



# 9.0

## Appendix - Site Analysis Maps

This section identifies existing conditions, patterns and qualities of GPEC by mapping at various scales observations, planning parameters and existing conditions. The analysis operates on a number of levels from physical environment to the activities taking place in them.



## 9.1 Landform and Topography

The study area is bounded by the Nepean River to the west and Eastern Creek to east, with Wianamatta-South Creek and Ropes Creeks running in a north-south direction through the study area. The landform of GPEC is characterised by flood plains, rolling hills and generally north-south ridges.

Subsidiary creeks branch from the four major riparian bodies. As a result, extensive flood plains span across GPEC.

Major ridgelines predominantly run north-south, providing peaks between the four riparian bodies. This includes between Cranebrook and Orchard Hills, St Marys to Erskine Park and Mount Druitt to Eastern Creek.

The steeper and more pronounced hills and ridgelines of Orchard Hills, Kingswood, St Marys and south Glenmore Park afford views and legibility to the landscape, extending to the Blue Mountains. The views, legibility and cooling breezes lend those areas to use as key destinations and movement corridors.

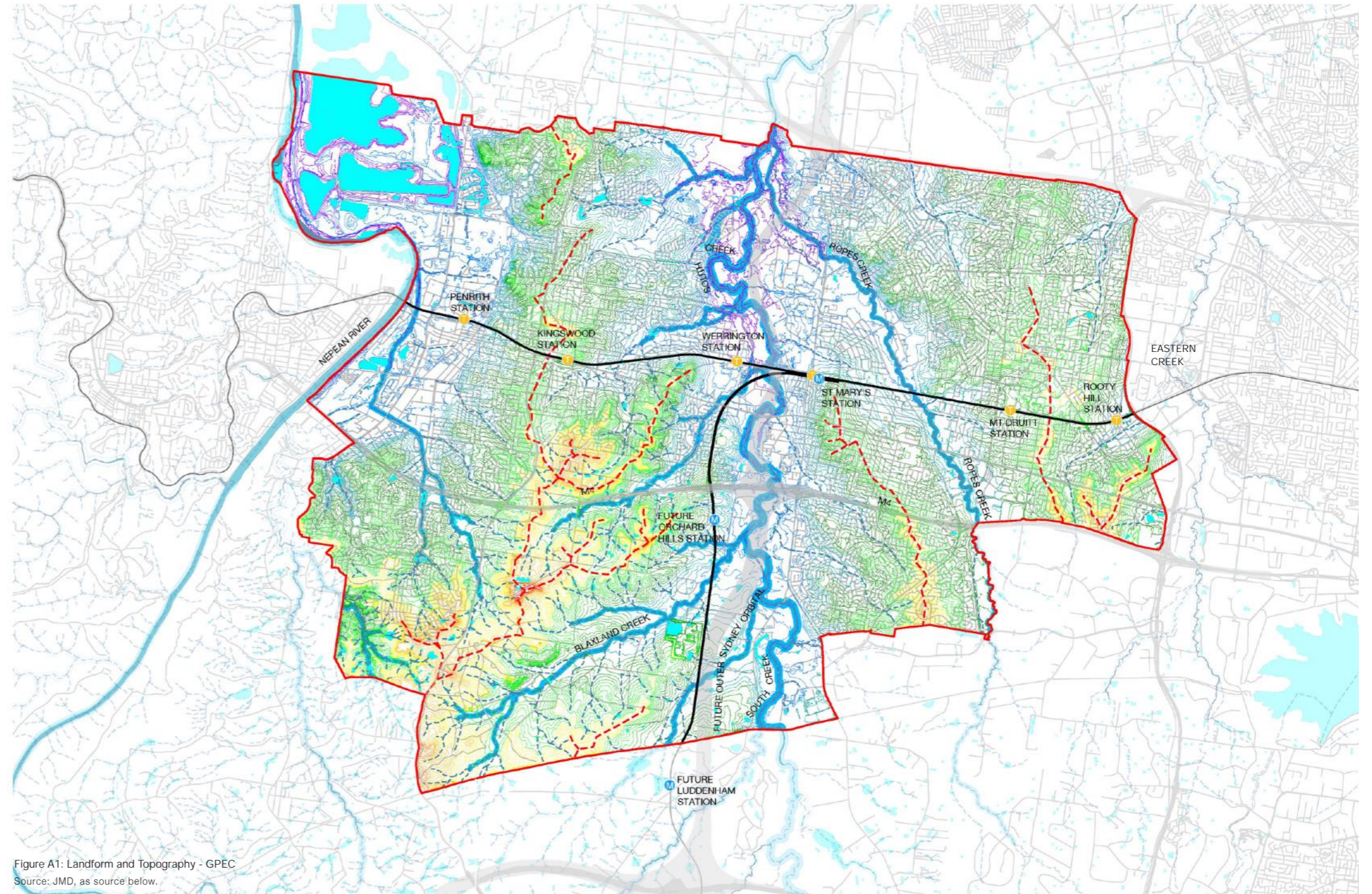


Figure A1: Landform and Topography - GPEC  
Source: JMD, as source below.

### Legend

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- ● EXISTING TRAIN LINE
- ● PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES
- - - 2M CONTOURS\* HIGH
- - - LOW
- MAJOR WATERCOURSE\*\*
- - - INDICATIVE RIDGE LINE

SOURCE \*NSW SPATIAL COLLABORATION PORTAL, MARCH 2021 PENRITH CONTOURS AHD 2m  
\*\*NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT ENERGY AND SCIENCE, MARCH 2021.BLUE DATASET\_WIANAMATTADeliverySTRATEGY\_29082020



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



## 9.2 View and Vistas

Most long range, regional views within GPEC are west towards significant landscape features of the Blue Mountains, north towards the Hills district and south toward the rolling hills of the Aerotropolis and Orchard Hills. These views are largely from ridgelines and high points accessible within the Western Sydney University campuses, ridge tops and road crests within Orchard Hills and higher areas of St Marys.

