, residents and visitors coming to and from the Airport. A thriving after-hours economy will provide entertainment, accommodation and arts and cultural experiences within one stop of the Airport. It will have a commercial mixed-use core providing for aerospace and defence industries and other associated business uses. Higher density residential areas will enhance the centre's vitality, which will be designed to respond to noise associated with aircraft movements.

Northern Gateway: a high technology centre, focused on tourism, health, education, research and development associated with food production and processing. Intensive agribusiness uses may be considered.

South Creek: a parkland and conservation spine providing open space, amenity, biodiversity and wellbeing values.

The planned Aerotropolis will be the key factor driving the transition of the Rural South East precinct from a rural to urban context. While this transition is likely to be gradual, a key challenge will be to manage the transition of existing agricultural uses and the emergence of new agricultural industries in response to the future Aerotropolis. In the transition from rural to urban, minimising land use conflict for existing agricultural uses such as poultry and egg farms and non-agricultural uses such as waste management facilities are important considerations.

Agribusiness Hub

The Aerotropolis structure plan (Figure 5) identifies an Agribusiness precinct in the south western part of Luddenham and the western edge of the Airport. The intent for this precinct is to build on existing agricultural strengths currently undertaken in the locality and take advantage of proximity to the Airport. The DPE's *Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan Stage 1 Initial Precincts (2018)* outlines that this precinct will seek to build on existing agricultural strengths of the locality and may include:

- ongoing agricultural production such as dairying and poultry farming;
- intensive horticulture such as mushroom and tomato farming;
- food processing; and
- food research and technology.

Noting that some of these land uses are occurring in the locality at present, it is expected that some transition will occur in response to new opportunities afforded by the airport, associated transport infrastructure and evolving employment lands in the northern Aerotropolis precincts. A more intensive use of farming land and greater competition for available agricultural land can be expected in this regard.

A key component of the Agribusiness precinct will be to establish an Intensive Integrated Production Hub (IIPH). The IIPH will incorporate high technology protected cropping horticulture to produce tomatoes, capsicums, berries leafy greens, mushrooms, aquaculture, cut flowers and potentially native bush foods. Many of these commodities are already being produced in some areas of Penrith's rural lands.

An agri-port will be a key component of the IIPH and will take advantage of opportunities to export fresh foods to international markets within 24-36 hours from farm gate to the end consumer.

While the Agribusiness Hub will be focussed around Luddenham, new agricultural technologies and transport infrastructure will create opportunities to enhance agricultural productivity more broadly across Penrith's rural lands. Managing the transition of existing agricultural uses and capitalising on new agribusiness opportunities within the Aerotropolis and in other rural areas of Penrith are key considerations for future planning.

3.4. Western Sydney Employment Area

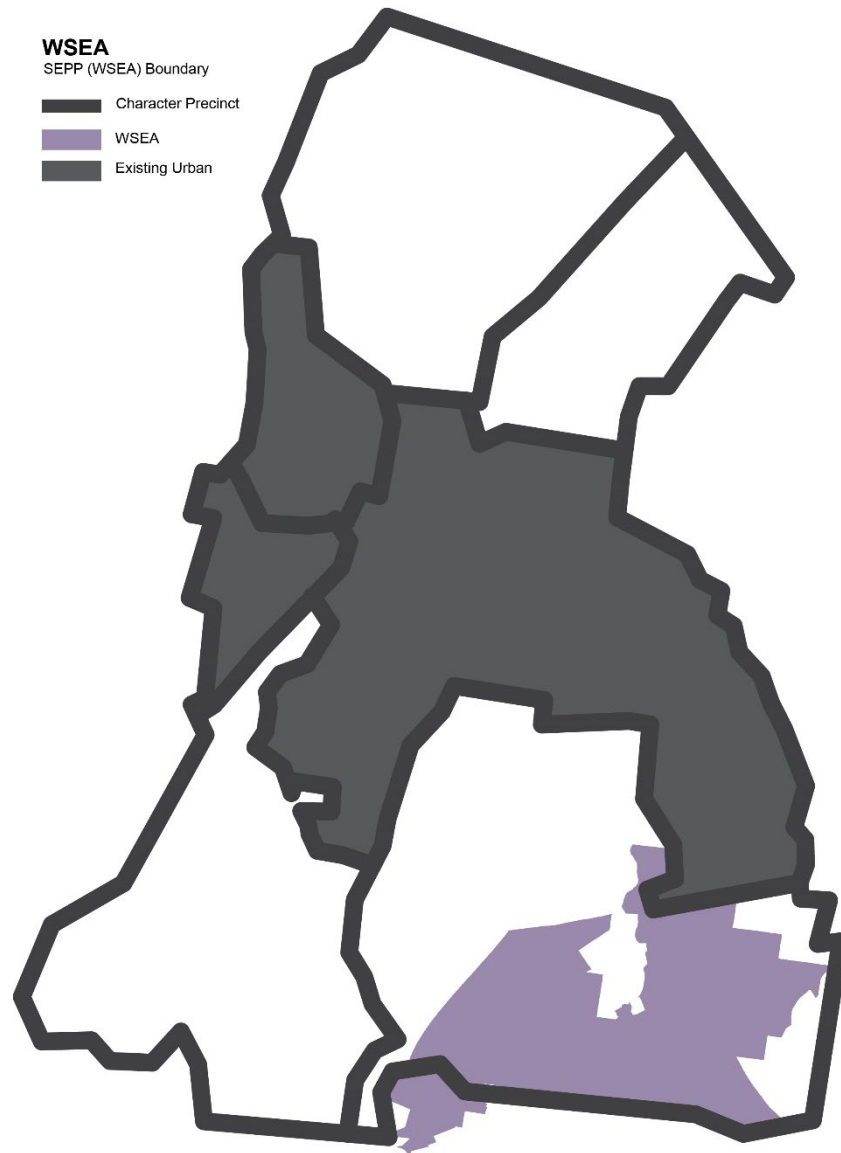


Figure 6 Western Sydney Employment Area

The WSEA, as shown in Figure 6, will become one of Western Sydney's major employment areas, with development in this area guided by State Environmental Planning Policy (WSEA) 2009.

For the majority of WSEA land within the Penrith LGA, the Western Sydney Aerotropolis Stage 1 Land Use and Infrastructure Implementation Plan will guide planning and development as described in Section 3.3.

3.5. Major transport network improvements

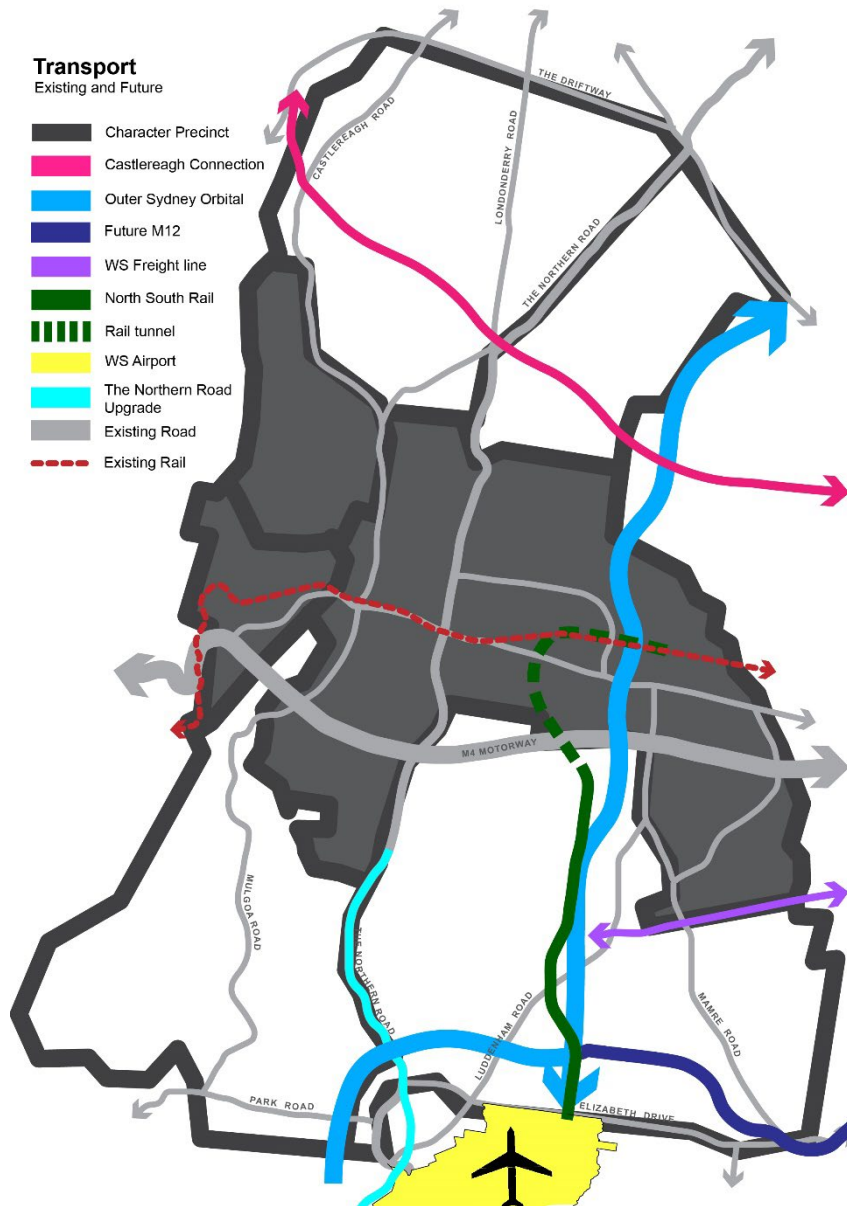


Figure 7 Proposed transport connections

The Western Sydney Airport and Aerotropolis will be supported by major investment in roads, passenger and freight rail. The NSW Government has identified and will protect the corridors of land needed to deliver major transport infrastructure critical to the growth of Western Sydney. These transport corridors are shown in Figure 7.

The proposed Outer Sydney Orbital corridor will provide for future motorway and freight rail connection between Box Hill in the north and the Hume Motorway near Menangle in the south. It will connect to the M4 Motorway, the Western Sydney Airport and the proposed Western Sydney Freight Line.

The proposed North South Rail Link will connect with the T1 Western Line at Werrington and St Marys and potentially to the T2 (to Parramatta) and T5 (to Sydney) lines via Leppington. Rapid bus services have also been proposed to improve connection between the Aerotropolis and Penrith. Upgrades to The Northern Road and the future Bells Line of Road-Castlereagh Connection will significantly improve local connectivity. These connections are illustrated in Figure 7.

This investment in major transport infrastructure will improve connectivity between Penrith's rural areas and the proposed Western Sydney Airport, Aerotropolis and Agribusiness Hub as well as to the broader Sydney Region. This will have benefits for export oriented agricultural activities as well as tourism opportunities, improved safety, increased road capacity and reduced congestion and travel times.

3.6. Sydney's Green Grid

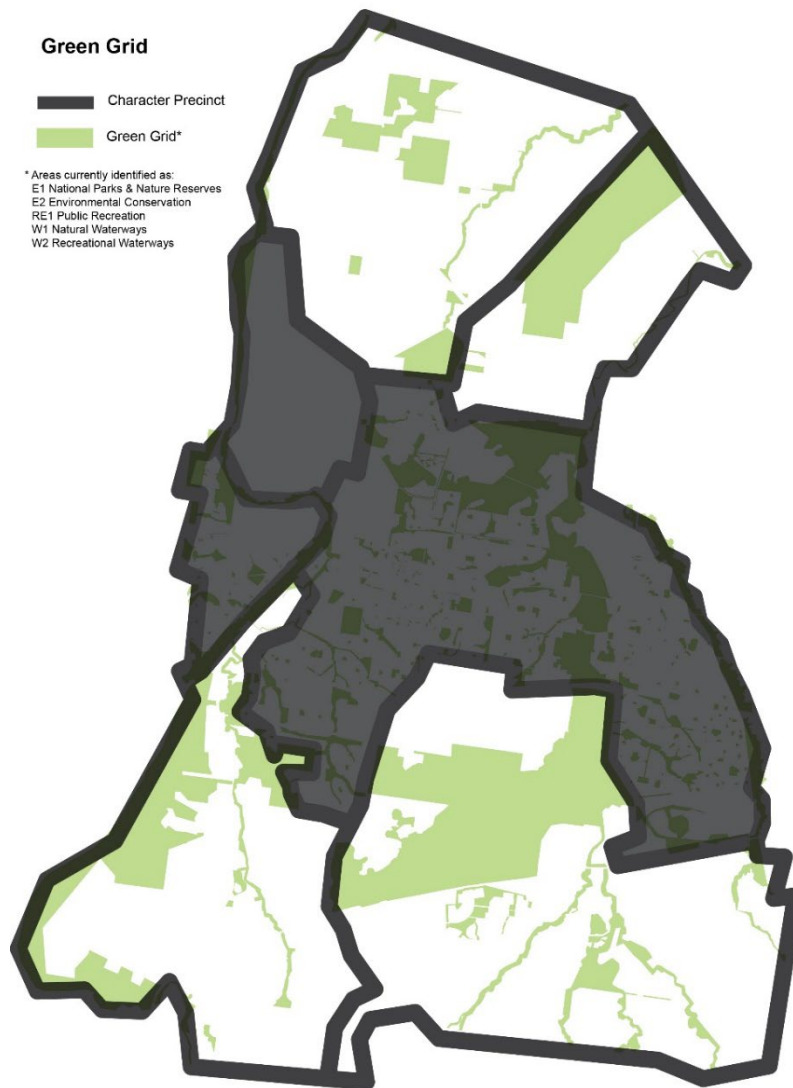


Figure 8: Land with supportive zonings, as a basis for enhancing the Green Grid

The Sydney Green Grid initiative provides a metropolitan-wide framework for creating a regional open space network. The framework is detailed in a series of reports published by the Government Architect NSW in 2017. The network deliberately coincides with, and aims to connect natural areas, and delivery projects often include measures to identify, protect and enhance biodiversity or scenic values in conjunction with opportunities to increase public access. In rural areas, the Green Grid network predominantly relies on existing public reserves, and riparian areas or large stands of vegetation on privately owned land.

The Penrith LGA plays a dominant role in the delivery of the Green Grid network for the Western District, with assets identified throughout the whole of the LGA. Figure 8 illustrates potential Green Grid opportunities identified by Council for Penrith. These lands are zoned for public recreation, conservation and waterways and form some of the more readily identifiable Green Grid opportunities. However, the opportunities represented in Figure 8 only go part of the way in identifying lands that have potential to contribute to the broader metropolitan Green Grid.

The Western City District Plan identifies several priority Green Grid corridors and other Green Grid project opportunities for the Penrith LGA. These projects will be important to the realisation of the 'Western Parkland City'.

The Priority Green Grid corridor projects for the Penrith LGA are listed below and numbered on Figure 9.

- **South Creek (1)**, to create a continuous open space corridor along the entire South Creek, with a focus on providing ecological protection and enhancement, better stormwater treatment and a regionally significant corridor for recreational uses.
- **Penrith Lakes Parklands (3)**, to establish diverse open space parklands and waterway facilities around the lakes and along the Nepean River with pedestrian and cycle links from Penrith and important links with the Great River Walk project.
- **Ropes Creek (4)**, to protect and enhance ecologically valued lands, improving water quality and stormwater runoff, and providing a diverse and connected sequence of recreational open spaces, walking and cycling trails.
- **Blaxland Creek and Bushland Reserve (6)**, to protect important future open spaces for the Western Sydney Airport Growth Area.

Other important Green Grid opportunities for the Penrith LGA identified in the District Plan are listed below and numbered on Figure 9¹.

- **Cranebrook – Windsor Nature Reserve Corridor (10)** (with Hawkesbury), which is an ongoing project to protect and enhance regionally significant ecological communities of the Wianamatta Nature Reserve, Castlereagh Nature Reserve and Windsor Downs Nature Reserve. The project involves connecting these nature reserves to improve resilience, while also improving water quality and stormwater treatment along Rickabys Creek and providing open space and links to other areas.
- **Eastern Escarpment Open Space and Trails (11)** (with Blue Mountains), to connect a series of recreational and tourist open space facilities along the escarpment to maximise unique landscape and views.
- **Nepean Creeks – Peach Tree, Mulgoa and Surveyors Creeks (15)**, to enhance and protect these assets and to increase access and recreational opportunities.
- **Shanes Park and Wianamatta Regional Park (17)** (with Blacktown), to protect important areas of regional biodiversity that also provide connections to Ropes Creek and South Creek.
- **Warragamba Pipeline Open Space Corridor (20)** (with Fairfield), to consider uses of surplus easement lands for recreational open space, urban greening and walking and cycling trails.

Green Grid outcomes are also expected to be incorporated into the delivery of major transport infrastructure projects, including (but not limited to) the M9/Outer Sydney Orbital and M12 motorways.

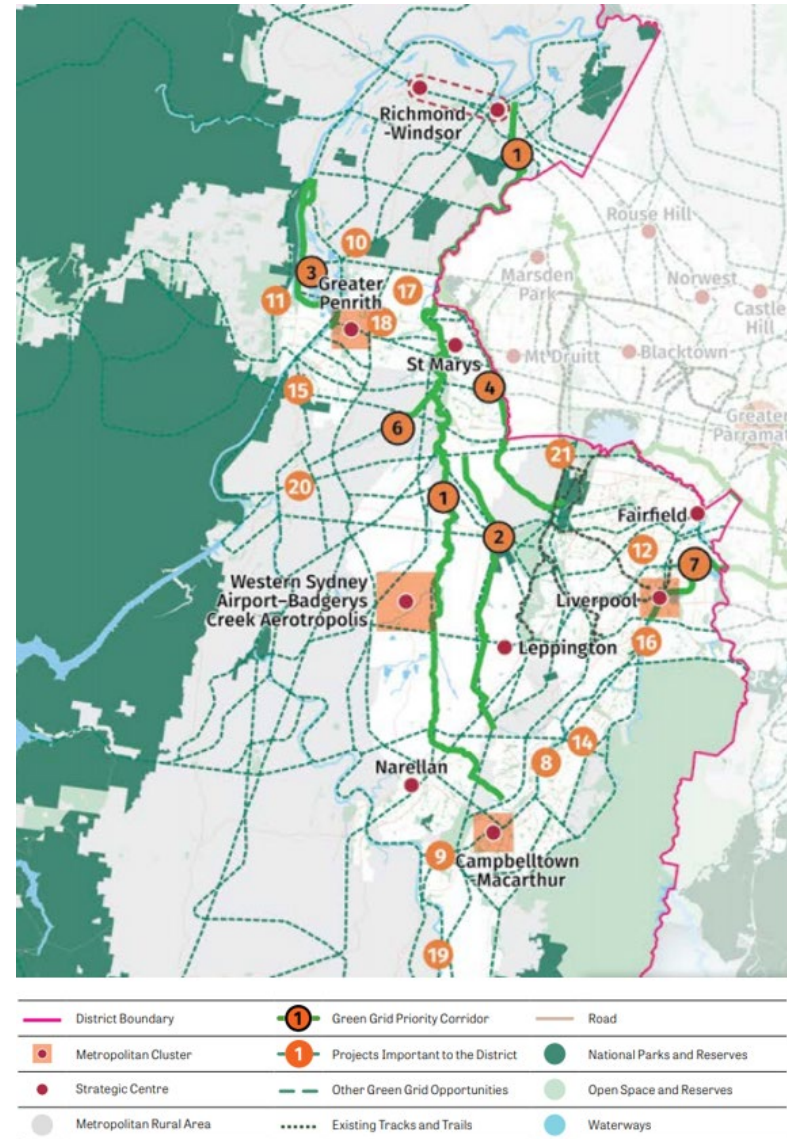


Figure 9 Penrith LGA Green Grid Opportunities

¹ Greater Sydney Commission, 2018, p. 122

4. NATURAL FEATURES AND RESOURCES

4.1. Water



Figure 10 Key watercourses in the Penrith LGA

The Penrith LGA has a water-rich environment, with the main waterways shown in Figure 10. The network of waterways flowing through the area provide numerous environmental benefits including important habitat for plants and animals. They are cultural resources, hold aesthetic values, are popular locations for recreation, and support a wide range of activities that underpin the LGA's economy, from sporting events along the Nepean River to agriculture and mining/quarrying.

Penrith's waterways form a small part of the expansive Hawkesbury-Nepean Catchment area, which is one of the largest coastal basins in NSW, covering 21,400 square kilometres. Penrith LGA makes up 405 square kilometres or 0.02% of this catchment². Penrith's waterways generally flow in a south to north direction. The Nepean River becomes the Hawkesbury River at the confluence of the Grose River at Agnes Banks, just outside the LGA border. Penrith's other smaller waterways feed into the Hawkesbury River in the City of Hawkesbury LGA to the north.

Collectively, the network of waterways in Penrith forms a localised 'blue grid' that is highly valued by the community. Waterways of State or Metropolitan level relevance are:

- The Nepean/ Hawkesbury River which is the main river of the Sydney Region. The river system begins in the Southern Highlands, near Robertson, and flows north until it reaches Penrith. All other waterways within Penrith ultimately flow into the Hawkesbury Nepean River.
- Cosgroves Creek, Kemps Creek and Ropes Creek all begin in outer suburbs in the south of Greater Sydney and converge with South Creek within the LGA, which is a defining feature of the Rural South of the LGA. These creeks are of Metropolitan significance as much of the proposed urban growth will be focused around these waterways.

Of more localised relevance are:

- Rickabys Creek, which begins inside the LGA at North Cranebrook before flowing north through Londonderry and into the Hawkesbury River outside of the LGA.

The larger waterways are fed by smaller tributaries both within and outside of the LGA.

² Hawkesbury Nepean Catchment Management Authority 2008

The approach to manage waterways reflected in the objectives, strategies and planning priorities set out in The Greater Sydney Region Plan and The Western City District Plan is to:

- Identify and protect environmentally sensitive areas of waterways;
- Rehabilitate areas of waterways that are already compromised;
- Improve access, including recreation and tourism opportunities, along waterways; and
- Apply a risk-based approach to manage the cumulative impacts of development and land uses.

South Creek and its tributaries are described as the 'green spine' of the future Western Parkland City. Considerable effort is expected to be directed at rehabilitating South Creek, and towards incorporating public access and recreational opportunities into any new development along its waterfront. Planning initiatives associated with the South Creek Precinct, currently being undertaken by the State Government, will further elaborate on this.

Both Plans also support an integrated approach to protecting and managing local waterways. This will require collaboration with neighbouring councils, Sydney Water and State agencies. Other strategic initiatives, currently being undertaken by State Agencies relevant to long-term planning objectives include:

- *The Sydney Green Grid Project* – Led by the Office of the Government Architect NSW, this project provides a metropolitan-wide strategic framework for creating a regional open space network. Penrith sits within the 'West District'. Penrith's waterways play an important role in the delivery of the 'green grid' with the project identifying several project cluster opportunities along local waterways. Specific focus areas in Penrith's rural areas are discussed in Section 3.5 of this report. Focusing on these areas will help to achieve the broader objectives of the Green Grid Project.
- *The Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-Use Planning*³ – Strategy 25.3 of the Greater Sydney Region Plan states the need to improve the health of catchments through a risk-based approach. State agencies including the Office of Environment and Heritage and the Environmental Protection Authority have developed a risk-based framework to assist decision makers, such as Council, with managing the cumulative impacts of land uses on catchment and

waterway health. This Framework has been adapted from the ANZECC Guidelines (a national water quality framework for assessing water quality), to suit the NSW regulatory context and draws heavily on the NSW Water Quality Objectives.

- *The NSW Water Quality and River Flow Objectives* – The community's environmental values for a waterway or catchment area should underpin water quality objectives (benchmarks to reach) and land use planning decisions. In 1999 the NSW Government in consultation with local communities developed objectives for most catchments across NSW. However, this did not include the Hawkesbury – Nepean Catchment. Objectives for this catchment were developed earlier by the Healthy Rivers Commission in 1998, these appear to no longer be publicly available. In 2018 Sydney Water undertook consultation with communities within the Hawkesbury Nepean catchment, including Penrith, to capture local community values for river health and waterway use to guide decision making for the catchment area. This included establishing community reference groups. The outcomes of this project are not yet publicly available, but once they are available can be used to establish water quality objectives based on current community values for the Hawkesbury – Nepean catchment within the Penrith LGA. These water quality objectives can then serve as a reference for planning and decision making to manage waterways.

Major impacts to waterway health in Penrith will continue to arise from urban and rural development, population growth, and the increased use of waterways for tourism and recreation.

In rural areas, agricultural runoff, soil erosion and poorly operating on-site sewage management systems all contribute to nutrient and sediment runoff entering creeks and rivers. Extensive land clearing along waterways has already caused significant erosion problems and introduced invasive weed species that replace native vegetation.

Land fronting waterways in the rural areas of Penrith is typically held in private ownership, which can limit public recreational access for visitors (e.g. kayaking, boating, fishing, camping, etc.). Consequently, waterfront recreational opportunities are currently more readily accessible from within the urban areas of the LGA.

³ OEH & EPA 2017

The conversion of rural land to facilitate urban development also has a significant impact on water quality. In the coming years, most of the growth planned within the LGA is expected to be within Penrith's Rural South East, within the South Creek catchment. Increased stormwater runoff and nutrients discharged from wastewater treatment plants will contribute substantial nutrient loads into local waterways. At the same time, as the population grows increased volumes of water are extracted upstream to meet future water supply, this reduces river flows.

Managing these issues involves a combination of approaches such as applying planning controls that mitigate the effects of rural land uses on water quality, educational programs that encourage better management practices, and site-specific projects that rehabilitate compromised riparian corridors.

Council's approach to identifying, protecting and enhancing Penrith's 'blue grid' is through the application of environmental protection zonings and associated clauses under the LEP. The specific application of these controls in rural areas to date appears to be:

- Applying W1 Natural Waterways zoning to the Nepean River, and E2 Environmental Conservation along the associated riparian corridor in rural areas of the LGA;
- Applying E2 Environmental Conservation to all other major watercourses and associated riparian corridors including Mulgoa Creek, Rickabys Creek, South Creek and Ropes Creek. This zoning varies in width depending on the extent of the vegetation⁴.
- Applying E1 National Parks and Nature Reserves to riparian corridors within existing reserves
- Applying E2 Environmental Conservation to regionally significant wetlands identified under the Sydney REP 20 (Hawkesbury – Nepean River)
- Applying other land use zonings such as RU1 Primary Production and RU4 Primary Production Small Lots to smaller waterways and riparian corridors.

This approach identifies Penrith's major waterways, wetlands and riparian corridors as being environmentally sensitive and prohibits nearly all land uses within these areas. The objectives of both the W1 and E2 Zones

recognise the need to protect, manage, restore and enhance Penrith's water resources and associated riparian corridors.

Council's LEP is supported by more detailed water management requirements under Part C3 of the Penrith DCP. These controls seek to protect Penrith's water resources from inappropriate development and further degradation and specifically address using and conserving water, protecting water quality and catchment health, and development near watercourses, wetlands and riparian corridors.

The application of these controls does not appear to have been based on a detailed environmental assessment of all of Penrith's water resources. Instead these controls recognise the value of all of Penrith's water resources, irrespective of their condition, and seek to maintain intact waterbodies while enhancing and restoring waterbodies that are currently compromised.

The Sydney Regional Environmental Plan No 20 – Hawkesbury Nepean River (No 2 1997) also sets out planning considerations, policies and strategies to protect the Hawkesbury Nepean River system. The SREP 20 applies to the entire Penrith LGA. Planning controls outlined in SREP 20 require development consent for land uses with the potential to affect water resources such as intensive animal industries, intensive horticulture establishments, and sewerage system works.

Penrith's waterways are also protected under the Water Management Act 2000 (WM Act). The WM Act regulates water usage to protect the environmental needs of water resources, including rivers and groundwater sources, through the application of legislated water sharing plans. The water sharing plans that currently apply within Penrith are:

- Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011
- Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011

The plans outline how water is to be allocated and shared and specifically address:

- The management of access licences;
- Water allocation accounts;

⁴ Penrith City Council 2009

- The trading of access licences and water allocation;
- The extraction of water;
- Operation of dams; and,
- The management of water flows.

The WM Act also regulates 'controlled activities', which are certain types of activities (e.g. building, removing material, carrying out works, etc.) in, on or under waterfront land. The WM Act defines 'waterfront land' as the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of these watercourses.

Where controlled activities require approval, the applicant must demonstrate that the activity will be carried out in a way that avoids or minimises negative impacts on waterfront land and water users. Decision making for controlled activities is undertaken by the Natural Resource Access Regulator (Department of Industry – Water).

This approval overlaps with the planning controls outlined under the SREP 20, which also triggers development consent for land uses in or within 40metres of a watercourse.

