



Photo by Mark Powell Photography

Penrith Local Emergency Management Plan

November 2024

Acknowledgement of Country

Penrith City acknowledges the Traditional Custodians of the lands where we work and live. We celebrate the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters of NSW.

We pay our respects to Elders past, present and emerging and acknowledge the Aboriginal and Torres Strait Islander people that contributed to the development of this plan.

We advise this resource may contain images, or names of deceased persons in photographs or historical content.

Penrith Local Emergency Management Plan

Published by Penrith Local Emergency Management Committee

Document Control History

Version and Amendments

The Penrith EMPLAN is a controlled document.

Penrith LEMC welcomes feedback from the area's residents, visitors, and other stakeholders.

Proposals for amendments should be addressed to:

Post: Emergency Management Coordinator

Penrith City Council

PO Box 60

Penrith, NSW, 2750.

Version	Date	Comment
1	June 2002	Version 1 - Displan
2	October 2006	Revised DISPLAN
3	September 2011	Revised DISPLAN
4	November 2012	New version of DISPLAN to reflect changes in the State Emergency & Rescue Management (SERM) Act 1989 (v2010)
5	November 2015	New EMPLAN. Complete rewrite in accordance with the State Emergency & Rescue Management (SERM) Act 1989 and amendments, and the ¹ NSW Local Emergency Management Plan Guideline 2015.
6	January 2021	Revised EMPLAN, CMG's and Evacuation Centres.
7	2024	Added document control, versions, contact list. Updated community profile and population, evacuation centres, risk assessments in line with ISO31000:2018 and updated CMGs.

¹ The Guideline for the development of the Local Emergency Management Plan was prepared by the State Emergency Management Committee (SEMC) Working Group and published by the NSW Ministry for Police and Emergency Services (MPES) 2015.

Distribution List

The controlled master copy of the Penrith EMPLAN is held by the Emergency Management Coordinator, Penrith City Council.

Controlled copies of the Penrith EMPLAN, including restricted operational information and supporting documents, is distributed to:

- Members of the Penrith Local Emergency Management Committee, as listed in the LEMC Contact List
- North-West Metropolitan Regional Emergency Management Committee (REMC)
- Penrith Local Emergency Operations Centre (LEOC)
- North- West Metropolitan Regional Emergency Management Officer (REMO)
- Others as approved by the Penrith Local Emergency Management Committee.

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The recipients of the full copy of the Penrith EMPLAN must take all reasonable steps to ensure restricted operational information remains secure and confidential.

Individuals must not intentionally access files, registers or other documents that contain restricted operational information unless it is necessary for their specific role and duties.

The information provided in the Penrith EMPLAN is undertaken to be accurate at the time of publication.

Emergency Contact List

Life threatening or time critical emergencies (Ambulance, Fire, Police) **CALL 000**

OPERATOR	WEBSITE	PHONE CONTACT
Council - Penrith City Council	Penrithcity.nsw.gov.au	02 4732 7777
Communities and Justice (Welfare Services)	https://www.dcj.nsw.gov.au	1800 152 152
Dams		
Water NSW	Waternsw.com.au	1300 662 077
Penrith City Council	Penrithcity.nsw.gov.au	02 4732 7777
Dept of Primary Industries and Regional Development (Animal & Agricultural Services)	https://www.dpi.nsw.gov.au	1800 675 888 (Animal & Aquatic pests/diseases) 1800 084 881 (Emergency plant pest)
Dept of Public Works (Engineering Services)	https://publicworks.nsw.gov.au	1300 008 888
Emergency Alert (Australia)	emergencyalert.gov.au	
Environment Protection Authority (Environmental Services)	https://www.epa.nsw.gov.au	131 555
Essential Services (Energy & Gas)		13 10 03
Endeavour Energy	Endeavorenergy.com.au	(Emergency Assistance) 13 19 09 (faults and emergency)
Jemena Gas	Jemena.com.au/gas https://gasleakreport.jemena.com.au	
Fire and Rescue NSW	https://www.fire.nsw.gov.au/	02 9265 2999
Hazards Near Me	https://www.nsw.gov.au/emergency/hazards-near-me-app	
Lifeline	lifeline.org.au	13 11 14
National Emergency Management Agency (NEMA)	https://nema.gov.au	See website
National Relay Service	iprelay.com.au	
Teletypewriter		1800 442 300
Speak and listen		1800 555 727
SMS relay		1800 442 300
NSW Ministry of Health (Health Services)	https://www.health.nsw.gov.au	02 9391 9000
NSW Reconstruction Authority	https://www.nsw.gov.au/reconstruction-authority	02 9212 9200
NSW Telco Authority	https://www.nsw.gov.au/telco-authority	1800 343 963
Penrith City Council	Penrithcity.nsw.gov.au	02 4732 7777
After-hours / General enquiries		
Police		
Penrith Police Station		02 4721 9444
St Marys Police Station		02 9677 7499
Crime Stoppers	nsw.crimestoppers.com.au	1800 333 000
Police Link	police.nsw.gov.au	13 14 44

Radio

ABC Radio Sydney (702 AM)

<https://www.abc.net.au/listen/live/sydney> **13 9994**

Rural Fire Service (NSW) Cumberland District Fire Control Centre	https://www.rfs.nsw.gov.au/	Bushfire Information Line 1800 679 737 02 4734 7777
Water Distributor and Sewerage Services (Sydney Water)	www.sydneypwater.com.au	13 20 90 (Faults) 13 20 92 (General)
State Emergency Service NSW	ses.nsw.gov.au	13 25 00

Telephone

Optus Personal Small and medium business	optus.com.au	13 13 44 13 33 43
Telstra Mobiles Home Phone	telstra.com.au	12 51 11 13 22 03
Vodafone NBN	https://www.vodafone.com.au https://www.nbnco.com.au	
Translation services	tisonational.gov.au	13 14 50
Transport for NSW (Transport Services)	https://www.transport.nsw.gov.au	13 15 00
Traffic (Live traffic)	livetraffic.com	13 17 00

USEFUL APPS **ICON**

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BOM Weather		
Live Traffic		
Hazards Near Me NSW		
Emergency Plus		
ABC NEWS		

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1 Administration

1.1 Authority

The Penrith Local Emergency Management Plan (EMPLAN) has been prepared by the Penrith Local Emergency Management Committee in compliance with the *State Emergency and Rescue Management Act 1989*.



APPROVED

Chair

Penrith Local Emergency Management Committee

Dated: 18 November 2024

ENDORSED

Chair

North-West Metropolitan Regional Emergency Management Committee

Dated: 25/3/25

1.2 Purpose

The purpose of this plan is to detail arrangements for the prevention of, preparation for, response to and recovery from (PPRR) emergencies within the Local Government Area(s) (LGA) covered by this plan.

It encompasses arrangements for:

- emergencies controlled by Combat Agencies
 - emergencies controlled by Combat Agencies and supported by the Local Emergency Operations Controller (LEOCON)
 - emergency operations for which there is no Combat Agency and are therefore controlled by the LEOCON
 - circumstances where a Combat Agency has passed control to the LEOCON.
-

1.3 Objectives

The objectives of this plan are to:

- define Functional Area, Supporting Agency and Participating Organisation roles and responsibilities to prevent, prepare for, respond to and recover from emergencies
 - set out the control, coordination and liaison arrangements at the local level
 - detail activation and alerting arrangements for involved agencies
 - detail arrangements for the acquisition and coordination of resources.
-

1.4 Scope

The plan describes the arrangements at the local level to prevent, prepare for, respond to, and recover from emergencies and also provides policy direction for the preparation of local sub plans and supporting plans:

- Arrangements detailed in this plan assume that the resources upon which the plan relies are available when required.
 - The effectiveness of arrangements detailed in this plan is dependent upon all involved agencies preparing, testing and maintaining appropriate internal instructions and/or standing operating procedures.
-

1.5 Principles

The following principles are applied in this plan:

- a) The Emergency Risk Management (ERM) process is to be used as the basis for emergency planning in NSW. This methodical approach to the planning process is to be applied by emergency management committees at all levels.
 - b) Responsibility for preparation, response and recovery rests initially at the local level. If local agencies and available resources are not sufficient, they are augmented by those at the regional level.
 - c) Control of emergency response and recovery operations is conducted at the lowest effective level.
 - d) Agencies may deploy their own resources from their own service from outside the affected LGA or region if they are needed.
 - e) The LEOCON is responsible, when requested by a Combat Agency, to coordinate the provision of resources support. Emergency Operations Controllers (EOCONs) would not normally assume control from a Combat Agency unless the situation can no longer be contained. Where necessary, this should only be done after consultation with the Regional Emergency Operations Controller (REOCON) and with the agreement of the Combat Agency and the appropriate level of control.
 - f) Emergency preparation, response and recovery operations should be conducted with all agencies carrying out their normal functions wherever possible.
 - g) Prevention measures remain the responsibility of authorities/agencies charged by statute with the responsibility.
-

1.6 Audience

The audience for this plan is the Penrith Local Emergency Management Committee (LEMC) and local non-government organisations (NGOs) business and community groups with a significant role in emergency management.

Although the wider community is not the primary audience, community members may find the contents of this plan informative.

Parts 6 to 8 contain restricted operational information that is not made publicly available due to the sensitivity and privacy of the information contained. The LEMC will make available the restricted sections to Combat Agencies and Functional Areas.

1.7 Test and review process

The Penrith Local Emergency Management Committee (LEMC) will review this plan every 3 years, or following any:

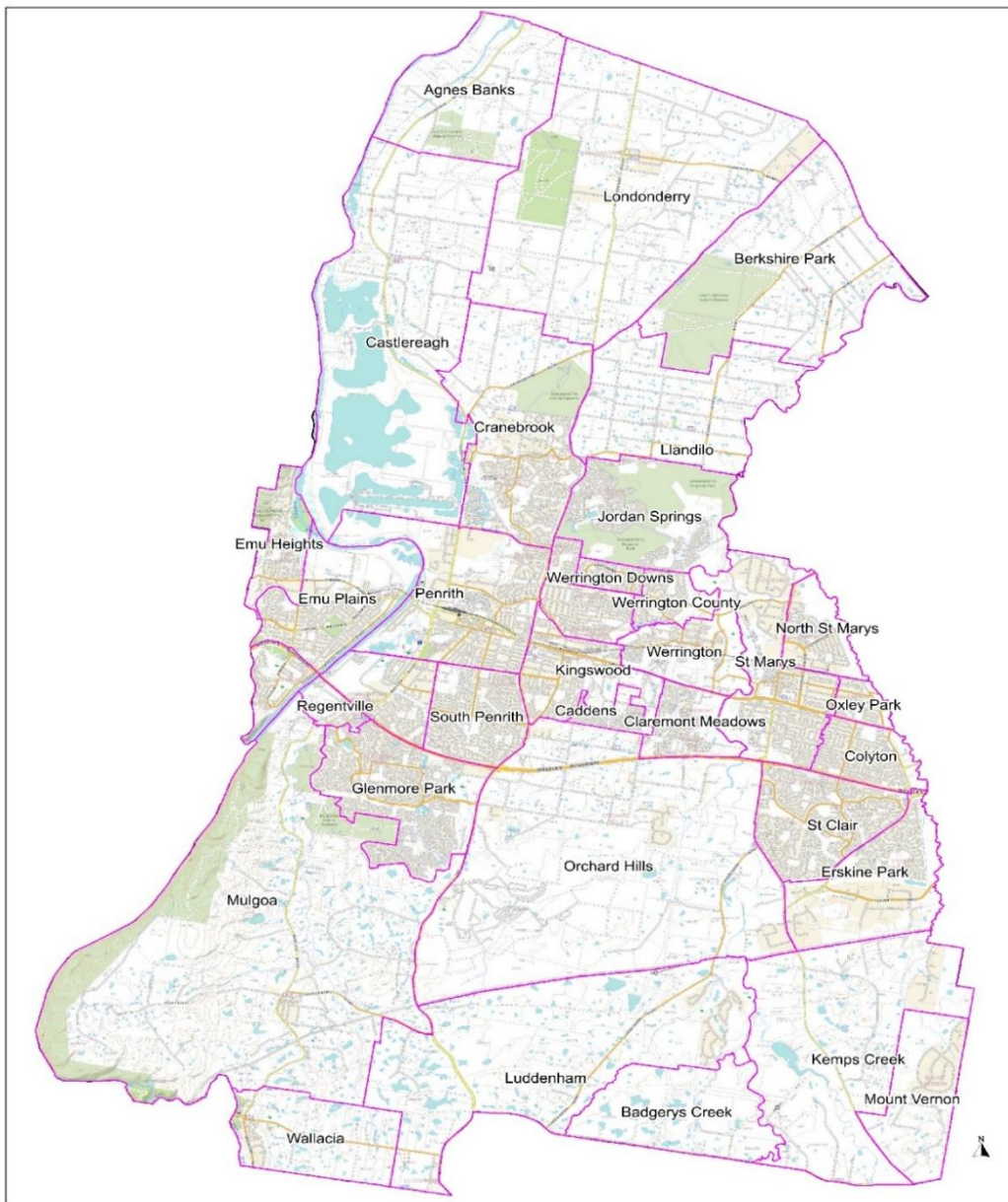
- activation of the plan in response to an emergency
- legislative changes affecting the plan
- exercises conducted to test all or part of the plan.

2 Community context

2.1 General

Penrith City is located at the western fringe of the Sydney metropolitan area - approximately 54 kilometres from the Sydney GPO. Penrith City is bounded by Hawkesbury City in the north, Blacktown City and Fairfield City in the east, Liverpool City and Wollondilly Shire in the south and Blue Mountains City in the west.

Penrith City contains a blend of urban and rural communities which include Agnes Banks (part), Badgerys Creek (part), Berkshire Park, Caddens, Cambridge Gardens, Cambridge Park, Castlereagh, Claremont Meadows, Colyton, Cranebrook, Emu Heights, Emu Plains, Erskine Park, Glenmore Park, Jamisontown, Jordan Springs, Kemps Creek (part), Kingswood, Kingswood Park, Leonay, Llandilo, Londonderry, Luddenham (part), Mount Vernon, Mulgoa, North Penrith, North St Marys, Orchard Hills, Oxley Park, Penrith, Regentville, South Penrith, St Clair, St Marys, Wallacia (part), Werrington, Werrington County and Werrington Downs.



2.2 Landform and topography

The topography of the Penrith LGA varies, with elevations of between 20m and 240m AHD.

The Penrith area is part of the Cumberland Plain. Whilst local variations exist, the following general description provides a broad overview.