District views between the Werrington and St Marys precincts are present due to the low-lying Wianamatta-South Creek and Ropes Creek corridor.

Many district or regional views are often taken from the vehicle's perspective with a sense of transition between flatter Penrith and the hillier Blue Mountains to be gained along the Great Northern Road, through Glenmore Park as well as the Great Western Highway.

There are few district views in the GPEC area that locate significant built form from a distance. Local view opportunities to see heritage built form, or newer, taller buildings exist along main streets within town centres.

Within each town centre there are local views to open space along existing high streets. With the exception of elevated areas or localised topographical high points, such as train station pedestrian overpasses, or at Nepean Hospital which lies upon a crest, there are not many locations to gain district views.

The figure adjacent classifies the existing views as 'views to be maintained' to establish their importance as part of the identity and character of GPEC. These view corridors could be considered in later parts of this report to be retained or maintained as part of urban, landscape or transport directions that may make up the Structure Plan for GPEC.

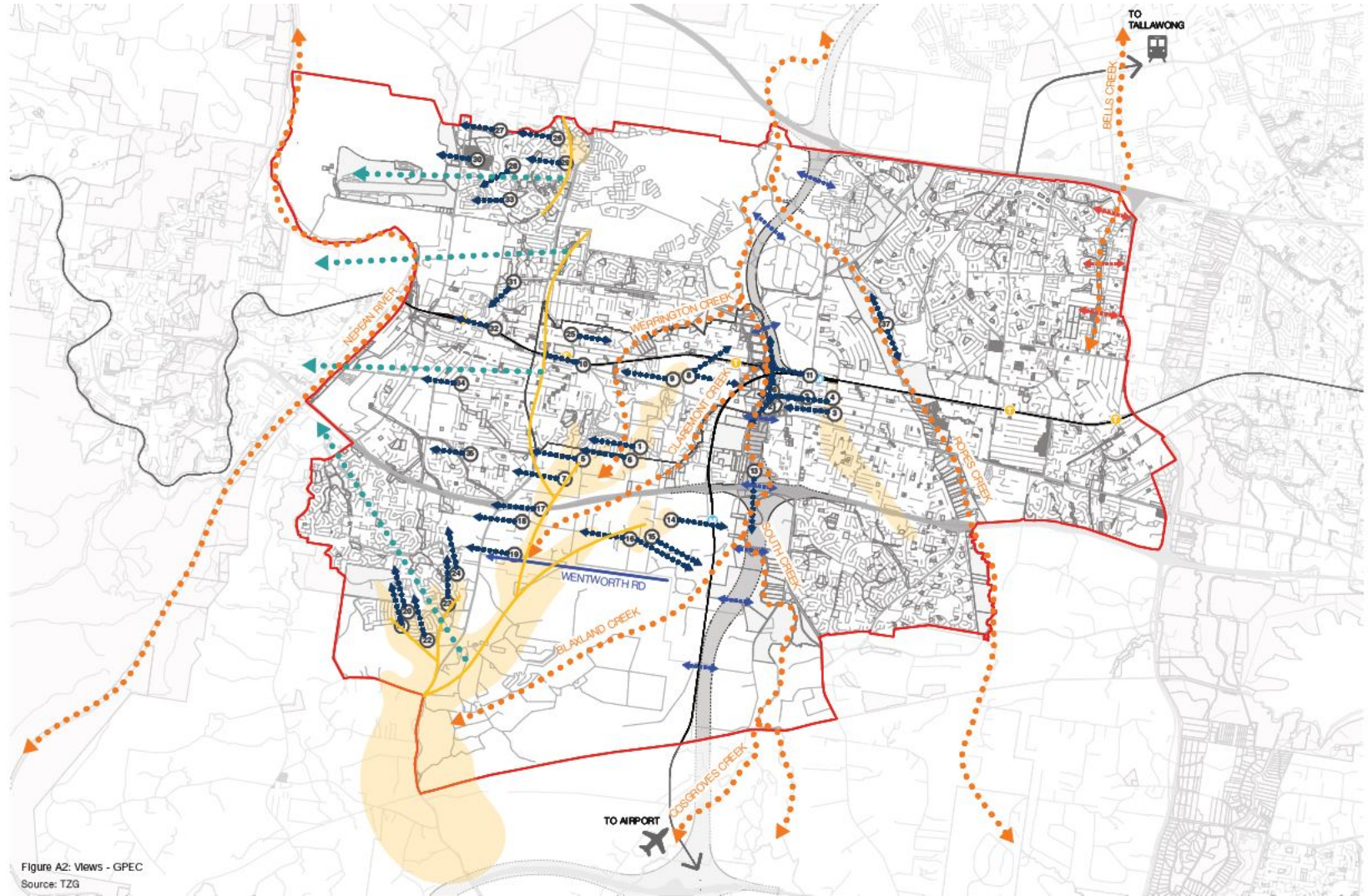
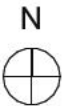


Figure A2: Views - GPEC  
Source: TZG

**Legend:**

- PRIMARY VIEW CORRIDORS ALIGNED WITH CREEK OR RIVER TO BE MAINTAINED
- PRIMARY VIEWS FROM RIDGELINE TOWARDS BLUE MOUNTAINS TO BE MAINTAINED
- VIEW CORRIDOR THROUGH WENTWORTH RD TO BE MAINTAINED
- VIEWS ACROSS OUTER SYDNEY ORBITAL TO BE MAINTAINED
- VIEWS ACROSS BELLS CREEK AND MITTIGAR RESERVE TO BE MAINTAINED

- INDICATIVE EXISTING HIGH TERRAIN
- INDICATIVE RIDGE LINE
- DIRECTION OF VIEW/ VISTA
- VIEWS IMAGE



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



View and Vistas / Key Areas

Legend:

Typical view corridors towards the Blue Mountains

- 10 A44 Great Western Highway towards Kingswood/16 Carinya Avenue, St Marys
- 23 Intersection Glengary Dr & Cooee Ave, Glenmore Park
- 30 Mountain View Reserve Lookout, Cranebrook
- 32 The Crescent, Penrith

Typical view corridors aligned with existing creeks

- 36 Intersection of The Kingsway, Werrington and Wianamatta-South Creek
- 37 Intersection of Debinat Ave, North St Marys and Ropes Creek

Examples of potential key views or similar - Orchard Hills

- 14 120 Lansdowne Street - Orchard Hills
- 15 1 Homestead Road - Orchard Hills
- 16 16 Homestead Road - Orchard Hills
- 18 123 Homestead Road - Orchard Hills

Examples of potential key views or similar - St Marys

- 2 Nariel Street - St Marys
- 38 Phillip Street - St Marys
- 3 6 Stapleton Parade near Bennett Park - St Marys
- 4 31 Lethbridge St near Astley Park - St Marys
- 11 Saint Marys station pedestrian overpass
- 39 Great Western Highway - St Marys

(Refer to Figure A2 for mapped locations by number)



Images sources: TZG, Google Maps



### 9.3 Riparian Corridors

GPEC is comprised of three major waterway systems - Nepean River, Wianamatta South Creek and Ropes Creek. A fourth waterway - Eastern Creek - lies to the east of GPEC. Riparian corridors, waterways and water dependent ecosystems with high ecological value extend from the major waterways. Vegetated Riparian Zones within the study areas are classified as areas required to be protected or areas to be improved. These waterway areas to be protected align largely with the landscaped biodiversity-protected areas of Wianamatta Regional Park and the Australian Defence site.

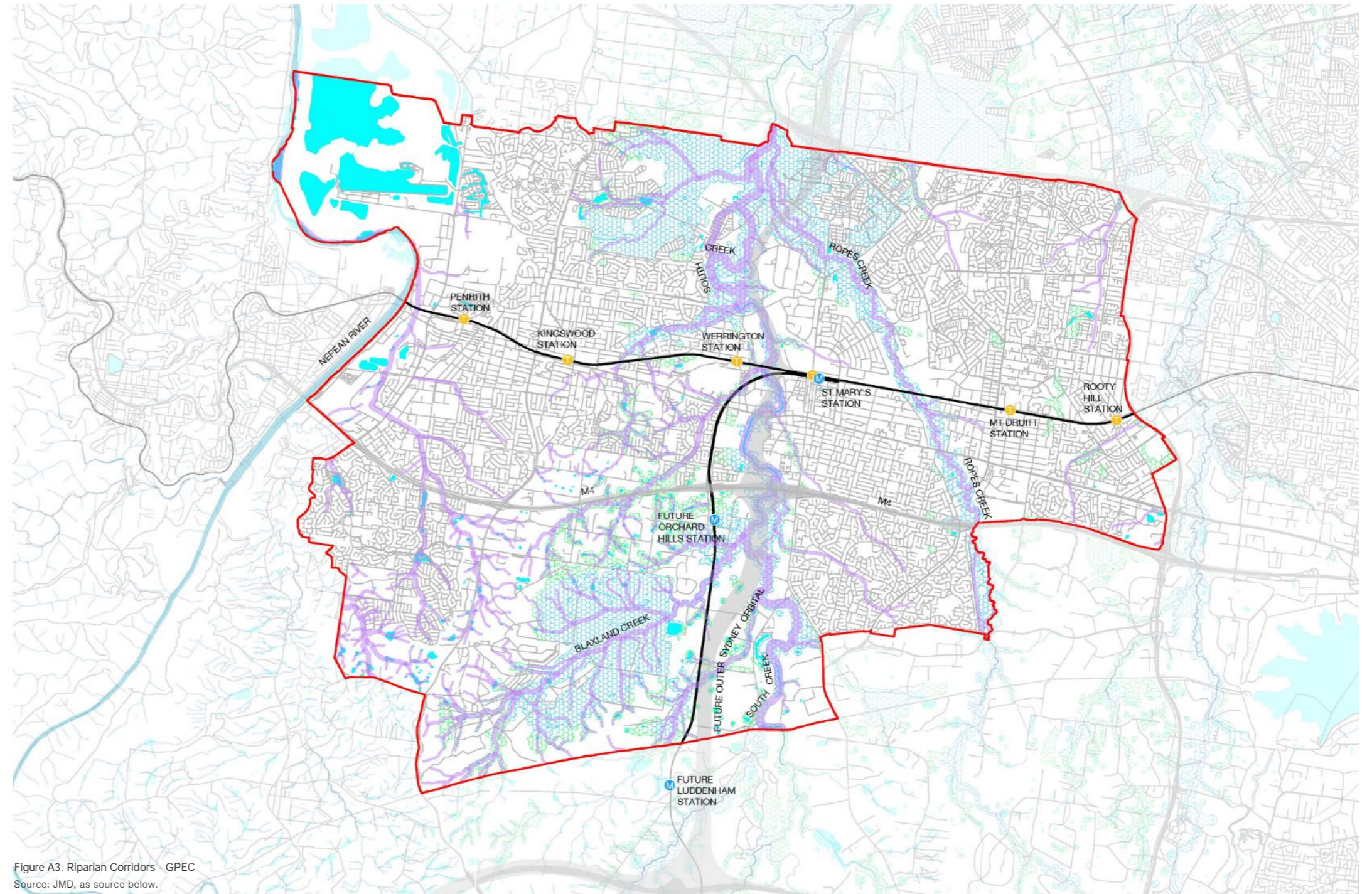


Figure A3: Riparian Corridors - GPEC  
Source: JMD, as source below.