The following actions are recommended to be included in the Rural Strategy:

- (a) Work with state agencies and the local community to establish water quality objectives (benchmarks) for the Hawkesbury-Nepean Catchment. Planning controls should subsequently be reviewed to assist with achieving these water quality objectives.
- (b) Adopt a risk-based approach to consider the cumulative impact of development and rural land uses on waterways and the broader catchment.
- (c) Investigate opportunities to rehabilitate local waterways which will contribute to the delivery of the metropolitan wide Green Grid project.
- (d) Investigate opportunities to improve access to waterways in rural areas of Penrith, these may align with Green Grid project opportunities.
- (e) Work with State Agencies to deliver the South Creek Corridor Project.

4.2. Soils

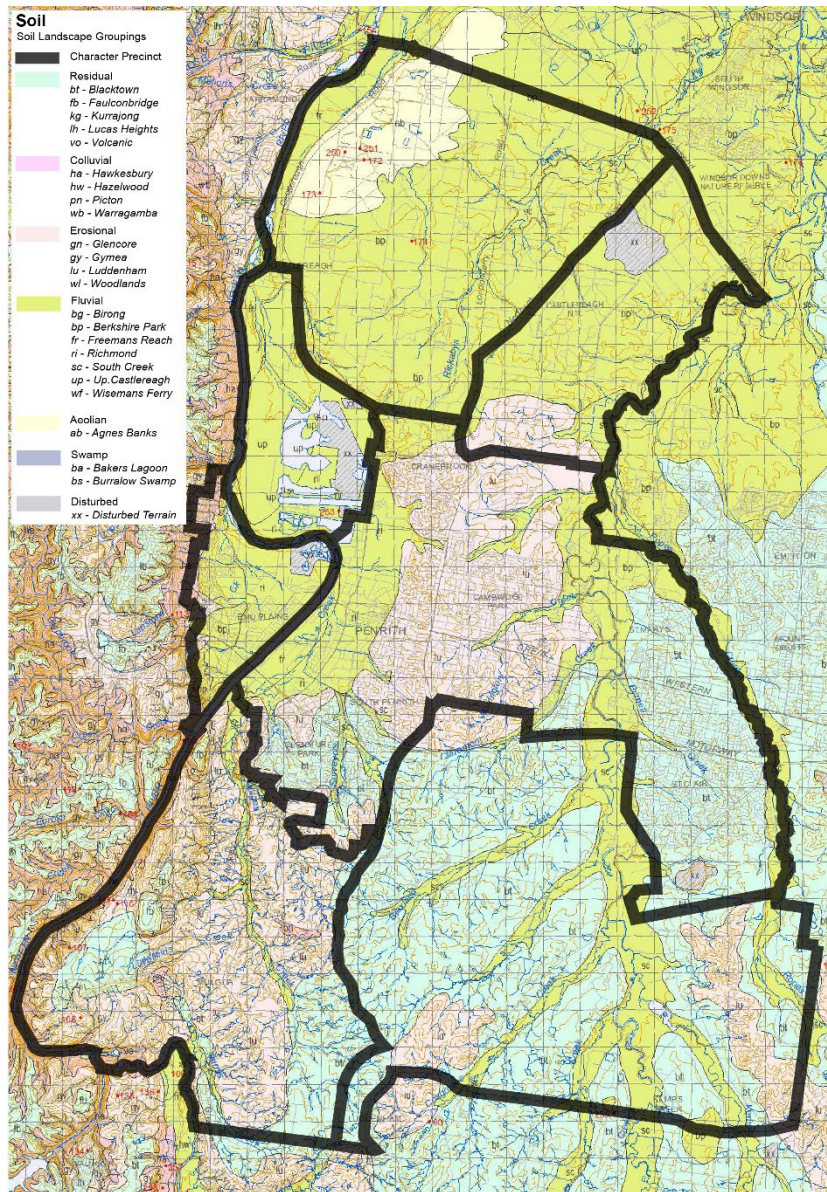


Figure 11. Soil landscapes of Penrith (Source: State Government of NSW and Office of Environment and Heritage (OEH) 1990)

Land-forming processes over millennia contribute to the unique soil landscapes across Penrith. A soil landscape is a land area that shares major soil and landscape attributes and constraints and has relatively uniform land management requirements. Generally, soil landscapes in Penrith are formed on the sediments of Wianamatta Group shales and sandstones and consist of silt, sand and clays.

The rural areas of Penrith comprise a number of soil landscapes as shown in Figure 11. The general distribution of these landscapes is listed in Table 1. In the rural north, the Berkshire Park soil landscape is the most widespread, consisting of heavy and sandy clays which are of low soil fertility. South Creek and Rickabys Creek soil landscapes occur along the riparian corridors, and these areas are prone to erosion and salinity, but can accommodate some cultivation in localised areas. The Freemans Reach soil landscape occurs along the Nepean floodplain in Agnes Banks, which is known for its moderately fertile soils. This area of Penrith has the highest capability of supporting agricultural uses that rely on good quality soils. This soil landscape also provides resources for sand and gravel mining. The Agnes Banks soil landscape occurs in most other areas of Agnes Banks. The aeolian sandy soils here have been mined for over 50 years and areas are prone to wind erosion from mining.

Rural areas in the south of Penrith and parts of Llandilo in the north are commonly made up of Luddenham and Blacktown soil landscapes. The Blacktown soil landscape is found in Orchard Hills south of the Western Motorway, large areas of Luddenham, and pockets of Wallacia, Badgerys Creek and Kemps Creek. The Luddenham soil landscape occurs in much of the Mulgoa Valley, areas of Orchard Hills north of the Western Motorway, and in parts of Mount Vernon, Kemps Creek, Badgerys Creek and Luddenham. These landscapes are generally suitable for grazing and regular cultivation but are prone to sheet erosion from intensive farming practices such as overgrazing paddocks. Salinity outbreaks are also known to occur in these soil landscapes. South Creek and Second Ponds Creek soil landscapes occur along riparian corridors. The Second Ponds Creek landscape is not well suited to horticulture and there is a high likelihood of salinity occurring in these areas. Uncleared bushland areas of Mulgoa generally comprise Gymea and Faulconbridge Picton soil landscapes.

Various State agencies have undertaken different types of soil mapping to understand the properties and distribution of soil landscapes, their capability and suitability for various land uses and potential land use risks such as salinity, erosion and acidification⁵. Soil mapping is used in land - use planning to identify land with the highest capability for agriculture, and to identify land most at risk of hazards such as salinity. Specific mapping resources available include:

- *Hydrogeological landscapes*⁶. A hydrogeological landscape is an area that has shared characteristics that influence salt stores and pathways for salt movement. This mapping identifies areas that are at risk of salinity and how this salinity shows itself in the landscape. Table 1 shows the hydrogeological landscapes typically found in rural localities of Penrith. The Penrith LGA is known to be significantly affected by salinity and the hazard risk associated with each landscape is also shown in Table 1.
- *Land and Soil Capability*⁷. This mapping assesses the capability of the land to sustain a variety of land uses. It is based on an eight class system, with 1 being the most capable land that can sustain most land uses and 8 being land that can only sustain low impact land uses such as nature conservation. This mapping can be used to identify the land with the best soil, water and land characteristics for agriculture that requires good quality soils. Generally, Classes 1 – 3 are considered high capability land that should be preserved for agricultural land uses. Penrith has no Class 1 or 2 land but has small areas of Class 3 land along the alluvial plains of the Nepean River. Table 1 broadly shows the land and soil capability of land in rural localities of Penrith.
- *Biophysical Strategic Agricultural Land*⁸. This mapping was undertaken by the State Government in 2014 to identify land that is most capable of sustaining high levels of agricultural productivity. This land correlates with the Class 1-3 Land and Soil Capability land and is shown in Figure 12.

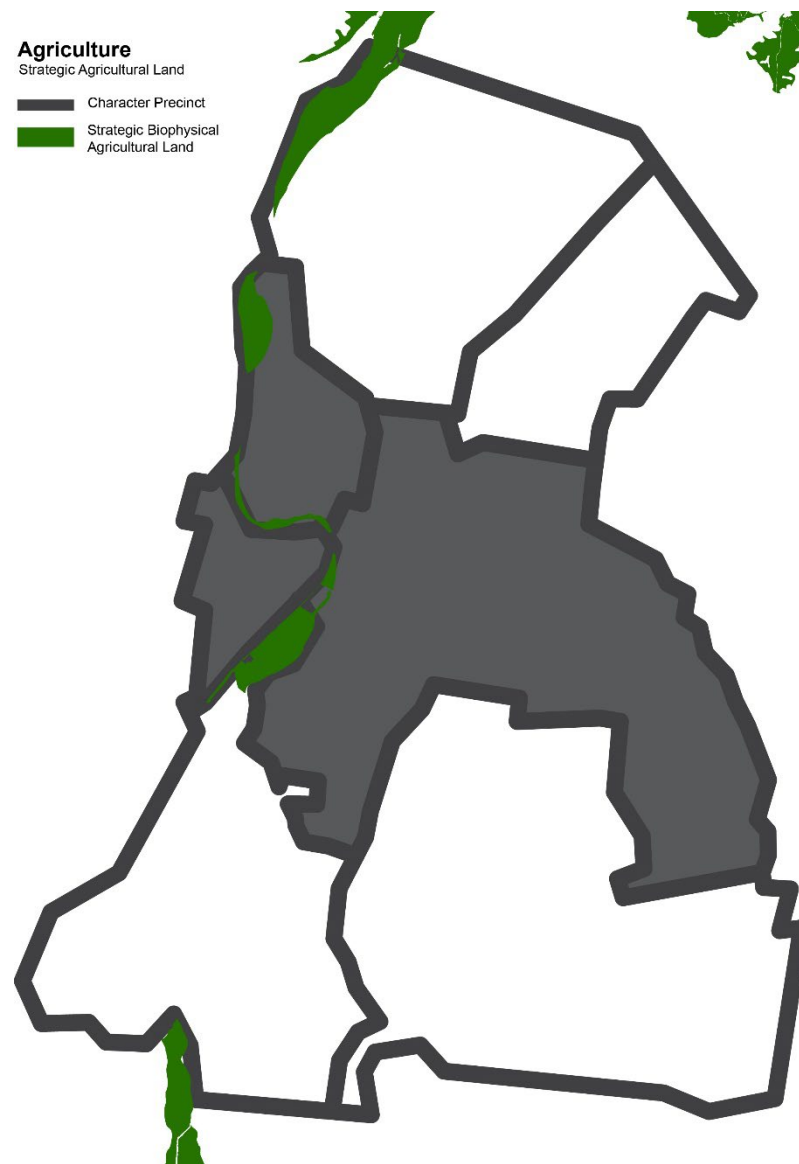


Figure 12. Strategic agricultural land (Source: Department of Planning and Environment 2014)

5 OEH 2019
6 OEH 2011

7 OEH 2018a
8 OEH 2014

Table 1: Soil mapping relevant to rural areas

Places	Soil landscapes	Hydrogeological landscape (salinity hazard)	Land and soil capability
Agnes Banks	Freemans Reach Agnes Banks	Richmond Lowlands (moderate) Agnes Banks Sands (low)	Class 3 east of Castlereagh Rd (high capability) Class 5 west of Castlereagh Rd
Castlereagh	Berkshire Park Agnes Banks	Richmond Lowlands (moderate) Londonderry (moderate)	Class 5 majority Class 3 in small area (high capability) Class 4 in small area near to Penrith Lakes Class 6 in small area
North Cranebrook	Berkshire Park Rickabys Creek	Londonderry (moderate)	Class 5 majority Class 6 in areas
Londonderry	Berkshire Park Agnes Banks Rickabys Creek South Creek	Londonderry (moderate)	Class 5 majority Class 6 in areas
Berkshire Park	Berkshire Park South Creek Rickabys Creek	Londonderry (moderate) Shanes Park (moderate)	Class 5 majority Class 6 in some areas
Llandilo	Luddenham Blacktown Berkshire Park	Londonderry (moderate) Shanes Park (moderate) Upper South Creek (high) Ropes Crossing (high)	Class 4 majority Class 5 in some areas Class 6 in some areas
Mulgoa	Luddenham South Creek Blacktown Gymea Faulconbridge	Mulgoa (moderate) Picton (moderate) Hawkesbury (low)	Class 4 to the west Class 6 in areas Class 7 in areas
Wallacia	Luddenham	Mulgoa (moderate)	Class 6 majority

Places	Soil landscapes	Hydrogeological landscape (salinity hazard)	Land and soil capability
	Blacktown		Class 4 to the east
Orchard Hills	Blacktown South Creek Luddenham	Upper South Creek (high) Shale Plains (high)	Class 4 majority Class 5 Class 6
Luddenham	Luddenham Blacktown Second Ponds Creek	Greendale (high) Mulgoa (moderate)	Class 4 Class 5 Class 6
Kemps Creek	South Creek Luddenham Second Ponds Creek	Upper South Creek (high)	Class 5 majority Class 4 Class 6
Mount Vernon	Luddenham Blacktown Second Ponds Creek	Mount Vernon (moderate)	Class 6 majority Class 5

(Source: Adapted from OEH 2018, OEH 2011 & Chapman et al. 2009)

The key management priorities associated with soil are to protect land and soil with the highest productive capability for agricultural land uses, and to mitigate hazards such as salinity and erosion. The application of rural land zonings and minimum lot sizes through Council's LEP provides a basis for protecting the most productive land suitable for agriculture. The approach taken to date appears to be the following:

- Generally applying RU1 Primary Production or RU4 Primary Production Small Lots to Class 3 capability land, recognising that it is the most fertile land for agriculture in the LGA.
- Applying a 1000ha minimum lot size to Class 3 land at Regentville/Jamisonstown which is most under pressure from urban encroachment.
- Applying a 20ha minimum lot size to Class 3 land at Agnes Banks/Castlereagh.

Figure 1 shows that some highly capable agricultural land in Penrith is now urban land and cannot be used for agriculture. Rural land use zonings and large minimum lot sizes have generally been applied to the remaining important agricultural land to encourage agricultural land uses and to prevent further fragmentation. It is also important to prevent inappropriate

4.3. Mineral resources

Penrith contains significant mineral resources that are important to the construction industry in Greater Sydney. Known mineral resources located in Penrith's rural areas include aggregate, construction sand, industrial sand and structural clay which provide raw materials for concrete, bricks and roofing tiles used to build housing and infrastructure across Sydney.

The NSW Government has undertaken an audit of mineral resources across the state⁹. Mineral resource sites are classified as either identified resources or potential resources. *Identified resource areas* are either significant operating or proposed quarries, or, undeveloped sites where substantial mineral resources are known to occur. While *potential resource areas* are areas with a high likelihood of mineral resources being present of which the potential has not been fully assessed and confirmed.

In Penrith's Rural North West Precinct there are three identified resource areas around Agnes Banks and Londonderry containing industrial sand, construction sand and clay deposits, and also one potential resource area for structural clay.

In Penrith's Rural South East Precinct there are three identified resource areas around Kemps Creek, Badgerys Creek and Orchard Hills containing shale deposits which are quarried for structural clay. Two of these sites also accommodate waste management facilities. While not picked up in the audit, rural areas in the south may also have coal and coal seam gas resources¹⁰. Additional mineral resources may also occur in other areas of the LGA, but they have not been identified by the audit.

Both the Greater Sydney Region Plan and Western City District Plan recognise the importance of Penrith's mineral areas for Greater Sydney's construction industry. Access to locally based construction materials is critical for continued growth of the industry and for reducing construction costs. The objectives, strategies and planning priorities outlined in the Region and District Plan seek to protect and support mineral resources, in particular construction materials, by preventing inappropriately dispersed urban activities in rural areas.

There are two key environmental planning instruments that sets out the NSW Government's approach to identifying and facilitating the extraction of mineral resources in Greater Sydney.

- *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, under Part 2(7) of this SEPP mining and quarrying is permitted with consent anywhere that also permits agriculture and industry, such as on land with a rural land use zoning.
- *Sydney Regional Environmental Plan No 9 – Extractive Industry (No 2 – 1995)*, which identifies land within the Penrith LGA where extractive industry development is permitted with consent. It also sets out the matters of consideration when assessing a development application, and when amending planning controls that affect land containing mineral resources.

Council, in general, identifies and protects mineral resources within the LGA by:

- applying the RU1 Primary Production and RU2 Rural Landscape zoning to land with known mineral resources to allow for their future extraction; and
- considering the proximity of identified resource sites when assessing the siting and density of future rural residential development¹¹.

The application of land zonings, through the Standard Instrument LEP format, to known mineral resource areas is currently withheld in one major area in the Rural North West Precinct. This area is identified as a Deferred Matter in Council's LEP. We understand that these lots have not been zoned under Penrith LEP 2010, at this stage, to allow for additional ecological investigations to assess the significance of existing biodiversity values and inform the application of future land zonings. As these areas contain mineral resources their future rezoning will be subject to the considerations under the *Sydney REP No 9 – Extractive Industry (No 2 – 1995)*.

⁹ NSW Trade & Investment Energy & Resources Division, 2011 - Note that this Mineral Resources Audit referenced in the study was produced in 2011, and that additional resources may have been identified in the last 8 years.

¹⁰ Penrith City Council 2009a
¹¹ Penrith City Council 2009a

The following actions are recommended in order to protect Penrith's resource deposits and to not sterilise them from future extraction:

1. Consult with State Government to review and amend both the mineral resources audit and the Sydney REP 9 – Extractive Industry (No 2 – 1995) to accurately reflect the status of Mineral resources in the Penrith LGA.
2. Review land use zoning in known mineral resource areas to protect mineral resource areas for future use, generally following the below approach:
 - (a) Applying a default RU1 Primary Production zoning to known mineral resource areas
 - (b) Preventing incompatible development adjoining known and potential mineral resource areas (e.g. rural residential development)
 - (c) In cases where mineral resources areas are likely to contain high biodiversity values it recommended that further ecological studies be undertaken prior to any LEP Rezoning.
 - (d) In cases where mineral resource areas also contain high scenic and landscape values it is recommended that RU2 Rural Landscape zoning be considered in these areas.

Section 5.2 Mining and Quarrying provides further discussion on mining and quarrying activities within rural areas of Penrith.

4.4. Biodiversity

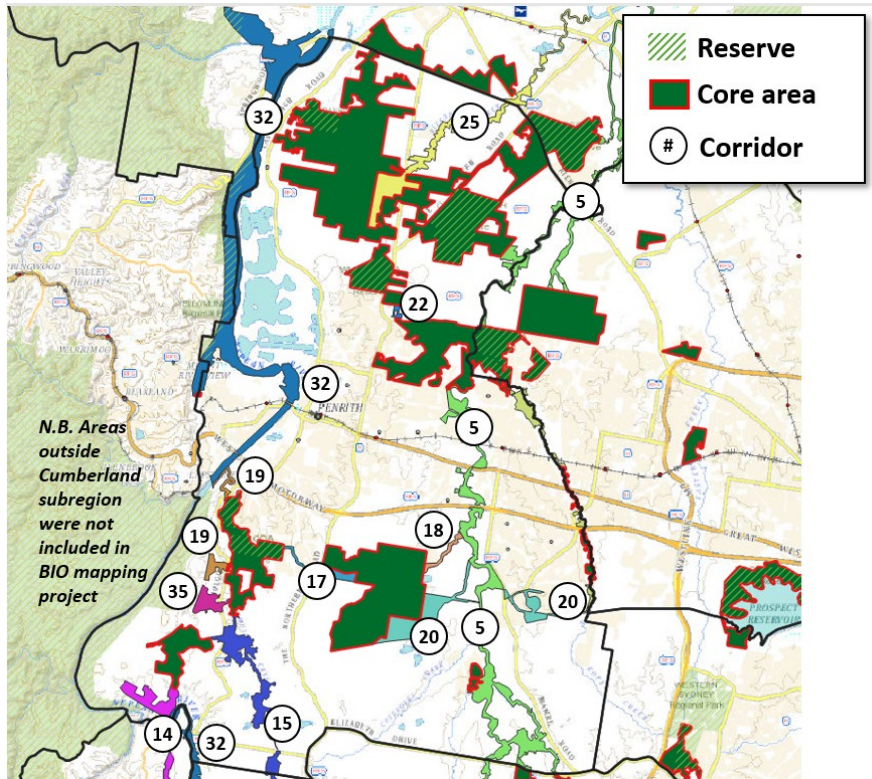


Figure 14. OEH recommended 'Priority Investment Areas', showing proposed 'core areas', 'corridors', and existing reserves

The Penrith LGA sits within the Cumberland Plain subregion. This subregion is recognised as one of the fastest growing and most populous areas in Australia. The extent of urban development within the subregion has already resulted in a high level of clearing and fragmentation of native vegetation. This significantly increases the conservation value of remaining vegetation, and highlights the need to prioritise conservation and reparation initiatives that can support healthier and more resilient ecological outcomes.

The NSW Government released the Cumberland Plain Recovery Plan in 2011, and the Cumberland subregion Biodiversity Investment Opportunity (BIO) Map in 2015. Collectively, these identify a network of 87 'core areas' and 27 'biodiversity corridors' as a basis for strategic planning and investment initiatives within the subregion. These are shown for Penrith LGA in Figure 14.

The core areas were identified as those most likely to support the conservation of flora species, fauna species, populations of species, and ecological communities that were protected under National or State legislation at the time the Recovery Plan was prepared. The 'biodiversity corridors' have been identified as key linkages to support habitat connectivity within or between biodiversity subregions, or between other biodiversity features such as 'core areas'.

BIO mapping is suitable for landscape-scale planning but is considered indicative and will require additional ecological investigations to confirm property-specific conservation requirements. This recognises that mapping for the 'core areas' was based on the best available vegetation and survey data available at the time, and mapping for 'corridors' primarily drew on aerial photography to delineate remnant vegetation occurring along riparian corridors, on land to which E2 – Environmental Conservation zonings already apply, or other contiguous vegetation that has not otherwise been zoned for development.

We understand the NSW Government is currently developing the Cumberland Plain Conservation Plan to guide strategic conservation planning in Western Sydney. The Plan will be a key strategic document that identifies the biodiversity needs across the Cumberland Plain subregion and will set out clear milestones and deliverables to conserve biodiversity in the subregion over the next 30 to 40 years¹².

¹² Department of Planning Industry and Environment 2019

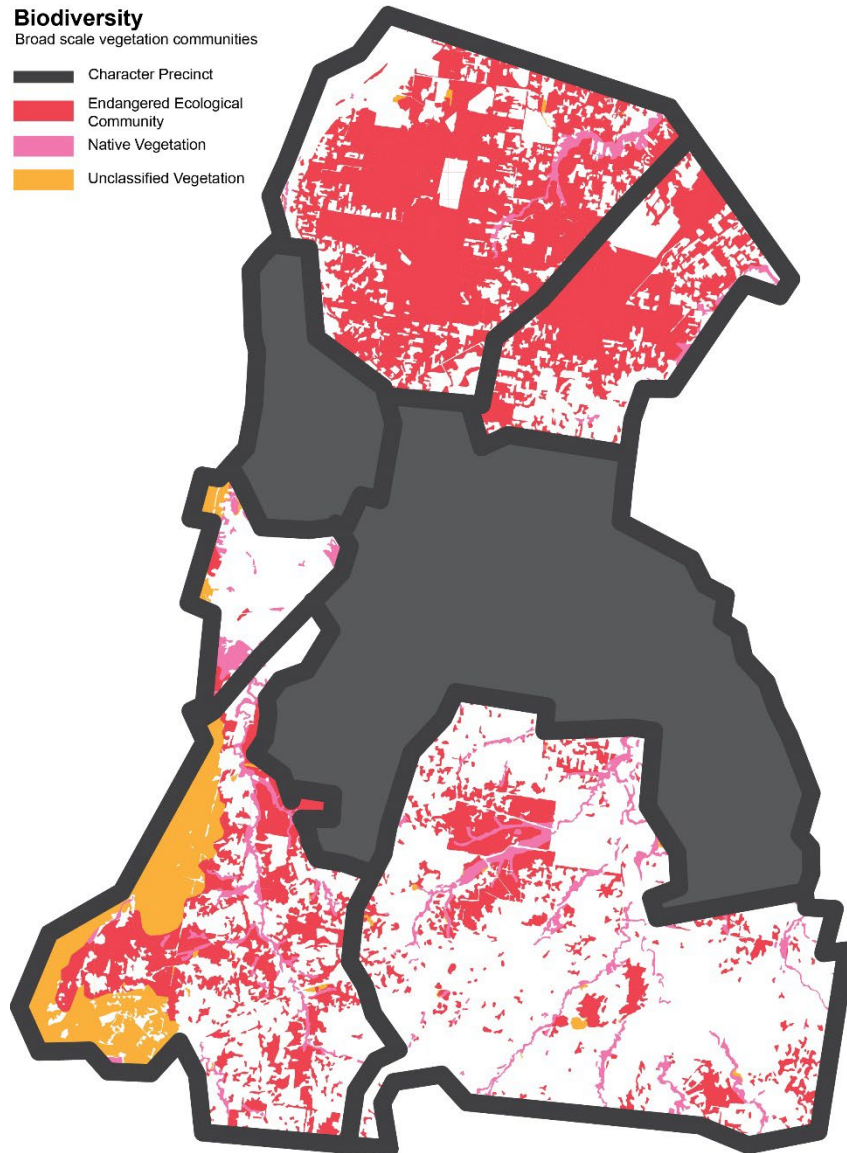


Figure 15. Broad-scale vegetation communities mapping (Source: Council)

In addition to BIO Mapping, broad-scale vegetation mapping can also assist with identifying where biodiversity values are likely to occur, and where further investigations may be required as part of the land use or development assessment process.

Figure 15, based on vegetation mapping provided by Penrith City Council, suggests that endangered ecological communities, protected by National or State-level legislation, readily occur within the LGA, and includes the following broad vegetation mapping categories:

- Endangered Ecological Communities: enhanced protection / difficult to offset.
- Classifiable Native Vegetation: native vegetation requiring offsets.
- Unclassified Vegetation: presently unclassified vegetation.

Some of Penrith's important biodiversity is already conserved within the NSW National Parks and Wildlife Estate. These areas include National Parks, Nature Reserves and Regional Parks. Each area is subject to a Plan of Management, which details objectives and requirements for conservation, research and public access.

The Blue Mountains National Park (over 247,000ha in total), is located along the western boundary of the LGA, this National Park forms part of the Greater Blue Mountains World Heritage Area. It is recognised and protected because of its unspoilt landscapes and outstanding biodiversity, scenic, and cultural values.

There are four Nature Reserves within the Penrith LGA and one adjoining the north of the LGA. The primary purpose of a Nature Reserve is to conserve their representative ecosystems, native plants and animals. Unlike National and Regional Parks, these areas do not, as a matter of principle, necessarily provide opportunities for public access and recreation. These reserves coincide strongly with the Cumberland Plain BIO mapping 'core areas', as illustrated in Figure 14. Specifically these Nature Reserves are:

- **The Mulgoa Nature Reserve** (approximately 213ha in total over 2 areas, located entirely within the LGA), which contains significant ecological, geological and Aboriginal cultural heritage values and considered to be an outstanding opportunity for learning and research.
- **Wianamatta Nature Reserve** (approximately 181ha, located entirely within the LGA), which protects a high number of ecological

values, including 10% of the total remaining population of the Castlereagh Swamp Woodland Community (state-protected EEC).

- **Agnes Banks Nature Reserve** (approximately 114ha, located entirely within the LGA), which is considered an 'island remnant' of relic aeolian sand formation characteristic of the Cumberland Plain.
- **Castlereagh Nature Reserve** (approximately 495ha, located entirely within the LGA), which is considered an 'island remnant' of comparatively unaltered and geographically restricted clays, sand, and gravel characteristic of the Cumberland Plain.
- **Windsor Downs Nature Reserve** (approximately 332ha, adjoining LGA), which is considered an 'island remnant' of relic red podzolic soils of the Londonderry clay characteristic of the Cumberland Plain.

There are three Regional Parks within the LGA, which are described below. Regional parks provide more opportunities for public recreation and enjoyment.

- **Yellomundee Regional Park** (approximately 485ha), which is located along the western LGA boundary, and contiguous with the Blue Mountains National Park. It is recognised as having Aboriginal cultural heritage values of State significance, and non-indigenous cultural heritage, biological, landscape and recreational values of regional significance.
- **Penrith Lakes Regional Park** (less than 1ha), this small road corridor at the end of McCarthys Lane was reserved in 1998 for the purpose of providing the basis for a larger regional park in future. No further acquisitions have taken place to date. This area is outside the Rural Lands and Villages study boundary.
- **Wianamatta Regional Park** (approximately 900ha) which is located in St Marys and extends into neighbouring Blacktown LGA. The park is recognised as having significant natural, scenic, cultural heritage, recreation, tourism, research and educational values.

Other private conservation orders may also be in place within the LGA, but this information was not available for this Study.