The highest and steepest areas are found on the Blue Mountains Escarpment at Emu Plains and along the Nepean Gorge, south of the M4 Motorway Bridge. Flat alluvial plains are associated with the Nepean River, extending north of the Penrith town centre and along the middle to lower section of South, Ropes, and Mulgoa Creeks. Gently to moderately undulating land characterises the central and southern parts of the LGA, while the northern portion exhibits slight undulations².

2.3 Climate

Penrith City is a rapidly growing regional centre with a projected increase of 160,000 residents over the next 25 years. The city is intersected by the Nepean River, which not only contributes to its identity but also serves as a valuable natural asset.

Located within the Sydney basin, Penrith occupies the lower altitude portion of the basin while being surrounded by the elevated terrain of the Blue Mountains to the west. This geographical setting has significant impacts on Penrith's climate.

Due to the area's topography, Western Sydney, including Penrith does not experience sea breezes from the east³. Consequently, Penrith tends to have consistently higher temperatures and lower rainfall compared to the more coastal regions of Sydney.

Penrith is situated on the Cumberland Plain, characterized by gently undulating plains and low hills formed by the Wiannamatta group of shales, as well as alluvial deposits along rivers and floodplains. These soils support eucalypt woodlands with a grassy understorey, including the critically endangered Cumberland Plain Woodland, which now covers only 8.5% of its original extent.

Significant portions of native bushland are still preserved in Penrith, accounting for approximately 17% of the remaining bushland on the Cumberland Plain in Western Sydney. Some of these areas are part of the national reserve system, while substantial bushland can also be found on private land⁴.

Temperature

Long-term temperature records indicate a consistent increase across the entire Sydney Metropolitan area since the 1960s, with the most significant warming observed in recent decades. This trend is supported by data from local weather stations at Orchard Hills and Penrith Lakes.

For instance, the mean annual maximum temperature recorded at Penrith Lakes between 1995 and 2022 was 24.7°C, while the mean annual maximum temperature between 1970 and 1989 at Orchard Hills was 23.4°C. Similarly, the mean annual minimum temperature at Penrith Lakes during the same period was 12.4°C compared to 11.6°C at Orchard Hills.

² (Penrith City Council, 2022)

³ (Pfautsch, Wujeska-Krause, & Rouillard, 2020)

⁴ (Penrith City Council, 2023)

In terms of seasonal variations, average maximum temperatures during summer range from 28 to 30°C, while average minimum temperatures during winter range from 5 to 10°C. On average, there are 21 hot days (>35°C) each year. The highest recorded temperature to date was 48.9 degrees Celsius on January 4th, 2020.

Current Climate and weather events

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean max temp °C	30.8	29.6	27.6	24.7	21.2	18.2	18.1	20	23.4	25.9	27.5	29.7	24.7
Mean No. of days >= 35°C	7.1	3.7	1.3	0.1	0	0	0	0	0.2	1.1	2.9	5.0	21.4
Mean number of days >= 40°C	2.3	0.8	0.1	0	0	0	0	0	0	0	0.6	1	4.8
Mean min temp °C	18.6	18.5	16.8	13.1	9.2	6.8	5.4	6.2	9.3	12.3	15	17.0	12.4
Mean rainfall (mm)	95.1	118.8	104.7	50.2	35.2	45.2	37.2	30.4	30.8	54.9	83.5	65	755.1
Mean No. days of rain	12.2	11.8	12.3	10.1	10.2	14.3	11.6	8.1	7.6	9.4	12.1	10.8	130.5
Mean No. days of rain >= 25 mm	1.1	1.4	1	0.5	0.3	0.5	0.3	0.3	0.2	0.6	0.9	0.6	7.7

Figure 1 – Penrith Lakes weather station data 1995-2024⁵

Rainfall

Rainfall in Penrith can exhibit significant variations from year to year due to the influence of larger-scale climate patterns like the El Niño Southern Oscillation (ENSO). On average, Penrith receives 740 mm of rainfall annually, with a higher amount typically occurring during summer and autumn compared to winter and spring.

Notably, thunderstorm activity in Penrith primarily transpires between January and March during the summer season, and there has been an observed increase in the severity of these storms, as witnessed during the 2019 summer season. Between 1995 and 2022, the highest average rainfall recorded in Penrith was 1283.2 mm in 2022, while the lowest was 450 mm in 2019.

Flood Weather

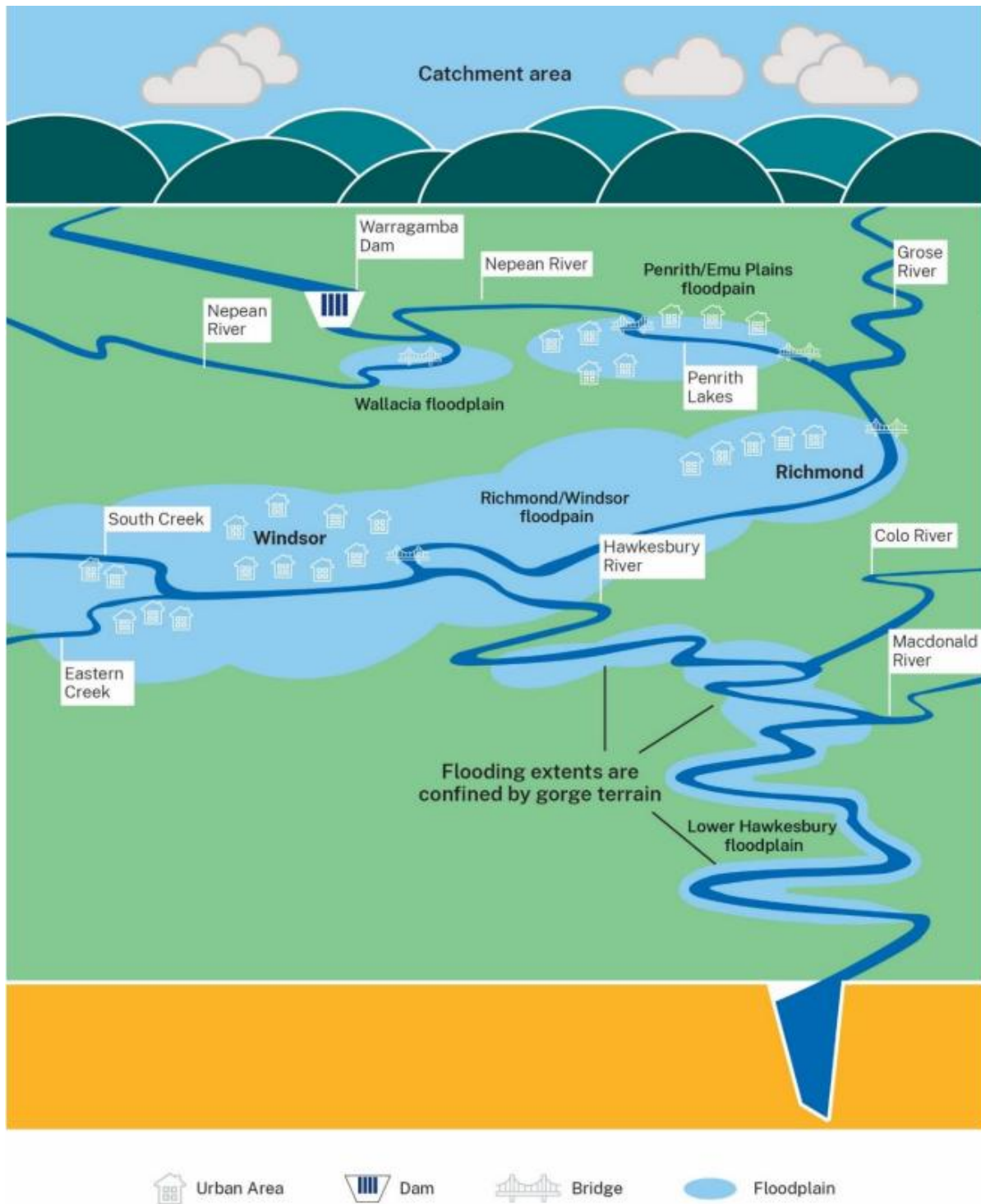
The majority of significant flood events in the Hawkesbury-Nepean catchment have historically taken place in late autumn or winter, primarily triggered by East Coast Lows (ECLs). ECLs are powerful low-pressure weather systems that typically occur multiple times per year along the eastern coast of Australia.

One distinguishing characteristic of ECLs is their lack of connection to climate drivers such as ENSO, making them challenging to predict⁶. However, when an East Coast Low coincides with a period of increased rainfall influenced by ENSO and/or a negative IPO (Interdecadal Pacific Oscillation), as observed in 2022, the conditions become favourable for flooding to transpire and the "bathtub effect" within the valley to occur. Preceding wet conditions play a significant role in determining the magnitude of the flood, as a higher proportion of rainfall turns into runoff.

⁵ (Bureau of Meteorology, 2022)

⁶ (Infrastructure NSW, 2021)

Figure 2 - The two main floodplains in the Hawkesbury-Nepean Valley⁷



⁷ (NSW Reconstruction Authority, 2024)

Fire Weather

According to the Bureau of Meteorology (BoM), there has been a noticeable increase in extreme fire weather and an extended fire season across significant areas of Australia since the 1950s⁸. In New South Wales (NSW), the fire season, which typically spans from October to March, is now commencing earlier and lasting longer, with fire weather conditions extending into spring and autumn.

Fire weather severity is classified by the BoM based on the Forest Fire Danger Index (FFDI), with a rating of 'severe' when the FFDI exceeds 50. The FFDI combines temperature, humidity, wind speed, and fuel conditions to determine fire risk. Observations of FFDI are currently available for Richmond and Sydney Airport.

On average, severe fire weather conditions are estimated to occur once per year at Sydney Airport and approximately 1.8 days per year at Richmond. It is expected that Penrith's FFDI will closely resemble the conditions recorded at Richmond, indicating a higher risk of bushfires compared to more coastal areas of Sydney⁹.

⁸ (Bureau of Meteorology, 2022)

⁹ (Office of Environment and Heritage, 2014)

2.4 Climate change impacts

The following climate change implications summary was prepared by Climate Change in Australia, in conjunction with the CSIRO and the Australian Government Department of Agriculture, Water and the Environment, and the Bureau of the Meteorology. These implications are generally applicable to the East Coast of Australia.

- Penrith will become warmer, experiencing more hot days and fewer cold nights across all seasons. This will significantly increase the demand for cooling in summer and accelerate the deterioration of buildings, roads, and Council assets, leading to higher life-cycle costs and maintenance needs.
- The projected increase in extreme hot temperatures is expected to result in more heat-related deaths, hospital admissions for heat stress and illness¹⁰. Higher temperatures may also contribute to the spread of vector-borne, water-borne, and food-borne diseases¹¹.
- The annual rainfall trends are influenced by climate drivers such as the El-Nino Southern Oscillation (ENSO), Southern Annular Mode (SAM), Indian Ocean Dipole (IOD) and the Inter-Decadal Pacific Oscillation (IPO). It is projected that rainfall trends will decrease during the Winter season. However, increased intensity of extreme rainfall events is projected generally. There is evidence of extreme flooding events (1867, 1864 and 1961 flood events) occurring when the IPO is in a negative period¹².
- Changes in global and regional climate patterns are impacting water availability. Projections indicate increased frequency and severity of drought, which will affect water availability. As rainfall decreases and evaporation increases, changes in water storage volume and runoff patterns are expected¹³.
- Reductions in flows of streams within the Hawkesbury-Nepean catchments will negatively impact on aquatic biodiversity and wetland ecosystems. Small urban streams will likely become ephemeral, while urban wetlands will dry out or suffer serious water quality problems from weed or algae. Aquatic weed in the Nepean River will require increasing effort and resources to control¹⁴.
- Suitability for cropping production and grazing will be affected by climate change impacts¹⁵ with evidence of these changes already having an impact on agricultural productivity, water availability and the spread of pests, weeds and disease¹⁶
- Australia's major food-producing regions will face increasing water shortages, leading to higher food prices and limited availability. Heatwaves and extreme weather events will reduce crop yields, livestock numbers, and the quality and seasonal availability of food products¹⁷.
- The risk of severe bushfires will increase due to decreased rainfall and higher temperatures. The average annual days of very high or extreme bushfire risk are projected to rise in spring and summer periods by 2070.¹⁸
- Global temperature increases will intensify rare rainfall events, resulting in higher flood levels. By 2071, the 100-year flood level is projected to rise by 1.1 meters at Wallacia and 0.5 meters at Penrith.¹⁹

¹⁰ (The Australia Institute, 2022)

¹¹ (NSW Health, 2022)

¹² (Infrastructure NSW, 2021)

¹³ (Environment Protection Agency, 2022)

¹⁴ (CSIRO, 2007)

¹⁵ (Global Change Insitute, 2014)

¹⁶ (Local Land Services NSW, n.d.)

¹⁷ (Climate Council of Australia, 2015)

¹⁸ (Adapt NSW, n.d.)

¹⁹ (Infrastructure NSW, 2019)

More frequent and severe short-duration rainfall events will lead to increased flooding in Penrith's urban streams and surcharge of sewerage and drainage systems, causing water quality and quantity issues.²⁰

Model projections suggest a 30% increase in the annual frequency of potential severe thunderstorm days in Sydney by the end of the century.²¹ This will place additional demands on emergency services, increase insurance premiums, and result in more frequent power blackouts due to damaged transmission lines.

Projected Weather

Global average annual carbon dioxide levels have been steadily rising and reached 418 parts per million in 2022. This increase in carbon dioxide contributes to the warming of the Earth's surface, oceans, and atmosphere. It hampers the Earth's ability to radiate incoming solar radiation back into space.

Due to the long-lasting nature of carbon dioxide in the atmosphere, future warming and sea level rise are now considered inevitable, leading to irreversible climate change.

These atmospheric changes have already resulted in 2016 being recorded as the warmest year globally since reliable air temperature records began in 1880. Furthermore, the past 15 years rank among the warmest 16 years ever recorded. In Australia, the mean surface air temperature has risen by approximately 1°C since 1910²².