**Legend**

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- ● EXISTING TRAIN LINE
- ● PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES
- VEGETATED RIPARIAN ZONE\*
- CREEKS & WATERWAYS - AREAS TO BE PROTECTED\*
- CREEKS & WATERWAYS - AREA TO BE IMPROVED\*

SOURCE \*NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT ENERGY AND SCIENCE, MARCH 2021. BLUE DATASET\_WIANAMATTADELIVERYSTRATEGY\_29082020





## 9.4 Waterways, Catchments and Flooding

The Hawkesbury-Nepean Valley is one of the most complex floodplains in Australia due to its unique, deep and extensive flood potential, but also due to its large and fast-growing population located within some parts of these flood prone areas.

In GPEC, flooding extents are spread along all the tributaries of Wianamatta-South Creek and Ropes Creek, the Nepean River and Penrith Lakes. At junctions between waterways, such as around the Wianamatta Regional Park, Penrith and St Marys, there is a substantial area of zone between the PMF and the 1 in 100 year flood extent. In these areas, where residential development may be limited, other flood-planning complementary uses can be considered, such as open space, recreation and ecological areas.

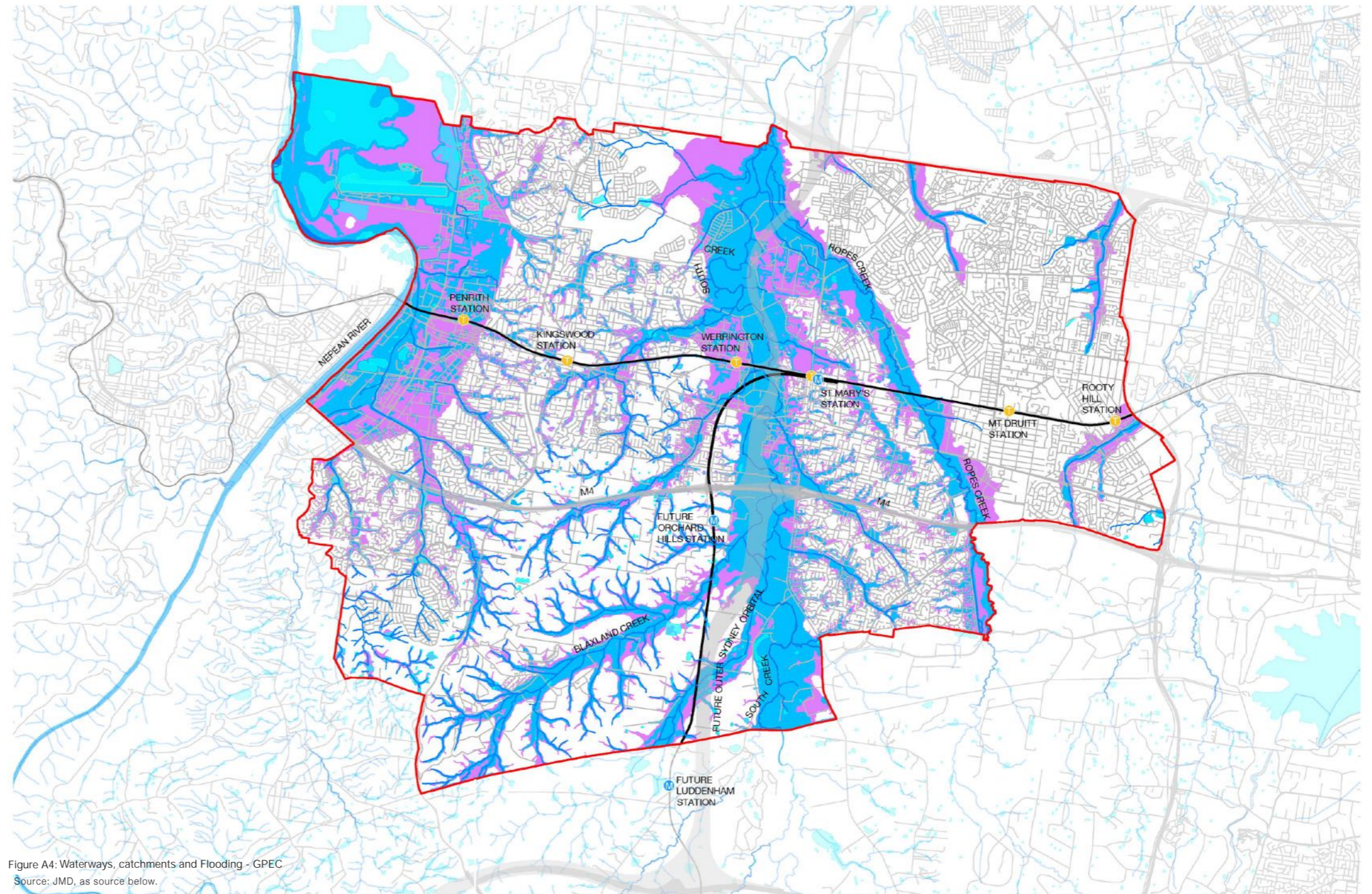


Figure A4: Waterways, catchments and Flooding - GPEC  
Source: JMD, as source below.

**Legend**

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- ● EXISTING TRAIN LINE
- ● PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES
- 1% AEP (1:100 YEAR) FLOOD EXTENT\*
- PMF (PROBABLE MAXIMUM FLOOD) EXTENT\*

SOURCE \*PENRITH CITY COUNCIL AND BLACKTOWN CITY COUNCIL. MARCH 2021. BCC OWNERSHIP AND FLOOD DATA 20210430, 210521\_FLOOD DATA



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



## 9.5 Green Grid

A Green Grid is a network of open space, high-quality vegetation corridors combined with active transport paths that connect key locations such as town centres, public transport hubs, major residential areas and biodiversity protection areas. It can also incorporate blue elements such as waterways, dams, and WSUD initiatives.

Green Grid opportunities lie principally along existing bands of vegetation, cadastral boundaries, and topographical, infrastructure and riparian corridors. On the other hand, it is often fragmented by infrastructure corridors such as the rail line, the Northern Road, the Great Western Highway and M4 and potentially the Outer Sydney Orbital. The Nepean River currently has few connections to it from the GPEC area, as is the case for Ropes Creek from St Marys and St Clair.