4.4.1. Local Biodiversity Legislation

The application of environmental protection zonings through Council's LEP provides a basis for prioritising conservation measures, including through the prohibition of unsuitable uses and the imposition of additional assessment requirements for developments requiring approval. The approach taken to date in non-urban appears to be:

- Applying E1 National Parks and Nature Reserves zonings to existing parks and reserves within the NSW National Parks and Wildlife estate;
- Applying E2 Environmental Conservation or E3 Environmental Management zonings where ecological values have been confirmed and/or where other conservation management arrangements are in place; and
- Applying other land use zonings, supplemented by mapped controls to protect biodiversity (described below), to areas supporting agricultural activities or rural residential uses.

The application of land zonings, through the Standard Instrument format, has been withheld in one major area in the Rural North. This area includes several lots totalling 1,173ha, and is currently identified as a Deferred Matter to allow for additional ecological investigations to inform the application of environmental protection zonings, or other protection measures where relevant. We understand those investigations have not yet concluded. LEP 201 (Rural Lands) and LEP 1991 (Environmental Heritage Conservation) continue to apply within this area until these matters are resolved.

Council's LEP provides mapped controls for 'Natural resources sensitive land', which are identified as representing the LGA's biodiversity corridors and areas of remnant indigenous vegetation. The mapping gives effect to LEP Clause 7.3 'Development on natural resources sensitive land', with LEP controls supplemented by provisions in Council's DCP Section 2.2 'Biodiversity Corridors and Areas of Remnant Indigenous Vegetation in Non-Urban Areas'.

4.4.2. Federal and State Biodiversity Legislation

There are two primary pieces of legislation that protect biodiversity, these are the Commonwealth's Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act); and the NSW Biodiversity Conservation Act 2016 (BC Act). These Acts set out specific requirements around how to consider and conserve biodiversity, and how to balance environment and other uses.

Land uses likely to impact biodiversity protected under the EPBC and BC Acts require a higher-level of assessment and often requires conservation measures to be provided in-situ. The principles set out in the BC Act set out the hierarchy for decision making to conserve biodiversity. These principles are avoid, minimise, offset, and conserve. Importantly, proposed developments that impact upon biodiversity must firstly demonstrate avoidance, minimisation and mitigation of biodiversity impacts before seeking to offset proposed impacts. These requirements may limit the extent to which some types of development are suitable and feasible in a particular location.

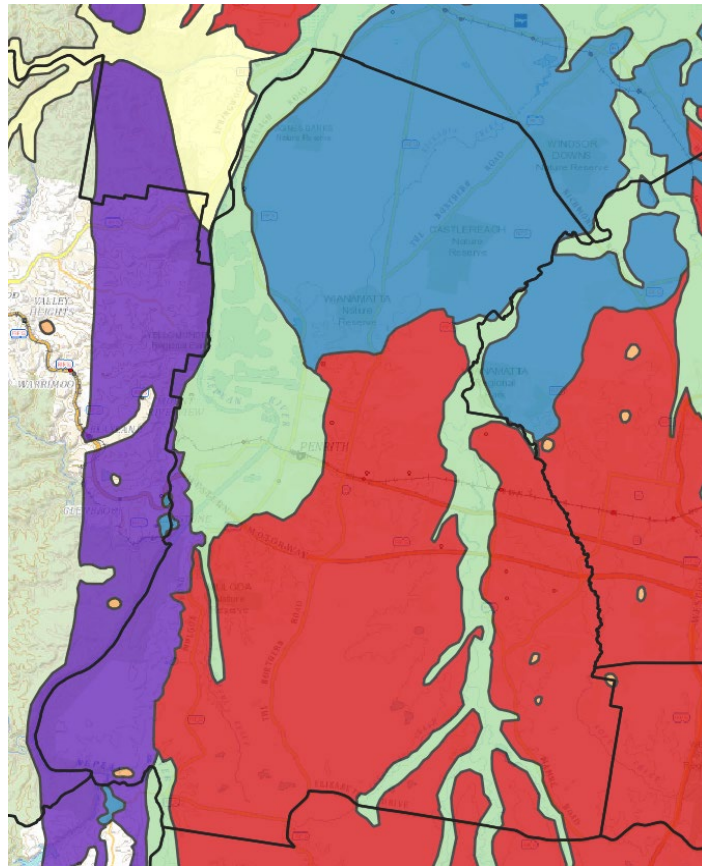
Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (MNES) require approval from the Australian Government Minister for the Environment. Council staff may advise applicants of the need to address requirements of the EPBC Act, but Councils are not responsible for making a referral to the Australian Minister on behalf of applicants, and Council's own approval of a project does not need to be referred under the EPBC Act.

Table 2 summarises the listed MNES that could be present within the Penrith LGA. The World Heritage Properties and National Heritage Places are mapped locations that are already subject to conservation management arrangements. The likelihood of occurrence for each listed species and ecological communities is highly variable.

Programs, databases, and other resources supporting the administration of these acts provide useful reference material for identifying the likely presence and extent of protected biodiversity, and the conservation measures required to ensure their future safety. One example is the Save Our Species Program which seeks to record and manage threatened flora and fauna listed under the BC Act and has a corresponding database. This information can assist Council in directing development away from locations that are already understood to be unsuitable, or otherwise signposting where protected biodiversity is likely to trigger a higher level of assessment.

Table 2. Summary of MNES within Penrith LGA

<i>Matter</i>	<i>Count</i>	<i>Comment</i>
Threatened Ecological Communities	8	<p>Of the 8 listed EECs, 3 are endangered and 5 are critically endangered. Seven of the EECs are 'likely to occur within the area', and one 'may occur within the area'.</p> <p>Probability of occurrence is based on broad distribution modelling and aerial photography and would need to be confirmed through additional survey work.</p>
Threatened Species	50	<p>A variety of vulnerable, endangered, critically endangered bird, fish, frog, insect, mammal, plant species.</p> <p>The presence of some species has been confirmed through previous survey work. However, the probability of occurrence for many species is based on broad distribution modelling and would need to be confirmed through additional survey work.</p>
Migratory Species	16	<p>A variety of vulnerable, endangered, critically endangered species which migrate or traverse the LGA from Australia and Oceania.</p> <p>The presence of some species has been confirmed through previous survey work. However, the probability of occurrence for many species is based on broad distribution modelling and would need to be confirmed through additional survey work.</p>
World Heritage properties	2	Greater Blue Mountains Area.
National Heritage places		Within the LGA, this includes the Blue Mountains National Park and the Orchard Hills Defence Establishment.



Key







-  Grose River Gorge
-  Kurrajong Fault Scarp
-  Hawkesbury - Nepean Terrace Gravels
-  Hawkesbury - Nepean Channels and Floodplains
-  Cumberland Plain
-  Sydney Basin Diatremes

Figure 16. Penrith LGA showing NSW Landscapes boundaries

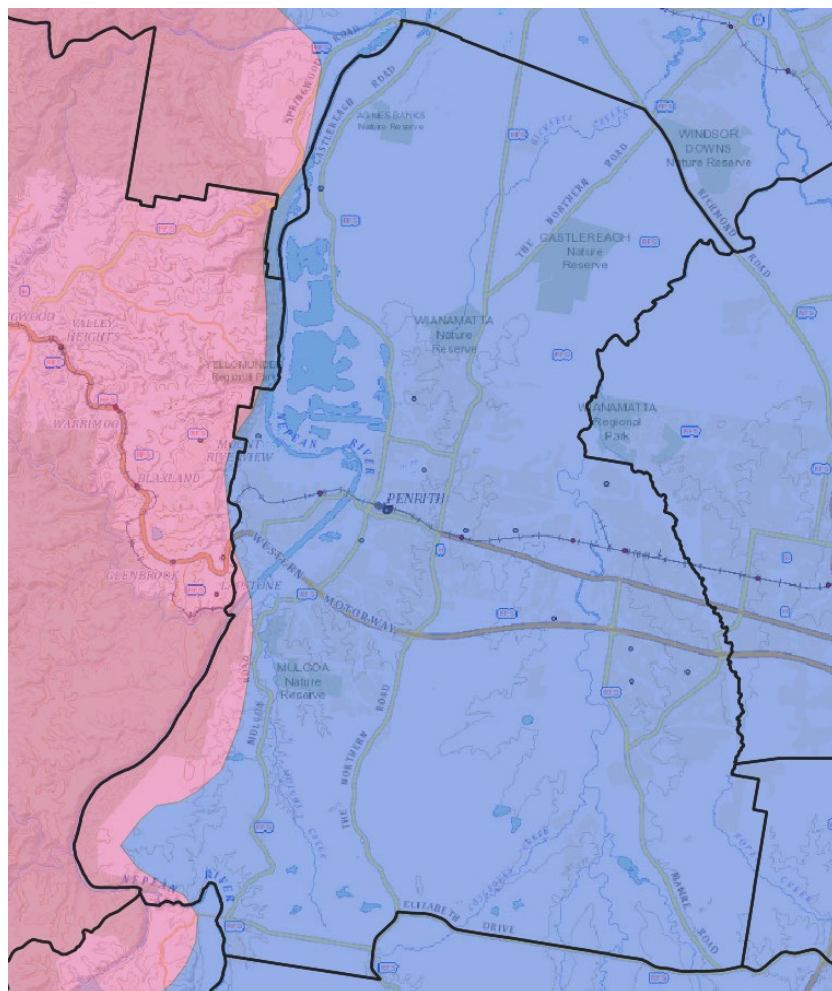
4.4.3. NSW Landscapes Biodiversity Framework

Under the NSW Landscapes framework, the Penrith LGA is predominantly characterised by four landscapes, shown in Figure 16. These landscapes are:

- Kurrajong Fault Scarp occurring along the LGA's western boundary and extending across the Mulgoa valley in the south;
- Hawkesbury-Nepean Channels and Floodplains, associated with the Nepean River in the western part of the LGA and the South Creek / Ropes Creek corridor in the eastern part of the LGA;
- Hawkesbury-Nepean Terrace Gravels in the northern portion of the LGA; and the
- Cumberland Plain in the central and southern parts of the LGA.

The NSW Landscapes are used as a basis for identifying land for conservation under the Convention of Biological Diversity (commonly referred to as 'Aichi Biodiversity Targets'). Australia has committed to protecting 17% of its representative biodiversity and the Government is prioritising its conservation initiatives and investments to protect NSW landscapes that are furthest from this 17% protection level (priority landscapes). This is currently being delivered through a State-led Biodiversity Investment Program targeting priority landscapes.

Within the Penrith LGA, the Hawkesbury - Nepean Channels and Floodplains and Cumberland Plain NSW Landscapes are considered the highest priority (Category 1) for conservation to support this target. We understand the NSW Government is prioritising private conservation protection measures in this area, as opposed to the dedication of land to the national reserve system. This recognises that the dedication of land to the national reserve system effectively extinguishes its availability to serve as biodiversity offsets for development.



Key

-
 Wollemi subregion
-
 Cumberland subregion

Figure 17 Penrith LGA showing IBRA sub-regional boundaries

4.4.4. IBRA Biodiversity Framework

Under the Interim Biogeographic Regionalisation for Australia (IBRA) framework, endorsed by all levels of government, the Penrith LGA is in the Sydney Basin Bioregion, with the majority of the LGA in the Cumberland subregion and a south western portion within the Wollemi subregion, as shown in Figure 17.

The impacts of development on biodiversity (e.g. vegetation communities, ecosystems, species, etc.) are assessed in increasing detail throughout the approvals process. The biodiversity impacts are considered at the IBRA subregion level (e.g. whether the impact will result in the extinction or significantly reduce the viability within the subregion). Where unavoidable impacts occur, a biodiversity offset must be secured within the same or adjoining IBRA subregion.

The Cumberland Plain subregion has been extensively cleared for agriculture and urban development and remains under extraordinary pressure for further development. Consequently, the potential to secure suitable (like for like) offsets for development within this subregion is severely limited.

4.4.5. Biodiversity recommendations

The following actions are recommended to be included in the Rural Strategy:

1. Identify appropriate land use zonings for the Deferred lands following conclusion of the relevant ecological studies.
2. Review and update mapped controls, and DCP guidelines for 'Natural Resources Sensitive Lands', taking into consideration to:
 - (a) More accurately identify biodiversity corridors, this may rely on undertaking a habitat connectivity study; and
 - (b) Support relevant Green Grid network delivery projects, particularly where these rely on coordinated efforts across privately-owned land (e.g. corridors or cross-connection)

4.5. Scenic and visual amenity

Penrith's scenic and cultural landscapes are a defining rural character element and are highly valued by local residents and visitors.

The approach to managing scenic and cultural landscapes reflected in the objectives, strategies and planning priorities set out in The Greater Sydney Region Plan and The Western City District Plan is to:

- Identify and protect scenic and cultural landscapes; and
- Enhance and protect views of scenic and cultural landscapes from the public realm.

These plans collectively recognise that scenic and cultural landscapes contribute to the character of an area, create a sense of identity, reflect Aboriginal, colonial and migrant heritage and culture and provide opportunities for recreation and tourism. The Mulgoa Valley is recognised as a regionally significant scenic and cultural landscape important to Greater Sydney.

The *Penrith Scenic and Cultural Landscapes Study* (Envisage 2019) prepared alongside this Study, was tasked with identifying matters of scenic, cultural and landscape importance for Penrith's rural lands. It states:

“Penrith has a diverse landscape created from three main elements – the wide Nepean River, the flat Cumberland Plain and the rugged Blue Mountains escarpment which rises abruptly to the west. The landscape setting is characterised by the vegetated escarpment that forms a strong visual backdrop intrinsically linked to the contrasting landform of the broad plains and undulating hills of Penrith LGA. The opportunity for panoramic vistas to the escarpment from within the city centre and from surrounding major roads and rural areas is a marked characteristic of the area.”

The views and vistas of the mountains, rivers, lakes and rural lands are some of Penrith's unique attractors. Improving accessibility to this asset has potential to achieve major tourism and economic benefits.

Across Penrith's rural lands, scenic landscapes and views are often experienced whilst visiting open space and whilst travelling by car. By linking recreational places (e.g. shared paths and public open space) to rural villages, the value of co-location can be used to encourage more visitation and economic activity for businesses in rural villages (cafés and dining, recreation/fitness and wellness activities, accommodation opportunities). Shared paths in rural lands and villages could also provide an opportunity to improve the community's access and connection to locally grown produce.

The *Penrith Scenic and Cultural Landscapes Study* identifies specific strategies for:

- Landscape characteristics generally, based around 'Broad Landscape Character Units';
- Important vistas and view corridors, particularly those to the Blue Mountains and Nepean River;
- Highly visually sensitive areas, including 'gateways' of visual sensitivity; and
- Significant scenic and cultural landscapes, including seven large areas of mention.

Readers should refer to the *Penrith Scenic and Cultural Landscapes Study Report* (Envisage 2019) for more detail.

The 'Broad Landscape Character Units' (BLCUs) defined by the *Penrith Scenic and Cultural Landscapes Study* correlate to the Penrith's rural Precincts as follows.

Rural North West

The Rural North West Precinct is made up of two BLCUs.

Rural North East

The Rural North East Precinct is made up of one BLCU, which is shared with the Rural North West Precinct.



Nepean River Rural Flats: including flat alluvial lands along the eastern edge of the Nepean River and extending from Emu Plains and along the western side of Castlereagh Road north of Penrith Lakes. Key scenic attributes identified for this area relate to agricultural land uses including equestrian and turf farming and substantial views to the Blue Mountains escarpment.



Northern Cumberland Plain: this extends across the majority of the northern rural area and encompasses both the Rural North West and Rural North East precincts. The pleasant scenic character of this locality is defined by its flat to very gently undulating landform, large areas of native vegetation, treed rural farmlands and tree lined creek lines. There are views towards the Blue Mountains from the low ridgeline in western areas.

Rural South West

The Rural South West Precinct is most recognisable for its scenic and landscape character. It is made up of two BLCUs.



Western Forested Hills: characterised by the heavily vegetated escarpment that provides a visual backdrop to the Mulgoa Valley. The high level of tree cover provides a scenic quality that can be seen from various parts of the Mulgoa Valley. The Fairlight Gorge is a key landscape feature in this area.



South Western Hills and Valleys: comprising the remainder of the Mulgoa Valley. The winding and densely treed Mulgoa Road connects a string of villages and heritage destinations in a highly picturesque rural setting. The Mulgoa and Wallacia villages, and Glenmore and Fernhill Estates are key features.

Rural South East

The Rural South East Precinct is made up of two BLCUs, which will experience the highest level of land use change in the coming years.



Central Rural Hills: located either side of the M4 Motorway and characterised by its hilly topography and views across valleys in some places towards the Blue Mountains. Its character is defined by farmlands with some evidence of remnant historical orchards interspersed with areas of tall native vegetation.



South Eastern Low Hills and Valleys: comprising the remainder of the South East Rural precinct. This locality is characterised by low undulating hills, rural and semi-rural uses interspersed with small residential settlements. In comparison to the northern and south western rural lands the landscape has been heavily cleared in most parts providing open vistas and views towards the Blue Mountains.

Council's current approach to identifying and protecting Penrith's scenic and cultural landscapes is based on provisions for Scenic Character and Landscape Values, including a local LEP clause and mapping. These are supported by guidelines and mapping (Figure 18) set out in the DCP to assist with the preparation and assessment of development applications. This approach is generally supported, but the following actions are recommended to give effect to the strategies outlined in the *Penrith Scenic and Cultural Landscapes Study*:

The following actions are recommended to be included in the Rural Strategy:

1. Collectively review the LEP and DCP controls specified for Scenic and Landscape values to:
 - (a) Separately map Broad Landscape Character Units; Highly Visually Sensitive Areas, including 'gateways' of visual sensitivity; Important Regional Vistas and View Corridors; and Significant Scenic and Cultural Landscapes.
 - (b) Require a visual impact statement to be provided for all developments to address the broad landscape characteristics relevant to the Broad Landscape Character Unit applying. Support this by incorporating characteristics for each unit into Council's DCP.
 - (c) Require more detailed visual impact assessments to be provided for developments proposed within Important Regional Vistas and View Corridors and Highly Visually Sensitive Areas. Support this by incorporating guidelines for development within each area.
 - (d) Require more detailed visual impact assessments to be provided for developments proposed within nominated Significant Scenic and Cultural Landscapes. Support this by incorporating 'statements of significance' for each landscape into Council's DCP.

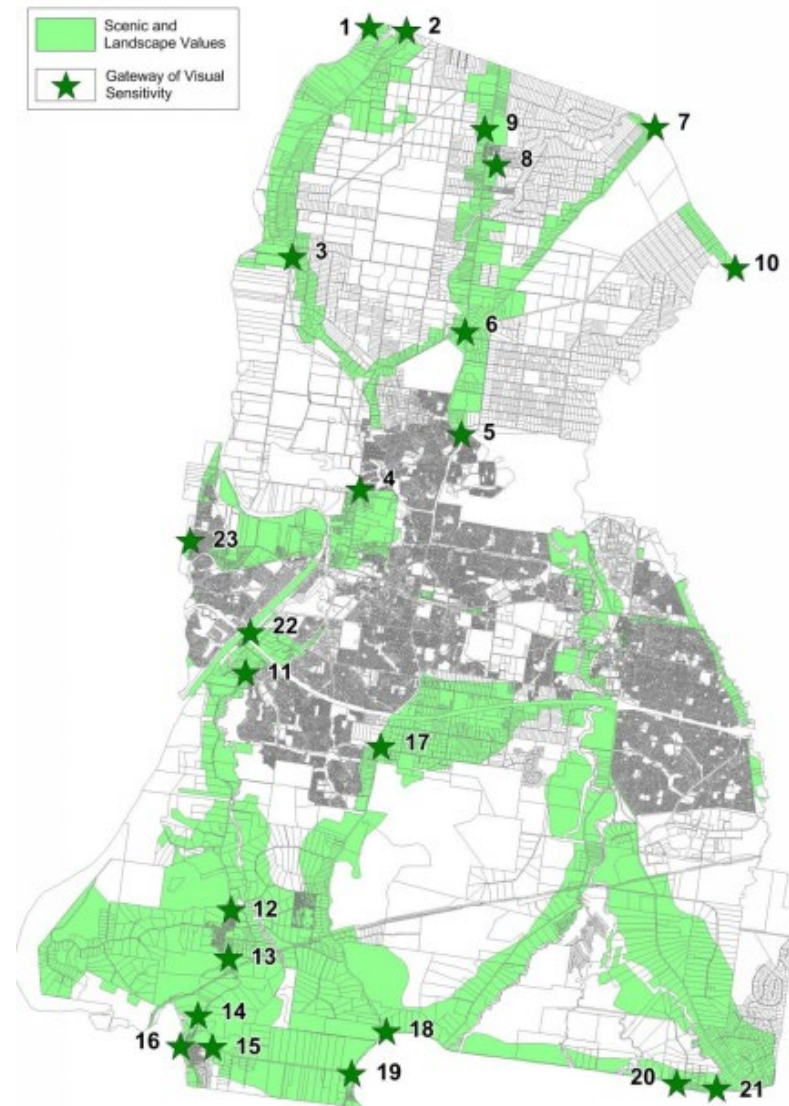


Figure 18. Areas currently identified as valuable for Scenic and Landscape reasons (Source: Council's DCP)

4.6. Hazards – bushfire, flooding and heatwaves

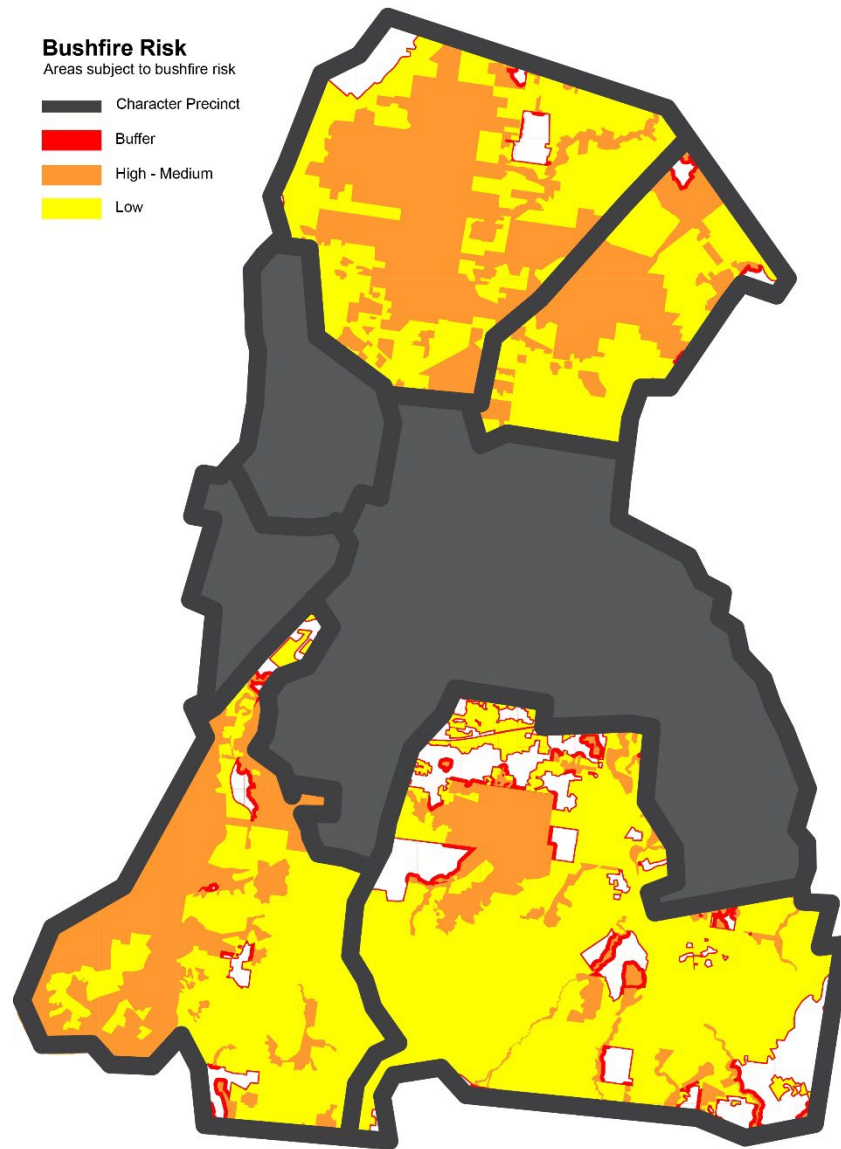


Figure 19: Bushfire Risk for Penrith's rural lands

The landscape and natural environment of Penrith's rural areas are affected by a range of natural hazards including bushfire, flooding and heatwaves, which requires consideration in both land use planning and in the ongoing management practices within the LGA to reduce impacts on people, places and property.

Bushfire

The majority of Penrith's rural lands are bushfire affected as illustrated in Figure 19. It is noted current Bushfire Risk mapping may change in response to the updated NSW Bushfire Management Guidelines (2018). The bush fire season is generally between October and March, but may occur earlier due to dry winter conditions.

Penrith's rural farmlands are generally heavily cleared with a low fire risk identified. Areas of medium to high fire risk are generally associated with conservation areas and natural bushland as well as rural grasslands, where fire has potential to cross property boundaries. The rural villages of Londonderry, Luddenham, Mulgoa and Wallacia have not been identified as fire risk areas.

There is a history of fire events in the northern bushland areas of Londonderry and Castlereagh, with reported incidences of fires spreading into bushland from burning of stolen vehicles and illegally dumped waste. There is potential for fire impacts in Penrith due to fires occurring in the Blue Mountains. The following considerations are relevant to the future planning for Penrith's rural lands:

- Ongoing management of bushfire affected land with practices such as hazard reduction burning and maintaining firebreaks important factors in mitigating bushfire risk. However, such practices can cause conflict with sensitive biodiversity and ecological values of some areas.
- A key risk has been identified for Rural South West precinct, particularly for Mulgoa, which has limited access and egress along stretches of Mulgoa Road.

The Western City District Plan aims to avoid locating new urban development in areas exposed to natural hazards such as bushfire. It also notes that risks and associated hazard reduction measures need to be considered for planning and development on land prone to bushfire.

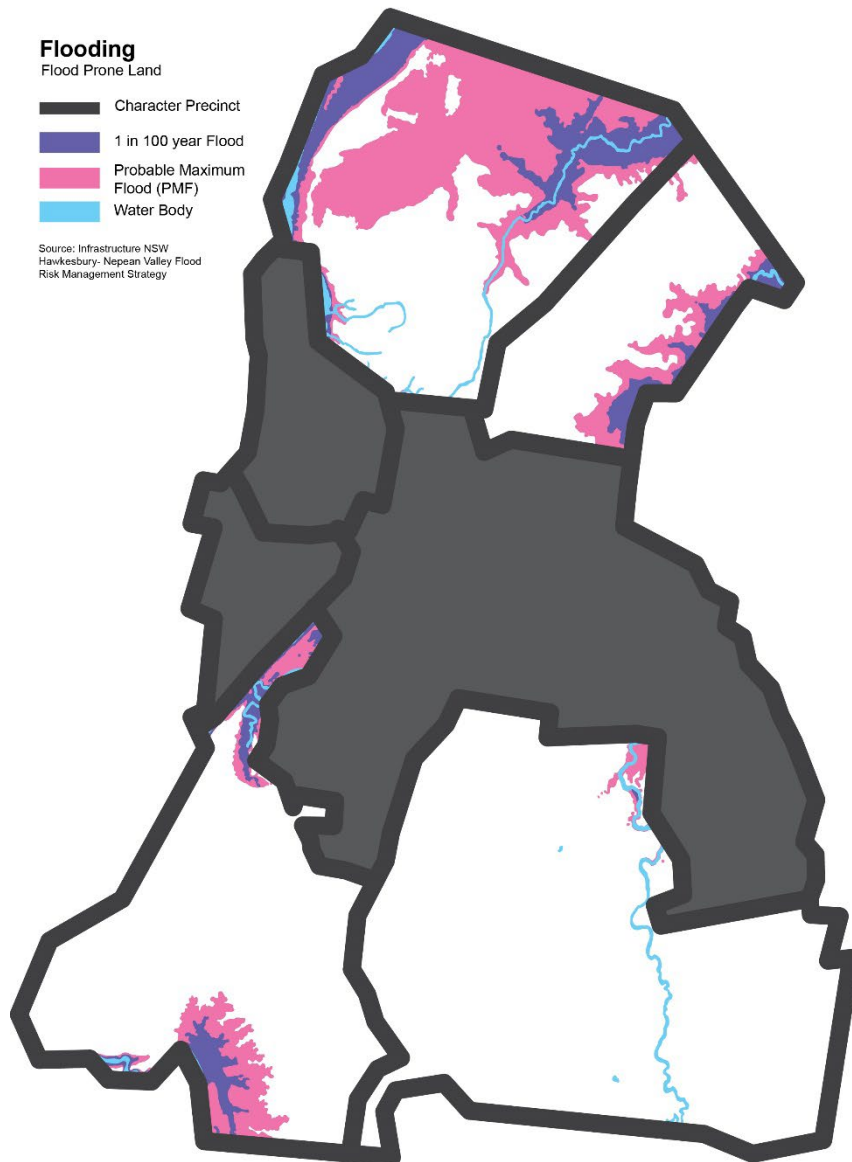


Figure 20: Identified Flood Areas - Hawkesbury-Nepean Valley Flood Risk Management Strategy 2017

Flooding

The Hawkesbury-Nepean Valley Flood Risk Management Strategy was prepared by NSW Infrastructure in January 2017. It identifies flood prone land in all precincts being land that is impacted by the Probable Maximum Flood (PMF). This is illustrated in Figure 20.