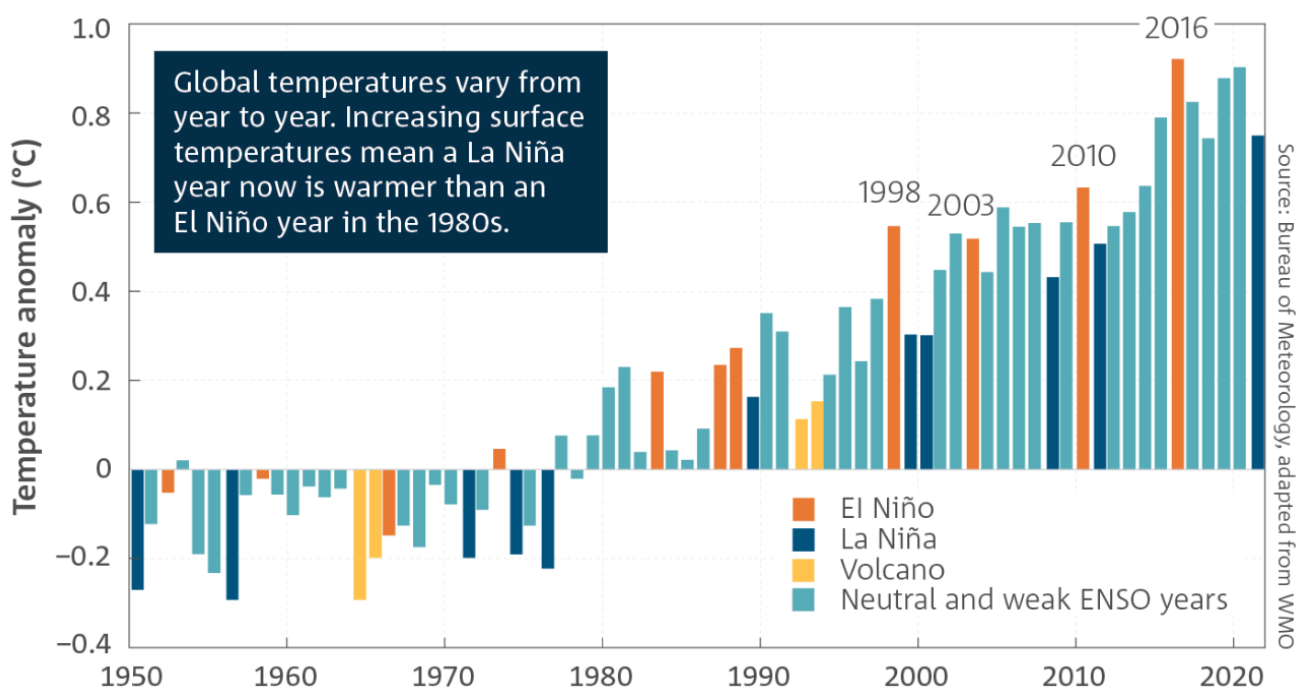


Figure 3 - History of temperature anomaly and ENSO influences²³

²⁰ (World Health Organisation, 2011)

²¹ (Climate Council of Australia, 2016)

²² (CSIRO and Bureau of Meteorology, 2016)

²³ (Bureau of Meteorology and CSIRO, 2022)

Observations and climate modelling consistently indicate an ongoing and long-term climate change that interacts with natural variability. These changes are expected to have significant impacts on the Penrith environment and community, particularly concerning the increased frequency and intensity of heat events, fire weather, and drought.

The climate change projections referenced in this document are derived from the NSW and ACT Regional Climate Modelling (NARClIM 2.0) project. The information presented in this document is based on the NARClIM2.0 projection specifically focused on Metropolitan Sydney.^{24 25}

For future climate change projections NARClIM2.0 delivers two distinct time frames of 2040-2059 and for projections to 2090. These projections are delivered based on low or high emissions scenarios (see Figure 7).

The low emission scenario (**SSP1-2.6**) describes a low-emissions future with a global transition toward sustainable and equitable development. A high-emissions (**SSP3-7.0**) future describes a future of regional conflict and development where countries do not collaborate on tackling climate change, and do not focus on sustainable and equitable development.

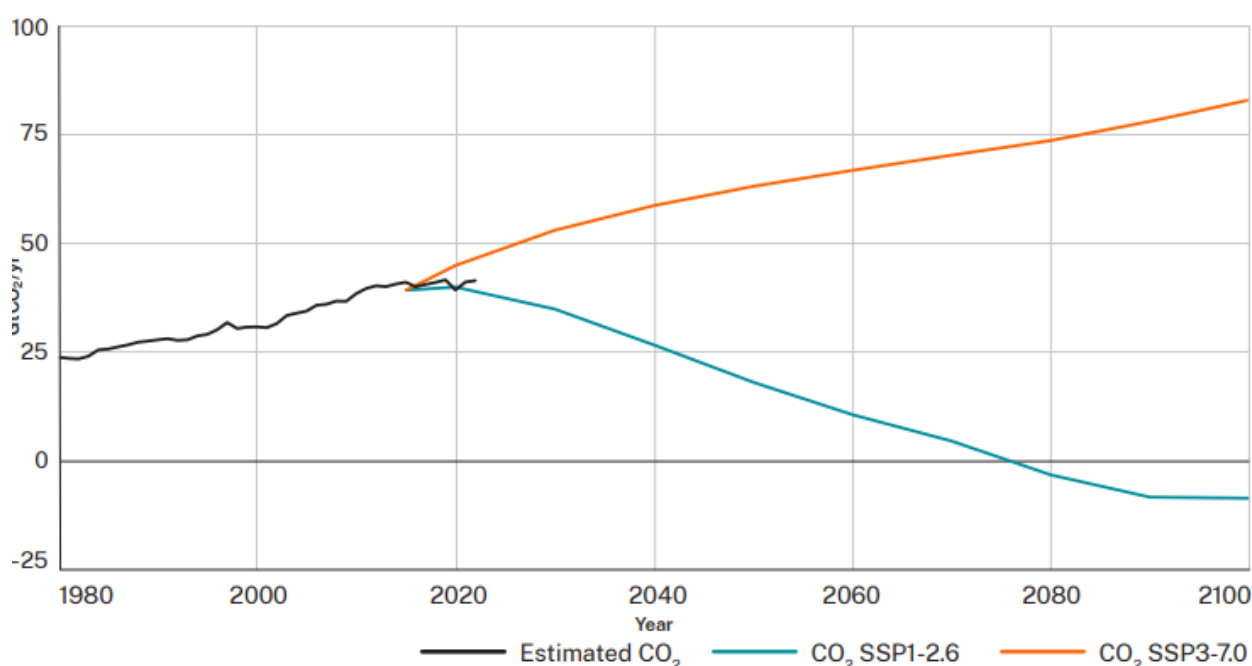


Figure 4 - Human-caused global emissions of carbon dioxide - past and projected ²⁶ (DCCEEW,2024)

Projected Temperature

All climate models across NSW are in agreement that average, minimum, and maximum temperatures will continue to rise both in the near future and the far future. This trend is expected to bring about an increase in the number of hot days and a decrease in the number of cold nights. The rising maximum temperatures have significant implications for human health, leading to heat stress and a higher frequency of heatwave events. Additionally, they are likely to impact the health and distribution patterns of plants and animals.

²⁴ (Office of Environment and Heritage, 2014)

²⁵ (Adapt NSW, n.d.)

²⁶ Department of Climate Change, Energy, the Environment and Water

	2050		2090	
	Low-emissions	High-emissions	Low-emissions	High-emissions
Temperature	1.0°C (0.6–1.7°C)	1.8°C (1.0–2.8°C)	1.2°C (0.5–2.0°C)	3.4°C (2.3–5.0°C)
Maximum temperature	1.1°C (0.6–1.9°C)	1.9°C (1.1–3.1°C)	1.3°C (0.5–2.2°C)	3.5°C (2.4–5.3°C)
Minimum temperature	1.0°C (0.6–1.6°C)	1.7°C (0.9–2.6°C)	1.1°C (0.6–1.8°C)	3.5°C (2.4–5.0°C)

The bold number is the ensemble average for the period. Underneath the average is the ensemble range.

Figure 5 - Projected annual average temperature increase - Metropolitan Sydney²⁷

Across Metropolitan Sydney, average temperatures will continue to increase throughout this century. By 2090, average temperature is projected to rise by around 1.2°C under a low emissions scenario and around 3.4°C under a high emissions scenario.

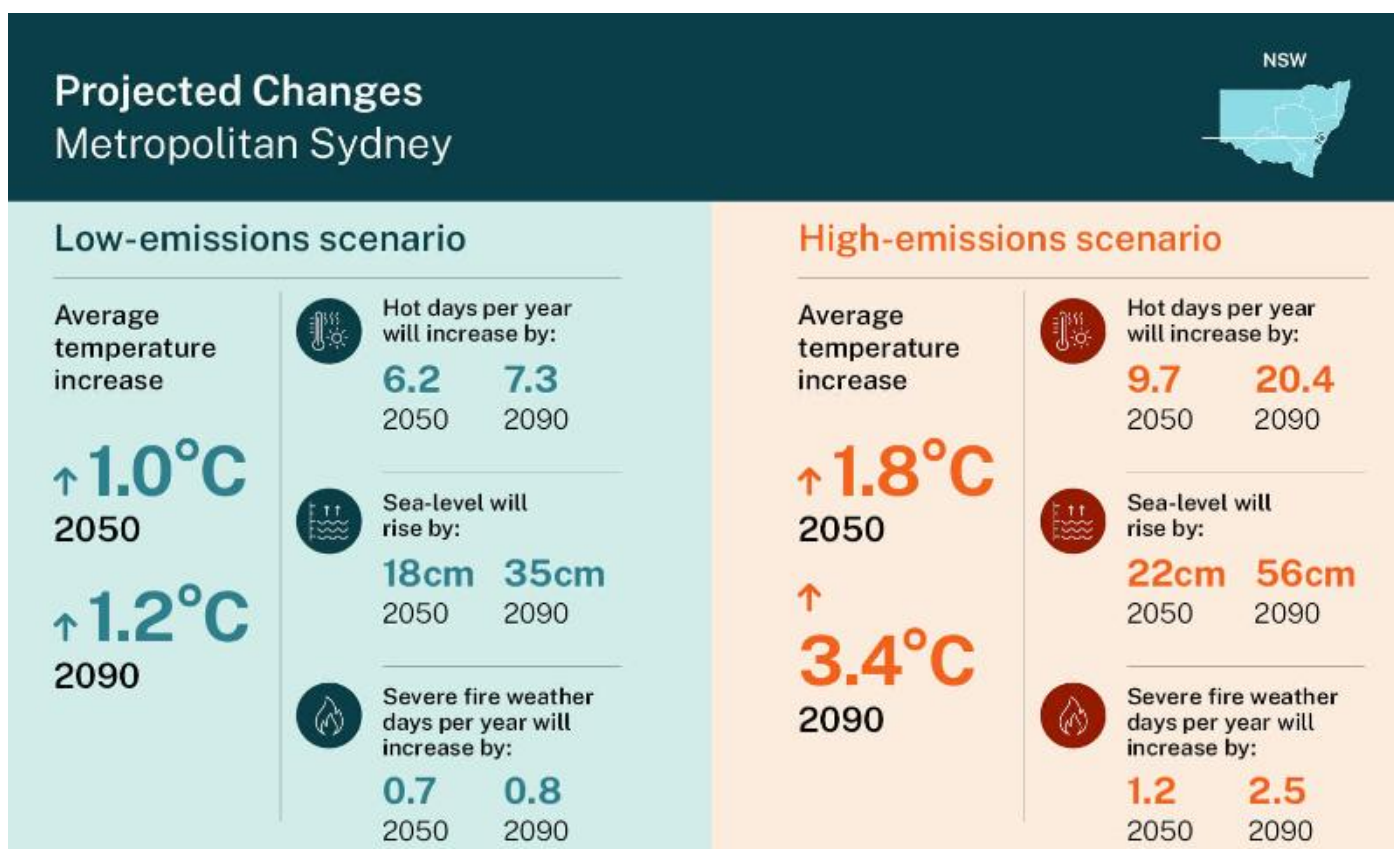


Figure 6 - Projected Changes - Metropolitan Sydney²⁸

²⁷ Department of Climate Change, Energy, the Environment and Water.

²⁸ Department of Climate Change, Energy, the Environment and Water.

Projected Temperature Extremes

The annual number of hot days 35°C and above is projected to increase for Metropolitan Sydney by 2050. By 2090, under a high emissions scenario, the region is projected to experience more than triple the annual number of hot days, compared with the 1990–2009 average.

Increases in hot days are projected to occur across the region, with Greater Western Sydney to experience the greatest increases.

2050		2090	
Low-emissions	High-emissions	Low-emissions	High-emissions
6.2 days (2.6–11.1 days)	9.7 days (3.7–20.4 days)	7.3 days (1.9–16.5 days)	20.4 days (9.5–37.2 days)

The bold number is the ensemble average for the period. Underneath the average is the ensemble range.

Figure 7 - Projected increase in average annual number of hot days - Metropolitan Sydney²⁹

The annual number of cold nights below 2°C is projected to decrease for Metropolitan Sydney by 2050. By 2090, under a high emissions scenario, areas of the Blue Mountains are projected to experience an 80% reduction in the annual number of cold nights, compared with the 1990–2009 average.

2050		2090	
Low-emissions	High-emissions	Low-emissions	High-emissions
7.2 days (4.2 to 10.6 days)	11.3 days (7.0 to 14.0 days)	8.1 days (4.5 to 11.4 days)	17.0 days (13.5 to 19.3 days)

The bold number is the ensemble average for the period. Underneath the average is the ensemble range.

Figure 8 - Projected decrease in average annual number of cold nights - Metropolitan Sydney³⁰

Extensive research supports the notion that prolonged hot days lead to a higher incidence of illness and mortality, particularly among vulnerable members of the community such as the elderly, young children, and those with chronic diseases.

Furthermore, an increase in the number of hot days is closely associated with elevated bushfire risks and water supply shortages. It also has significant implications for the health of ecosystems and biodiversity, as well as the functioning of critical infrastructure.

²⁹ Department of Climate Change, Energy, the Environment and Water.

³⁰ Department of Climate Change, Energy, the Environment and Water.

Projected Rainfall

Annual average rainfall in the region is projected to remain variable throughout this century. On average, winter rainfall is projected to decrease by 20-35% by 2090. Changes in both the quantity and patterns of rainfall can have significant consequences. They may impact the reproductive cycles of native species and affect agricultural and primary production, which rely on winter rains for optimal growth.

	2050		2090	
	Low-emissions	High-emissions	Low-emissions	High-emissions
Annual	-7.2% (-18.5% to +12.6%)	-16.3% (-28.6% to +1.3%)	-9.7% (-22.4% to +5.7%)	-9.2% (-36.9% to +24.6%)
Summer	-9.9% (-21.0% to +4.1%)	-18.8% (-39.8% to +5.0%)	-12.4% (-31.1% to +13.8%)	-2.6% (-42.0% to +33.6%)
Autumn	-0.5% (-22.3% to +16.7%)	-10.1% (-29.4% to +14.2%)	-1.7% (-24.7% to +19.6%)	-1.5% (-19.6% to +41.6%)
Winter	-17.2% (-41.0% to +36.5%)	-33.0% (-51.7% to -2.7%)	-20.3% (-38.9% to -2.1%)	-35.1% (-65.5% to +11.3%)
Spring	-2.8% (-13.4% to +15.4%)	-4.2% (-28.9% to +15.8%)	-6.6% (-24.4% to +12.3%)	-7.4% (-34.8% to +16.4%)

The bold number is the ensemble average for the period. Underneath the average is the ensemble range.