Cycleways located within the green grid network provide an additional multipurpose corridor that encourages active transport and allows space for green connections but, in GPEC, the active transport network is currently sparse and disconnected.

The Green Grid opportunities shown in this document builds on the Sydney Green Grid outlined in Tyrrell Studio's Sydney Green Grid Spatial Network and Project Opportunities Report, but focuses more on alignment along riparian and creek corridors than the road system. It also includes many sections of the Great West Walk.

These disconnections could form potential Green Grid links within GPEC, however largely lie within privately-owned land, complicating their realisation. However, the relatively-large freehold parcels in the rural areas of Orchard Hills may simplify the consolidation of green grid links if they are concentrated along lot boundaries, an advantage that St Marys does not enjoy except in its industrial north.

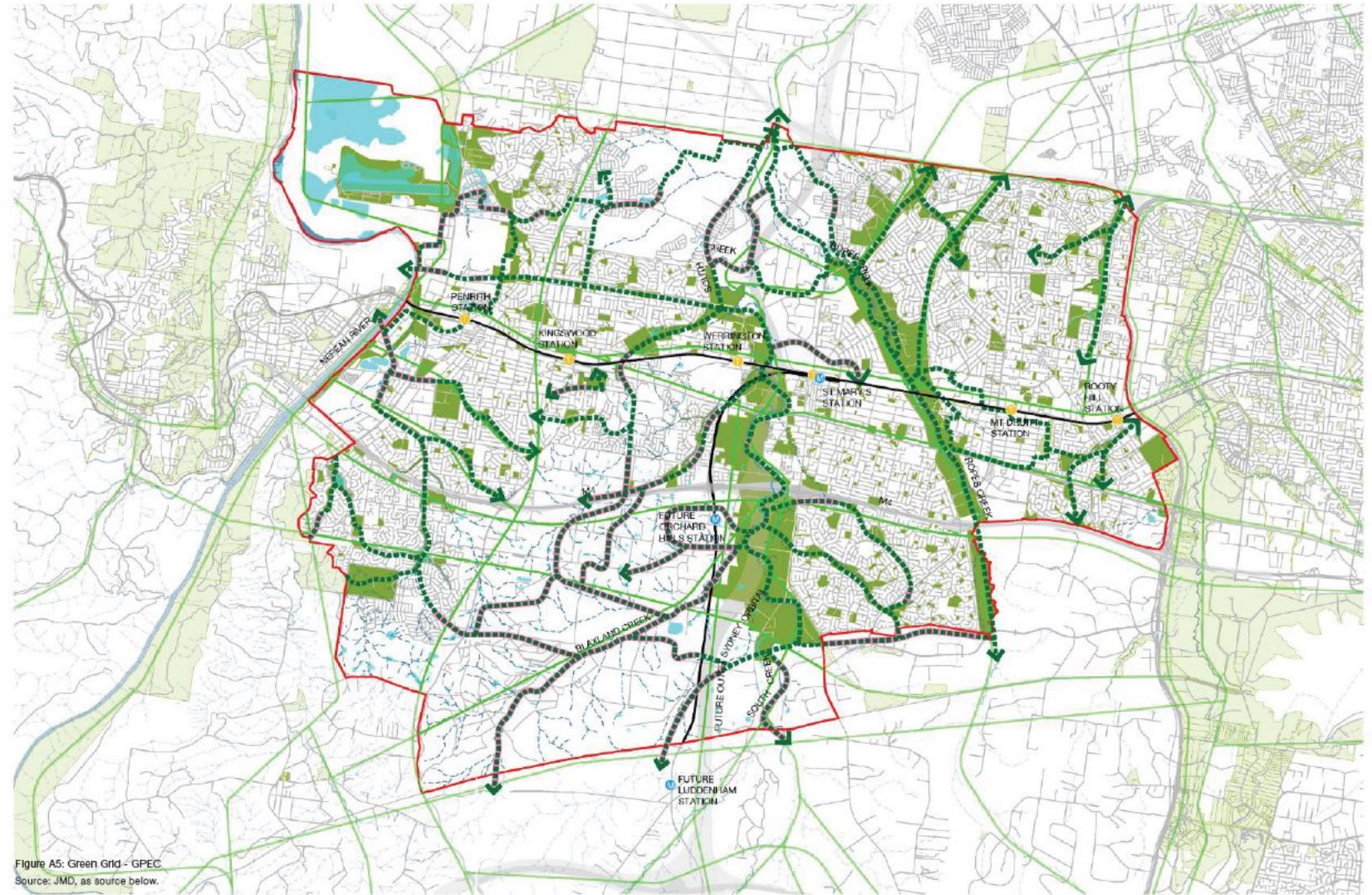


Figure A5: Green Grid - GPEC  
Source: JMD, as source below.

**Legend**

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- EXISTING TRAIN LINE
- PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES
- - - GREEN GRID OPPORTUNITIES
- - - GREEN GRID OPPORTUNITIES - WITHIN PRIVATE ZONING\*\*
- SYDNEY GREEN GRID\*
- OPEN SPACE\*

SOURCE \*TYRRELL STUDIO SYDNEY GREEN GRID VIA NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT, MARCH 2021.  
\*\*DFSI SPATIAL SERVICES, MARCH 2021





## 9.6 Open Space

Open space in the GPEC area is made up of a mix of parks, civic uses and other undeveloped, operational or inaccessible open space. They currently serve much of the existing urban areas, with most residential areas being within 400 metres of adequately-sized open space (at least 0.5 hectares according to draft Greener Places Guide metrics). However, much of GPEC's parks and recreational spaces offer poor amenity and lack quality facilities and landscaping. Bushland, in biodiversity protection areas, and riparian corridors, make up large uninterrupted areas of open space but in some instances, such as at the Australian Defence site or at Wianamatta South Creek, are inaccessible.