The northern rural lands are most impacted by flooding with the following localities affected by the 1:100 year flooding event:

- Nepean River from Castlereagh to Agnes Banks;
- South Creek from Berkshire Park to Llandilo;
- Rickabys Creek in Londonderry;
- Mulgoa Creek at the northern end of Mulgoa; and
- Nepean River and Jerry's Creek in Wallacia.

It is noted that a new dam wall for the Warragamba Dam will have flood mitigation effects for flood prone areas along the Nepean River corridor.

The Hawkesbury-Nepean Valley Flood Risk Management Strategy identifies the following major regional evacuation routes for Penrith's rural lands subject to major flooding, which are illustrated in Figure 21.

Rural North West

- Castlereagh Road
- The Northern Road
- Londonderry Road

Rural North East

- Llandilo Road
- The Northern Road

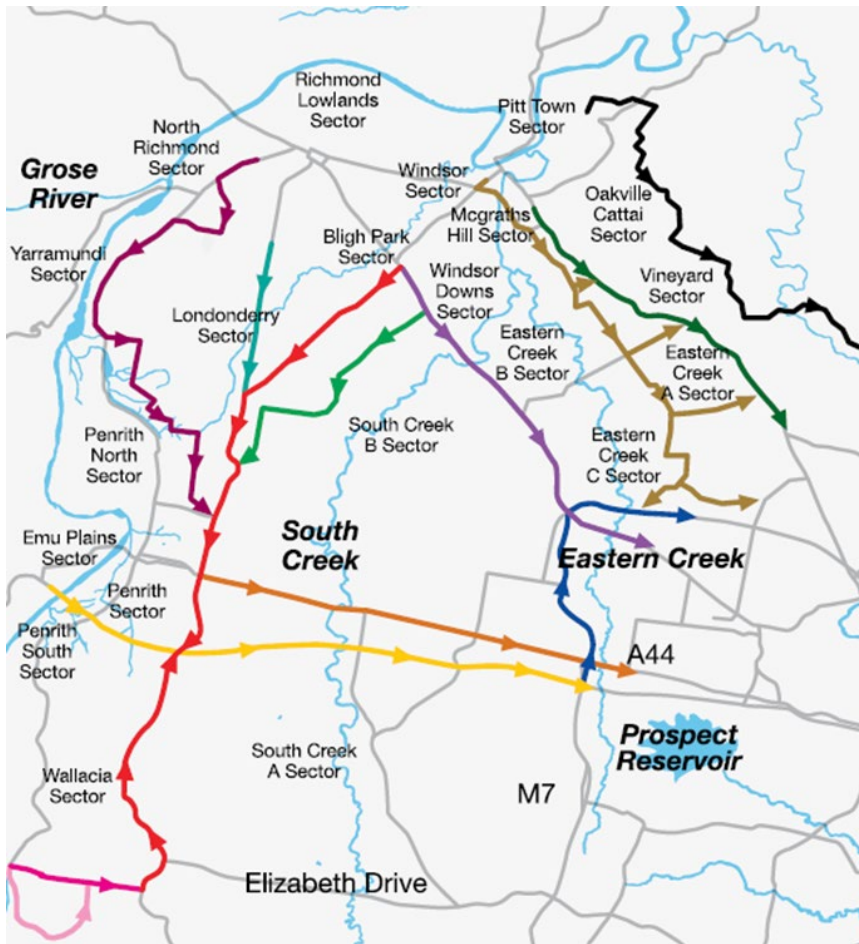
Rural South West

- Park Road (via The Northern Road)

Rural South East

- Not significantly flood affected

The Strategy seeks to establish an integrated approach to road and land use planning to appropriately manage flood evacuation capacity. It also seeks to ensure that all flood risk mapping is prepared and accessible to the community to raise awareness of flood risk. Council is currently working to achieve these outcomes.



Legend

- Castlereagh Road route
- Great Western Highway
- Hawkesbury Valley Way
- Llandilo Road route
- Londonderry Road route
- M4 Motorway
- Old Northern Road route
- Park Road route
- Pitt Town route
- Richmond Road route
- The Northern Road route
- Wallacia alternate route
- Windsor Road route
- Westlink M7

Figure 21: Flood evacuation routes Hawkesbury-Nepean Valley Flood Risk Management Strategy 2017

Heatwaves

As the effects of climate change occur, Western Sydney will become more susceptible to heatwaves. More frequent climate extremes have potential to exacerbate bushfire and flooding but also have significant impacts on physical comfort and health of the community. Figure 22 illustrates the level of vulnerability to heatwaves. It highlights that Penrith’s rural lands are generally less susceptible to heatwaves than urban areas and play an important role in reducing the heat island effect in Western Sydney.

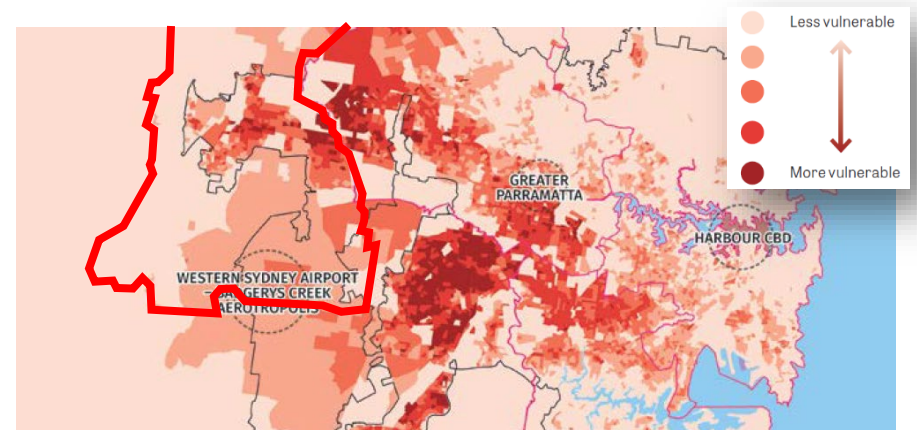


Figure 22 Vulnerability to heatwaves (Source Western City District Plan)

The Western City District Plan states:

“Climate change is likely to result in a longer bushfire season with more bushfires, and longer lasting heatwaves with more extremely hot days. Areas such as Penrith experience on average 21 very hot days (above 35 degrees), with projections for an additional five to 10 very hot days per year in the near future. Heatwaves kill more people than bushfires, with disadvantaged and elderly people most affected.”

To minimise the effects of heatwaves, the Western City District Plan aims to retain water as well as to protect and enhance the tree canopy through initiatives such as the green grid and also to increase tree cover.

5. RURAL ENTERPRISES AND NON-RESIDENTIAL USES

5.1. Agriculture

Penrith's rural lands form part of the Metropolitan Rural Area (MRA) of Greater Sydney. Agricultural activities in the MRA are predominately intensive plant and animal production which are farmed on relatively small landholdings. The main agricultural commodities produced in Sydney's MRA are poultry, eggs, vegetables, cultivated turf and cut flowers. These are also the main agricultural commodities produced in Penrith as shown in Table 3.

Penrith is a heavy lifter of Greater Sydney's total agricultural production. The value of agricultural production in Penrith in 2015-2016 was \$109.5 million or 17% of the value of Greater Sydney's agricultural output. Penrith's agricultural output is also higher than most neighbouring LGAs including Liverpool (\$86 million), Wollondilly (\$97 million), Blue Mountains (\$3 million), Blacktown (\$26 million), and Fairfield (\$18 million).

Penrith also substantially contributes to the agricultural output of NSW more broadly. Penrith is a leader in egg production contributing 18% of the total egg output in NSW in 2015-2016, and produces nearly 1% of all of NSW's total agricultural output.

The agriculture sector in Penrith directly employs around 800 people, although this figure does not account for jobs further down the supply chain such as transport and distribution of agricultural commodities¹³. The number of people employed in agriculture has declined since the 2015-2016 financial year when the industry employed around 900 people¹⁴. However, current employment levels in the industry are higher than they were 5 and 10 years ago.

Table 3. Economic value of agricultural commodities in Penrith 2015/2016 (Source: ABS 2018a, ABS 2018b)

Commodity description	GVP \$ Penrith	GVP \$ Greater Sydney	GVP \$ NSW	Penrith % of Greater Sydney GVP	Approximate Number of agricultural businesses
Total agriculture	109,654,198	644,951,539	13,085,845,904	17%	102
Poultry (eggs)	45,350,725	89,414,847	258,149,403	51%	8
Poultry (meat)	36,998,952	215,080,824	874,990,665	17%	11
Vegetables	16,135,725	141,722,661	419,918,982	11%	39
Nurseries and cut flowers	4,195,337	77,830,866	218,223,069	5%	8
Cultivated turf	2,733,118	55,373,351	81,833,801	5%	3
Fruit and nuts	1,399,051	7,185,573	613,971,115	19%	8
Cattle and calves (meat)	1,084,021	24,303,952	2,561,879,380	4%	16
Dairy (milk)	1,030,985	18,914,267	593,688,399	5%	3

¹³ Ibid the Population Experts 2018

¹⁴ Ibid.

5.1.1. Egg and poultry production

The poultry sector including egg and meat production is the largest agricultural sector in Penrith. The value of local egg production in 2015 - 2016 was \$45 million, while the value of poultry meat production was nearly \$37 million. The local industry is important to the Region because it supplies a large portion of eggs and chicken meat to Greater Sydney. Egg production is higher than any other LGA in Greater Sydney and the second highest of all LGAs in NSW, based on value of production. Local egg production contributes over 50% of the total value of eggs in Greater Sydney, while meat production contributes 17% of the total value of poultry meat in the Region.

Penrith's rural lands have around 20 egg and poultry farms (egg and meat) still operating. These businesses are concentrated in Londonderry and Llandilo in northern rural areas of Penrith and in Luddenham and Kemps Creek in southern rural areas of Penrith. These areas are important to the sector. The local industry benefits from its proximity to a large consumer market and nearby processing and distribution facilities based in Western Sydney.

While the outlook of the poultry industry in NSW is positive, particularly the growing demand for free-range eggs, the local industry is faced with substantial pressures that will impact upon its growth potential. Important poultry areas in both the north and south of Penrith are at risk of being displaced from encroaching urban and infill development. Poultry farming has many environmental impacts such as noise, odour, light, dust, water usage and visual that need to be managed to avoid land use conflict and poor environmental outcomes. Encroaching development near poultry farms makes it increasingly difficult for them to manage these impacts and avoid land use conflict, it can also limit the potential for these operations to expand and remain competitive.

In Luddenham and Kemps Creek in the south, poultry farms may be displaced from new development associated with the Aerotropolis. In Londonderry and Llandilo poultry farms are interspersed among rural residential development on small lots. Infill development could make it increasingly difficult for these poultry farms to continue to operate. Efforts should be made to discourage encroaching and infill residential

development in important poultry areas including Londonderry and Llandilo to maintain the viability of the local industry.

Strengths and opportunities

- Poultry farms do not require good quality agricultural land with fertile soils like many other agricultural industries.
- Close proximity to established consumer markets, processing and distribution facilities within Western Sydney.
- Positive industry outlook, in particular the growing demand for free range eggs.
- Increased export opportunities associated with Western Sydney Airport. Exports are currently a small share of poultry meat production in Australia. However, major chicken producers in Europe, Asia and America have experienced outbreaks of Avian Influenza which has affected global supply due to trade restrictions on outbreak countries¹⁵.
- Value adding opportunities from chicken litter which is a waste material but is a valued fertiliser for pasture and crops.

Constraints and challenges

- Increasing land prices and infrastructure production costs can prohibit growth of the industry.
- Incompatible with sensitive land uses such as residential, business, and community due to environmental impacts such as noise, odour, light and dust.
- Development within 100metres of a waterbody, 150metres from a residential development not associated with the poultry farm, or 500metres of another poultry farm will require an Environmental Impact Statement which is a more costly and onerous development assessment process.
- Managing and maintaining good farm biosecurity. Disease outbreaks can spread between farms and can decimate the local poultry growing and poultry meat industry. Biosecurity measures must be carefully implemented on poultry farms including locating breeder farms remotely from other poultry farms, vaccination, personnel quarantine and removal of rodents and dead birds.

¹⁵ DPI 2017

5.1.2. Vegetables and market gardening

Vegetable growing is the second largest agricultural sector in Penrith. The value of vegetable production in the 2015/2016 financial year was \$16 million contributing 11% of Greater Sydney's total value of vegetable production. Vegetables grown in the area include mushrooms, tomatoes, cabbages, lettuces, Asian vegetables and capsicums among other varieties. These vegetables are considered perishable vegetables in that they have a short shelf life and benefit from being produced close to consumer markets. Penrith is the fourth biggest producer of perishable vegetables in Sydney and the eighth biggest producer in NSW¹⁶. Vegetables grown in Sydney's MRA, including Penrith, are critical to the availability of fresh produce within Sydney. The practice of growing vegetables close to markets is also more efficient and sustainable as it reduces the time and costs associated with transporting produce to markets.

Vegetable producing areas occur throughout Penrith's rural lands. In the north Llandilo, Berkshire Park and Londonderry are the main vegetable producing areas, while in the south Kemps Creek and Badgerys Creek are the main vegetable producing areas. Other notable areas where pockets of vegetable production occur are in Luddenham at the intersection of The Northern Road and Elizabeth Drive, and in Orchard Hills immediately south of the M4 Motorway. In many of these areas, vegetable growing occurs alongside rural residential development on small properties generally between 1 to 5 hectares. Vegetables are grown in both controlled climate greenhouses and glasshouses and in outdoor market gardens.

Vegetable growing, and in particular market gardening, contributes to the rural character of these areas. Historically, market gardens have been established by farmers of culturally and linguistically diverse (CALD) backgrounds throughout the MRA of Greater Sydney. This appears to also be consistent in Penrith, as the most culturally diverse areas such as Kemps Creek and Llandilo are also the areas with the highest occurrence and employment in market gardening¹⁷. Vegetable growing areas of Penrith, particularly in the south, are at risk of being displaced by encroaching urban land uses.

Strengths and opportunities

- Provide important employment opportunities for residents of culturally and linguistically diverse backgrounds.
- Close proximity to a large consumer market.
- Intensive horticulture can operate on small landholding sizes of 1-2ha and above.
- Proximity to Western Sydney Airport and Agribusiness Hub can be a leverage point to grow the industry.

Constraints and challenges

- Increasing land prices, small fragmented landholdings and high capital outlays can prohibit growth of the industry.
- The effects of climate change will increase the likelihood and frequency of severe weather events such as flash flooding and droughts.
- Managing soil erosion, sedimentation and nutrient run-off entering waterways when located close to a waterbody.

5.1.3. Nurseries, cut flowers & cultivated turf

Nursery and cut flower production is the third largest agricultural sector in Penrith. The value of cut flower production in the 2015/2016 financial year was \$2.9 million, while the value of nursery production was \$1.2 million. Penrith contributes modestly to nursery and cut flower production in Greater Sydney making up 5% of Greater Sydney's total value of nurseries and cut flowers.

In rural areas in the north of Penrith nurseries are found in North Cranebrook, Llandilo and Agnes Banks. In the south of Penrith wholesale nurseries are located in Orchard Hills and Kemps Creek. The Glenleigh Wholesale Nursery is located next to the Glenleigh Estate in Mulgoa. There is little information currently available on the location of flower growing operations within rural areas of Penrith.

The Muru Mittigar Native Nursery located in Llandilo grows plants from the Sydney Region specialising in Cumberland Plain plant species¹⁸. Many plants are grown from seeds collected in the local area and include species that are now listed as threatened or endangered under State and Federal biodiversity legislation. The nursery also seeks to employ and train local Aboriginal people wherever possible.

The new Western Sydney Airport may increase the potential to grow native flowers and plant species locally for export to the international market. Most of Australia's flower exports are native Australian and South African varieties, but Australia's share in the production of these varieties is only around 10%¹⁹. Although further investigation is needed to determine the most appropriate species based on environmental conditions and market demand, flower varieties such as Flannel flowers and Waratahs are valued wildflowers that occur in the Sydney basin.

Strengths and opportunities

- Close proximity to a large consumer market.
- Potential to expand native flower and plant production and leverage off proximity to the Western Sydney Airport and large Sydney market.
- Nursery and cut flower production can operate on smaller landholding sizes of around 1h and above.

¹⁸ Muru Mittigar 2017

¹⁹ Australian Government Rural Research and Development Corporation 2013

Constraints and challenges

- Increasing land prices, small fragmented landholdings and high capital outlays can prohibit growth of the industry.
- Can be sensitive to market trends such as the fluctuating demand for cut flowers and plant species.
- Varieties grown is somewhat dependent on environmental conditions such as climate.

Cultivated turf

Cultivated turf is the fourth biggest agricultural sector in Penrith. The value of cultivated turf in the 2015/2016 financial year was \$2.7 million contributing 5% of Greater Sydney's total value of turf production. Despite only contributing modestly to Greater Sydney's cultivated turf supply, the Penrith LGA is the fourth biggest producer of cultivated turf in Sydney and sixth in NSW. The majority of turf is cultivated in the neighbouring Hawkesbury LGA²⁰.

Growing turf requires flat, fertile soils and plenty of water and can therefore only be grown in suitable areas. In Penrith, turf is cultivated along the fertile alluvial plains of the Nepean River in Agnes Banks and northern areas of Castlereagh. Other rural areas of Penrith are generally unsuitable for turf production.

Strengths and opportunities

- Close proximity to a large consumer market.
- Highly valued for both private landscaping and on public land such as sporting ovals.

Constraints and challenges

- Limited capacity to expand the industry as cultivating turf requires flat and fertile lands with sufficient water (generally Class 1-3 Land and Soil Capability).
- Managing soil erosion, sedimentation and nutrient run-off entering waterways.

²⁰ Edge Planning 2015

The approach to manage agriculture in the objectives, strategies and planning priorities set out in the Greater Sydney Region Plan and The Western City District Plan is to:

- Protect and support agricultural production by preventing inappropriately dispersed urban activities in rural areas; and
- Seek opportunities to grow the agriculture sector leveraging off the Western Sydney Airport.

Other strategic initiatives, currently being undertaken by State Agencies relevant to long-term planning for agriculture include:

- *The Western Sydney Aerotropolis* - The proposed Agribusiness Hub, as part of the Aerotropolis, is positioned as the main opportunity to expand the agriculture sector in the Western City District. The vision for the hub is discussed in Section 3.3.2 of this Study. Planning for the Agribusiness Hub is still at the pre-feasibility stage and the NSW Government has recently released a pre-feasibility study which provides a high-level blueprint for the Agribusiness Hub. Future land use and planning controls for the proposed area will need to be considered as the project further develops.

Other precincts within the Aerotropolis are intended for flexible employment and urban land uses as discussed in Section 3.3.1 of this study. It is likely that agricultural land uses within these areas will be gradually displaced over the next decade. Given this, it will be important to preserve commercial agricultural land in other areas of the LGA to ensure that Penrith's rural lands continue to remain productive.

- *The Primary Production and Rural Development SEPP* – The new SEPP commenced in February 2019 and provides a new planning framework for agriculture. The five former agriculture themed SEPPs have been repealed. Key aspects of the reform include:
 - Revising the definitions in the Standard Instrument LEP for the following land uses: 'intensive livestock agriculture', 'extensive agriculture', 'feedlot', 'water reticulation system' and 'water storage facility'.
 - Including a new model clause in the Standard Instrument LEP that sets development consent thresholds for intensive livestock agriculture based on number of animals.
 - Including a new clause in the Standard Instrument LEP that allows lots to be subdivided for the purpose of agriculture to

create a lot size less than the minimum lot size shown on the lot size map. The new lot does not come with a dwelling entitlement.

- Aligning with the NSW Right to Farm policy (see below)

Any future reviews of Penrith's LEP and DCP controls will need to reflect this new planning framework for agriculture.

- *The NSW Right to Farm Policy* - The State Government supports the right of farmers to operate their agricultural practices without conflict or interference from other land users. This is shown in the Right to Farm Policy. Under this policy, all councils will be expected to apply planning controls or suitable mechanisms to:
 - Promote the continued use of agricultural land for commercial agricultural purposes;
 - Protect important agricultural land and other resources on which agriculture depends;
 - Avoid land use conflict; and
 - Support the retention of critical industry mass and access to services, infrastructure, processing facilities and markets.

The application of rural land use zonings and minimum lot size through Council's LEP provides a basis for prioritising agricultural land uses. The specific application of these controls to date appears to be:

- Applying the RU1 Primary Production zoning to land where agriculture is the primary land use, larger lots occur, and where some of the most productive agricultural land is located. This zoning applies to Castlereagh and Agnes Banks west of Castlereagh Road and in Luddenham on either side of Park Road.
- Applying the RU4 Primary Production Small Lot zoning to land where a mix of rural uses occur, including agriculture. Landholding sizes are around 1-3 ha. This zoning is widespread and applies to areas of Agnes Banks, Castlereagh, Londonderry, North Cranebrook, Llandilo, Berkshire Park, Orchard Hills, Kemps Creek, and Regentville/ Jamisontown.
- Applying the E3 Environmental Management zoning and permitting some agricultural land uses to most rural land throughout the Mulgoa Valley.
- Applying the E4 Environmental Living Zone to rural living areas where intensive agricultural activities should not occur. This zoning is applied to areas of Castlereagh, Cranebrook and Mount Vernon.

- Applying the additional permitted use clause to allow agriculture with consent in an E4 zone in Mount Vernon.

Controls in the LEP are supported by additional controls in the DCP under section D1 Rural Land Uses. These controls outline additional assessment requirements for land uses with a high likelihood of causing land-use conflict with neighbouring rural living if not managed appropriately such as poultry farming and market gardening.

The main threat to agricultural production is encroaching urban and rural residential development, which is perceived as a more valuable use of the land. This issue is not unique to Penrith. Research by the Institute of Sustainable Futures at the University of Technology Sydney considered the potential impact of urban growth upon Sydney's local food production. The research found that under the current population growth scenario used in current strategic planning Sydney will lose around 60% of total food production, compared to 2011 levels²¹.

With the future loss of land suitable for agriculture in the Rural South of Penrith, it will be vital to protect rural land used for commercial agriculture in the Rural North of Penrith. Allowing further subdivision in primary production zones or rezoning this land for residential use will continue to erode suitable agricultural land.

²¹ Wynne, Cordell & Jacobs 2019

5.2. Mining & quarrying

Penrith has valuable mineral resources that are quarried for the extraction of sand, shale, or structural clay. These resources are used to make construction materials for the Greater Sydney market including concrete, mortar, bricks and roofing tiles. Section 4.3 of this Study discusses mineral resources found in the Penrith LGA.

In the Rural North, sand extraction occurs in Agnes Banks and is used for mortar, concrete and to manufacture coloured glass. Londonderry also contained a quarry which was an important source of plastic red firing clay for use in terracotta roof tile manufacture until the closure of the plant which it supplied²². Other areas of Londonderry contain substantial clay deposits that are undeveloped on land that is heavily vegetated.

In the Rural South, areas of Kemps Creek, Badgerys Creek and Erskine Park contain shale deposits which are quarried for structural clay. Some of these are operating as both quarries and landfill sites, recognising the compatibility of the two land use activities.

Penrith Lakes was also home to Australia's largest sand and gravel quarry. While operating for over 100 years, it contributed a major proportion of aggregate used in Greater Sydney's construction industry. The quarry ceased operating in 2015 and plans for its ongoing rehabilitation into the Penrith Lakes Parkland are underway.

Both the Greater Sydney Region Plan and Western City District Plan recognise the importance of Penrith's mineral areas for Greater Sydney's construction industry. Access to locally based construction materials is critical for continued growth of the industry and for reducing construction costs. The objectives, strategies and planning priorities outlined in the Region and District Plan seek to protect and support the extraction of mineral resources, in particular construction materials, by preventing inappropriately dispersed urban activities in rural areas.

Other strategic initiatives, currently being undertaken by State Agencies relevant to long-term planning for mining and quarrying include:

- *Mineral Resources Audit* – The NSW Government undertakes an audit of mineral resources across the State, providing information and mapping for each LGA. The audit maps both identified and

potential resource sites across the LGA, as discussed in Section 4.3 of this Study. The audit also maps 'transition areas' around each mineral resource. These are buffer areas of 1000 metres for sites where blasting may be used, and 500 metres for sites where blasting is not required. This mapping can assist with identifying and zoning appropriate transition areas where current and future mining and quarrying operations may occur.

There are two key environmental planning instruments that sets out the NSW Government's approach to identifying and facilitating the extraction of mineral resources in Greater Sydney.

- *Sydney Regional Environmental Plan No 9 – Extractive Industry (No 2 – 1995)*, which identifies land within the Penrith LGA where extractive industry development is permitted with consent. It also sets out the matters of consideration when assessing a development application, and when amending planning controls that affect land containing mineral resources.
- *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, under Part 2(7) of this SEPP mining and quarrying is permitted with consent anywhere that also permits agriculture and industry, such as on land with a rural land use zoning.

Part 2(9A) of the Mining SEPP does exclude coal seam gas production from occurring within 2km of a 'residential zone', which is defined as R1, R2, R3, R4 zonings, which generally reflect urban areas, as well as the RU5 Rural Village zoning. Notably, R5 Large Lot Residential and E4 Environmental Living zonings, which are commonly applied in rural areas, are not considered to be 'residential zones' for the purpose of excluding coal seam gas production.

Clause 50A of the Environmental Planning and Assessment Regulation 2000 requires a DA for consent to mining and petroleum development on land shown on the Mining SEPP's 'Strategic agricultural land map' to be accompanied by a Gateway certificate and Site verification certificate, which are both issued by the State Government.

²² NSW Trade & Investment 2011

The Standard Instrument LEP mandates land use permissibility within zones that must be incorporated into all LEPs. The combined effect of the Mining SEPP and mandated Standard Instrument LEP uses limits the extent to which Councils can utilise land use zonings to influence where mining can occur without also discouraging rural activities generally. Table 4 shows the permissibility of mining and quarrying under the Mining SEPP and how this is currently applied in the Penrith LGA. Under the current Penrith LEP mining and quarrying is permissible on land zoned RU1, RU2, RU4 and E3.

Table 4. Mining & quarrying permissibility under the Mining SEPP and Penrith LEP 2010

Zones	Mining and quarrying permissible via the Mining SEPP	Current Penrith LEP zoning permissibility
RU1 Primary production	Yes, as mandatory	Yes, as mandatory
RU2 Rural landscape	Yes, as mandatory	Yes, as mandatory
RU4 Primary production small lots	Yes, as mandatory	Yes, as mandatory
RU5 Village	Not as mandatory	Not applied
R5 Large lot residential	Not as mandatory	Not applied
E1 National parks and nature reserves	Not as mandatory	Not applied
E2 Environmental conservation	Not as mandatory	Not applied
E3 Environmental management	Not as mandatory	Yes
E4 Environmental living	Not as mandatory	Not applied

Council's approach to managing mining and quarrying in their LEP and DCP appears to be:

- Generally applying the RU1 Primary Production (in the north) or RU2 Rural Landscape (in the south) to land with operating mines and quarries.
- Making Extractive Industries permissible with consent in the RU1 Primary Production zone. Council has not amended the LEP to make Extractive Industries permissible with consent, or prohibited in other rural zones as Extractive Industries are permissible with consent in all land use zones where Agriculture and industry is permissible with consent under the *SEPP (Mining, Petroleum Production and Extractive Industries) 2007*.
- agricultural land map' to be accompanied by a Gateway certificate and Site verification certificate, which are both issued by the State Government.

5.3. Tourism & recreation

Tourism and recreation opportunities in Penrith are often associated with adventure sports and natural assets such as the Nepean River. Penrith City Council is actively promoting tourism development within the LGA including the plan to make Penrith the ‘Adventure Capital’ of Sydney. Penrith’s Destination Management Plan provides an audit of tourism experiences and accommodation throughout Penrith as shown in Table 5. While most of these experiences are located in urban areas of Penrith there are also several experiences in the rural areas of Penrith. Overall, tourism is undeveloped in most rural areas of Penrith, in particular there is a shortage of tourist and visitor accommodation on offer.

Growing tourism in rural areas can have a number of place-based benefits. Tourism can contribute significantly to local economic development, new employment opportunities and increase pride of place.

Penrith’s 2017 Economic Development Strategy outlines a target of an additional 2000 jobs in the tourism sector by 2031²³. Penrith has many assets that can be capitalised on to grow tourism and visitation in rural areas. These include natural features, impressive built heritage, sporting events, and rural activities such as equestrian. The new Western Sydney Airport will also serve as a global gateway for international visitors to access Penrith, it is expected that there will be increasing demand for accommodation conveniently located near the airport.