Figure 9- Projected change to average rainfall - Metropolitan Sydney³¹

Projected Fire Weather

On average, the annual number of severe fire weather days is projected to increase for Metropolitan Sydney by 2050. By 2090, under a high emissions scenario, the annual number of severe fire weather days are projected to more than double for the region, with the largest increase in spring. Greater Western Sydney is projected to experience the greatest increases. These factors contribute to a higher probability of experiencing very high fire danger conditions in NSW.

2050		2090	
Low-emissions	High-emissions	Low-emissions	High-emissions
0.7 days (0.1 to 1.8 days)	1.2 days (0.1 to 3.1 days)	0.8 days (-0.7 to 2.5 days)	2.5 days (0.1 to 6.2 days)

The bold number is the ensemble average for the period. Underneath the average is the ensemble range.

Figure 10 - Projected increase in average annual number of severe fire weather days - Metropolitan Sydney³²

³¹ Department of Climate Change, Energy, the Environment and Water.

³² Department of Climate Change, Energy, the Environment and Water.

2.5 Land use

The land use zonings and minimum lot sizes:

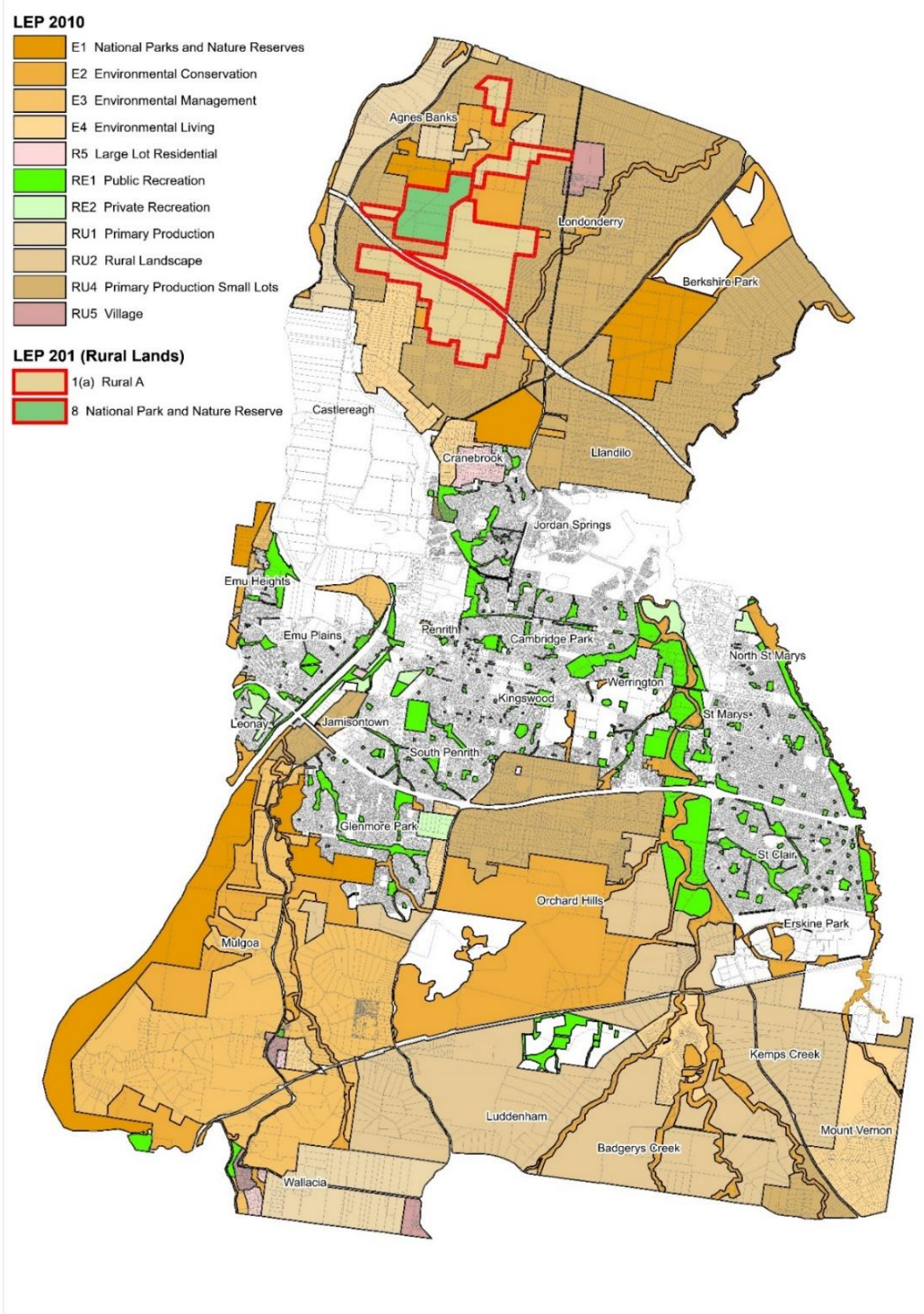
RU1 Primary Production	20 hectares
RU2 Rural Landscape	40 hectares
RU4 Primary Production Small Lots	560 m2 2 hectares 1000 hectares
RU5 Village	1000 hectares 550 m2 2000 m2
R5 Large Lot Residential	4000 m2 2 hectares
E1 National Parks and Nature Reserves	40 hectares 20 hectares
E2 Environmental Conservation	20 hectares 40 hectares 2 hectares
E3 Environmental Management	20 hectares 40 hectares 1 hectare 600 m2
E4 Environmental Living	1 hectare 2 hectares 20 hectares 4000 m2

Figure 11 - Minimum Lot Sizes

Land Use Zone / Type / Classification	Area (sq km)	% of LGA
Business Zones	6.44	2
Industrial Zones	15.76	4
Recreation Zones	24.77	6
Residential Zones	57.58	14
Rural Zones	159.8	40
Environment Protection Zones	116	29
Infrastructure Zones	21.12	5
	403.8	100

Figure 12 - Land Use Zonings

Current Rural and Environmental Zonings



Agricultural Lands

Within the Penrith LGA, there is a diverse range of agricultural activities, including numerous commercial farming and grazing businesses. These encompass commercial vegetable farms, orchards, beef grazing holdings in Berkshire Park, Llandilo, Luddenham, Kemps Creek, and Badgerys Creek. Additionally, there are egg and poultry farms concentrated in Londonderry, Llandilo, Luddenham, and Kemps Creek.

Rural landowners also keep a variety of livestock and companion animals. Furthermore, nursery and cut flower production take place in the rural areas of Penrith, with nurseries located in North Cranebrook, Llandilo, Agnes Banks, Orchard Hills, Kemps Creek, and Mulgoa. Turf farming activities are carried out along the fertile alluvial plains of the Nepean River in Agnes Banks and North Castlereagh.

These agricultural activities on rural lands in the Penrith LGA have potential implications for emergency service agencies, particularly the Department of Primary Industries and Regional Development. They may need to manage the evacuation of animals during bushfires, address flooding or isolation of livestock and farming properties, and respond to outbreaks of significant plant and animal communicable diseases.

Employment land use

Penrith LGA is home to significant industrial centres, including Penrith (Castlereagh Road), St Marys (Dunheved Estate), Emu Plains (Old Bathurst Road), Jamisontown, Luddenham (Sydney Science Park), and Erskine Park.

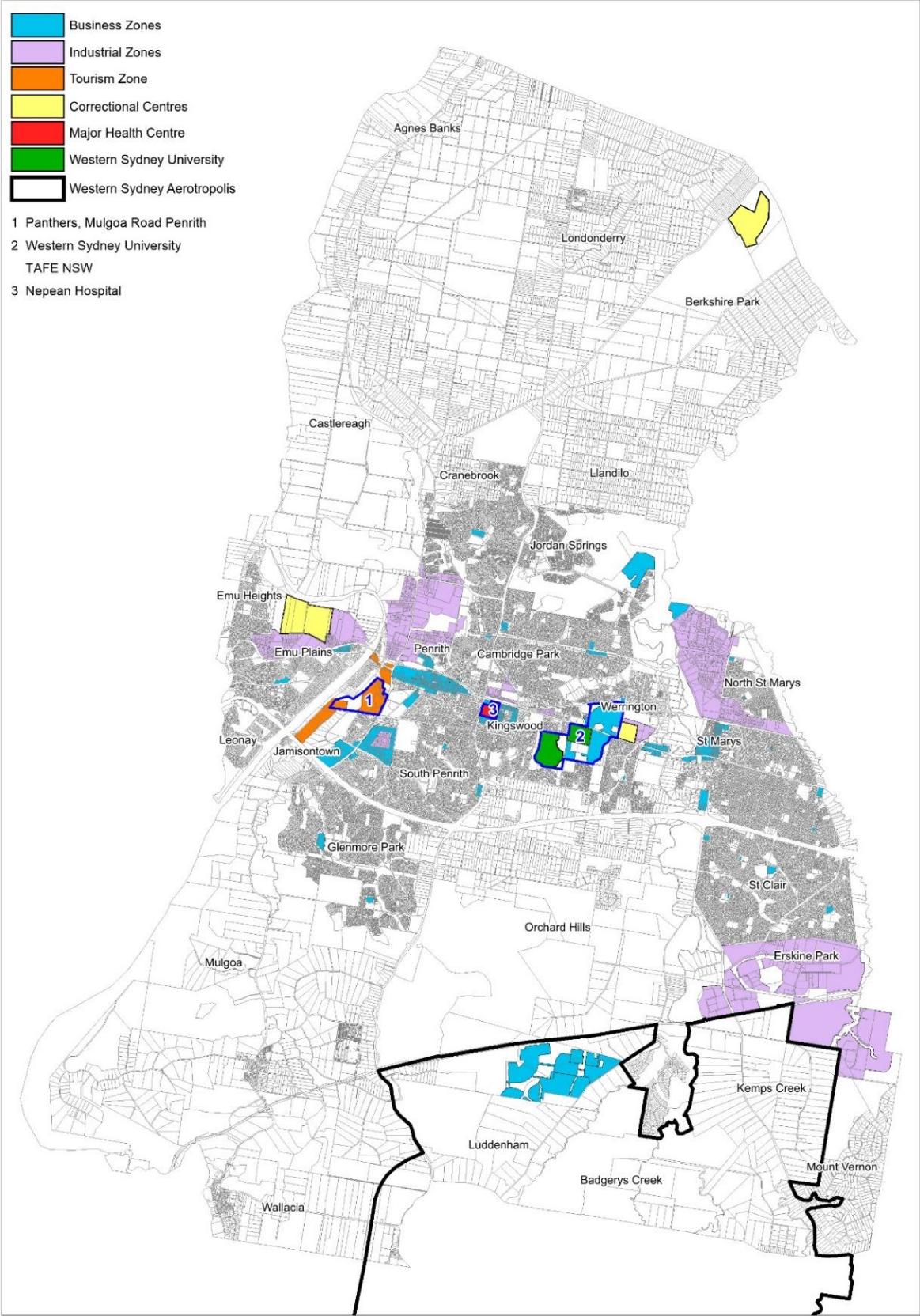
Located in Kingswood, "The Quarter" serves as a crucial hub for health and education in Western Sydney. Spanning over 300 hectares between Penrith and St Marys, it aims to be a globally recognized destination for healthcare, medical research, education, and technology. Employment facilities in "The Quarter" include Western Sydney University, NSW TAFE, Nepean Hospital, and Nepean Private Hospital.

Within the LGA, three correctional centres are situated: Cobham for juveniles in Kingswood, Emu Plains Correctional Centre, and John Moroney in Londonderry.

Figure 11 below illustrates existing and planned employment lands within the Penrith LGA, which encompass various industries such as light industry, agriculture, education, health facilities (including Nepean Hospital), tourism, and correctional centres.

Zoned Employment Lands

Figure 13 - Zoned employment lands



Residential land use

The following map shows the existing residential zones, City Centres and current and future release areas within the Penrith LGA.

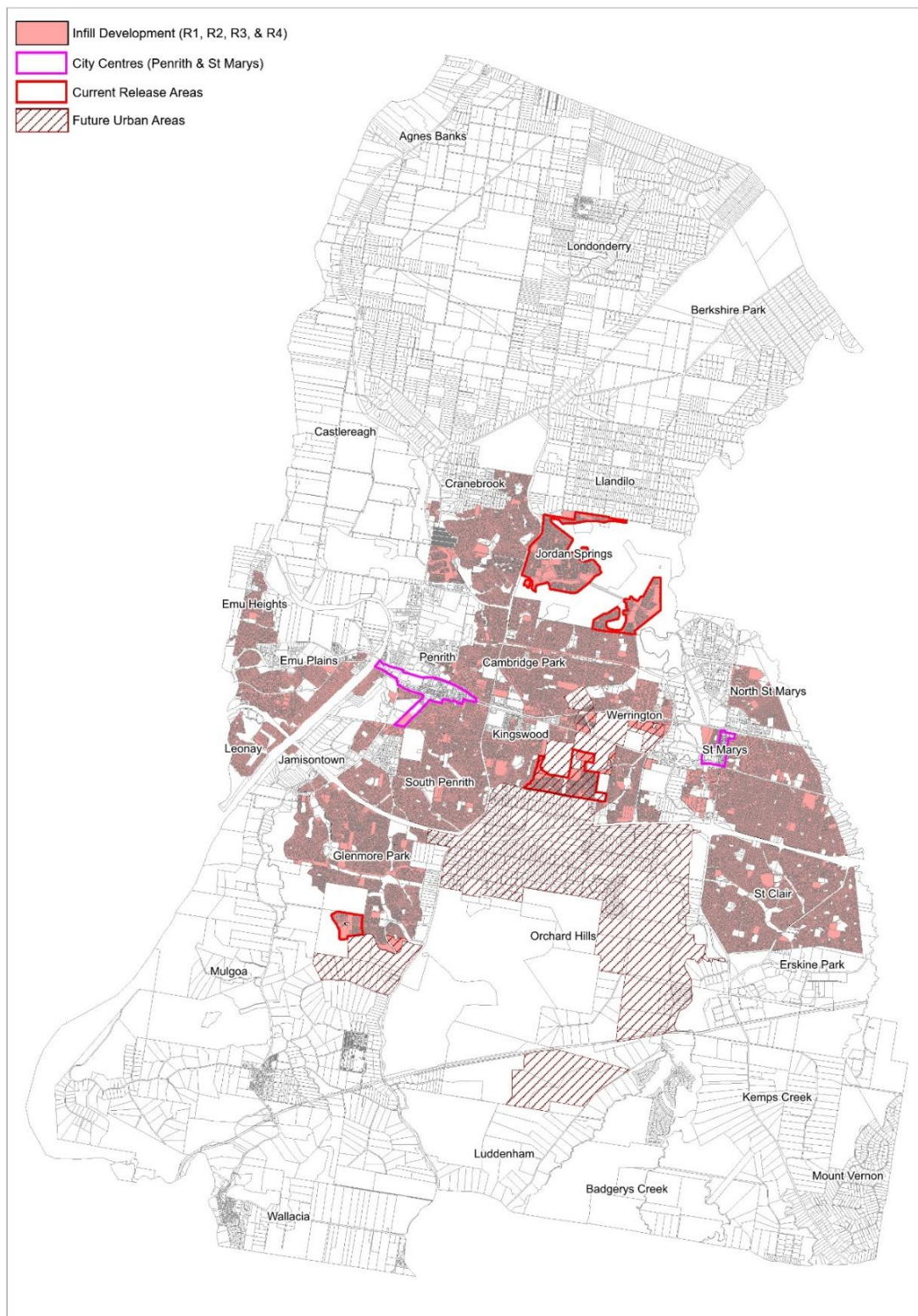


Figure 14 - Residential land

Waterways

The primary waterway in the area is the Nepean River, which sees significant watercraft activity, including motorboats, rowboats, and jet skis, particularly during the summer season. There are also smaller waterways that flow in a northerly direction but are not suitable for navigation. Water NSW is responsible for maintaining the waterway and weir.