Significant barriers to open space and its connectivity still exist with the presence of industrial areas or massive infrastructure corridors such as the A44, the M4, the rail line, and the future Outer Sydney Orbital traversing the site, in some areas with limited crossing points. The M7 separates the eastern areas of GPEC from Bungarrabee Park and the Western Sydney Parklands while there are limited streets connecting its southwestern areas to the Nepean River. Power transmission lines, while in some cases can be streamlined with riparian corridors, can still limit the use and planting potential in open space. Access to open spaces is also negatively impacted by the presence of large blocks and road patterns in older centres and subdivision areas. Significant open space is located at Penrith Lakes around the International Regatta Centre and Penrith Whitewater Stadium.

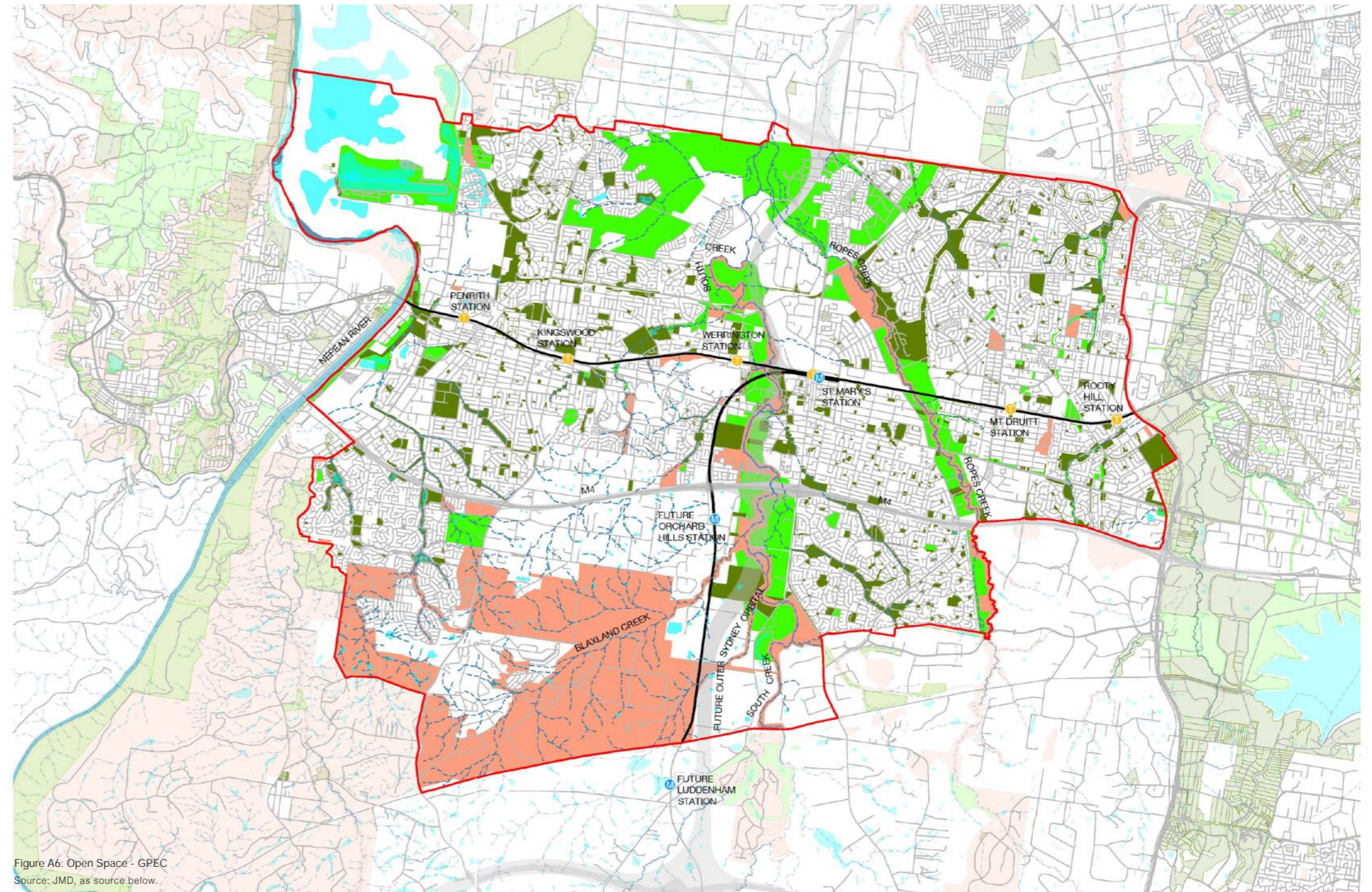


Figure A6: Open Space - GPEC  
Source: JMD, as source below.

### Legend

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- ● EXISTING TRAIN LINE
- ● PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES
- LOCAL OPEN SPACE - COUNCIL OWNED\*
- REGIONAL OPEN SPACE - FEDERAL & STATE OWNED\*
- CONSERVATION LAND\*

SOURCE \*NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT. MARCH 2021  
TYRRELL STUDIO SYDNEY GREEN GRID.



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



## 9.7 Urban Heat Island Effect

By charting the variation of temperature to a non-urban vegetated reference (such as heavily wooded areas or national parks around Sydney) during the Summer of 2015-2016, a strong correlation between the effects of urbanisation and land surface temperatures is shown.

In the GPEC area, areas displaying a maximum of 4 degrees differential are limited to locations in heavily forested areas, such as at Ropes Crossing and adjacent to water bodies such as the Nepean River and Ropes and Wianamatta-South Creeks.

Most of the Orchard Hills precinct, being relatively less developed than other precincts, does not display temperatures above 6 degrees above the reference, while nearly all residential, commercial and industrial areas show an increase of up to 8 degrees. The hottest parts of the GPEC area are centred on Penrith and St Mary's town centres, residential areas in Ropes Crossing and Glenmore Park, and Minchibury's M Centre carpark.