Table 5. Tourism experiences and accommodation in rural areas of Penrith (Source: The Stafford Group & Penrith City Council 2015, high level internet search)

Place area	Tourism and recreational experiences	Accommodation
Rural North West	<ul style="list-style-type: none"> ▪ Sydney International Regatta Centre (Penrith Lakes - outside the study area) ▪ Nepean Motor Sports Club (Castlereagh) ▪ LMX Bicycle Supercross (North Cranebrook) ▪ Wianamatta Nature Reserve (North Cranebrook) ▪ Fiona Hughes Equestrian Centre (Londonderry) 	<ul style="list-style-type: none"> ▪ Penrith Lakes Bed and Breakfast and Bunkhouse (outside of study area)
Rural North East	<ul style="list-style-type: none"> ▪ Castlereagh Nature Reserve (Berkshire Park) 	Nil
River West	Nil	<ul style="list-style-type: none"> ▪ Nepean River Holiday Park (outside of study area)
Rural South West	<ul style="list-style-type: none"> ▪ Mulgoa School of Equitation (Mulgoa) ▪ Mulgoa Nature Reserve (Mulgoa) ▪ The Rock Lookout (Mulgoa) ▪ Glenmore Heritage Valley Golf Club (Mulgoa) ▪ Blaxland Crossing Reserve (Wallacia) 	<ul style="list-style-type: none"> ▪ Wallacia Caravan Park ▪ Wallacia Hotel ▪ Mulgoa Valley Receptions
Rural South East	<ul style="list-style-type: none"> ▪ Luddenham Raceway (Go Karting, Paintball and Motorsport) ▪ Model Park (Sydney Society of Model Engineers Inc.) (Luddenham) ▪ The Honey Shed (Blue Mountains Honey Company) (Luddenham) ▪ Twin Creeks Golf and Country Club (Luddenham) 	<ul style="list-style-type: none"> ▪ The vines holiday cottages (Orchard Hills)

Heritage

The rural areas of Penrith contain many listed heritage items that serve as historical markers of early European settlement in Sydney. Mulgoa alone has 13 listed heritage buildings that shape the distinctive local character of the area including impressive homesteads, cottages and community buildings. Other rural areas that contain clusters of heritage items include Castlereagh and Agnes Banks along Castlereagh Road, Mamre Road in orchard Hills, and the rural or village centres of Llandilo, Luddenham and Wallacia. In general, when driving around rural areas of Penrith, heritage items are not well signposted and there is little understanding of their significance and history, or which buildings are publicly accessible and which buildings are not.

Better identifying and marketing these heritage assets and adaptively re-using them, and opening them up to the public where possible, can increase heritage tourism in the local area. Stately homesteads such as the Fernhill Estate in Mulgoa make impressive locations for events. Tools that identify and describe items of heritage significance in the local area can also attract visitors to better understand the local history and stories of the area. Council has made steps to encourage heritage tourism in the LGA including marketing a 'Penrith Heritage Drive', although the drive only includes few items in rural areas of Penrith. Council has also introduced planning controls in the Penrith LEP that allow additional permitted uses such as a restaurant or café in some heritage areas.

Natural Assets

Penrith has many natural assets in rural areas of the LGA including the Nepean River, South Creek, the Blue Mountains National Park and nature reserves. The National Parks and Reserves provide opportunities for bushwalking and appreciating nature. The Nepean River provides opportunities for water sports such as kayaking and there is river access via Delvin Road in Castlereagh. In other rural areas of Penrith there is limited opportunities to interact with the river and wayfinding to these areas is difficult for visitors.

Increasing public access to Penrith's natural assets, such as the Nepean River and South Creek, and better promoting these assets will help grow tourism in rural areas. It will also provide opportunities for the local community to better enjoy the natural environment. Increasing public access could include extending the 'Great River Walk' into rural areas, acquiring more public space along waterfronts, and developing

infrastructure such as a boat launching ramp in rural areas. Better promoting natural assets could include establishing a Visitor Information Centre in Penrith and introducing signage to publicly accessible waterfront areas.

Events

The Sydney International Regatta Centre (SIRC) holds events all year round. Despite this, there are no accommodation options available in the rural lands of Castlereagh, Agnes Banks and Cranebrook near to the SIRC. These areas have a scenic rural and natural character that make them attractive places for tourist accommodation, such as bed and breakfasts, that complement this character.

The approach to manage and grow tourism and recreation reflected in the objectives, strategies and planning priorities set out in The Greater Sydney Region Plan and The Western City District Plan is to:

- Build capacity for tourist accommodation in appropriate locations through LEPs
- Consider opportunities to implement place-based initiatives to attract visitors, improve visitor experience and ensure key tourist attractions are well connected to transport.
- Connect and activate the Nepean River as a focal point and a destination

Tourism and recreation focused projects of Metropolitan significance in the LGA include the Penrith Lakes Precinct and the South Creek Corridor. It is expected that over the next decade the State Government will direct considerable effort toward rehabilitating these areas and establishing tourism and recreational opportunities for the broader public.

Other strategic initiatives, currently being undertaken by State Agencies or Penrith City Council relevant to long-term planning for tourism and recreation include:

- *Penrith Destination Management Plan 2015* – The DMP outlines Penrith’s strengths to attract visitors, current gaps in the tourism offering and future strategic directions to grow visitation and tourism across the LGA. Key identified strengths include Penrith’s offering of events and adventure sports, important natural assets including the Nepean River, and the LGAs location between the Sydney City and the Blue Mountains. Identified gaps include a lack of short-term accommodation and the need to grow cultural tourism. While the DMP primarily has an urban focus, the strategic direction to develop a ‘destination caravan park’ is likely to occur in rural areas.
- *Sport, Recreation, Play and Open Space Strategy 2019* – This Strategy is currently in preparation and will consider the quality, quantity and distribution of open space across the LGA, recognising that there is a need to improve access and the capacity of open spaces by providing better connections and multiple recreational opportunities.

The application of land use permissibility in rural areas through Council’s LEP provides a basis for encouraging tourist and visitor accommodation. The approach taken by council to date appears to be:

- Permit small-scale tourist accommodation of up to 20-30 guests²⁴.
- Prohibit larger-scale accommodations such as hotel and motel accommodation, serviced apartments, and camping and caravan parks recognising that these types of accommodation require good transport and reticulated sewer and are more appropriate in other areas of the LGA.

The specific application of these controls under the Penrith LEP is shown in Table 6 below.

Table 6. Permissibility of short-term accommodation under the Penrith LEP 2010

	Tourist and visitor accommodation							
	BA	B&B	FSA	HMA	SA	Camping	Caravan	Eco
RU1 Primary Production	X	✓	✓	X	X	X	X	X
RU2 Rural landscape	✓	✓	✓	X	X	X	X	X
RU4 Primary Production Small Lots	✓	✓	✓	X	X	X	X	X
RU5 Village	✓	✓	✓	✓	X	X	X	X
R5 Large Lot Residential	✓	✓	✓	X	X	X	X	X
E2 Environmental Conservation	X	X	X	X	X	X	X	X
E3 Environmental Management	✓	✓	✓	X	X	X	X	X
E4 Environmental Living	X	✓	X	X	X	X	X	X
<i>Backpackers Accommodation (BA), Bed and Breakfast Accommodation (B&B), Farm Stay Accommodation (FSA), Hotel or Motel Accommodation (HMA), Serviced Apartments (SA)</i>								

²⁴ Penrith City Council 2014 p. D1-43

5.4. Other uses

5.4.1. Animal boarding and training

Equestrian

Equestrian activities occur throughout rural areas of Penrith. The local equine industry is well established in rural areas of Penrith and encompasses a range of equestrian activities including horse breeding, horse training and competitive equestrian sports such as horse and harness racing, show-jumping, eventing and polo. Keeping horses and recreational riding is also a popular pastime associated with rural residential living.

Little information is available on the contribution of the equine industry to the local economy and employment. The economic contribution of the industry can be difficult to quantify because it is so varied and includes breeding, training, events, and support and health services. Horse breeding of thoroughbreds and warmbloods can cost upwards of a \$1 million per foal when sired by a renowned stallion. The value is dependent on the reputation of the studs and the fees for servicing and agisting mares and foals. In addition, the horse industry generates significant employment through training, coaching services, agistment, events, support services (e.g. feed, riding equipment, transport and infrastructure needs) and through equine health services (e.g. veterinary, chiropractic and hoof care services). The main equine veterinary hospitals servicing the industry locally are located just over the Hawkesbury border in Agnes Banks as well as in Clarendon and Cobbity.

The Agnes Banks and Castlereagh Area is home to a number of world-renowned thoroughbred studs and training establishments. These studs can attract people and horses in the industry from all over the world to visit Penrith. There are also various equestrian riding schools and activities providing opportunities for people to visit and go horse-riding.

In the north, one of these studs has recently been purchased by Racing NSW. They intend to use the property for education and training purposes, as a quarantine station and also to support their horse rehabilitation program. Other smaller equestrian businesses are located throughout the rural north including small-scale harness racing trainers in Londonderry and Berkshire Park, while local pony clubs are located in Londonderry and Orchard Hills. In the southern rural areas of Penrith equestrian activities are dispersed throughout Mulgoa, Luddenham, Orchard Hills and Kemps Creek and include breeding, agistment, training and educational activities.

There may be potential to grow equestrian activities in the rural areas of Penrith subject to properties being large enough to accommodate new equine uses, such as competition venues, to grow the local industry. For instance, to accommodate either a training track for harness racing trainers, an arena for dressage trainers, or an equine competition venue would generally require a property size larger than 2.2 hectares. Within the Penrith LGA there are currently no significant competition venues nor are there designated areas for trail riding. However, training, eventing and competition venues are located in neighbouring LGA's. Facilities include the Hawkesbury Race Club, Sydney Showjumping Club Hawkesbury Riding Club (for dressage and eventing) and several competition venues in the neighbouring Hawkesbury LGA, and competition venues in Camden to the south. Both the Sydney and Windsor Polo Clubs are located nearby, while Horsley Park to the east of the Penrith LGA is home to the Sydney International Equestrian Centre.

Dog Kennels

The commercial breeding, keeping and training of dogs is a prevalent land use throughout rural areas of Penrith, particularly in the north. The Greyhound racing industry is well established in Londonderry which is home to the Richmond Greyhound Race Club and many properties breeding, keeping and training greyhounds. Dog training facilities are located in Agnes Banks, Berkshire Park and Orchard Hills, which is also home to Dogs NSW who promote responsible dog ownership, while dog and cat boarding kennels occur throughout Berkshire Park and areas of Llandilo and Londonderry.

The keeping, training and breeding of dogs can cause land use conflict primarily due to concentrated noise from the animals and overall impact on the rural landscape character. The incidence of land use conflict is heightened when dog kennels are interspersed with rural residential land uses, which is generally the case in rural areas of Penrith. Council provides planning controls in the Penrith DCP that address the key issues associated with dog boarding, training and breeding establishments.

5.4.2. Truck keeping

Truck keeping in rural areas is primarily associated with home-based transport and construction businesses that provide important employment opportunities for residents. Census data shows that road freight transport is already the top industry of employment in nearly all rural areas of Penrith. Other major industries, such as site preparation services and road and bridge building, also rely on truck keeping ²⁵.

While truck keeping is widespread throughout rural areas of Penrith, it is currently most visible in Berkshire Park and Londonderry in the north and Kemps Creek in the south. In these areas, properties are of a suitable size to accommodate small scale truck keeping alongside rural living (0.8 - 2 ha). Trucks are often kept in large storage sheds, with other materials such as earthmoving equipment. Mounds of earth and stockpiled materials are also visible on some properties.

Truck keeping is an important driver of employment in rural areas but is also a persistent cause of land-use conflict with adjoining rural residential uses. Council receives more complaints regarding truck keeping and associated activities in rural areas than nearly any other land use.

The prevalence of this type of use is expected to increase in the coming years, particularly in association with the Aerotropolis, and delivery of major new motorways such as the Castlereagh Connection and Outer Sydney Orbital. This is expected to come with increased demand for larger-scale operations, and to accommodate larger trucks. If not managed appropriately, this has the potential to quickly impact on rural amenity.

Council's controls currently allow for the keeping of up to 2 trucks in specified rural and environmental zonings as exempt development. The keeping of 3 or more trucks in rural areas is prohibited outright. Despite this, land use complaints indicate that the keeping of 3 or more trucks is already occurring illegally in some locations, suggesting the need to review the effectiveness of these controls.

It is not recommended that larger truck keeping operations are facilitated as exempt development. However, larger scale operations could be considered through alternative development pathways.

It is also recommended that development guidelines for truck keeping, including truck parking areas and rural sheds or outbuildings associated with this use, are reviewed and updated. These controls should, at minimum, address the following considerations, which reflect most of the complaints received in relation to this use.

- Siting, bulk and scale of sheds
- Required setbacks from property boundaries and/or sensitive uses, such as dwellings or existing agricultural production areas
- Management of visual impacts
- Ongoing requirements for on-site stockpiling and storage of material
- Ongoing management of noise, dust, and light spill to surrounding properties, including hours of operation
- Requirements for access roads (e.g. engineering standards)

Consideration should also be given to the preparation of site-specific guidelines for more popular locations, such as Berkshire Park, Londonderry, and Kemps Creek to better assist with the identification and assessment of impacts associated with truck keeping development within the localised context.

5.4.3. Home businesses and home industries

Penrith's rural areas support a wide variety of home-based businesses and industries. They provide important employment opportunities for people living in rural areas. Home-based enterprises tend to be small-scale, generally employing between 1-2 people. They include electronic and whitegoods repair, hair and beauty, transport, construction and pet-boarding businesses, among others. These enterprises are not always visible as they occur in people's homes, or ancillary buildings, however many are identifiable from signage out the front of the property. Home businesses and industries are most visible in the rural residential areas of Londonderry and Berkshire Park in the north but are widespread throughout rural Penrith.

Home enterprises have the potential to cause land use conflict, for example truck keeping is a known cause of land use conflict. However, many have a limited impact on the amenity of local areas. Planning controls under the Penrith LEP permit home businesses and industries with consent generally

²⁵ ABS 2017

where residential accommodation is permissible, while the Penrith DCP outlines planning controls relating to the design, operation, advertising and traffic associated with home businesses and industries. These controls facilitate residents being able to establish local businesses and to work from home in rural areas while mitigating potential impacts on local amenity.

6. RURAL COMMUNITIES

Rural communities are as diverse as their landscapes. Understanding the unique history, current characteristics and expected future challenges of rural communities is an important consideration when planning for long-term change.

This section provides a high-level review of historic and present-day information relevant to different parts of Penrith’s rural areas. This is intended to offer insights into how change expected at the localised level may impact on current and future residents. It illustrates social, cultural and employment characteristics that may assist in future planning and plan-making within the LGA.

Figure 23 to Figure 26 outlines key statistics relating to population and housing in Penrith’s rural lands and are based on 2016 statistics sourced from idProfile. Based on these figures, the following observations are made:

Population (Figure 23): Luddenham, Londonderry, Berkshire Park, Mulgoa and Wallacia and Luddenham are the most populated areas, and are generally the localities that include more densely populated villages. Smaller lot sizes (i.e. 2ha minimum) also impacts on population density particularly in the northern rural areas.

Population Growth (Figure 24): Population growth is strongest around Luddenham, however it is noted that population growth statistics includes the Twin Creeks Estate, which is not included as part of Penrith’s rural lands. Outside of Luddenham, population growth has been strongest in Londonderry and Berkshire Park, noting that some intensification of residential uses has occurred in Londonderry Village.

Dwelling Growth (Figure 25): Dwelling growth generally coincides with population growth figures with Luddenham, Londonderry Berkshire Park experiencing the most significant growth in dwelling numbers.

Dwelling Vacancy (Figure 26): Dwelling vacancy is highest in Mulgoa and Wallacia, which suggests that existing housing is not being efficiently utilised to house the rural population in these localities.

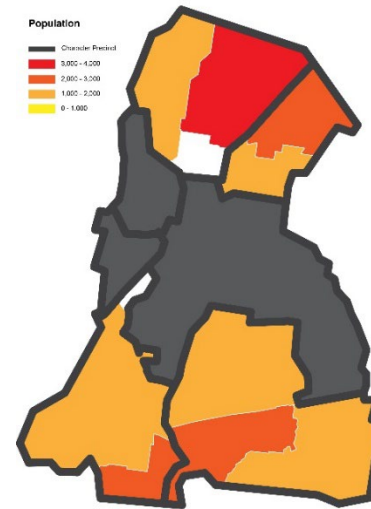


Figure 23 Population of Penrith's rural lands

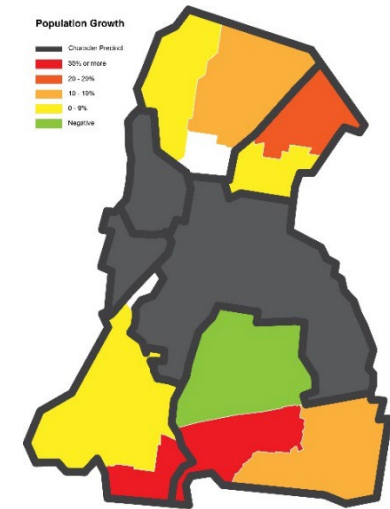


Figure 24 Population growth in Penrith's rural lands

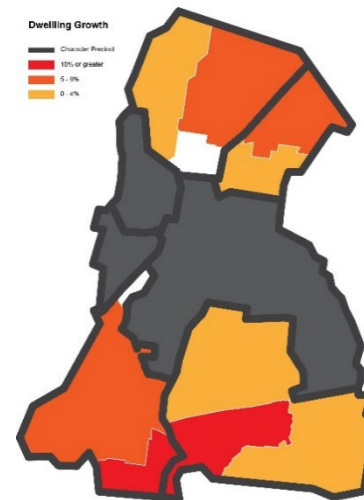


Figure 25 Dwelling growth in Penrith's rural lands

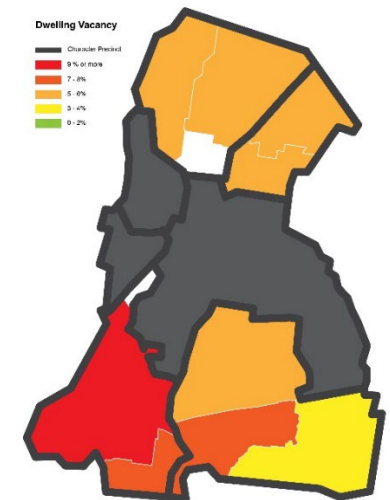


Figure 26 Dwelling vacancy in Penrith's rural lands

(Source: CPSD adapted from id Profile 2018)

6.1. Method

A high-level review of demographic characteristics in Penrith's rural areas is provided below, consolidating data from the following sources:

- Demographic analysis prepared by .id the population experts (Profile id.) for Penrith City Council;
- Penrith Community Profile 2018 prepared by Penrith City Council; and
- Australian Bureau of Statistics Census data from the years 2006, 2011 and 2016.

Profile id. data was favoured for this review, as it was considered the most accurate. Information was supplemented from the other sources where relevant.

Information was used collectively to prepare profiles for smaller areas within each of Penrith's rural Character Precincts. For consistency between data sources, information was aggregated around statistical suburbs. Data presented in this Report may have been adjusted as follows:

- Profile id. aggregates data for some rural suburbs, which is directly reflected in the profiles presented below. Suburb-specific census data within aggregated areas is provided for median age and household size.
- Where a statistical suburb spans across two LGAs (e.g. Agnes Banks, Wallacia, Luddenham, and Kemps Creek), Profile id. information reflects data for only those parts of the suburb within the Penrith LGA boundary. Otherwise, census data is presented for the entire suburb, so may reflect information that is not specifically relevant to the Penrith LGA.

All information presented is based on census data, noting there is a low level of confidence in data relating to smaller population sizes. This is typical for rural areas across Australia. The information has only been used to identify insights and characteristics that appear to be unique to a localised area.

Information is presented separately for the following 'demographic profile areas', comprising one or more statistical suburbs.

Within Penrith's Rural North West

- Agnes Banks-Castlereagh (aggregated)
- Londonderry

Note: Data for North Cranebrook has not been included because it is within the statistical suburb of Cranebrook. This suburb is predominantly urban, and, if presented, the data would not provide an accurate reflection of the rural community's characteristics.

Within Penrith's Rural North East

- Berkshire Park
- Llandilo

Within Penrith's Rural South East

- Part Wallacia-Luddenham (aggregated)
- Orchard Hills
- Kemps Creek - Badgerys Creek - Mount Vernon (aggregated)

Within Penrith's Rural South West

- Mulgoa
- Part Wallacia-Luddenham (aggregated)

Note: The River West Precinct consists of the statistical suburbs of Emu Heights, Emu Plains and Leonay. Demographic data for these suburbs has not been included in this Study as these suburbs are predominantly urban.

6.2. Culture and heritage

6.2.1. Aboriginal heritage

Prior to 1789, the land district around Castlereagh and the Nepean River was the territory of a number of neighbouring Aboriginal groups, who lived in open campsites and sheltered under temporary gunyahs or dwellings of wide sheets of bark bent into an A-frame. The men hunted possums, birds, ducks, wallabies, kangaroos and reptiles and used digging sticks, spears, boomerangs and traps. The women harvested yams by churning up the river bank, collected berries, grubs and shoots and cooked their food over an open fire. The rivers and creeks were a valued natural resource to the local people, providing food, drinking water, swimming and transport.

The occupation of the area by Europeans from early 1800s resulted in the serious disruption of the traditional lifestyles of Aboriginal groups, breaking the traditional territorial boundaries and isolating previous areas of food gathering and shelter. The 1828 census recorded 156 Aboriginal people living in the Penrith area. Today Penrith has many Aboriginal and Torres Strait Islander residents from many different nations.

Given the extent of Aboriginal settlement, much of Penrith's rural areas are expected to contain objects and places that are of significance to Aboriginal people for social, spiritual, historical and commemorative reasons²⁶. Significant places can include ceremonial and burial grounds, scarred trees and carved trees, art sites and stone arrangements²⁷.

The Penrith City Strategy (2013) indicates that there are 82 Aboriginal archaeological sites within Penrith LGA. These are generally located near watercourses and demonstrate artefact creation, use and repair²⁸. Piecemeal portions of Penrith's rural lands have also been surveyed, mainly to support assessments of proposed developments. Otherwise, the location of significant Aboriginal places and objects has not been widely revealed.

The Penrith LEP and DCP outline planning controls to preserve items and sites of Aboriginal archaeological significance across broader Penrith. Controls outlined in the Penrith DCP includes high-level mapping to signpost where land is likely to contain Aboriginal archaeological sites. This

reflects the only available mapping to support broadscale identification and protection of important features.

The NSW Government has proposed a new system for managing and conserving Aboriginal cultural heritage. These reforms offer a contemporary and respectful vision for the management of Aboriginal cultural heritage that aims to:

- Recognise Aboriginal cultural heritage values;
- Provide broader protection and more strategic conservation of Aboriginal cultural heritage values;
- Create a new governance structure that gives Aboriginal people legal responsibility for and authority over Aboriginal cultural heritage;
- Improve outcomes for Aboriginal cultural heritage with new information management systems and processes; and
- Facilitate better assessments and clearer consultation processes for proposals that might affect Aboriginal cultural heritage.

These reforms will be supported by a new legal framework that respects and conserves Aboriginal cultural heritage in New South Wales.

It is recommended that the Council support the NSW Government in these reforms.

Penrith City Council strongly supports collaborating with Aboriginal and Torres Strait Islander organisations and has a strong working relationship with the Deerubbin Local Aboriginal Land Council (DLALC). Council and DLALC have a Working Together Agreement that provides a structured framework for dialogue and action on matters of mutual interest²⁹.

6.2.2. European heritage

European settlers discovered the Nepean River at Penrith in 1789 making it one of the earliest settled areas in Australia³⁰. Penrith's rural areas contain significant buildings and natural landscapes that document European settlement and the historical, cultural, social and technological changes that have occurred since this time. Many rural areas have sustained farming activity since early European settlement and contain

²⁶ Penrith City Council 2014 p. C7-14

²⁷ OEH 2018

²⁸ Penrith City Council 2013 p. 41

²⁹ Penrith City Council 2018 p. 13

³⁰ Paul Davies Pty Ltd 2006 p. 11

farmhouses, stately manors, cottages and community buildings that serve as markers of the growth and evolution of rural farming communities³¹. The most recent Penrith Scenic and Cultural Landscapes Study identifies the Mulgoa Valley including the rural villages of Mulgoa and Wallacia and Castlereagh Road to the north of Penrith Lakes as important cultural landscapes for their European heritage³².

The 2007 Penrith Heritage Study was the last comprehensive study of significant heritage items and places undertaken for the LGA. Its findings have already been incorporated into the Penrith LEP and DCP where relevant. Given the age of the Penrith Heritage Study, it is recommended that a new study is completed to identify whether any additional features warrant protection.

6.2.3. Cultural diversity of Penrith today

Today, Penrith is a culturally rich and linguistically diverse LGA and its rural areas reflect this diversity (see Table 7). Penrith's rural communities have a broad cultural make-up, with the most common places of origin being the United Kingdom, Malta, Italy, China and New Zealand. Kemps Creek - Badgerys Creek - Mount Vernon in the rural south is one of the most culturally diverse rural areas of the LGA with more than 1 in 5 residents being born overseas and one third of residents speaking a language other than English at home. Nearly 1 of every 5 residents were born overseas in both Berkshire Park and Llandilo, making them the most culturally diverse areas of the rural north.

People who identify as Aboriginal and Torres Strait Islanders represent 4% of the total population of the Penrith LGA, which is higher than both Greater Sydney and New South Wales³³. Today, the Aboriginal population of broader Penrith is made up of around 30 different tribal groups from across Australia³⁴. There are more Aboriginal and Torres Strait Islanders living in the rural north than the rural south, with the highest proportion living in Berkshire Park (12.8%), Llandilo (5.5%) and Londonderry (4.5%) (see Table 7).

Table 7. Cultural and linguistic diversity of residents living in rural areas, Penrith LGA, 2016 (id. the population experts 2018)

	Aboriginal and Torres Strait Islanders	Total number of people born overseas
Agnes Banks - Castlereagh	37 (2.2%)	217 (13%)
Londonderry	177 (4.5%)	519 (13.3%)
Berkshire Park	275 (12.8%)	420 (19.7%)
Llandilo	89 (5.5%)	299 (18.3%)
Mulgoa	44 (2.3%)	314 (16.6%)
Wallacia - Luddenham	59 (2.4%)	336 (13.9%)
Orchard Hills	28 (1.5%)	111 (5.9%)
Kemps Creek - Badgerys Creek - Mount Vernon	29 (1.6%)	439 (24.1%)
Agnes Banks - Castlereagh	United Kingdom 56 (3.3%) Malta 46 (2.7%) Italy 14 (0.8%)	140 (8.4%)
Londonderry	United Kingdom 118 (3%) Malta 94 (2.4%) New Zealand 37 (0.9%)	378 (9.6%)
Berkshire Park	Malta 63 (3%) New Zealand 40 (1.9%) Vietnam 34 (1.6%)	181 (8.5%)

31 Paul Davies Pty Ltd 2007
32 Envisage Consulting 2019 p.26

33 Penrith City Council 2018
34 Ibid.

Table 9 continued

	Aboriginal and Torres Strait Islanders	Total number of people born overseas
Berkshire Park	Malta 63 (3%) New Zealand 40 (1.9%) Vietnam 34 (1.6%)	181 (8.5%)
Llandilo	Malta 92 (5.6%) United Kingdom 51 (3.1%) China 28 (1.7%)	375 (23%)
Mulgoa	United Kingdom 75 (4%) Germany 22 (1.2%) India 22 (1.2%)	232 (12.2%)
Wallacia - Luddenham	United Kingdom 89 (3.7%) Malta 31 (1.3%) New Zealand 22 (0.9%)	285 (11.8%)
Orchard Hills	Lebanon 41 (2.2%) India 23 (1.2%) Netherlands 15 (0.8%)	458 (24.1%)
Kemps Creek - Badgerys Creek - Mount Vernon	Italy 99 (5.4%) Iraq 55 (3%) China 31 (1.7%)	630 (34.6%)

6.3. Social and economic snapshot

Demographic snapshot for all rural areas profiled

Most populated areas 2016	Londonderry (around 3,900) Wallacia-Luddenham (around 2,420) Berkshire Park (around 2,140)
Highest growth areas 2010-2016	Wallacia-Luddenham (+41%, around 700) Berkshire Park (+27%, around 460) Kemps Creek–Badgerys Creek–Mount Vernon (+16%, around 250)
Lowest growth areas 2010-2016	Orchard Hills (-5%, around 105) Mulgoa (+6%, around 105) Agnes Banks-Castlereagh (+7%, around 110)
Oldest area 2016	Orchard Hills (median age 43) Mulgoa (median age 41)
Youngest area 2016	Berkshire Park (median age 34) Luddenham (median age 35)
Highest earning areas 2016	Mount Vernon (average \$2,560/week) Luddenham (average \$2,230/week) Mulgoa (average \$2,220/week)
Lowest earning areas 2016	Badgerys Creek (average \$1,280/week) – below LGA average Kemps Creek (average \$1,610/week) – below LGA average Londonderry (average \$1,860/week)

- At least half of all rural households are couple families with children, and average household sizes are generally consistent across most rural areas (3.2-3.6 persons per household). The suburb of Mulgoa is the extreme lower end of this (2.9 persons per household), which may reflect its proportionately older population.
- With the exception of the Kemps Creek and Badgerys Creek suburbs, Penrith's rural households generally earn above average incomes compared with LGA and State benchmarks. However, there is a high variability of total socio-economic disadvantage, which may suggest some areas are more vulnerable to economic shocks (e.g. lower education levels or other socio-economic limitations arising from mobility or language).