The Nepean River weir, located north of the Rowing Club in Penrith, serves the purpose of regulating the natural water flow and improving navigability. However, following the floods in March 2021, the marker buoys of the weirs were washed away. On January 26, 2022, a small boat carrying five people capsized as it was swept over the weir, resulting in one fatality. Four days later, another incident involving four people occurred, fortunately without any loss of life.

Water storage areas

Major freshwater storage reservoir facilities exist at:

- RAAF Base Orchard Hills - The Northern Road, Orchard Hills
- Cranebrook - adjacent to the intersection of Borrowdale Way and The Northern Road
- Kingswood - Glebe Place
- Erskine Park - adjacent to the corner of Swallow Drive and Chameleon Drive

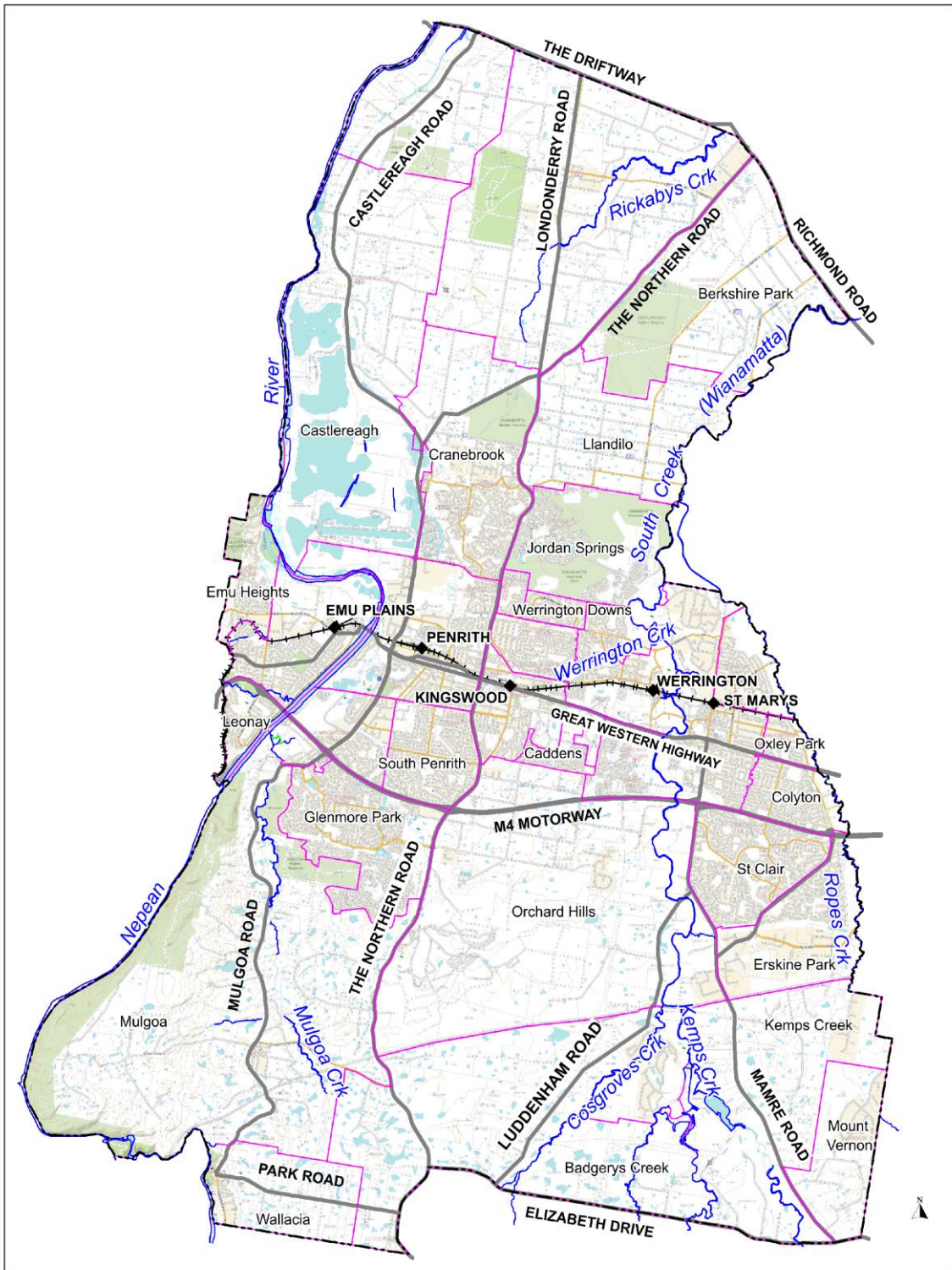


Figure 15 - Map of major transport routes & waterways

2.6 Population and people

Population statistics were obtained from various sources, including Profile id³³ data for the Penrith LGA, the Australian Bureau of Statistics³⁴, and the Department of Planning and Environment³⁵. The Penrith City Community Profile offers a demographic analysis of the city and its suburbs, based on data from the 2021, 2016, 2011, 2006, 2001, 1996, and 1991 Censuses of Population and Housing. The profile is regularly updated with population estimates, and most statistics are current up to 2022.

As of 2022, the total resident population in the Penrith LGA was 220,786 showing an increase from 201,597 in 2016. This represents significant growth between these Census periods, with an average annual growth rate of over 1%. The projected Estimated Resident Population for Penrith City in 2036 is 258,195, with a population density of 6.38 persons per hectare, up from 4.98 persons per hectare in 2016. These figures indicate that Penrith is continuing to experience substantial growth in its resident population.

Historic and projected population change

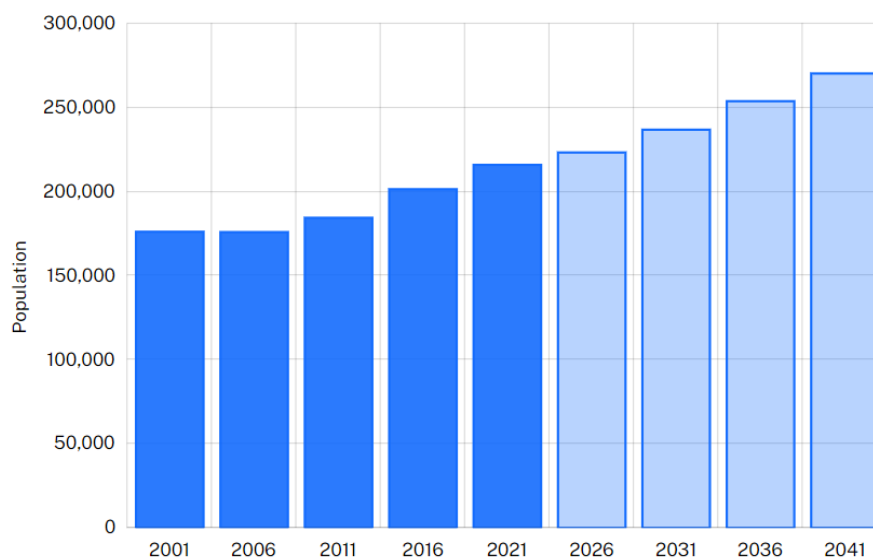


Figure 16 - Historic and projected population change for Penrith LGA 2001-2041 - NSW Department of Planning and Environment

The resident population in the Penrith LGA is projected to increase by over 167,650 people between 2016 and 2041, with an average annual growth rate of 2.5%. This growth is accompanied by an increase of over 64,950 households, resulting in a decrease in the average number of persons per household from 2.87 to 2.70.

Penrith City is expected to have a population of 248,600 by 2026 and reach 369,250 by 2041. This represents an overall population change of 83.1% between 2016 and 2041, as shown in the graph below. While the average annual rate of population increase is expected to be 1.25% over the twenty-year period from 2016 to 2036, higher growth is anticipated in the five-year period from 2016 to 2021, with an average annual rate of 1.72%.

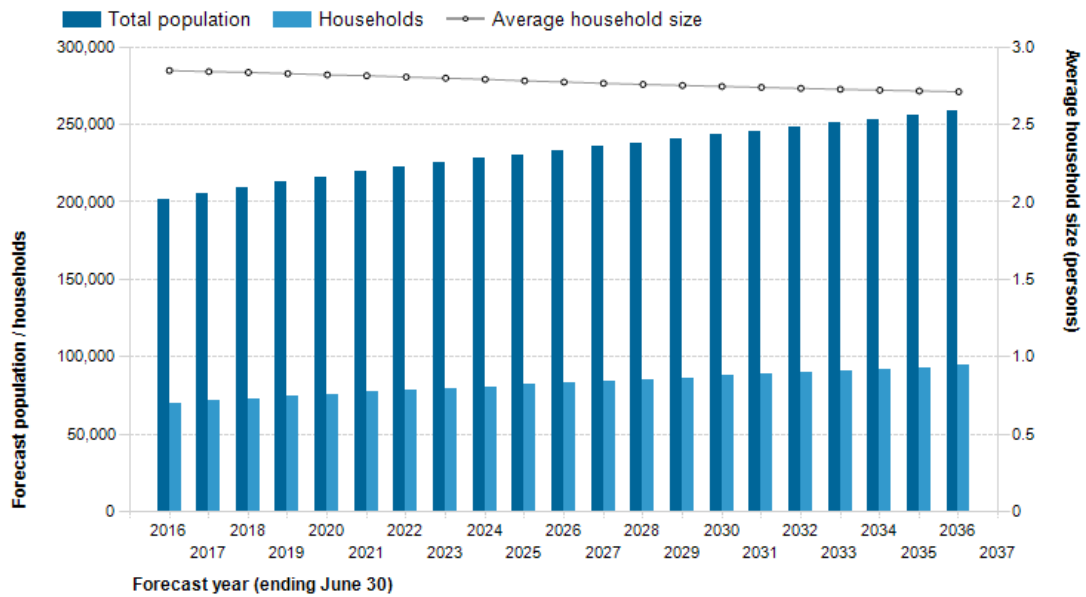
³³ (profile.id, 2021)

³⁴ (Australian Bureau of Statistics, 2021)

³⁵ (Department of Planning and Environment, 2022)

Forecast population, households and average household size

Penrith City



Population and household forecasts, 2016 to 2036, prepared by .id the population experts, December 2017.

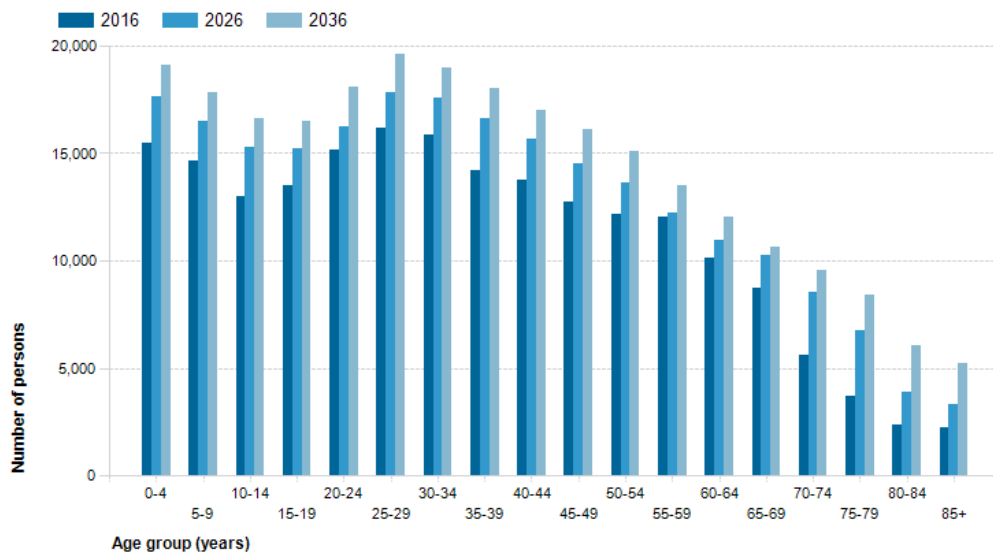


Figure 17 - Forecast population for Penrith LGA

The latest population projections take into account the expected construction of new dwellings in new release areas and some infill development, estimating more than 24,900 additional dwellings by 2036. The highest average annual population increases between 2016 and 2036 are anticipated in the Caddens release area (6.0%), Penrith (3.8%), Werrington (3.5%), and the St Marys release area – Jordan Springs (3.5%).

Forecast age structure - 5 year age groups

Penrith City - Total persons



Population and household forecasts, 2016 to 2036, prepared by .id the population experts, December 2017.



Figure 18 - Population Forecast Age Structure

Household Type

The dominant household type in Penrith is couples with children, accounting for 35.4% of households, while couples without children make up 21.3%. Penrith has a slightly higher proportion of single-parent families at 14.0%, compared to Greater Sydney's 10.5%. Additionally, Penrith City LGA has 20.7% of residents living on their own.