Key future challenges include the provision of urban greening initiatives to lower the Urban Heat Island Effect in the existing urban centres frequented by residents in the daytime, existing residential areas, and to prevent the low albedo and heat absorption associated with urbanisation and development.

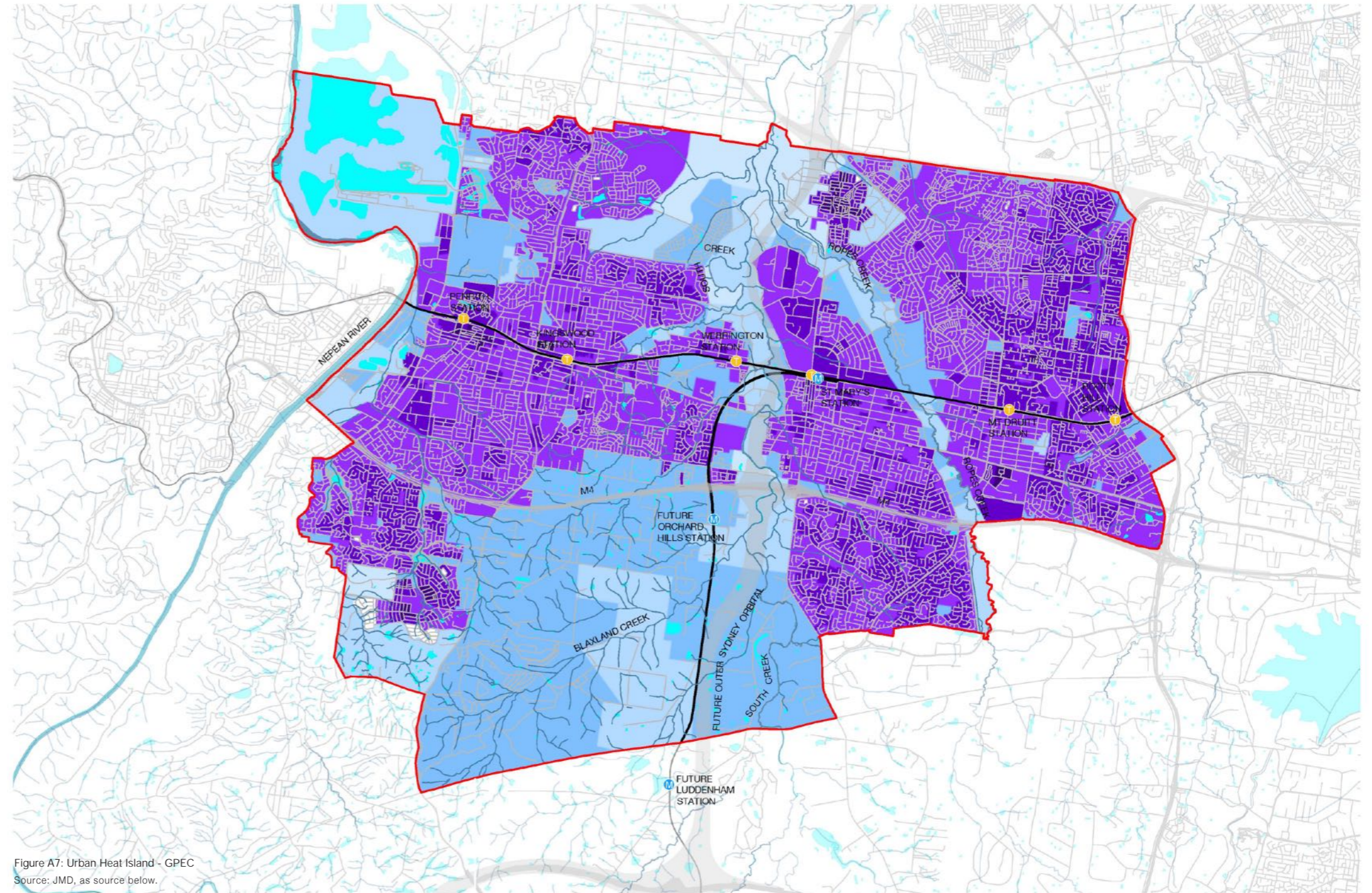


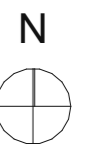
Figure A7: Urban Heat Island - GPEC  
Source: JMD, as source below.

### Legend

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- EXISTING TRAIN LINE
- PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES

- |  |       |  |
|--|-------|--|
|  | 0-2   | DEGREES ABOVE NON-URBAN VEGETATED REFERENCE AROUND SYDNEY* |
|  | 2-4   |  |
|  | 4-6   |  |
|  | 6-8   |  |
|  | 8-10  |  |
|  | 10-12 |  |

SOURCE \*NSW GOVERNMENT SEED PORTAL. NSW URBAN HEAT ISLAND TO MODIFIED MESH BLOCK 2016



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



## 9.8 Soil Salinity

GPEC comprises predominantly moderate and high salinity areas due to its landform and geology.

Low permeability and relatively-poor drainage in the clay soils of the Cumberland Plain have led to a moderate salinity potential in the GPEC area. This is exacerbated in lower slopes where water accumulation is high and can mean scalding, salt efflorescence and vegetation die back, an essential consideration in the development of the area.