- The top industries of employment for most suburbs typically reflect around 4-5% of the resident workforce, suggesting Penrith's rural areas have a relatively high level of employment diversification. The exception to this is Badgerys Creek, where around half the population are employed in just two industries.
- Penrith's rural areas appear to be an important source of skills and workforce servicing urban areas, with top employment industries reflective of health, education, retail, and construction-related services. Freight and logistics also featured heavily as an employment industry across several rural suburbs. Collectively, this suggests Penrith's rural communities are heavily reliant on the transport network.
- Traditional rural industries such as farming do not appear to be a major source of employment for Penrith's rural communities. Vegetable growing only featured as a top 3 industry of employment in 4 suburbs: Badgerys Creek (33%), Kemps Creek (6.5%), Llandilo (4%), and Wallacia (3.5%). Despite having a high-value poultry industry, this industry does not feature heavily as a major source of employment for any of Penrith's rural communities.
- Tourism-related services such as hospitality and accommodation do not feature strongly as an employment sector for any of Penrith's rural communities. This may suggest the resident population currently lacks skills and experience in this potentially high-growth industry.
- With the exception of Orchard Hills, all of Penrith's rural areas experienced some degree of population growth in the 10 years leading up to 2016. There was a high variability in growth rates for different areas, with the highest levels of proportionate growth occurring in Wallacia-Luddenham (41%) and Kemps Creek - Badgerys Creek - Mount Vernon (16%) in the south and Berkshire Park (27%) and Londonderry (10%) in the north. This demonstrates a high level of popularity that, within the context of the predominantly urban-servicing employment characteristics, suggests demand for rural residential uptake, and development, is predominantly for purely lifestyle pursuits.

6.4. Demographic profiles

6.4.1. Rural North West

Agnes Banks (AB) - Castlereagh (CR)

Demographic profile Agnes Banks - Castlereagh	
Usual Resident Population 2016 (.id, the population experts)	1,664
% Population Growth (2006-2016)	7% (+ 109 people)
Median Age (2016 Census)	AB 36 / CR 40
Number of Dwellings (2016)	495
% Dwelling Growth (2006-2016)	3% (+15)
Dwelling Vacancy Rates (2016)	5% (25 dwellings)
Average Household Size (2016)	3.3
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	\$1,910
Employment (AB)	
Top 3 industries Hospitals (4%), Supermarket and grocery stores (3.5%) Site preparation services (3%)	Top 3 occupations Technicians and trades (19%), Clerical & administrative (18%) Managers (13%)
Employment (CR)	
Top 3 industries Road freight transport (6%) Plumbing services (4%) Site preparation services (3.5%)	Top 3 occupations Clerical & administrative (21%), Technicians & trades (17%) Machinery operators & drivers (13%)

- 55% of households are couple families with children.
- The suburbs collectively have a higher proportion of older workers, empty nesters and retirees (50 to 69 year olds) when compared to Penrith LGA and NSW.

Londonderry

Demographic profile Londonderry	
Usual Resident Population 2016 (.id, the population experts)	3,896
% Population Growth (2006-2016)	10% (+339 people)
Median Age (2016 Census)	38
Number of Dwellings (2016)	1,215
% Dwelling Growth (2006-2016)	6% (+67)
Dwelling Vacancy Rates (2016)	5% (58 dwellings)
Average Household Size (2016)	3.4
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	\$1,860
Employment	
Top 3 industries Road freight transport (5%) Supermarket & grocery stores (3%) Plumbing services (2.5%)	Top 3 occupations Technicians & trades (20.5%) Clerical & administrative workers (15%) Machinery operators and drivers (14%)

- 52% of households are couple families with children.
- The suburb also has a higher proportion of older workers, empty nesters and retirees (50 to 69 year olds), and young adults (18 to 24 year olds) when compared to Penrith LGA and NSW.
- Of Penrith's rural demographic areas, Londonderry ranks third in terms of total population growth, with around 340 new residents in the 10 years to 2016.
- Compared to the broader LGA, the suburb has a high level of socio-economic disadvantage.

6.4.2. Rural North East

Berkshire Park

Demographic profile Berkshire Park	
Usual Resident Population 2016 (.id, the population experts)	2,142
% Population Growth (2006-2016)	27% (+459)
Median Age (2016 Census)	34
Number of Dwellings	348
% Dwelling Growth (2006-2016)	5% (+18)
Dwelling Vacancy Rates	6% (20 dwellings)
Average Household Size	3.5
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	\$1,720
Employment	
Top 3 industries Road freight transport (6%) Site preparation services (4%) Road and bridge construction (4%)	Top 3 occupations Technicians & trades (21.5%) Machinery operators & drivers (16%) Managers (15%)

- Some of the unique demographic characteristics of Berkshire Park may be attributed to the resident population of the major correctional facility located in this suburb.
- This is the youngest of Penrith's rural suburbs, with a significantly higher proportion of 18 to 34 year olds when compared with Penrith LGA and NSW. It also has a lower proportion of seniors and elderly (74+) compared to the NSW benchmark.
- 59% of households in Berkshire Park are couple families with children.
- Berkshire Park has a high level of socio-economic disadvantage when compared to the broader LGA.

Llandilo

Demographic profile Llandilo	
Usual Resident Population 2016 (.id, the population experts)	1,639
% Population Growth (2006-2016)	9% (+135)
Median Age (2016 Census)	36
Number of Dwellings	472
% Dwelling Growth (2006-2016)	3% (+14)
Dwelling Vacancy Rates	5% (25 dwellings)
Average Household Size	3.5
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	\$1,890
Employment	
Top 3 industries Road freight transport (5%) Vegetable growing (outdoors) (4%) Site preparation services (4%)	Top 3 occupations Technicians & trades workers (17%) Clerical & administrative (17%) Managers (16%)

- 55% of households are couple families with children
- The suburb also has a higher proportion of older workers, empty nesters and retirees (50 to 69 year olds) than the Penrith LGA and broader NSW, but a lower proportion of seniors and elderly (70 years and over) when compared with Penrith LGA and NSW.
- It is one of the four rural demographic areas where vegetable growing was a top industry of employment.
- Llandilo has a high level of socio-economic disadvantage when compared to the broader LGA.

6.4.3. Rural South West

Mulgoa

Demographic profile Mulgoa	
Usual Resident Population 2016 (.id, the population experts)	1,893
% Population Growth (2006-2016)	6% (+108)
Median Age (2016 Census)	41
Number of Dwellings	623
% Dwelling Growth (2006-2016)	6% (+35)
Dwelling Vacancy Rates	9% (57 dwellings)
Average Household Size	3.2
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	\$2,217
Employment	
Top 3 industries Road freight transport (4.5%), Real estate services (2.5%) Plumbing services (2.3%) Hospitals (2.3%)	Top 3 occupations Clerical & administrative (18.5%) Technicians & trades (17%) Managers (16%).

- 52% of households are couple families with children. It also has the highest dwelling vacancy rate (9%) of all the areas profiled.
- Mulgoa has the second-highest median age (41) of all the rural demographic areas profiled (after Orchard Hills). The suburb has a higher proportion of empty nesters and retirees (60 to 69 year olds) and primary schoolers (5 to 11 year olds) when compared with Penrith LGA and NSW.
- This suburb has the third-highest household income of the areas profiled and has a low level of disadvantage when compared to broader Penrith.

Wallacia (WAL) - Luddenham (LUD)

Demographic profile Wallacia - Luddenham	
Usual Resident Population 2016 (.id, the population experts)	2,421
% Population Growth (2006-2016)	41% (708)
Median Age (2016 Census)	WAL 40 / LUD 35
Number of Dwellings	809
% Dwelling Growth (2006-2016)	27% (+173)
Dwelling Vacancy Rates	7% (59 dwellings)
Average Household Size	WAL 2.9 / LUD 3.6
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	WAL \$1,730 / LUD \$2,230
Employment (WAL)	
Top 3 industries Road freight transport (5%) Vegetable growing (3.5%) Primary education (3%)	Top 3 occupations Clerical & administrative (19%) Managers (19%) Technicians & trades (17%)
Employment (LUD)	
Top 3 industries Road freight transport (3%), Supermarket & grocery stores (2.5%) Hospitals (2.5%)	Top 3 occupations Clerical & administrative (19%) Managers (19%) Technicians & trades (17%)

- Note: employment data includes areas outside of the Penrith LGA.
- The suburbs collectively have a higher proportion of older workers, empty nesters and retirees (50 to 69 year olds) and primary and secondary schoolers (5 to 17 year olds) when compared with Penrith LGA and NSW.
- Wallacia has the second-highest dwelling vacancy rate (7%) of all the areas profiled (after Mulgoa).
- Luddenham has the second-highest average household income (\$2,230) of all areas profiled (after Mount Vernon), and a low level of disadvantage. Conversely, Wallacia has a comparatively higher level of disadvantage.

6.4.4. Rural South East

Luddenham

See the demographic profile above for Wallacia - Luddenham.

Orchard Hills

Demographic profile Orchard Hills	
Usual Resident Population 2016 (.id, the population experts)	1,875
% Population Growth (2006-2016)	-5% (-106)
Median Age (2016 Census)	43
Number of Dwellings (2016)	587
% Dwelling Growth (2006-2016)	1% (+3)
Dwelling Vacancy Rates (2016)	6% (35 dwellings)
Average Household Size (2016)	3.4
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	\$2,072
Employment	
Top 3 industries Road freight transport (4%) Primary education (2.5%) Electrical services (2.5%)	Top 3 occupations Administrative workers (17%) Technicians & trades (16.5%) Professionals (16%)

- 56% of households are couple families with children
- Orchard Hills has the highest median age (43) of all the rural demographic areas profiled. It has one of the highest proportions of seniors (70 to 84) when compared to other rural areas of Penrith and the broader LGA. It also has a higher proportion of older workers, empty nesters and retirees (50 to 69 year olds) and young adults (18 to 24 year olds) when compared with Penrith LGA and NSW.

- Orchard Hills has an average level of disadvantage when compared to broader Penrith, and has the fourth highest household income of the areas profiled.

Kemps Creek (KC) - Badgerys Creek (BC)³⁵ - Mount Vernon (MV)

Demographic profile Kemps Creek - Badgerys Creek - Mount Vernon	
Usual Resident Population 2016 (.id, the population experts)	1,820
% Population Growth (2006-2016)	16% (+246)
Median Age (2016 Census)	KC 41 / BC 37 / MV 38
Number of Dwellings (2016)	493
% Dwelling Growth (2006-2016)	1% (+3)
Dwelling Vacancy Rates (2016)	4% (18 dwellings)
Average Household Size (2016)	KC 3.4 / BC 3 / MV 3.6
Average weekly household income Penrith (\$1,660) / NSW (\$1,490)	KC \$1,610 / BC \$1,280 / MV \$2,560
Employment (KC)	
Top 3 industries Vegetable growing (outdoors) (6.5%) Road freight transport (5%) Primary education (3%)	Top 3 occupations Managers (21%) Clerical & administrative (18%), Technicians & trades (16%)
Employment (BC)	
Top 3 industries Vegetable growing (outdoors) (33%) Road freight transport (18.5%) Legal services (7.5%)	Top 3 occupations Managers (21%) Clerical & administrative (18%), Technicians & trades (16%)
Employment (MV)	
Top 3 industries House construction (4%) Concreting services (3.5%) Primary education (3.5%)	Top 3 occupations Managers (21%) Clerical & administrative (18%), Technicians & trades (16%)

32. Census data for Badgerys Creek is based on a very small sample size (population 225). For this reason, there is a low level of confidence in the accuracy of the data. This is typical for small rural

areas across Australia. The information has only been used to identify insights and characteristics that appear to be unique to a localised area.

- Note: employment and median weekly household income data for Kemps Creek and Badgerys Creek includes areas outside of the Penrith LGA.
- Collectively, these suburbs have a higher proportion of young adults (18 to 24 year olds), older workers, empty nesters and retirees (50 to 69 year olds), seniors and elderly (70 years and over) when compared to Penrith LGA and NSW.
- Mount Vernon has the highest average household income (\$2,560) of all the areas profiled and is relatively advantaged compared to the rest of Penrith's rural areas. Conversely, Kemps Creek is one of only two rural suburbs to have a household income below the LGA average and has a higher level of disadvantage when compared to other rural areas of Penrith.

6.5. Housing

This Study was not tasked with identifying opportunities to accommodate additional residential development in rural areas. However, adjustments to the current stock will likely be required to cater for anticipated changes occurring within the LGA or in line with broader trends. These include:

- Creating housing options that would allow seniors currently living in rural areas to age in place, or as close as possible to their existing social and support networks;
- Maintaining a suitable level of rental accommodation to cater for those residents who aren't seeking, or cannot currently afford homeownership;
- Deliberate policy-driven efforts to attract and retain a higher-skilled resident workforce within the LGA, which would, in part, be supported by executive-style housing in rural areas; and
- The potential for existing dwellings to be used as short-term holiday rentals, which may cumulatively decrease the overall supply of housing for longer-term residents.

6.5.1. Current housing stock

Housing in Penrith's rural lands generally correspond to one of the following categories, noting that lot sizes are indicative only:

- Farmhouses on large lot agricultural lands (>2ha);
- Farmhouses on small lot agricultural lands(<2ha);
- Dwellings on rural lifestyle blocks (<2ha); and
- Dwellings in village settlements (600m²).

While housing in Penrith's rural lands differ in floor space and the lot size in which they sit, single detached dwellings houses are the predominant typology across Penrith's rural areas, ranging from 87% to over 98% of all housing stock in the areas profiled (illustrated in Figure 27).

Dwellings and lot coverage vary in size between rural precincts and profiled areas. The Rural North East appears to have smaller and older housing stock generally. Mulgoa and Mount Vernon, in the southern rural areas tend to have larger and newer housing, suggesting these areas cater more heavily towards the rural lifestyle market.

The Londonderry and Wallacia villages offer some more compact housing typologies, with evidence of recent townhouse developments in both villages. Wallacia also has a seniors housing development adjacent to its commercial centre in the form of two-storey walk up apartment buildings. Regardless, compact housing typologies and seniors housing options in rural areas remain very limited.

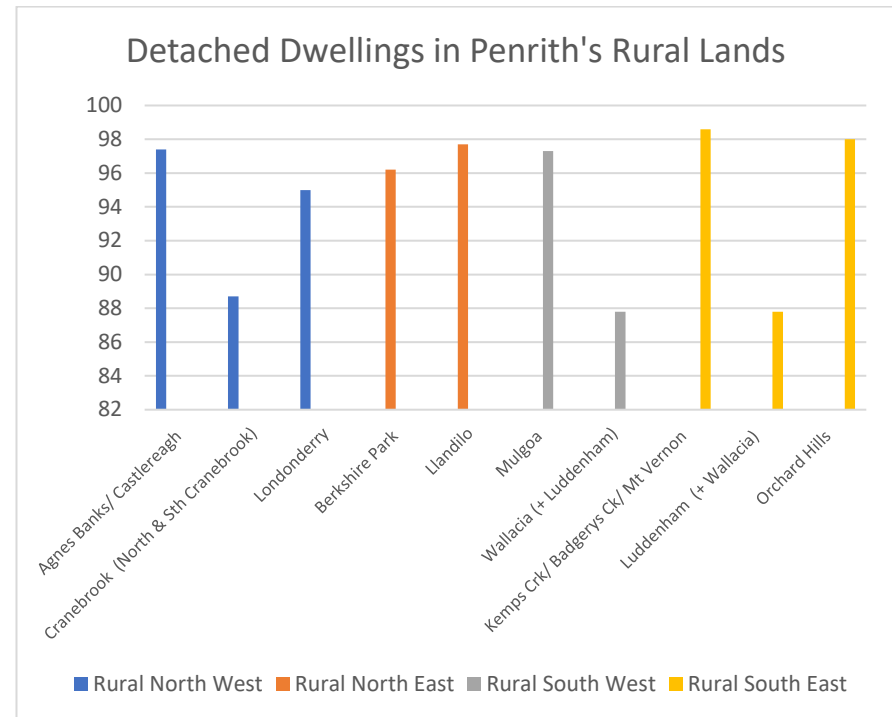


Figure 27 Housing types (based on 2016 ABS data accessed via id Profile)

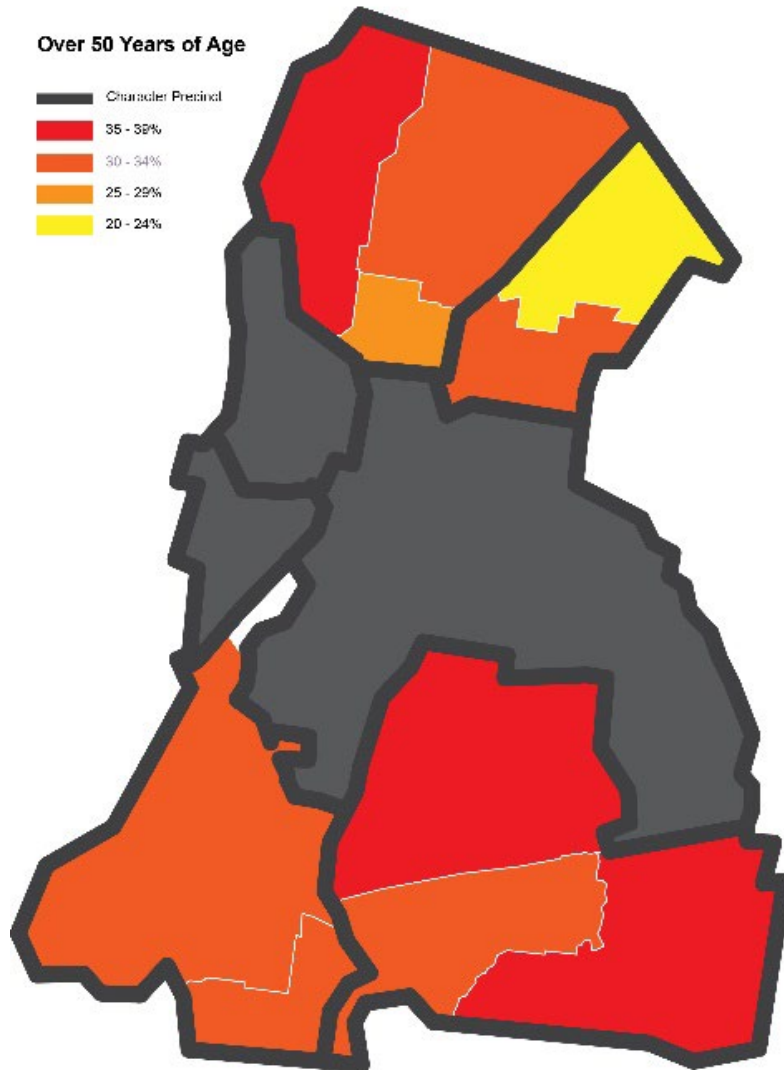


Figure 28: Proportion of persons over 50 years of age in Penrith's rural areas
(Source: CPSP adapted from id Profile 2018)

6.5.2. Housing for an aging population

Penrith's rural areas currently provide limited opportunities for seniors to age as close to home as possible. As can be seen in Figure 28, Penrith's rural lands are home to a significant population of persons over 50, which encompasses older workers and pre-retirees (age 50-59), empty nesters and retirees (age 60-69), seniors (age 70-84) and the elderly (85 and over).

There are few housing options that catering specifically for seniors in rural locations that are:

- Relatively free from environmental hazards such as bushfire and flooding, which would put people with limited mobility at greater risk; and
- Within walking distance to relevant services and amenities or are otherwise serviced by public transport to urban centres.

Relevant services, amenities, medical practitioners and transport opportunities in rural areas are currently only available in Londonderry, Mulgoa and Wallacia.

Further investigations beyond this Study would be necessary to determine the specific demands for this type of accommodation to provide place-specific recommendations for:

- Dedicated 'seniors housing' options as defined by legislation (including Council's LEP, encompassing independent living units and residential care facilities); and
- 'Downsizing housing' options that are suitable for and attractive to seniors, with low maintenance requirements and ready access to local health services, amenities and public transport (e.g. townhouses in a village location).

6.5.3. Rural residential living

There is evidence of rural residential uses occurring in all areas of Penrith's rural lands, including in areas zoned for primary production purposes. It is recognised that some rural residential housing has potential to contribute to the productivity of agricultural land. In this regard there is evidence of smaller, hobby scale agricultural production (e.g. animal keeping and vegetable growing), which may provide complementary income for some rural residential households.

In circumstances where rural residential housing is not used for agricultural pursuits and is used primarily for lifestyle purposes, this conflicts with the productive potential of viable agricultural land and can result in other land use conflicts relating to the compatibility between nearby or adjacent uses (e.g. housing and poultry farming). This requires careful management to ensure that land zoned for primary production can accommodate land uses consistent with primary production purposes in accordance with the objectives of the relevant zone. Consideration will need to be given to identifying locations where such housing is suitable.

It is noted that, with its E4 Environmental Living zoning, Mount Vernon is a location popular for rural lifestyle uses and commands elevated views towards the Blue Mountains in some locations. The broader context of Mount Vernon is characterised by an area of RU4 Primary Production Small Lots in the adjacent Fairfield City LGA, some of which also includes rural lifestyle uses.

7. INFRASTRUCTURE

7.1. Transport



Figure 29 Existing Major Roads

7.1.1. Existing Road Network

The Penrith LGA is serviced by a number of strategic links providing access on a local, district and regional scale. These include:

- Western Motorway (M4);
- Westlink Motorway (M7);
- Great Western Highway (A44);
- The Northern Road (A9);
- Castlereagh Road; and
- Londonderry Road.

The Northern Road and Castlereagh Road provide key north south connections across Penrith LGA, with the former providing connections to Windsor and Campbelltown. Direct east west connections across the LGA are limited to Elizabeth Drive at the south of the LGA, the M4 Motorway, Great Western Highway. In the northern rural areas, east west connections are generally limited to lower order roads.

A key limitation of the existing Road network is the lack of east west connections in Penrith's rural lands, however, this situation will be improved through the implementation of key transportation upgrades as described in **Section 3.5**.

7.1.2. Public Transport

Public transport in Penrith's rural areas is generally focused on key routes. In the northern areas, bus services are available along Castlereagh Road, Londonderry Road, Llandilo Road and St Marys/ Stoney Creek Road. In the southern areas, public transport services to more populated areas of Mulgoa and Wallacia are regular, however less populated areas in the south eastern portion of the LGA are sparse and irregular owing to the lower population density. The Penrith LGA is serviced by the T1 Western Line. Bus services in Penrith's rural areas generally feed into this line.

As land use intensity increases, limited services available to rural areas will need to be improved particularly the Rural South East and to some degree in the Rural North East and Rural North West precincts. While the responsibility for monitoring, planning and implementation of public transport services to meet capacity rests with Transport for NSW, Council may play an important advocacy role for considering new public transport routes or enhanced frequency of services as needs arise.

7.2. Waste management

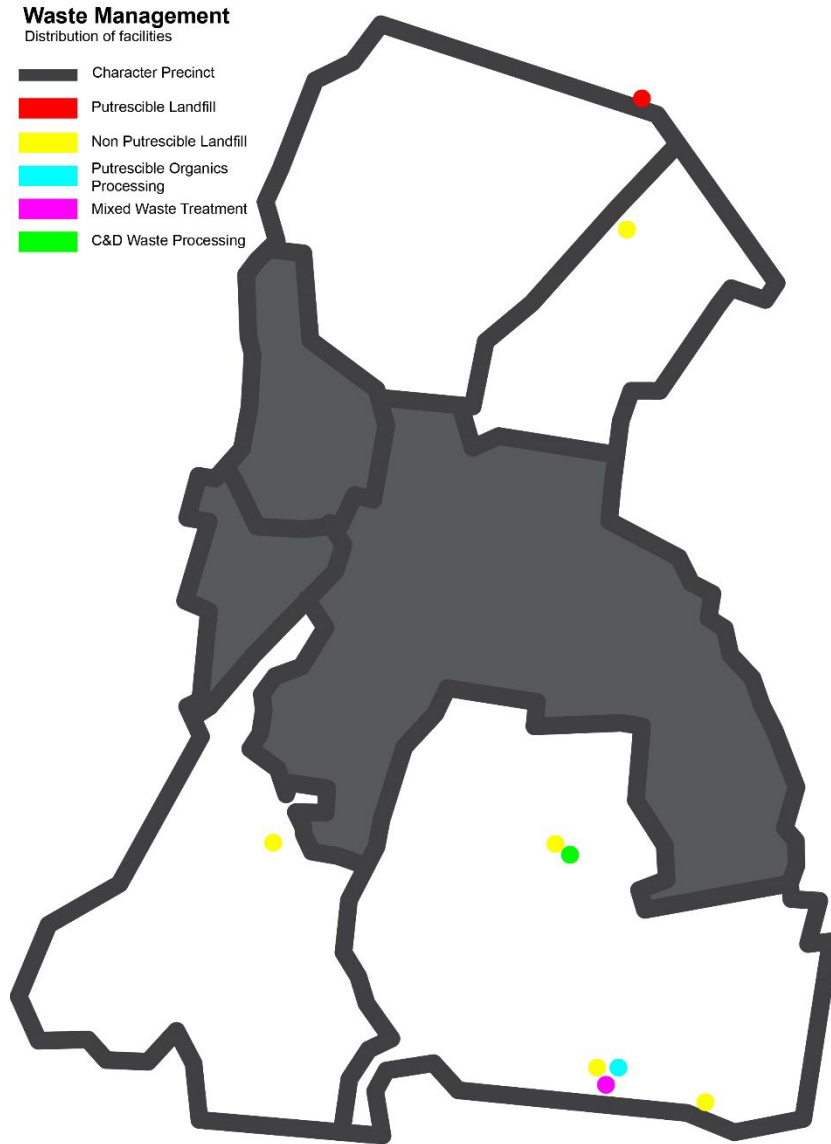


Figure 30: Existing waste management facilities

There are a number of existing waste management facilities located in Penrith's rural lands that are mainly located in the Rural South East precinct. These facilities include:

- Non putrescible land fill;
- Putrescible organics processing;
- Mixed waste treatment;
- Construction and demolition waste processing; and
- Putrescible landfill (located in the adjacent Hawkesbury Council LGA close to LGA boundary).

While buffers to these facilities takes into consideration the existing rural context, transitioning lands uses in the Rural South East precinct will require consideration for:

- Protection of existing facilities from encroachment of sensitive urban uses, which may require preservation or strengthening of buffer zones;
- Emerging land uses and ongoing management of land use conflict through co-location of compatible activities and industries; and
- Identification and protection of suitable new or alternative sites (if necessary).

Consideration will need to be given for establishing appropriate planning provisions to protect waste facilities from encroachment of residential or other sensitive urban land uses. Establishing appropriate buffers and ensuring land use compatibility in proximity to waste management operations are important considerations for future planning in proximity to waste management facilities.

Illegal waste dumping has been reported as a significant problem in some localities, particularly in more secluded and unsurveilled areas of Penrith's rural lands. Rural areas of Penrith are serviced by a three-bin waste service which is collected weekly for general rubbish and alternating fortnightly for recycling and green waste. All households with a domestic waste service are provided with an on-call service of four free clean up collections per calendar year, which accepts bulky household waste.

Council provides 'waste rangers' who monitor and investigate illegal dumping, however awareness raising of Council's on call collection services may be of benefit to prevent illegal dumping in future.