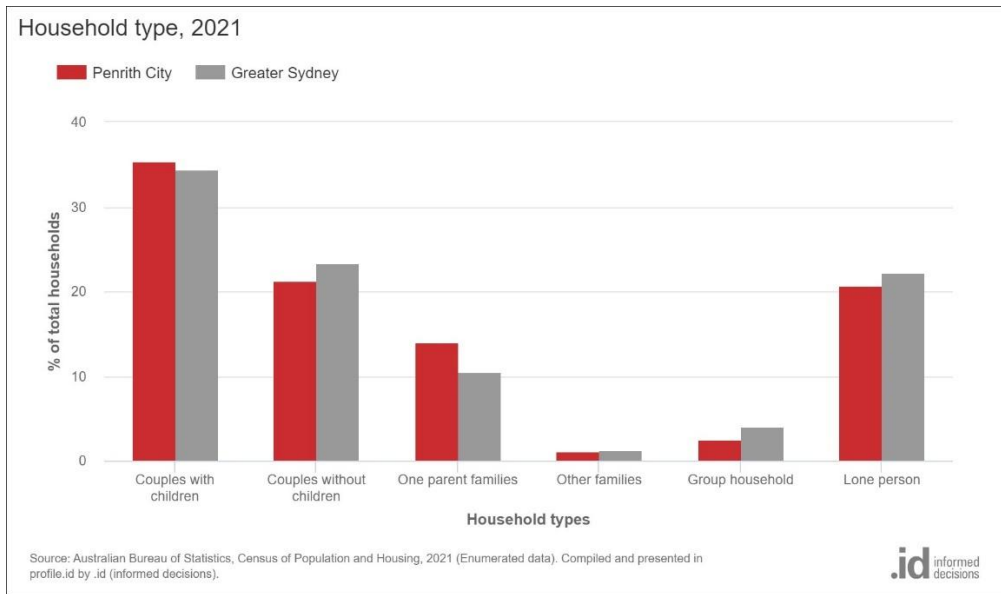


Figure 19 - Population by household type, profile.id

Ethnicity

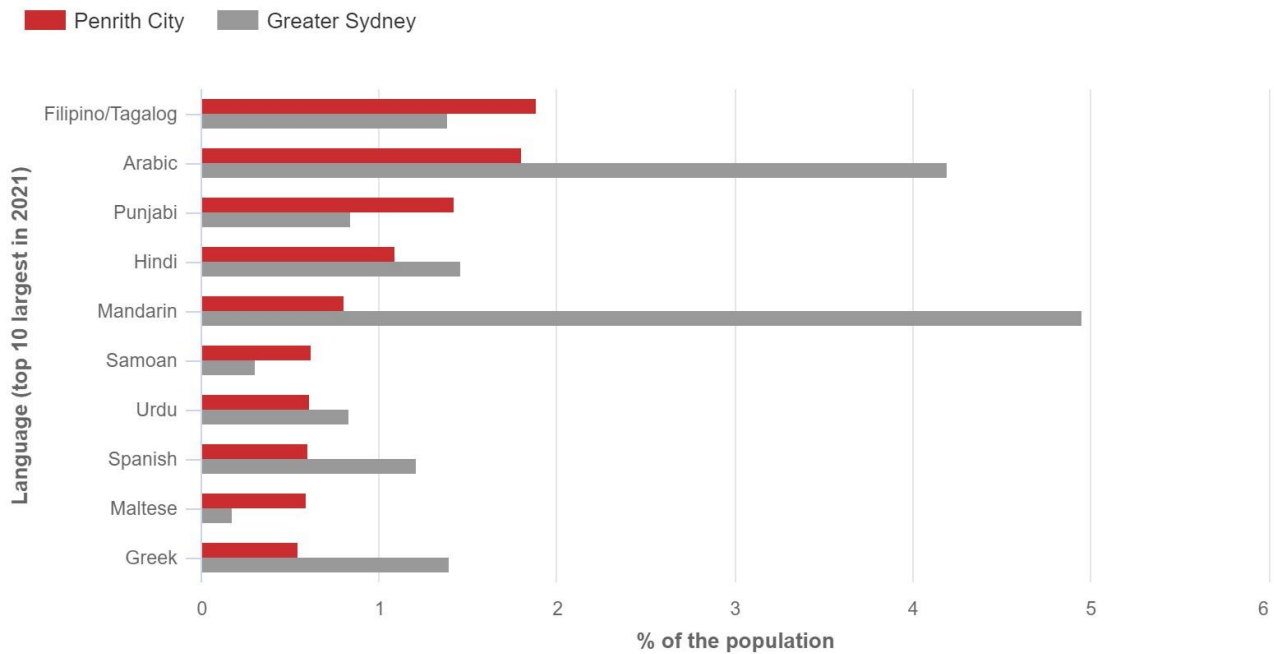
The analysis of the country of birth of the population in Penrith City in 2016, compared to Greater Sydney, reveals a smaller proportion of people born overseas and a smaller proportion of people from a non-English speaking background. In Penrith City, 23.3% of the population was born overseas, and 19.6% were from a non-English speaking background, whereas for Greater Sydney, these figures were 38.6% and 37.4% respectively.

Among the non-English speaking countries of birth in Penrith City, India was the dominant one, with 3.1% of the population or 6,744 people born there. In contrast, there were notable differences between Penrith City and Greater Sydney in terms of the countries of birth. For example, Penrith City had a smaller percentage of people born in China (0.7% compared to 4.6%) and a smaller percentage of people born in Vietnam (0.2% compared to 1.8%).

Between 2016 and 2021, the number of people born overseas in Penrith City increased by 8,466, representing a 20% increase, and the number of people from a non-English speaking background increased by 9,758, a growth of 29.6%.

The largest changes in birthplace countries of the population in this area between 2011 and 2016 were for those born in India (+2,981 persons), Philippines (+1,314 persons), Nepal (+512 persons), United Kingdom (-809 persons).

Language used at home, 2021



Source: Australian Bureau of Statistics, Census of Population and Housing, 2021 (Usual residence data). Compiled and presented in profile.id by .id (informed decisions).

.id informed decisions

Figure 20 - Language used at home - profile.id

The dominant languages spoken at home, other than English, were Filipino/Tagalog (1.9%), Arabic (1.8%), Punjabi (1.4%), Hindi (1.1%).

Aboriginality

The Indigenous population of Penrith increased from 7,742 in 2016 to 10,926 in 2021. Aboriginal or Torres Strait Islanders now account for 5.0% of Penrith's total population, compared to 3.9% in 2016.

When analysing the Aboriginal and Torres Strait Islander service age groups in Penrith City in 2021 and comparing them to the Aboriginal and Torres Strait Islander population in New South Wales, it is evident that there is a similar proportion of individuals in the younger age groups (0 to 17 years) and a lower proportion in the older age group (65+ years).

Overall, in Penrith City, 40.4% of the Aboriginal and Torres Strait Islander population falls within the 0 to 17 age range, while 4.4% are aged 65 years and over. In contrast, the figures for the Aboriginal and Torres Strait Islander population in New South Wales are 39.4% and 6.5%, respectively.

Key differences between the age groups of the Aboriginal and Torres Strait Islander population in Penrith City and the statewide population include a higher percentage of individuals aged 18 to 24 years (14.0% compared to 12.3%), a higher percentage of individuals aged 25 to 34 years (15.9% compared to 13.9%), and a lower percentage of individuals aged 50 to 59 years (7.3% compared to 9.1%).

Penrith

Indigenous

Cohorts	Persons
Non-Indigenous	89.9%
Aboriginal	4.9%
Torres Strait Islander	0.1%
Both Aboriginal and Torres Strait Islander	0.1%
Not stated	5.1%
Total	100%

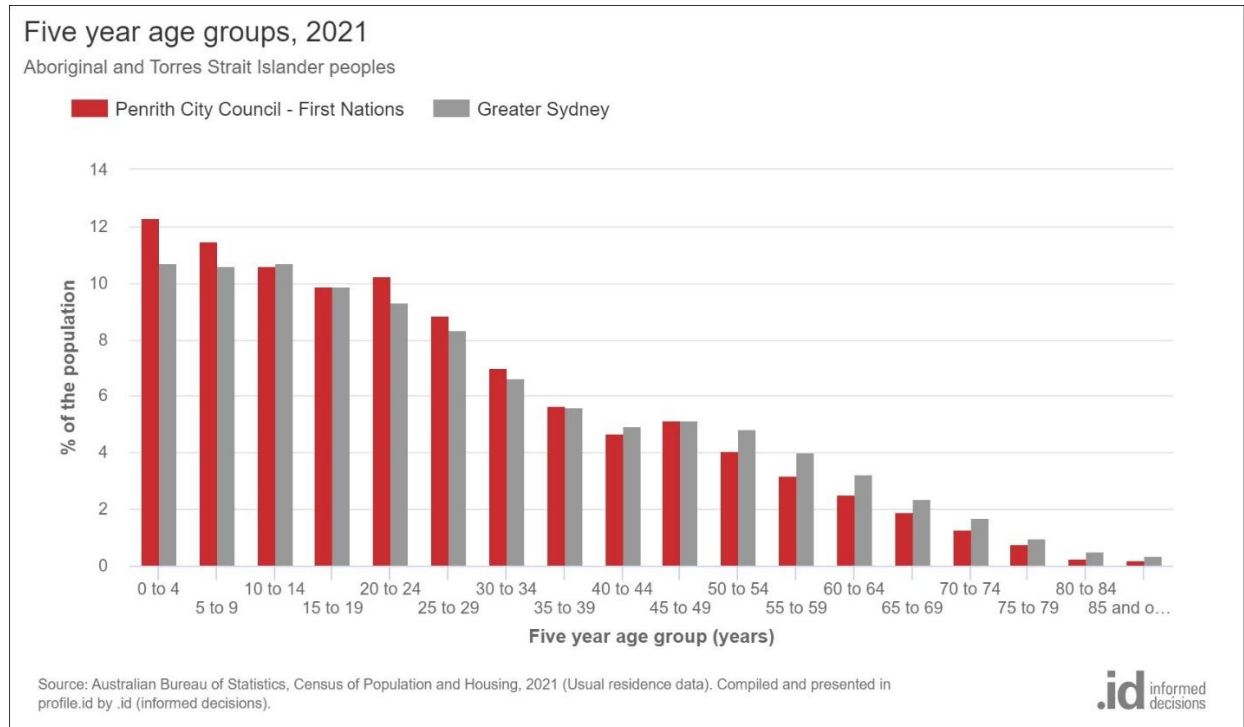


Figure 21 - Indigenous population Penrith and age groups - profile.id

Persons requiring assistance due to disability

The 2021 Census revealed that 12,041 residents of Penrith City, accounting for 5.5% of the population, require assistance in their day-to-day lives due to a disability. This assistance may involve support with self-care, body movements, or communication, resulting from disabilities, long-term health conditions, or old age.

People in need of assistance due to disability			
Penrith City - Usual residence	2021		
Area	No.	Total population	%
Berkshire Park	56	2,154	2.6
Cambridge Park	465	7,053	6.6
Castlereagh - Agnes Banks	88	1,739	5.1
Claremont Meadows	204	5,170	3.9
Colyton	593	8,764	6.8
Cranebrook	863	15,776	5.5
Emu Heights	141	3,205	4.4
Emu Plains	536	8,129	6.6
Erskine Park	285	6,488	4.4
Glenmore Park	1,037	25,028	4.1
Jamisontown	309	5,321	5.8
Jordan Springs	405	11,774	3.4
Kingswood	906	14,127	6.4
Leonay	96	2,582	3.7
Llandilo	105	1,619	6.5
Londonderry	197	4,038	4.9
Luddenham - Wallacia	103	2,537	4.1
Mount Vernon - Kemps Creek - Badgerys Creek	142	1,743	8.1
Mulgoa	76	2,038	3.7
North St Marys	360	4,117	8.7
Orchard Hills	109	1,797	6.1
Oxley Park	207	4,192	4.9
Penrith	1,348	17,970	7.5
Regentville	42	827	5.1
South Penrith	719	12,010	6.0
St Clair	1,052	19,932	5.3
St Marys	833	13,264	6.3
Werrington	295	5,324	5.5
Werrington Downs - Werrington County - Cambridge Gardens	482	8,955	5.4
Penrith City	12,041	217,666	5.5
Greater Sydney	270,665	5,231,146	5.2

Figure 22 - People in need of assistance due to disability

Mental Health

The percentage of population (8.9%) within Penrith City that lives with a mental health condition (including depression or anxiety) is significantly higher compared to Greater Sydney (6.6%). With Mental Health the most reported long-term health conditions across Australia during the Census, it must be further understood, and planned for during emergencies which can exacerbate existing mental health conditions.

People with a mental health condition

Area	No.	Total population	%
Berkshire Park	66	2,154	3.1
Cambridge Park	816	7,053	11.6
Castlereagh - Agnes Banks	101	1,739	5.8
Claremont Meadows	406	5,170	7.9
Colyton	745	8,764	8.5
Cranebrook	1,617	15,776	10.2
Emu Heights	303	3,205	9.5
Emu Plains	809	8,129	10.0
Erskine Park	377	6,488	5.8
Glenmore Park	1,992	25,028	8.0
Jamisontown	601	5,321	11.3
Jordan Springs	802	11,774	6.8
Kingswood	1,475	14,127	10.4
Leonay	171	2,582	6.6
Llandilo	118	1,619	7.3
Londonderry	280	4,038	6.9
Luddenham - Wallacia	169	2,537	6.7
Mount Vernon - Kemps Creek - Badgerys Creek	98	1,743	5.6
Mulgoa	107	2,038	5.3
North St Marys	390	4,117	9.5
Orchard Hills	94	1,797	5.2
Oxley Park	288	4,192	6.9
Penrith	2,507	17,970	14.0
Regentville	80	827	9.7
South Penrith	1,100	12,010	9.2
St Clair	1,393	19,932	7.0
St Marys	1,162	13,264	8.8
Werrington	520	5,324	9.8
Werrington Downs/County - Cambridge Gardens	790	8,955	8.8
Penrith City	19,371	217,666	8.9
Greater Sydney	344,699	5,231,146	6.6

Figure 23 - Persons with mental health conditions

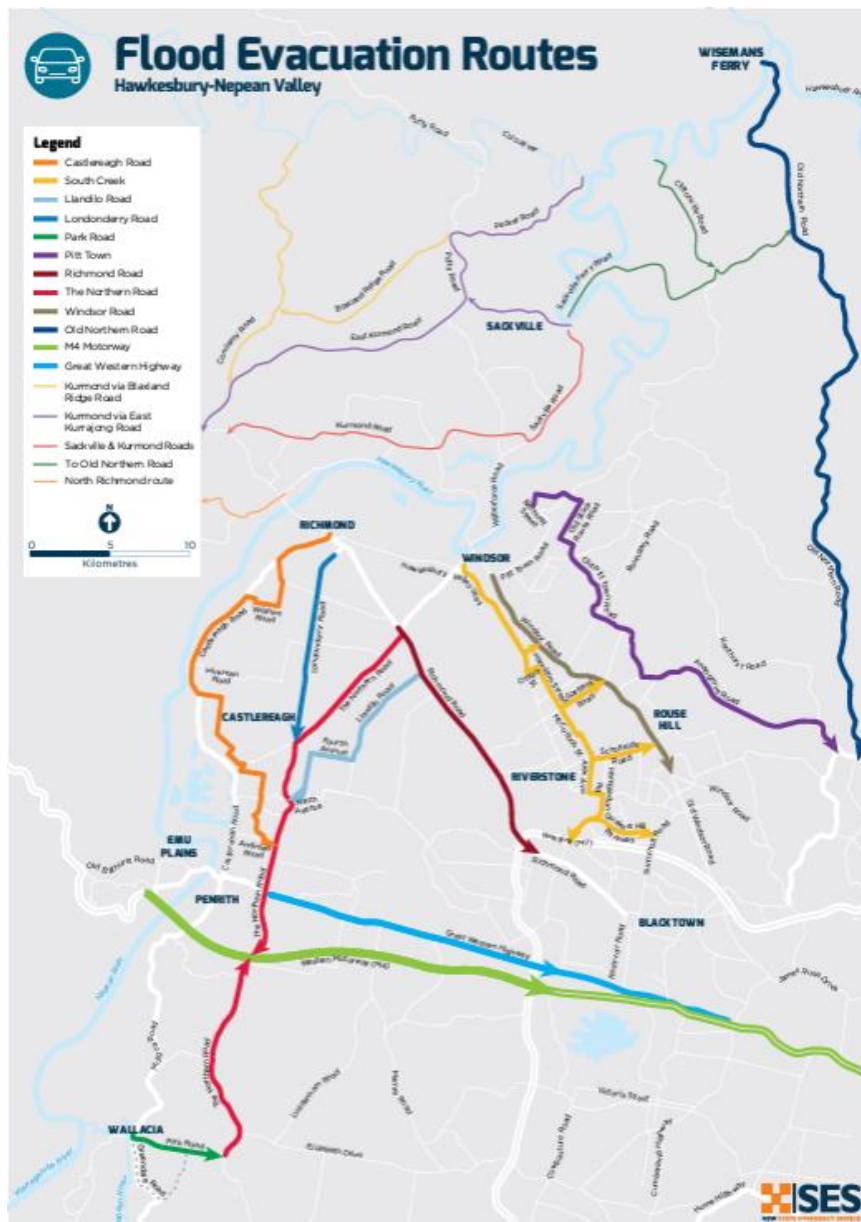
2.7 Transport

Road transport routes

The main road transport routes through the LGA are:

M4 Motorway	Great Western Highway
The Northern Road	Mamre Road
Castlereagh Road	Mulgoa Road
Elizabeth Drive	Dunheved Road

Notably, The Northern Road, Castlereagh Road, Great Western Highway, M4 Motorway and several other sub-arterial roads within the LGA also form part of the flood evacuation routes for the Hawkesbury-Nepean Valley.



Rail transport

The Main Western Rail Line connecting Sydney CBD to the Western Districts and Western NSW. The rail line traverses East-West through the centre of the city, adjacent to residential, commercial and industrial areas. The line is used for the transport of people (particularly during peak hours), hazardous and inert materials.

The consequences of a rail accident can vary depending on various factors, such as the type of material being transported (hazardous or inert), the timing of the incident, and its location relative to nearby residential areas and transportation routes. While incidents affecting both the internal and external rail network are rare, the potential consequences of such accidents can be significant.

The Western Sydney International Airport Metro rail network will intersect with St Marys Railway Station and traverse south through the LGA beyond the new airport.

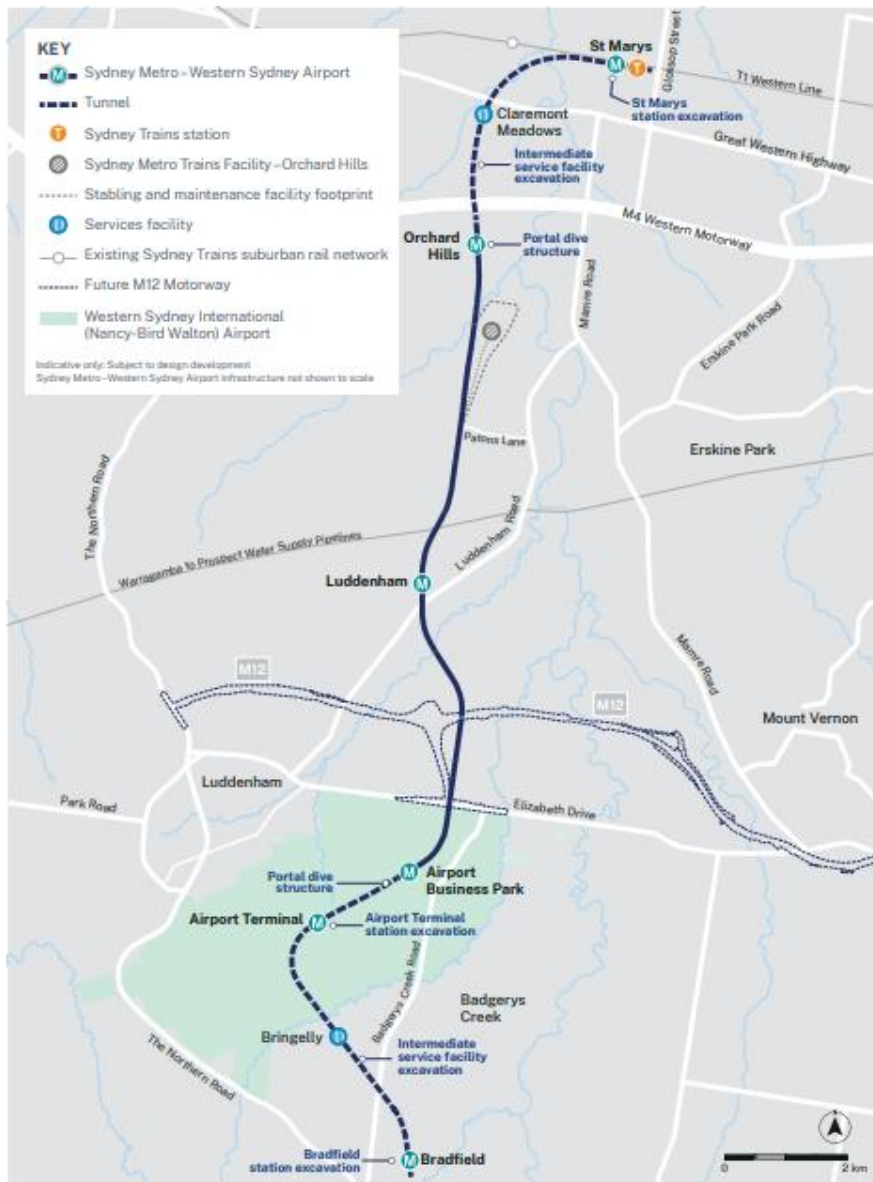


Figure 24 - Sydney Metro - Western Sydney Airport³⁶

³⁶ Sydney Metro – Western Sydney Airport August 2024 update newsletter

Air transport

There are no airports within the Penrith LGA. However, there are several facilities providing aviation capabilities including;

- Nepean Hospital Helipad
- Nepean Hospital Alternate pad at Western Sydney University
- Penrith Lakes Helipad

The Nancy Bird International Airport (Western Sydney Airport) at Badgerys Creek, when opened, will be situated just outside the LGA.

The LGA is intersected by major aircraft routes, including traffic from Richmond air base, Mascot, Bankstown, and to a lesser extent, the smaller airfield at Camden. The future Western Sydney Airport at Badgerys Creek will also have a direct impact on the Penrith LGA. Disruptions to major road transport routes could pose significant regional challenges.

2.8 Economy and Industry

Penrith City is primarily a residential and semi-rural area, with the majority of the population residing in residential areas located along the Great Western Highway and the main western railway.

The city spans a total area of approximately 407 sq km, with approximately 80% classified as rural and/or rural residential. The urban area consists mainly of residential zones, accompanied by some commercial and industrial areas that include extractive industries and manufacturing. The rural areas are predominantly used for agricultural purposes, such as dairy farming, poultry farming, hobby farming, orcharding, market gardening, and horse breeding. The major commercial centres within the LGA are located in Penrith, St Marys, and Erskine Park.

The employment statistics in this section have been extracted from data obtained from .id³⁷.

An analysis of the workforce in Penrith City in 2021/22 identified the three largest employment industries as Health Care and Social Assistance (16.0%), Construction (10.9%), Retail Trade (10.7%). Combined, these three industries accounted for a total of 33,719 people, representing 37.8% of the workforce.

Penrith

Employment

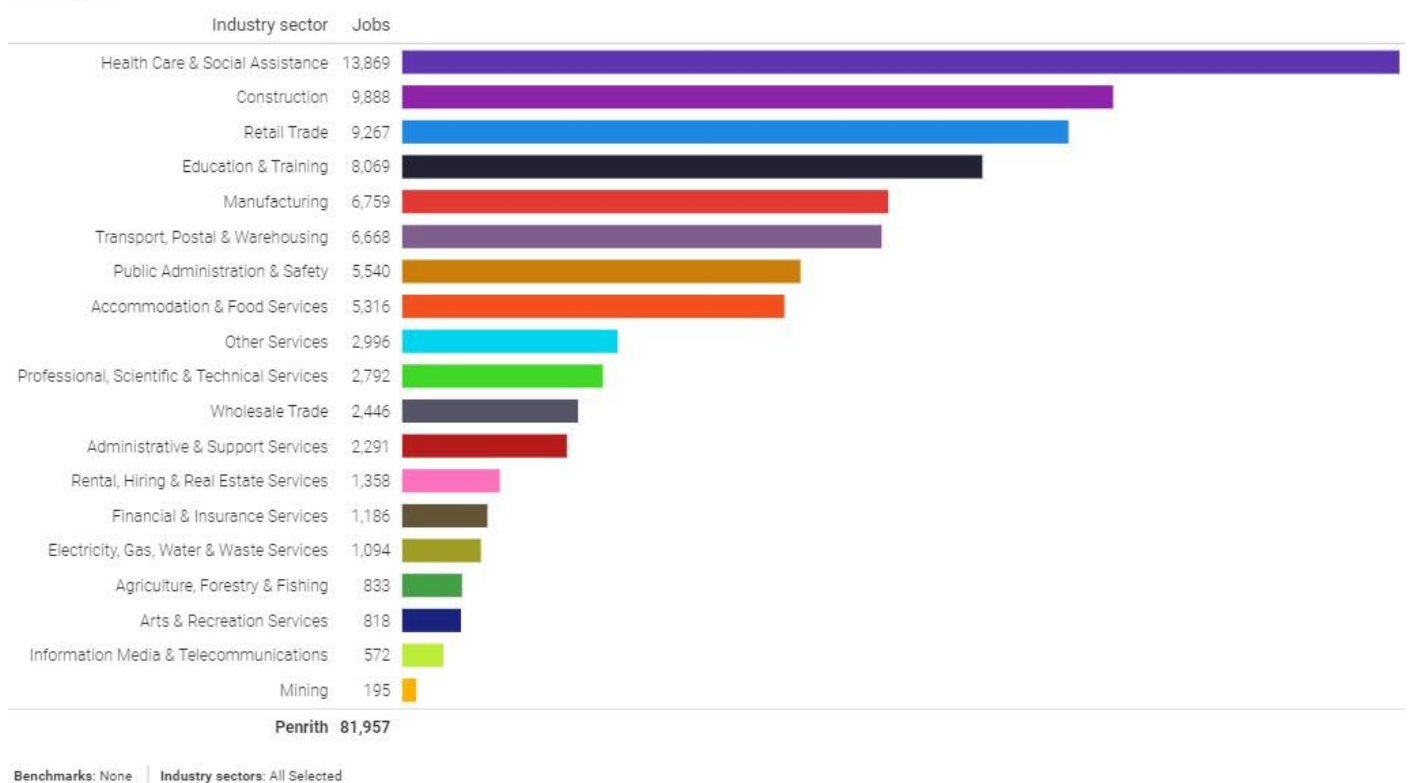


Figure 25 - Penrith Employment by Industry - remplan

³⁷ (profile.id, 2021)

The value of regional exports generated by the Penrith economy is estimated at \$9.050 billion. This represents 3.7% of the \$246.339 billion regional exports generated in New South Wales.

The value of goods and services imported into Penrith local industry sectors is estimated at \$9.782 billion, representing 4.2% of the \$230.4 billion imported into New South Wales.

Emergencies or disasters can have devastating economic impacts, as they can damage dwellings, businesses, and community infrastructure, leading to disruptions in services and employment. These impacts can be both direct and indirect, depending on the nature and severity of the emergency or disaster.

Direct impacts include damage caused by floods, storms, winds, bushfires, or fire to crops, commercial, residential, and public buildings, as well as infrastructure like roads and utilities. Indirect impacts result from disruptions to communication and transportation networks. These indirect impacts can affect tourism, workers, and businesses due to trade losses, disruptions to social and business networks, and interruptions in natural resource and product supply chains.

Historical data indicates that the most likely emergencies or disasters in the Penrith Local Government Area are low-impact and short-term bushfires and flood emergencies (riverine and flash flooding). While these events may have short-term effects, they are unlikely to have a long-term impact on the local Penrith economy.