7.3. Water supply

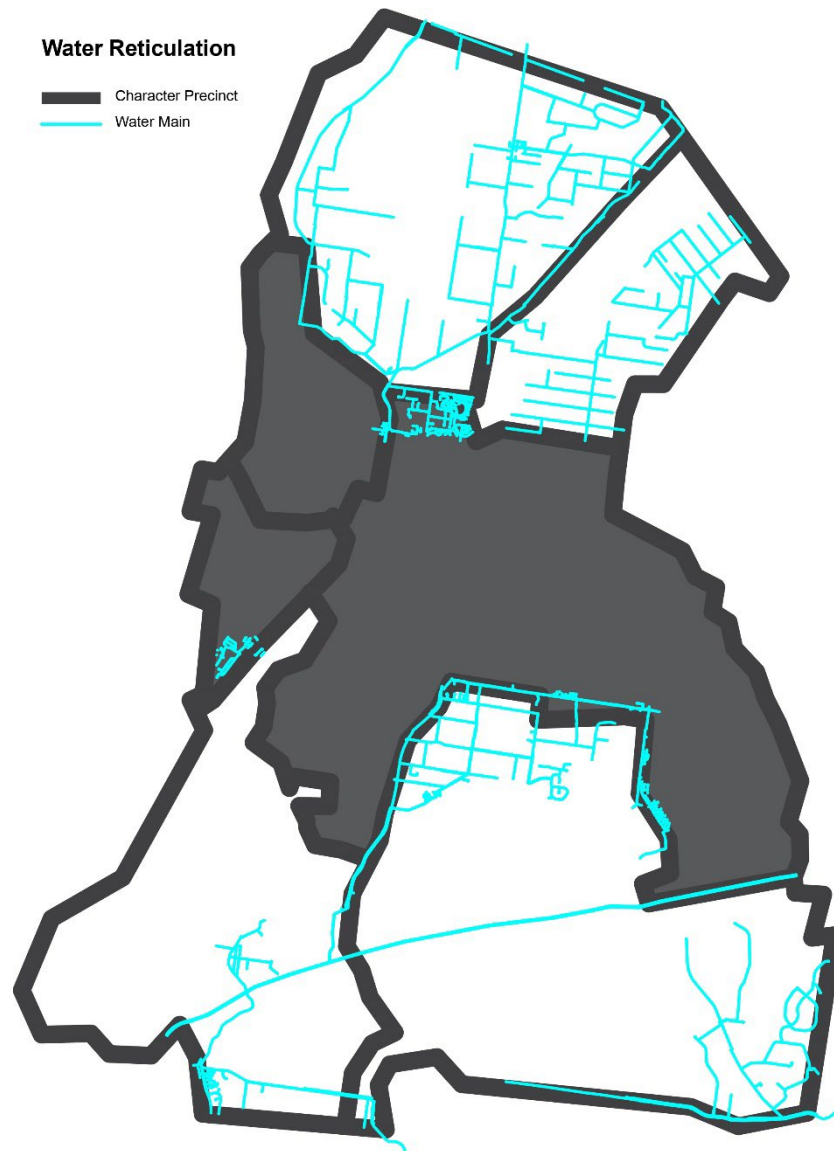


Figure 31: Reticulated water in Penrith's rural lands

Figure 31 illustrates the extent of water reticulation in Penrith's rural lands, noting that the majority of urban lands have been excluded from this map, except where there is an interface with rural lands.

Northern Rural Lands

The majority of northern rural lands have access to reticulated water. Access to water in these locations supports residential and various agricultural activities.

Southern Rural lands

Water reticulation for southern rural lands is focused in areas of more intensive land uses and smaller land parcels. These areas are:

- Northern area of Orchard Hills and areas adjacent to The Northern Road including the Defence Establishment;
- The villages of Mulgoa, Wallacia and Luddenham;
- Kemps Creek agricultural area; and
- Mount Vernon rural lifestyle area.

While there are gaps in the water reticulation network in the southern and to a lesser degree the northern rural areas, the responsibility for existing and future connection to the water supply rests with Sydney Water. Any identified need for new water connections would therefore be referred to Sydney Water.

7.4. Wastewater

Reticulated sewerage infrastructure is limited to a small part of Penrith's rural lands and is the responsibility of Sydney Water. In the northern rural areas, sewer infrastructure is available to Londonderry on RU5 zoned lots with a minimum lot size of up to 560m². Sewerage is available in Cranebrook, in areas subdivided into 2,000m² to 4,000m² lots. There is no reticulated sewerage infrastructure available at Llandilo or Castlereagh villages, which restricts potential for growth to occur in these locations.

In the southern rural areas, sewer infrastructure is available to most areas of Mulgoa and Wallacia Villages, however, in accordance with clause 7.19 (3) of the Penrith Local Environmental Plan 2010, the minimum lot size for land without connection to a sewer is 2ha, regardless of land use zoning. Sewer infrastructure has facilitated some growth in Mulgoa in recent years with recent subdivisions on land adjacent to Littlefields Road, Winbourne Road and Allan Road.

The remaining rural areas of Penrith are reliant on pump out services or on-site disposal. Pumpout services generally are confined to the village areas, with on-site disposal being provided for all of the other areas. On-site disposal can be in the form of a septic tank, absorption trenches or onsite waste water treatment systems. Council does not propose to extend existing pump out services at this point in time.

7.5. Cemeteries & Crematoria

The *Metropolitan Sydney Cemetery Capacity Report (November 2017)* prepared by Cemeteries and Crematoria NSW provides an analysis of cemetery capacity remaining in the Sydney metropolitan area. It identifies that the Sydney metropolitan cemeteries have limited remaining capacity for future burials and projects the exhaustion of existing metropolitan cemetery space by 2056. The report identifies the regions facing a critical shortage of cemetery space and localities that require urgent action to address these shortages. The capacity report notes that it is a key objective of the *Cemeteries and Crematoria Act 2013* to ensure that sufficient land is acquired and allocated so that current and future generations have equitable access to interment services.

The report considers capacity on a regional basis and identifies Penrith LGA in the 'Metro Sydney - West' subregion, noting the report predates the Western Sydney District Plan and therefore the current Western City District boundaries. As such, the report considers capacity for the Penrith, Blue Mountains and Hawkesbury LGAs. There are 22 cemeteries and 2 crematoria operating in this locality. The report estimates that there is 20.28 ha of land area available and carrying capacity of 18,500 grave plots in the 'Metro Sydney - West' region as of 1 January 2015. Total exhaustion of existing grave plots is predicted to occur between 2042 and 2046 with a shortfall of over 10,000 grave plots to 2056 in the former 'Metro Sydney - West' sub region.

The report notes that as cemeteries in each region become exhausted, pressure will be placed on neighbouring regions to take up the shortfall. Without additional capacity, this 'tipping point' has been predicted to occur between 2042 and 2046, requiring burials to occur outside of the Penrith, Blue Mountains and Hawkesbury LGAs adversely impacting accessibility to available facilities.

To ensure equitable access to interment and cremation facilities and meet projected demands for burial space, opportunities to accommodate new cemetery and crematorium capacity will need to be identified through future planning of Penrith's rural lands.

7.6. Emergency response

A number of potential hazard risks require consideration in the ongoing planning and management of Penrith's rural lands. These include:

- Bushfire;
- Flooding; and
- Storms (wind, rain and hail).

The Penrith Local Emergency Management Committee is responsible for the coordination and determination of emergency management policies and practices within the Penrith LGA. The committee includes:

- NSW Police;
- State Emergency Service (SES);
- Rural Fire Service (RFS);
- Various Utilities (e.g. Sydney Water);
- Department of Health; and
- Local Land Services.

Administrative operations for declared emergencies are conducted from the operations centre. Under State arrangements, Council provides a supporting role during emergency events.

The Penrith Local Emergency Management Plan outlines strategies and procedures for prevention, preparation, response and recovery from emergencies within the Penrith LGA. It defines roles and responsibilities for relevant participating organisations for emergency management and response. This plan was prepared in 2015 and is currently being updated to reflect current community demographics.

7.7. Community facilities and services

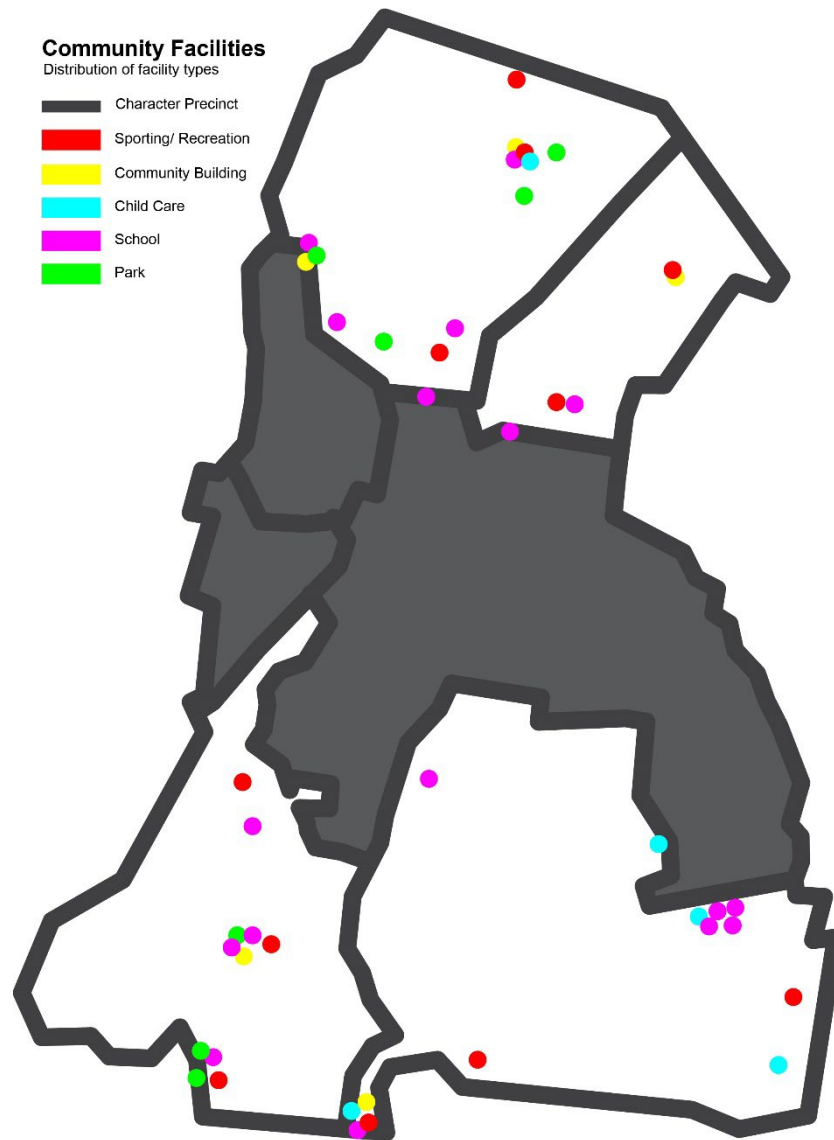


Figure 32: Location of community and recreation facilities

Community facilities and services in the Penrith LGA are generally concentrated largely in populated urban areas. Community facilities in the rural lands are dispersed and tend to be located in the populous northern areas of Londonderry, Llandilo and Castlereagh and Mulgoa and Wallacia in the south west of LGA. Community facilities across Penrith's rural lands include the following facility types:

- Sporting and recreation facilities (e.g. football oval, tennis courts).
- Community buildings such as community halls.
- Child care centres.
- Schools (includes primary, secondary, public and private)
- Parks and gardens.

Figure 32 illustrates the distribution of facilities in Penrith's rural lands. These are further detailed in Table 8.

The following observations are made from the analysis represented in Table 8 and Figure 32:

- There is a relatively even distribution of sporting and recreational facilities.
- Schools are relatively evenly distributed in Penrith's rural areas, however secondary schools are mainly in localities close to existing urban areas.
- Community facilities such as halls are provided in all northern and south western rural precincts areas, however no such facilities exist in the rural south east.
- Availability of child care facilities is limited, especially in the northern rural precincts, however it is acknowledged that home-based child care facilities may exist in the area.
- Access to non-sporting oriented parkland is limited, particularly in the Rural South East (Orchard Hills Kemps Creek and Mount Vernon) and Rural North East precincts (Llandilo and Berkshire Park).
- Access to community facilities in the Rural South East precinct (Orchard Hills, Kemps Creek and Mount Vernon) is limited.

Ongoing needs for community infrastructure will need to be monitored to ensure that appropriate provisions are in place. This is particularly important as the South East Rural precinct transitions towards employment uses and the intensification of agricultural activities in northern areas of the LGA occurs. As new employment and residential uses are introduced, there will be greater demand for community infrastructure such as childcare, public open space and community facilities.

Ensuring the appropriate provision of community and recreation facilities in Penrith's rural areas is essential to the wellness and cohesion of rural communities. The level of demand and need can only be firmly understood through the preparation of a social infrastructure needs analysis that takes into consideration projected demand based on a future land use context once this is known to a sufficient level of detail.

Table 8 Community facilities within character precincts and places

Place area	Sporting/ Active Recreation	Community Buildings	Childcare	Schools	Parks
Rural North West					
Agnes Banks	None identified	None identified	None identified	None identified	Agnes Banks Nature Reserve
Castlereagh	Nepean Sports Motor Club Smith Park Cricket Oval	Castlereagh Hall		Castlereagh Public School Lakes Christian College	
North Cranebrook	LMX Bicycle Motocross			St Pauls Grammar School Henry Fulton Public School	1 park Wianamatta Nature Reserve
Londonderry	Londonderry Park Soccer oval and hardcourts Richmond Raceway (greyhound racing)	Londonderry Neighbourhood Centre	Londonderry Early Learning Centre	Londonderry Public School	2 parks
Rural North East					
Berkshire Park	Berkshire Park – Hardcourts and oval	Berkshire Park community centre			Castlereagh Nature Reserve
Llandilo	Wilson Park Oval			Llandilo Public School Xavier College	
Rural South West					
Mulgoa	Gow Park (Cricket/ Soccer) Glenmore Heritage Valley Golf Club Sporting facilities at Mulgoa Park	Mulgoa Hall		Mulgoa Public School Mulgoa Pre School Nepean Christian School	Mulgoa Park Mulgoa Nature Reserve
Wallacia	Panthers Golf Course	Wallacia Progress Hall			Downs Park Blaxland Crossing Reserve
Rural South East					
Kemps Creek			Little Smarties Early Learning Centre	Mamre Anglican School Trinity Primary School Emmaus Catholic College (Secondary)	
Luddenham	Robert Green Oval, Sales Park (Cricket) Luddenham Raceway	Luddenham Showgrounds	Schoolies after school care	Holy Family Catholic Primary School	
Mount Vernon	Mount Vernon Tennis Courts		Do Re Mi Child Care		
Orchard Hills	Riding for the Disabled NSW – Nepean Centre		Old Macdonald's Child Care	Penrith Anglican College	

PART C: PLACED-BASED CONSIDERATIONS

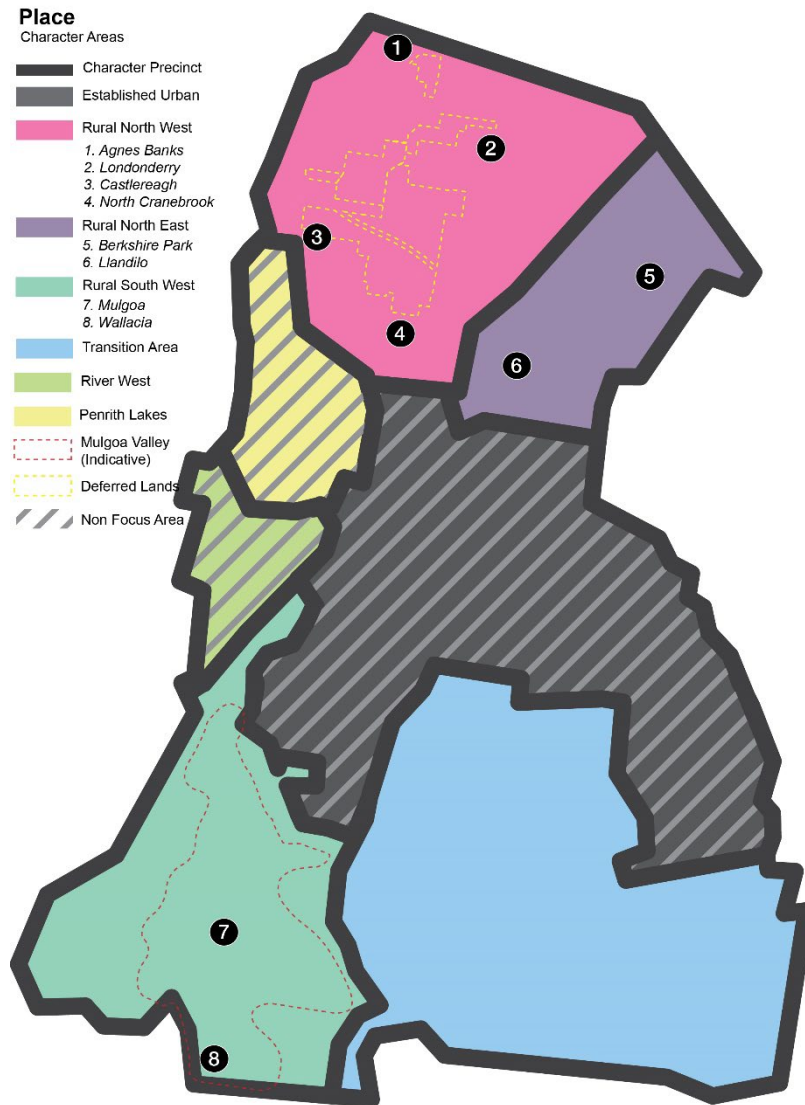


Figure 33: Recommended framework for preparing place-based intent statements

Part A set a basis for long-term planning and plan making in Penrith’s rural areas. This draws on consultation, a literature review and site inspections to determine boundaries for 4 Precincts, covering those areas of the LGA that are currently non-urban.

Of these Precincts, the Rural South East Precinct is effectively in transition, having already been identified for substantial growth to accommodate major new urban and infrastructure developments in the coming years through initiatives such as the Western Sydney Aerotropolis, Western Sydney Employment Area, Greater Penrith to Eastern Creek Corridor Growth Area including the Orchard Hills Urban Investigation Area.

The remaining three Precincts will remain characteristically rural. Within these Precincts are eight more localised Places that are reflective of the historic rural settlement pattern. These Places are already the focus of a higher level of social and economic activity, encompassing rural villages and centres. Two additional Places facing unique pressures – the Deferred lands and the Mulgoa Valley – were also identified through consultation.

It is recommended that place-based statements of intent for planning in each of these Places are prepared to establish a common understanding of desired future outcomes as a basis for identifying actions and initiatives required to achieve those outcomes. This Part consolidates recommended outcomes for long-term planning for each Place based on the thematic considerations presented in Part B.

Place-based considerations are presented by Precinct.

8. RURAL NORTH WEST

The Rural North West Precinct is framed by The Driftway (road) corridor (forming the LGA boundary) to the north, The Northern Road corridor to the east, Penrith Lakes and suburban areas to the south, and the Nepean River (forming the LGA boundary) to the west. It broadly encompasses the suburbs of Agnes Banks, Castlereagh (excluding the Penrith Lakes project area), Londonderry, as well as the northern portion of the suburb of Cranebrook.

Place-based planning efforts within this Precinct are recommended to be focused around:

- Agnes Banks, a rural community focused along Castlereagh Road and straddling the Penrith and Hawkesbury LGAs;
- Londonderry, a rural community focused around the intersection of Carrington Road and Londonderry Road;
- Castlereagh, a broader rural living area;
- North Cranebrook, a rural community at Penrith's northernmost urban fringe; and
- Deferred lands, generally extending to Rickards and Post Office Roads in the west; Cornwall Street in the north; Londonderry and Nutt Roads in the east and properties south of Smeeton Road in the south.

8.1. Precinct-wide considerations

Focused actions for the Rural Strategy are:

1. Investigate opportunities to extend the Sydney Green Grid to connect with The Great River Walk and the Cranebrook – Windsor Nature Reserve Corridor.
2. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements.
3. Investigate opportunities for new pedestrian and cycling infrastructure to connect Castlereagh Village and Cranebrook and provide broader connections to Penrith Lakes.

³⁶ It is noted that currently, horses must be imported into Melbourne, which has Australia's only quarantine facility. Domestic (i.e. interstate) horse travel happens only by road. For this reason,

8.2. Agnes Banks

Focused actions for the Rural Strategy are:

1. Identify and protect the highly capable agricultural land located along the Nepean River flats west of Castlereagh Road, recognising this area represents some of the best-quality soils available in Western Sydney. This should aim to minimise land fragmentation and discourage rural residential encroachment.
2. Facilitate the ongoing production of mineral resources (mainly sand) through quarrying to the east of Castlereagh Road to allow for continued supply of base materials for mortar, concrete and coloured glass. This should include retention and enhancement of vegetation along the eastern verge of Castlereagh Road as an important scenic backdrop and visual obstruction to quarrying and residential uses.
3. Investigate opportunities:
 - a) To expand the thoroughbred breeding and racing industry here, and in neighbouring Castlereagh. The area already contains world-renowned horse studs and this land-use complements the surrounding rural character. The Western Sydney Aerotropolis and associated major road network improvements will facilitate better connectivity to the area generally, enabling people and horses in the industry to travel more conveniently³⁶.
 - b) To attract visitors, including through the provision of visitor accommodation and activities associated with rural activities, leveraging the area's scenic qualities, position along the Nepean River, proximity to the Sydney International Regatta Centre, and visible heritage fabric.
4. Generally encourage a built form that complements the surrounding agricultural landscape character, addressing the siting and design of farmhouses, farm buildings and landscaping including property fencing.
5. Investigate opportunities for new public open space in Agnes Banks to benefit from distinctive views of Grose River valley and heritage context.

motorway connections are more important for enabling horse travel into the Penrith LGA, however this status may change in the future.

8.3. Londonderry

Focused actions for the Rural Strategy are:

1. Establish Carrington Road as the main street for Londonderry. This should aim to consolidate existing social and commercial activities. It should also facilitate opportunities to provide a greater range of services, recognising that this is already Penrith's most populated rural area, and has maintained a comparatively higher growth rate in recent years.
2. Identify new housing opportunities that enable a greater availability of rental accommodation and support people to age close to home. Where possible, these should be focused in and around the main street.
3. Identify and protect land that is genuinely suitable for small-lot agricultural production to provide greater certainty for investment in agribusiness. This area may have the potential to accommodate businesses that are expected to be displaced from the Rural South East Precinct.
4. Consider whether the structural clay deposits identified at four separate sites within the area have production potential.

8.4. Castlereagh

Focused actions for the Rural Strategy are:

1. Investigate opportunities to expand the thoroughbred breeding and racing industry here, and in neighbouring Agnes Banks. The area already contains world-renowned horse studs and this land-use complements the surrounding rural character. The Western Sydney Aerotropolis will facilitate better connectivity to the area generally, enabling people and horses in the industry to travel more conveniently.
2. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities associated with rural activities, leveraging the area's scenic qualities, position along the Nepean River, proximity to the Sydney International Regatta Centre, and visible heritage fabric.
3. Strengthen the role of the 'centre' specifically serving this community over the long term. This should be focused around the intersection of Castlereagh Road and Hinxman Road / Post Office Road, which already contain a public school and service centre.

8.5. North Cranebrook

Focused actions for the Rural Strategy are:

1. Maintain a rural feel, recognising North Cranebrook is an important transitional area between urban and rural parts of Penrith.
2. Investigate opportunities to support thoroughbred breeding and racing industry that is already well-established in Agnes Banks and Castlereagh.
3. Facilitate 'controlled environment' agricultural production, such as mushroom production, specialty crops such as berries, and floriculture. These types of uses do not rely on higher quality soils and may be more suited to this peri-urban area. 'Controlled environment' agricultural production to be confined to areas currently zoned RU4 and not in E4 zone.

8.6. Deferred lands

Focused actions for the Rural Strategy are:

1. Collaborate with the DLALC in accordance with the Working Together Agreement for the deferred lands.
2. Clarify the ecological values and priorities for biodiversity conservation contained within this area. This will rely on site-specific assessments and surveys.
3. Establish common principles to guide future planning and plan-making. These should address land-based and procedural outcomes, including (but not limited to):
 - (a) Land management priorities and supporting initiatives (e.g. anti-dumping, hazard reduction, weed and pest control)
 - (b) Processes for identifying and protecting biodiversity values within the area to establish appropriate environmental protection measures;
 - (c) Processes for protecting Aboriginal culture and heritage through the use, development, and ongoing management of land;
 - (d) Locations suitable for housing, employment, or community development opportunities catering specifically to Aboriginal people;
 - (e) Locations suitable for other land uses or development opportunities (e.g. through leasing or land disposal arrangements).
4. Consider flood planning and emergency response, particularly to identify suitable evacuation requirements.

9. RURAL NORTH EAST

The Rural North East Precinct is framed by Richmond Road and suburb of Windsor Downs in the north (forming the LGA boundary), South Creek in the east (forming the LGA boundary), Ninth Avenue and the broader St Mary's district in the south and The Northern Road in the west. It broadly encompasses the suburbs of Berkshire Park and Llandilo.

Place-based planning efforts within this Precinct are recommended to be focused around:

- Berkshire Park, a broader rural living area; and
- Llandilo, a rural community focused around a small centre on Seventh Avenue.

9.1. Precinct-wide considerations

Focused actions for the Rural Strategy are:

1. Maintain and, where possible, enhance vegetation along South Creek to reinforce the Metropolitan Rural Area boundary.
2. Investigate opportunities to extend the Sydney Green Grid to connect with The Great River Walk and the Cranebrook – Windsor Nature Reserve Corridor.
3. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements.

9.2. Berkshire Park

Focused actions for the Rural Strategy are:

1. Identify and protect an east-west green link between Government Road and South Creek to support habitat connectivity.
2. Protect opportunities for small-lot agricultural activities such as market gardening, greenhouse vegetables, poultry farming and animal boarding and training.
3. Maintain an absolute minimum of 2ha lot size per dwelling, predominantly recognising the area is not currently connected to reticulated sewer. This will also broadly assist with preserving rural character, noting the prevalence of truck keeping is likely to increase.

4. Consider preparing site-specific development controls or guidelines for truck keeping, including truck parking areas and rural sheds or outbuildings associated with this use.
5. Maintain the existing role of the Berkshire Park rural centre (i.e. cluster of community uses on Sixth Road) in the medium to long term by retaining existing permissible uses in this location. The potential for accommodating additional uses for this centre may be considered as a long-term initiative. This recognises the delivery of major transport infrastructure (e.g. the Castlereagh Connection and Outer Sydney Orbital) will influence local connectivity to services and facilities in surrounding centres such as Llandilo.

9.3. Llandilo

Focused actions for the Rural Strategy are:

1. Maintain a rural feel, recognising Llandilo is an important rural area that interfaces between urban and rural parts of Penrith.
2. Protect opportunities for small-lot agricultural activities such as poultry farming, market gardening, and nurseries, leveraging existing strengths and skills.
3. Broadly discourage further intensification of residential development, recognising the area is prone to flash flooding and encroachment of this type of use threatens the potential for sustaining viable agricultural activities.
4. Maintain an absolute minimum of 2ha lot size per dwelling, predominantly recognising the area is not currently connected to reticulated sewer. This will also broadly assist with preserving rural character, noting the prevalence of truck keeping is likely to increase.
5. Consider preparing site-specific development controls or guidelines for truck keeping, including truck parking areas and rural sheds or outbuildings associated with this use.
6. Reinforce the role of Llandilo's centre by supporting incremental growth based on existing additional permitted uses, to cater predominantly to the surrounding rural community. This recognises major retail and community services are conveniently provided in nearby Cranebrook, and connections to other areas, including Berkshire Park, are likely to be severed by the delivery of new motorways.

10. RURAL SOUTH WEST

The Rural South West Precinct is framed by Penrith's established and planned urban areas to the north, The Northern Road corridor to the east, the LGA boundary to the south, and the Nepean River (forming the LGA boundary) west. It broadly encompasses the suburbs of Mulgoa, Wallacia and the westernmost portion of Luddenham.

Place-based planning efforts within this Precinct are recommended to be focused around:

- Mulgoa, a rural community focused along the intersections of Mulgoa Road with Fairlight Road, and Mulgoa Road with Allan Road;
- Wallacia, a rural community straddling the Penrith and Liverpool LGAs and focused along the intersection of Mulgoa Road and Park Road; and
- The Mulgoa Valley more broadly, as an historically important rural landscape area.

10.1. Precinct-wide considerations

Focused actions for the Rural Strategy are:

1. Reinforce The Northern Road corridor as the Metropolitan Rural Area boundary.
2. Facilitate delivery of the Sydney Green Grid's 'Mulgoa Creek and Warragamba Pipeline Open Space Corridor' opportunities, considering potential opportunities for a new shared path linking the Mulgoa and Wallacia villages to recreational uses via the Warragamba Pipeline Open Space Corridor.
3. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements.

10.2. Mulgoa

Focused actions for the Rural Strategy are:

1. Identify opportunities for housing diversification and, where necessary, renewal within the village, particularly to suit an aging population. This recognises that the area is not currently suitable to accommodate

substantial population growth but will remain a popular place for residents and visitors due to its amenity.

2. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities within the village.