Employment (total) by industry

Penrith City	2021/22			2016/17			Change
Industry	Number	%	New South Wales%	Number	%	New South Wales%	2016/17 – 2021/22
Agriculture, Forestry and Fishing	854	1.0	2.1	860	1.1	2.2	-7
Mining	212	0.2	1.1	257	0.3	1.1	-45
Manufacturing	8320	9.3	6.2	7912	9.7	7.0	+408
Electricity, Gas, Water and Waste Services	1060	1.2	1.1	1107	1.4	1.0	-48
Construction	9715	10.9	8.9	10725	13.1	9.0	-1010
Wholesale Trade	3290	3.7	3.0	2445	3.0	3.4	+845
Retail Trade	9708	10.9	9.3	9194	11.3	9.6	+514
Accommodation and Food Services	6216	6.9	6.0	5509	6.8	6.9	+707
Transport, Postal and Warehousing	8174	9.1	5.1	5828	7.1	5.2	+2346
Information Media and Telecommunications	663	0.7	2.2	618	0.8	2.4	+45
Financial and Insurance Services	1138	1.3	5.5	1005	1.2	4.8	+133
Rental, Hiring and Real Estate Services	1395	1.6	1.8	1219	1.5	1.7	+177
Professional, Scientific and Technical Services	3387	3.8	10.1	2835	3.5	9.4	+552

Penrith City	2021/22			2016/17			Change
Industry	Number	%	New South Wales%	Number	%	New South Wales%	2016 to 2022
Administrative and Support Services	2340	2.6	3.3	2460	3.0	3.5	-120
Public Administration and Safety	5741	6.5	6.1	5182	6.4	5.7	+658
Education and Training	8214	9.2	8.6	8222	10.1	8.5	-8
Health Care and Social Assistance	14296	16.0	14.2	11852	14.5	13.1	+2444
Arts and Recreation Services	1111	1.2	1.6	1299	1.6	1.7	-188
Other Services	3540	4.0	3.8	3074	3.8	3.7	+466
Total Employed persons aged 15+	89472	100.0	100.0	81604	100.0	100.0	+7869

Figure 26 – Profile .id -Employment by Industry (Total)

Registered businesses by industry

Penrith City - Total registered businesses	2022			2019			Change
Industry	Number	%	New South Wales %	Number	%	New South Wales %	2019 to 2021
Agriculture, Forestry and Fishing	268	1.6	6.3	251	1.8	6.3	+17
Mining	25	0.2	0.2	15	0.1	0.2	+10
Manufacturing	821	5.0	3.3	767	5.4	3.3	+54
Electricity, Gas, Water and Waste Services	85	0.5	0.3	61	0.4	0.3	+24
Construction	4059	24.8	17.3	3600	25.2	17.3	+459
Wholesale Trade	516	3.1	3.5	493	3.5	3.5	+23
Retail Trade	955	5.8	6.0	779	5.5	6.0	+176
Accommodation and Food Services	526	3.2	4.4	437	3.1	4.4	+89
Transport, Postal and Warehousing	1875	11.4	7.4	1901	13.3	7.4	-26
Information Media and Telecommunications	113	0.7	1.2	73	0.5	1.2	-26
Financial and Insurance Services	484	3.0	5.3	434	3.0	5.3	+50
Rental, Hiring and Real Estate Services	1640	10.0	11.2	1491	10.4	11.2	+149
Professional, Scientific and Technical Services	1494	9.1	14.0	1249	8.7	14.0	+245
Administrative and Support Services	877	5.4	4.7	669	4.7	4.7	+208

Penrith City - Total registered businesses	2021			2019			Change
Industry	Number	%	New South Wales %	Number	%	New South Wales %	2014 to 2018
Public Administration and Safety	69	0.4	0.3	54	0.4	0.3	+15
Education and Training	258	1.6	1.7	196	1.4	1.7	+62
Health Care and Social Assistance	919	5.6	6.8	712	5.0	6.8	+207
Arts and Recreation Services	227	1.4	1.5	179	1.3	1.5	+48
Other Services	1164	7.1	4.6	897	6.3	4.6	+267
Industry not classified.	17	0.1	0.4	29	0.2	0.1	-12
Total business	16392	100.0	100.0	14287	100.0	100.0	+2105

Figure 27 – Profile .id economic profile – Businesses by Industry

Local workers key statistics - All industries

Penrith City	2021			2016			Change
Name	Number	%	New South Wales %	Number	%	New South Wales %	2016 to 2021
Local workers							
Total local workers (Census)	78347	100.0	100.0	68597	100.0	100.0	+9750
• Males	39712	50.7	51.5	34850	50.8	52.6	+4862
• Females	38640	49.3	48.5	33747	49.2	47.4	+4893
Age structure							
15 - 24 years	13182	16.8	13.8	11709	17.1	14.0	+1473
25 - 54 years	50057	63.9	65.8	43746	63.8	66.6	6311
55 - 64 years	11877	15.2	15.3	10646	15.5	15.0	+1231
65 years and over	3235	4.1	5.1	2503	3.6	4.3	+732
Top three industries							
Health care and social assistance	15110	19.3	25.9	12893	18.8	23.6	+2217
Retail Trade	8710	11.1	9.0	8034	11.7	9.7	+676
Construction	7828	10.0	8.6	6426	9.4	8.4	+1402

Penrith City	2021			2016			Change
Name	Number	%	New South Wales %	Number	%	New South Wales %	2016 to 2021
<i>Top three occupations</i>							
Professionals	15110	19.3	25.9	12893	18.8	23.6	+2217
Clerical and administrative workers	10840	13.8	13.0	9937	14.5	13.8	+903
Technicians and trades workers	9511	12.1	11.8	8729	12.7	12.7	+782
<i>Hours worked.</i>							
Full time	43042	54.9	58.0	42862	62.5	63.1	+180
Part time	33880	43.2	40.3	24349	35.5	34.9	+9531
Qualifications							
Bachelor or higher degree	31198	27.1	38.4	15769	23.0	32.6	+5429
Advanced diploma or diploma	8378	10.7	11.0	7015	10.2	11.1	+1363
Certificate level	19594	25.0	21.2	17341	25.3	22.2	+2253
No qualifications	27398	35.0	27.0	26521	38.7	31.1	+877
<i>Individual Income</i>							
Less than \$500 (includes negative/nil income)	9432	12.0	11.5	-	-	-	-

\$500 - \$1,749	56588	72.2	64.9	-	-	-	-
\$1,750 or more	11589	14.8	22.7	-	-	-	-
Method of Travel to Work							
Car	44040	56.2	46.4	52479	76.5	61.9	-8433
Public Transport	1722	2.2	4.0	2990	4.4	16.0	-1268
Bicycle	136	0.2	0.4	192	0.3	0.7	-56
Walked only	1098	1.4	2.5	1240	1.8	3.9	-142
Other Characteristics							
Born overseas.	23862	30.5	34.1	18768	27.4	32.8	+5094
Speaks a language other than English at home.	19282	24.6	27.2	14409	21.0	26.4	+4873
Arrived between 2016 and August 2021	2981	3.8	6.2	-	-	-	-

Figure 28 – Profile .id – economic profile – Local Workers Key Statistics

3 Hazards and risk summary

A Local ERM study has been undertaken by a subcommittee of the Penrith Local Emergency Management Committee. This identifies the following hazards as having risk of causing loss of life, property, utilities, services and/or the community's ability to function within its normal capacity. These hazards have been identified as having the potential to create an emergency.

The ERM study aligns to *AS/NZ ISO 31000:2018 – Risk Management – Guidelines* and the *National Emergency Risk Assessment Guidelines Handbook 2020*.

The Penrith Local ERM study should be referenced to identify the complete list of consequences and risk descriptions.

Hazard	Risk description	Likelihood rating	Consequence rating	Risk priority	Combat Agency/ responsible agency
Animal & Agricultural Biosecurity	Events caused by a biosecurity risk or impact, such as animal and plant pests and diseases (terrestrial and aquatic), and invasive species, including insects, other invertebrates, vertebrate pests and weeds. (Biosecurity (Animal and Plant) Sub Plan).	Likely	Moderate	High	Department of Primary Industries and Regional Development
Animal Escape	Dangerous animal escape from zoo, animal care facility or circus that harms or has the potential to cause harm to humans, native or domestic plants and animal populations.	Rare	Minor	Low	LEOCON
Bridge collapse	Failure of a major bridge structure with or without warning owing to structural failure or because of external/ internal events or other hazards/ incidents	Unlikely	Major	High	LEOCON
Building collapse (Major Structural Collapse)	Collapse of building owing to structural failure or impact from external/internal event or other hazards/incidents	Rare	Minor	Low	Fire and Rescue NSW (FRNSW) Urban Search and Rescue (USAR) LEOCON

Hazard	Risk description	Likelihood rating	Consequence rating	Risk priority	Combat Agency/ responsible agency
Communicable disease - Pandemic	Pandemics are epidemics on a global scale. Pandemics can be prolonged, continuing for many months or for over a year. The impact of a pandemic is highly variable but can be very widespread, affecting many areas of daily life.	Unlikely	Major	High	NSW Health
Dam failure (Water NSW Dams)	The uncontrolled release of the contents of a dam through collapse of the dam or some part of it, or the inability of a dam to perform functions such as water supply, prevention of excessive seepage or containment of hazardous substances.	Rare	Catastrophic	High	Dam owners NSW State Emergency Service (SES)
Dam failure (Local)	The uncontrolled release of the contents of a dam through collapse of the dam or some part of it, or the inability of a dam to perform functions such as water supply, prevention of excessive seepage or containment of hazardous substances.	Rare	Moderate	Medium	Dam owners NSW State Emergency Service (SES)
Earthquake	Earthquake of significant strength that results in localised or widespread damage	Rare	Catastrophic	High	LEOCON
Fire (bush or grass)	Unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires both with and without a suppression objective.	Almost Certain	Major	Extreme	NSW Rural Fire Service (RFS) Fire and Rescue NSW (FRNSW)
Fire (Industrial)	Serious industrial fire in office complexes and/or warehouses within industrial estates.	Rare	Minor	Low	FRNSW NSW RFS

Hazard	Risk description	Likelihood rating	Consequence rating	Risk priority	Combat Agency/ responsible agency
Fire (Major Urban Fire)	Fire involving a structure of any type including a unit block, commercial or industrial complex, major infrastructure or critical facility such as a nursing home, hospital etc.	Likely	Minor	Low	FRNSW NSW RFS
Flood (flash)	Flooding which is sudden and often unexpected because it is caused by sudden local or nearby heavy rainfall and typically occurs in small catchments. Technically, flash flooding means any flooding of short duration with a relatively high peak discharge in which the time interval between the observable causative event and the flood is less than six hours. (State Flood Plan)	Likely	Moderate	High	NSW SES
Flood (riverine)	River flows exceed the capacity of normal river systems resulting in flood waters escaping and inundating river plains	Likely	Moderate	High	NSW SES
HAZMAT	An incident involving anything that, when produced, stored, moved, used or otherwise dealt with without adequate safeguards to prevent it from escaping, may cause injury or death or damage to property. (Fire and Rescue NSW Act 1989)	Rare	Major	Medium	FRNSW
Heatwave Emergency	A sequence of abnormally hot conditions having the potential to affect a community adversely	Likely	Major	Extreme	NSW Ambulance Service
Landslip	Landslide is a general term given to movement of material downslope in a mass. Rockfall is defined as the free-falling or precipitous movement of a newly detached segment of bedrock of any size from a cliff or other very steep slope.	Rare	Minor	Low	LEOCON

Hazard	Risk description	Likelihood rating	Consequence rating	Risk priority	Combat Agency/ responsible agency
Storm	Severe storm with accompanying lightning, hail, wind and/or rain that causes severe damage and/or localised flooding (includes tornado).	Almost Certain	Moderate	High	NSW SES
Transport Accident (Involving animals)	Transport accidents involving animal carriers, usually livestock, managed under NSW emergency management and rescue arrangements and in accordance with animal welfare legislation. (Management of Animal Transport Accident Responses Policy)	Rare	Moderate	Low	LEOCON, NSW DPIRD / LLS
Transport emergency (road)	A major vehicle accident that disrupts one or more major transport routes that can result in risk to people trapped in traffic jams, restrict supply routes and/or protracted loss of access to or from the area	Rare	Minor	Low	LEOCON
Transport emergency (rail)	A major incident that disrupts one or more major rail line that can result in risk to people trapped in traffic jams, restrict supply routes and/or protracted loss of access to or from the area.	Rare	Major	High	LEOCON
Utilities failure	Major failure of essential utility for unreasonable periods of time as a result of a natural or man-made occurrence	Unlikely	Minor	Low	LEOCON

4 Local Plans and Arrangements

Responsibility for the preparation and maintenance of local plans rests with the relevant lead agency (e.g. Combat Agency).

Local plans are developed in consultation with the Penrith LEMC and the community.

The plans listed below are supplementary to this EMPLAN. The plans have been endorsed by the LEMC and are determined as compliant and complementary to the arrangements listed in this EMPLAN.

These plans are retained by the LEMO on behalf of the LEMC and public release versions may be made available on the council website.

Plan/policy	Purpose	Responsible agency
Penrith Local Recovery Plan	To outline the arrangements for recovery within Penrith LGA.	Penrith LEMC, NSW Reconstruction Authority
Penrith Local Flood Emergency Sub Plan	To set out the multi-agency arrangements for the emergency management of flooding in the Penrith LGA.	NSW State Emergency Service
Cumberland District Bushfire Risk Management Plan	Provides information on the bush fire risks within the Penrith LGA and outlines how land managers and fire authorities effectively manage risks.	Cumberland District Bushfire Risk Management Committee

Informal volunteer management

The LEMC recognises that informal volunteers may be a source of local knowledge, skills and surge capacity to meet the immediate demands of an emergency and facilitate recovery.

The LEMC has considered the community and risk profile of the local area and identified opportunities where informal volunteers may be engaged.

Opportunity	Purpose	Existing groups to liaise with
Catering	For responders	NSW Rural Fire Service NSW State Emergency Service
Debris Removal and clean up	For public spaces and private residences on request	NSW SES, NSW RFS, Disaster Relief Australia, Penrith City Council
Sandbags	Provision of sandbags to community	Rapid Response Team, Penrith City Council, NSW SES

Opportunity	Purpose	Existing groups to liaise with
Coordination of unaffiliated volunteers	To provide effective coordination of spontaneous volunteers	Disaster Relief Australia, Combat Agency, Supporting Agencies.
Recovery Centres	Provide Recovery assistance to community	ESFAC, Penrith City Council, NSW Reconstruction Authority
Staging Areas	For responders	Combat Agency, NSW RFS & SES, Disaster Relief Australia.

Engagement and communication plan

During an emergency, the LEMC and Combat Agency/Agencies will advise the community on what's needed, what's not needed and what's safe.

Communication channel	Audience	Expectations/messages
Local radio & ABC radio	Local community	Cooperation, equipment considerations
Social media	Affected community, indirectly affected community, informal volunteers from inside and outside the local area.	Coordination, cooperation, warning messages, evacuation warnings and orders, emergency updates, requests for informal volunteers.
Recovery on Wheels Network	Hawkesbury and Nepean recovery network	Coordination of local resources
Council Emergency Dashboard	Residents and visitors of Penrith LGA	Convey combat agency messaging, important local updates, council initiatives