10.3. Wallacia

Focused actions for the Rural Strategy are:

1. Protect and enhance opportunities for people to interact with the Nepean River's edge. This recognises that Wallacia is one of the few places where this is possible upstream from the Nepean River's confluence with the Warragamba River, and so offering an opportunity for a unique river experience.
2. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities within the village.
3. Investigate opportunities for housing diversification and, where appropriate, housing growth within the village. This should focus on housing types that are suitable for the area's aging population. It will predominantly rely on renewal and re-development to balance priorities for protecting the village's rural setting, as well as flood and other environmental management requirements.

10.4. Mulgoa Valley

Focused actions for the Rural Strategy are:

1. Review and update the boundary of the Mulgoa Valley to provide a common understanding of where land use and development planning decisions must protect and enhance the rural landscape.
2. Identify and protect lands important for delivering water quality and ecological improvements, particularly along the Nepean Creeks (Peach Tree, Mulgoa and Surveyors Creeks) and within the Mulgoa Nature Reserve.
3. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities. This should consider opportunities for the area's large heritage properties (e.g. Fernhill Estate), as well as opportunities associated with the Sydney Green Grid 'Warragamba Pipeline' priority project.
4. Investigate the opportunity for lookout on or near Fairlight Road, noting the need to ensure appropriate management of impacts on tree cover.

11. RURAL SOUTH EAST

The Rural South East Precinct is framed by Penrith's established and planned urban areas to the north, the LGA boundary to the east, Elizabeth Drive (forming the LGA boundary) to the south, and The Northern Road corridor the west. It broadly encompasses the suburbs of Orchard Hills, Kemps Creek, Mount Vernon, Badgerys Creek, and Luddenham.

The entire Precinct is already earmarked for transformational change that will see most of the area developed for urban or associated infrastructure outcomes in the coming years. Unlike the other Precincts, place-based planning efforts within this Precinct are recommended to be re-focused around the future land use framework specified for the following. This will enable considerations to be aligned with the staged planning processes being undertaken at the metropolitan-level.

Place-based planning efforts within this Precinct are recommended to be focused around:

- The South Creek Corridor, which encompasses riparian lands associated with South Creek, Kemps Creek, Cosgrove's Creek and Blaxland Creek.

Precinct-wide considerations should be taken into account when undertaking place-based planning in the Precinct.

11.1. Precinct-wide considerations

Urban land use planning outcomes will be identified through other initiatives, including Metropolitan-level planning and Council's Local Housing Strategy.

Focused actions for the Rural Strategy are:

1. Reinforce The Northern Road corridor as the Metropolitan Rural Area boundary.
2. Identify and support rural enterprises that will be displaced by future urban and infrastructure development.
3. Identify and protect any view corridors to the Blue Mountains from the proposed Outer Sydney Orbital, North South Rail corridors, Elizabeth Drive and the M12. This recognises that these routes are expected to cater for a high volume of daily commuter and visitor traffic.
4. Identify areas along the M4 motorway as highly visually sensitive, noting land situated between Mamre Road and The Northern Road is the only remaining 'green break' along this through route. The design of new urban areas along either side of the motorway should:
 - (a) Reflect and, where possible, reinforce the Metropolitan Rural Area Boundary approaching The Northern Road corridor; and\
 - (b) Maintain existing view corridors to the Blue Mountains from within the Orchard Hills area
5. Facilitate delivery of the Sydney Green Grid's 'South Creek' 'Warragamba Pipeline', 'Ropes Creek' and 'Blaxland Creek' priority projects, noting the potential to create a green link between the Mulgoa/Wallacia villages and public open space in the Rural South East.
6. Establish interim policy measures for development approvals within this Precinct, recognising that current planning controls are not yet fully reflective of the outcomes described in long-term strategic documents. This will provide greater certainty for investment within the Precinct. At minimum, these should:
 - (a) Identify procedures for considering applications for proposals that are currently legally permissible but may be unsuited to the future development context.
 - (b) Identify wastewater disposal requirements for all new developments. This recognises that the area is expected to but has not yet been serviced by a reticulated sewer network.

- (c) Identify local road and site access requirements for all new developments. This recognises that changes may occur within the local road network to, for example, align with new motorway intersections.
7. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements.

11.2. South Creek Corridor

The South Creek Corridor is expected to remain characteristically rural, providing an important 'green break' within this Precinct. The boundary of this corridor has yet to be confirmed and is subject to ongoing planning initiatives.

Focused actions for the Rural Strategy are:

1. Identify and protect lands important for delivering water quality and ecological improvements and flood management requirements.
2. Identify land within the corridor that is expected to be highly visually sensitive, particularly from high points within proposed urban areas or from major new transport corridors.

PART D: CONCLUSION

12. SUMMARY

Council's longstanding vision for the whole of Penrith is one of a

Sustainable and prosperous region with harmony of urban and rural qualities with a strong commitment to environmental protection and enhancement.

It would offer both the cosmopolitan and cultural lifestyles of a mature city and the casual character of a rural community.

The Rural Strategy can support this vision through the following goals for rural lands:

- Identify and secure the Metropolitan Rural Area Boundary.
- Protect ecological health and biodiversity.
- Preserve agricultural land, open space, natural beauty, and cultural connections.
- Support a diverse rural economy.
- Provide housing opportunities and choices to support rural communities' changing needs.
- Manage the conversion of rural lands required for urban or infrastructure.
- Encourage community and stakeholder collaboration

This Study provides a basis for responding to the Planning and Development Factors presented in Part B of this Report. It also establishes a place-based framework for considering localised responses to these factors, and other issues identified through research and consultation.

13. RECOMMENDED ACTIONS

Locality	Strategic Actions
RURAL NORTH WEST	
Precinct Wide	<ol style="list-style-type: none"> 1. Investigate opportunities to extend the Sydney Green Grid to connect with The Great River Walk and the Cranebrook – Windsor Nature Reserve Corridor. 2. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements. 3. Investigate opportunities for new pedestrian and cycling infrastructure to connect Castlereagh Village and Cranebrook and provide broader connections to Penrith Lakes.
Agnes Banks	<ol style="list-style-type: none"> 1. Identify and protect the highly capable agricultural land located along the Nepean River flats west of Castlereagh Road, recognising this area represents some of the best-quality soils available in Western Sydney. This should aim to minimise land fragmentation and discourage rural residential encroachment.
	<ol style="list-style-type: none"> 2. Facilitate the ongoing production of mineral resources (mainly sand) through quarrying to the east of Castlereagh Road to allow for continued supply of base materials for mortar, concrete and coloured glass. This should include retention and enhancement of vegetation along the eastern verge of Castlereagh Road as an important scenic backdrop and visual obstruction to quarrying and residential uses. .
	<ol style="list-style-type: none"> 3. Investigate opportunities: <ol style="list-style-type: none"> (a) To expand the thoroughbred breeding and racing industry here, and in neighbouring Castlereagh. The area already contains world-renowned horse studs and this land-use complements the surrounding rural character. The Western Sydney Aerotropolis will facilitate better connectivity to the area generally, enabling people and horses in the industry to travel more conveniently.³⁷ (b) To attract visitors, including through the provision of visitor accommodation and activities associated with rural activities, leveraging the area’s scenic qualities, position along the Nepean River, proximity to the Sydney International Regatta Centre, and visible heritage fabric.

³⁷ It is noted that horses must be imported into Melbourne, which has Australia’s only quarantine facility. Domestic (i.e. interstate) horse travel happens only by road. For this reason, motorway connections are more important for enabling horse travel into the Penrith LGA.

Locality	Strategic Actions
	4. Generally encourage a built form that complements the surrounding agricultural landscape character, addressing the siting and design of farmhouses, farm buildings and landscaping including property fencing.
	5. Investigate opportunities for new public open space in Agnes Banks to benefit from distinctive views of Grose River valley and heritage context.
Londonderry	1. Establish Carrington Road as the main street for Londonderry. This should aim to consolidate existing social and commercial activities. It should also facilitate opportunities to provide a greater range of services, recognising that this is already Penrith's most populated rural area, and has maintained a comparatively higher growth rate in recent years.
	2. Identify new housing opportunities that enable a greater availability of rental accommodation and support people to age close to home. Where possible, these should be focused in and around the main street.
	3. Identify and protect land that is genuinely suitable for small-lot agricultural production to provide greater certainty for investment in agribusiness. This area may have the potential to accommodate businesses that are expected to be displaced from the Rural South East Precinct.
	4. Consider whether the structural clay deposits identified at four separate sites within the area have production potential.
Castlereagh	1. Investigate opportunities to expand the thoroughbred breeding and racing industry here, and in neighbouring Agnes Banks. The area already contains world-renowned horse studs and this land-use complements the surrounding rural character. The Western Sydney Aerotropolis will facilitate better connectivity to the area generally, enabling people and horses in the industry to travel more conveniently.
	2. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities associated with rural activities, leveraging the area's scenic qualities, position along the Nepean River, proximity to the Sydney International Regatta Centre, and visible heritage fabric. .
	3. Strengthen the role of the 'centre' specifically serving this community over the long term. This should be focused around the intersection of Castlereagh Road and Hinxman Road / Post Office Road, which already contain a public school and service centre.
North Cranebrook	1. Maintain a rural feel, recognising North Cranebrook is an important transitional area between urban and rural parts of Penrith.
	2. Investigate opportunities to support thoroughbred breeding and racing industry that is already well-established in Agnes Banks and Castlereagh.

Locality	Strategic Actions
	3. Facilitate 'controlled environment' agricultural production, such as mushroom production, specialty crops such as berries, and floriculture. These types of uses do not rely on higher quality soils and may be more suited to this peri-urban area. 'Controlled environment' agricultural production be confined to areas currently zoned RU4 and not in E4 zone.
Deferred lands	1. Collaborate with the DLALC in accordance with the Working Together Agreement for the deferred lands.
	2. Clarify the ecological values and priorities for biodiversity conservation contained within this area. This will rely on site-specific assessments and surveys.
	3. Establish common principles to guide future planning and plan-making. These should address land-based and procedural outcomes, including (but not limited to): (a) Land management priorities and supporting initiatives (e.g. anti-dumping, hazard reduction, weed and pest control) (b) Processes for identifying and protecting biodiversity values within the area to establish appropriate environmental protection measures; (c) Processes for protecting Aboriginal culture and heritage through the use, development, and ongoing management of land; (d) Locations suitable for housing, employment, or community development opportunities catering specifically to Aboriginal people; (e) Locations suitable for other land uses or development opportunities (e.g. through leasing or land disposal arrangements).
	4. Consider flood planning and emergency response, particularly to identify suitable evacuation requirements.
RURAL NORTH EAST	
Precinct Wide	1. Maintain and, where possible, enhance vegetation along South Creek to reinforce the Metropolitan Rural Area boundary.
	2. Investigate opportunities to extend the Sydney Green Grid to connect with The Great River Walk and the Cranebrook – Windsor Nature Reserve Corridor.
	3. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements
Berkshire Park	1. Identify and protect an east-west green link between Government Road and South Creek to support habitat connectivity.
	2. Protect opportunities for small-lot agricultural activities such as market gardening, greenhouse vegetables, poultry farming and animal boarding and training.

Locality	Strategic Actions
	3. Maintain an absolute minimum of 2ha lot size per dwelling, predominantly recognising the area is not currently connected to reticulated sewer. This will also broadly assist with preserving rural character, noting the prevalence of truck keeping is likely to increase.
	4. Consider preparing site-specific development controls or guidelines for truck keeping, including truck parking areas and rural sheds or outbuildings associated with this use.
	5. Maintain the existing role of the Berkshire Park rural centre (i.e. cluster of community uses on Sixth Road) in the medium to long term by retaining existing permissible uses in this location. The potential for accommodating additional uses for this centre may be considered as a long-term initiative. This recognises the delivery of major transport infrastructure (e.g. the Castlereagh Connection and Outer Sydney Orbital) will influence local connectivity to services and facilities in surrounding centres such as Llandilo.
Llandilo	1. Maintain a rural feel, recognising Llandilo is an important rural area that interfaces between urban and rural parts of Penrith.
	2. Protect opportunities for small-lot agricultural activities such as poultry farming, market gardening, and nurseries, leveraging existing strengths and skills.
	3. Broadly discourage further intensification of residential development, recognising the area is prone to flash flooding and encroachment of this type of use threatens the potential for sustaining viable agricultural activities.
	4. Maintain an absolute minimum of 2ha lot size per dwelling, predominantly recognising the area is not currently connected to reticulated sewer. This will also broadly assist with preserving rural character, noting the prevalence of truck keeping is likely to increase.
	5. Consider preparing site-specific development controls or guidelines for truck keeping, including truck parking areas and rural sheds or outbuildings associated with this use.
	6. Reinforce the role of Llandilo's centre by supporting incremental growth based on existing permitted uses, to cater predominantly to the surrounding rural community. This recognises major retail and community services are conveniently provided in nearby Cranebrook, and connections to other areas, including Berkshire Park, are likely to be severed by the delivery of new motorways.
RURAL SOUTH WEST	
Precinct Wide	1. Reinforce The Northern Road corridor as the Metropolitan Rural Area boundary.
	2. Facilitate delivery of the Sydney Green Grid's 'Mulgoa Creek and Warragamba Pipeline Open Space Corridor' opportunities, considering potential opportunities for a new shared path linking the Mulgoa and Wallacia villages to recreational uses via the Warragamba Pipeline Open Space Corridor.
	3. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements

Locality	Strategic Actions
Mulgoa	<ol style="list-style-type: none"> 1. Identify opportunities for housing diversification and, where necessary, renewal within the village, particularly to suit an aging population. This recognises that the area is not currently suitable to accommodate substantial population growth but will remain a popular place for residents and visitors due to its amenity.
	<ol style="list-style-type: none"> 2. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities within the village.
Wallacia	<ol style="list-style-type: none"> 1. Protect and enhance opportunities for people to interact with the Nepean River's edge. This recognises that Wallacia is one of the few places where this is possible upstream from the Nepean River's confluence with the Warragamba River, and so offering an opportunity for a unique river experience.
	<ol style="list-style-type: none"> 2. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities within the village.
	<ol style="list-style-type: none"> 3. Investigate opportunities for housing diversification and, where appropriate, housing growth within the village. This should focus on housing types that are suitable for the area's aging population. It will predominantly rely on renewal and re-development to balance priorities for protecting the village's rural setting, as well as flood and other environmental management requirements.
Mulgoa Valley	<ol style="list-style-type: none"> 1. Review and update the boundary of the Mulgoa Valley to provide a common understanding of where land use and development planning decisions must protect and enhance the rural landscape.
	<ol style="list-style-type: none"> 2. Identify and protect lands important for delivering water quality and ecological improvements, particularly along the Nepean Creeks (Peach Tree, Mulgoa and Surveyors Creeks) and within the Mulgoa Nature Reserve.
	<ol style="list-style-type: none"> 3. Investigate opportunities to attract visitors, including through the provision of visitor accommodation and activities. This should consider opportunities for the area's large heritage properties (e.g. Fernhill Estate), as well as opportunities associated with the Sydney Green Grid 'Warragamba Pipeline' priority project.
RURAL SOUTH EAST	
Precinct Wide	<ol style="list-style-type: none"> 1. Reinforce The Northern Road corridor as the Metropolitan Rural Area boundary.
	<ol style="list-style-type: none"> 2. Identify and support rural enterprises that will be displaced by future urban and infrastructure development.
	<ol style="list-style-type: none"> 3. Identify and protect any view corridors to the Blue Mountains from the proposed Outer Sydney Orbital, North South Rail corridors, Elizabeth Drive and the M12. This recognises that these routes are expected to cater for a high volume of daily commuter and visitor traffic.

Locality	Strategic Actions
	<p>4. Identify areas along the M4 motorway as highly visually sensitive, noting land situated between Mamre Road and The Northern Road is the only remaining 'green break' along this through route. The design of new urban areas along either side of the motorway should:</p> <p>(f) Reflect and, where possible, reinforce the Metropolitan Rural Area Boundary approaching The Northern Road corridor; and</p>
	<p>5. Maintain existing view corridors to the Blue Mountains from within the Orchard Hills area.</p>
	<p>6. Facilitate delivery of the Sydney Green Grid's 'South Creek' 'Warragamba Pipeline', 'Ropes Creek' and 'Blaxland Creek' priority projects, noting the potential to create a green link between the Mulgoa/Wallacia villages and public open space in the Rural South East.</p>
	<p>7. Establish interim policy measures for development approvals within this Precinct, recognising that current planning controls are not yet fully reflective of the outcomes described in long-term strategic documents. This will provide greater certainty for investment within the Precinct. At minimum, these should:</p> <p>(g) Identify procedures for considering applications for proposals that are currently legally permissible but may be unsuited to the future development context.</p> <p>(h) Identify wastewater disposal requirements for all new developments. This recognises that the area is expected to but has not yet been serviced by a reticulated sewer network.</p> <p>(i) Identify local road and site access requirements for all new developments. This recognises that changes may occur within the local road network to, for example, align with new motorway intersections.</p>
	<p>8. Require all developments to consider flood planning and emergency response, particularly to identify suitable evacuation requirements</p>
South Creek Corridor	<p>9. Identify and protect lands important for delivering water quality and ecological improvements and flood management requirements.</p>
	<p>10. Identify land within the corridor that is expected to be highly visually sensitive, particularly from high points within proposed urban areas or from major new transport corridors.</p>

ABBREVIATIONS

BIO – Biodiversity Investment Opportunity

BLCU – Broad Landscape Character Unit

DCP – Development Control Plan

DEOH – Defence Establishment Orchard Hills

DLALC – Deerubbin Local Aboriginal Land Council

FSR – Floor space ratio

GSC – Greater Sydney Commission

IBRA – Interim Biogeographic Regionalisation for Australia

IIPH – Intensive Integrated Production Hub

LEP – Local Environmental Plan

LGA – Local Government Area

MRA – Metropolitan Rural Area

NPWS – National Parks and Wildlife Service NSW

SEPP – State Environmental Planning Policy

WSA – Western Sydney Aerotropolis

WSEA – Western Sydney Employment Area

REFERENCES

Australian Bureau of Statistics (ABS) 2018a, *Value of Agricultural Commodities Produced - New South Wales and Local Government Areas 2015-2016 (excel spreadsheet)*. Available: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/7503.02015-16?OpenDocument>

Australian Bureau of Statistics (ABS) 2018b, *Agricultural Commodities - New South Wales and Local Government Areas 2015-2016 (excel spreadsheet)*. Available: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/7121.02015-16?OpenDocument>

Australian Bureau of Statistics (ABS) 2017, *2016 QuickStats*. Available: <http://www.abs.gov.au/websitedbs/D3310114.nsf/Home/2016%20QuickStats>

Australian Government, NSW Government, Penrith City Council, Camden Council, Blue Mountains City Council, Fairfield City Council, Hawkesbury City Council, Campbelltown City Council, Wollondilly Council, Liverpool City Council 2018, *Western Sydney City Deal*. Available: https://citydeals.infrastructure.gov.au/sites/default/files/2018-06/western_sydney_city_deal_pdf.pdf

Australian Government Department of Environment and Energy 2018, *EPBC Act Protected Matters Report: LGA Penrith City Council*. Available: <http://www.environment.gov.au/epbc/pmst/>

Australian Government Department of Environment & Energy, (nd.), *Australia's Bioregions (IBRA) (webpage)*. Available: <https://www.environment.gov.au/land/nrs/science/ibra>

Australian Government Rural Industries Research and Development Corporation 2013, *Getting Started in Wildflower Growing: How to Grow Native Australian and South African Species for the Cut Flower Market*. Available: <https://www.agrifutures.com.au/wp-content/uploads/publications/12-090.pdf>

Cemeteries and Crematoria NSW 2017, *Metropolitan Sydney Cemetery Report*. Available: https://www.industry.nsw.gov.au/_data/assets/pdf_file/0014/143402/CCNSW-Metropolitan-Sydney-Cemetery-Capacity-Report.pdf

Chapman GA, Murphy CL, Tille PJ, Atkinson G and Morse RJ, 2009. Ed. 4, *Soil Landscapes of the Sydney 1:100,000 Sheet map, Department of Environment, Climate Change and Water, Sydney*. Available: <https://data.nsw.gov.au/data/dataset/soil-landscapes-of-the-sydney-1-100000-sheet557e2> (accessed 19 March 2019)

Chapman GA and Murphy CL, 1989, *Soil Landscapes of the Sydney 1:100,000 Sheet report, Department of Conservation and Land Management, Sydney*. Available: <https://data.nsw.gov.au/data/dataset/soil-landscapes-of-the-sydney-1-100000-sheet557e2> (accessed 19 March 2019)

Convention on Biological Diversity, (nd.), *Aichi Biodiversity Targets (webpage)*. Available: <https://www.cbd.int/countries/targets/?country=au>

Department of Environment, Climate Change and Water 2011, *Cumberland Plain Recovery Plan*. Available: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/cumberland-plain-recovery-plan>

NSW Department of Environment & Climate Change 2002, *Descriptions for NSW (Mitchell) Landscapes: Version 2*. Available: <https://www.environment.nsw.gov.au/resources/conservation/landscapesdescriptions.pdf>

NSW Department of Environment & Climate Change 2002b, *NSW Landscapes Mapping: Background & Methodology*. Available: <https://www.environment.nsw.gov.au/resources/conservation/EcosystemsMethodology.pdf>

Department of Industry - Water, 2018, *Controlled Activities (website)*. Available: <https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities>

Department of Infrastructure, Planning and Natural Resources 2002, *Salinity Potential in Western Sydney 2002 (map)*. Available: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Land-and-soil/salinity-potential-western-sydney-map-2002.pdf> (accessed 19 March 2019)

Department of Planning and Environment (DPE) 2018, *Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan: Stage 1 Initial Precincts*. Available: http://planspolicies.planning.nsw.gov.au/index.pl?action=view_job&job_id=9552

Department of Planning and Environment (DPE) & The Office of the Government Architect 2017, *Sydney Green Grid: Spatial Framework and Project Opportunities*, (prepared by Tyrrell Studio). Available: <https://www.governmentarchitect.nsw.gov.au/projects/sydney-green-grid>

Department of Planning and Environment 2014, *Biophysical Strategic Agricultural Land Maps*. Available: <https://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/Safeguarding-our-Agricultural-Land>

Department of Planning Industry and Environment (DPIE) 2019, *Planning Connects Webinar: Cumberland Conservation Plan (presented June 2019)* Available: <https://www.planning.nsw.gov.au/Policy-and-Legislation/Biodiversity/Cumberland-Plain-Conservation-Plan>

Department of Primary Industries (DPI) 2017, *Performance and Data Insights 2017*. Available: https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0004/750352/nsw-dpi-performance-data-and-insights-2017.pdf

Department of Primary Industries (DPI) 2015, *New South Wales Right to Farm Policy*. Available: https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0006/587184/NSW-Right-to-farm-policy.pdf

Edge Land Planning 2015, *Sydney Peri-Urban Network Issues Paper*. Available: <https://www.wollondilly.nsw.gov.au/assets/Documents/Planning-and-Development/SPUN/20150928-Sydney-Peri-Urban-Network-Issues-Paper.pdf>

Envisage Consulting 2019, *Penrith Scenic and Cultural Landscapes Study*. Available: provided by the author

Greater Sydney Commission 2018, *Greater Sydney Region Plan: A Metropolis of Three Cities*. Available: <https://gsc-public-1.s3-ap-southeast-2.amazonaws.com/greater-sydney-region-plan-0618.pdf>

Greater Sydney Commission 2018, *Western City District Plan*. Available: <https://gsc-public-1.s3-ap-southeast-2.amazonaws.com/s3fs-public/western-district-plan-0318.pdf>

Hawkesbury-Nepean Catchment Management Authority, 2008, *Hawkesbury Nepean Catchment Action Plan 2007 - 2016*. Available: https://archive.ils.nsw.gov.au/_data/assets/pdf_file/0004/496813/archive-hawkesbury-nepean-catchment-action-plan-2007-2016-complete.pdf (accessed 20 March 2019)

.id the Population Experts 2018, *Penrith City Council Community Profile*. Available: <https://profile.id.com.au/penrith>

.id the Population Experts 2018, *Penrith City Council Economic Profile: Industry Sector Analysis*. Available: <https://economy.id.com.au/penrith/industry-sector-analysis>

Infrastructure NSW 2017, *Hawkesbury Nepean Flood Risk Management Strategy*. Available: https://www.hawkesbury.nsw.gov.au/_data/assets/pdf_file/0018/93051/Infrastructure-NSW-Resilient-Valley,-Resilient-Communities-2017-January.pdf

Muru Mittigar 2017, *Native Nursery (webpage)*. Available: <https://www.murumittigar.com.au/provenance-nursery/>

National Parks and Wildlife Service 2014, *Statement of Management Intent Wianamatta Nature Reserve*. Available: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-statement-of-management-intent/wianamatta-nature-reserve-statement-of-management-intent-140250.pdf>

National Parks and Wildlife Service 2014, *Statement of Management Intent Penrith lakes Regional Park*. Available: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-statement-of-management-intent/penrith-lakes-regional-park-statement-of-management-intent-140475.pdf>

National Parks and Wildlife Service 2011, *Wianamatta Regional Park Plan of Management*. Available: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/wianamatta-regional-park-plan-of-management>

National Parks and Wildlife Service 2009, *Yellomundee Regional Park Plan of Management*. Available: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management/yellomundee-regional-park-plan-of-management-090510.pdf>

National Parks and Wildlife Service 2008, *Mulgoa Nature Reserve Plan of Management*. Available: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management/mulgoa-nature-reserve-plan-of-management-080671.pdf>

National Parks and Wildlife Service 1999, *Castlereagh, Agnes Banks and Windsor Downs Nature Reserves Plan of Management*. Available: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/castlereagh-agnes-banks-windsor-downs-nature-reserve-plan-of-management>

NSW Trade & Investment Resources & Energy Division 2011, *Mineral Resources Audit Penrith City*. Available: supplied by Penrith City Council

Office of Environment & Heritage (OEH), 2019, *About Soil Maps (webpage)*. Available: <https://www.environment.nsw.gov.au/topics/land-and-soil/information/soil-maps> (accessed 19 March 2019)

Office of Environment & Heritage (OEH) 2018, *Land and Soil Capability mapping for NSW*. Available: <https://data.nsw.gov.au/data/dataset/land-and-soil-capability-mapping-for-nsw4bc12>

Office of Environment & Heritage (OEH) 2018, *Aboriginal Cultural Heritage Places of Significance (webpage)*. Available: <https://www.environment.nsw.gov.au/nswcultureheritage/placesofsignificance.htm>

Office of Environment & Heritage (OEH), 2011, *Sydney Metropolitan Western Study Area Hydrogeological Landscapes (HGL)*. Available: <https://datasets.seed.nsw.gov.au/dataset/sydney-metropolitan-western-study-area-hydrogeological-landscapes-march-2011-first-edition6fe4a> (accessed 20 March 2019)

Office of Environment and Heritage (OEH) & Environmental Protection Authority (EPA) 2017, *Risk-Based Framework for Considering Waterway Health Outcomes in Strategic Land Use Planning*. Available: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/risk-based-framework-for-considering-waterway-health-outcomes-in-strategic-land-use-planning>

Paul Davies Pty Ltd 2007, *Penrith Heritage Study Vol. 3 - Locality Assessment*. Available: supplied by Penrith City Council

Paul Davies Pty Ltd 2006, *Penrith Heritage Study Vol. 1 - Report and Recommendations*. Available: supplied by Penrith City Council

Penrith City Council 2018, *Penrith Community Profile 2018*. Available: https://www.penrithcity.nsw.gov.au/images/documents/resources-documents/community-info/Penrith_Community_Profile_2018.pdf

Penrith City Council 2017, *Penrith Community Plan 2017*. Available: https://www.penrithcity.nsw.gov.au/images/documents/council/our-organisation/Community_Plan.pdf

Penrith City Council 2017, *Economic Development Strategy: Building the New West*. Available: Supplied by Penrith City Council

Penrith City Council 2015, *Penrith Destination Management Plan* (prepared by the Stafford Group). Available: <https://www.dssn.com.au/app/uploads/2018/07/Penrith-Destination-Management-Plan-DMP.pdf>

Penrith City Council 2014, *Penrith Development Control Plan 2014*. Available: <https://www.penrithcity.nsw.gov.au/building-development/planning-zoning/planning-controls/development-control-plans>

Penrith City Council 2013, *Penrith City Strategy*. Available: supplied by Penrith City Council

Penrith City Council 2009, *Exhibition of Stage 1 LEP Review Planning Documents - Summary of Submissions: Chapter 6. Government Departments and Other Authorities*. Available: Supplied by Penrith City Council

Penrith Local Emergency management Committee 2014, *Emergency Risk Management Study*. Available: Supplied by Penrith City Council

Transport for NSW 2018, *Outer Sydney Orbital Corridor Identification: Consultation on a Recommended Corridor of Land for Future Motorway and Freight Rail Line*. Available: <https://www.transport.nsw.gov.au/corridors/oso>