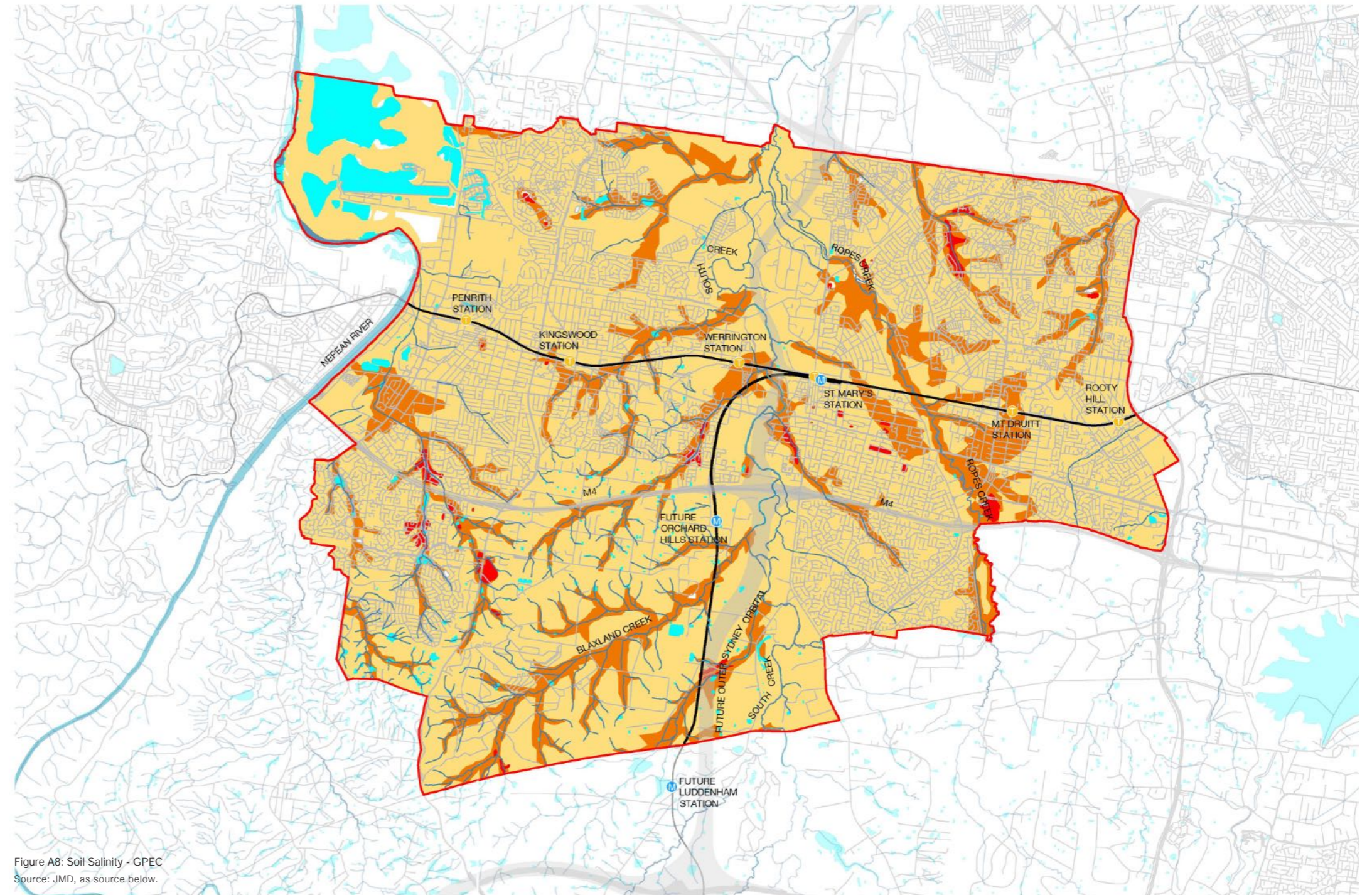


Figure A8: Soil Salinity - GPEC  
Source: JMD, as source below.

### Legend

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- EXISTING TRAIN LINE
- PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS
- DAMS & WATER BODIES

■ **KNOWN SALINITY:**  
AREAS THAT FALL UNDER THIS ZONE MAY EXPERIENCE HIGH INDEX OF WETNESS, SCALDING, SALT EFFLORESCENCE, VEGETATION DIEBACK, SALT TOLERANCE SPECIES AND WATERLOGGING\*

■ **HIGH SALINITY:**  
SIMILAR TRAITS TO KNOWN SALINITY. AREAS WITHIN THIS ZONE MAY EXPERIENCE HIGH ACCUMULATION OF WATER\*

■ **MODERATE SALINITY:**  
LIMITED MAPPING OF SCALDING AND VEGETATION. SALINE AREAS MAY BE PRESENT BUT WILL NEED TO BE SUBJECTED TO FURTHER INVESTIGATION\*

SOURCE \*NSW GOVERNMENT SEED PORTAL, MARCH 2021. SALINITY POTENTIAL WESTERN SYDNEY



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



## 9.9 Biodiversity Protection

GPEC boasts significant intact bushland that is protected at State and Federal levels. Parts of GPEC are also recognised in the Cumberland Plain Conservation Plan as being suitable for bio certification or land to be non-certified – avoided for biodiversity purposes. The Cumberland Plain Conservation Plan (the Plan) will facilitate the biodiversity approvals required to deliver development while protecting areas of biodiversity significance within Wilton, Greater Macarthur, the Western Sydney Airport and GPEC.

Two major intact swathes of threatened native vegetation occur, one associated with the Wianamatta Regional Park in the north and the other with the Australian Defence site in the south. Much of the rest is contained in private rural-zoned lands.

Note has also been taken of Priority Conservation Lands representing long-term biodiversity benefits for the lowest possible cost in the Cumberland Plain Recovery Plan (January 2011) and its associated corridors, as well as land with high biodiversity value that is particularly sensitive to impacts from development and clearing as part of the Biodiversity Offsets Scheme. Generally, these have been zoned as C2 Environmental Conservation.

The principal threat to biodiversity in this area is the loss and fragmentation of habitat, then arson/bushfire and stormwater runoff from urban hard-scape. The plant communities of the Cumberland Plain area are also particularly vulnerable to weed invasion due to their grassy understory, relatively fertile soils and past agricultural uses. Due to its scale and alignment, the Outer Sydney Orbital corridor presents as a major impact on these areas.

This site analysis has used the CPCP along with other biodiversity information such as biodiversity vegetation mapping to identify a more comprehensive picture of land that contains biodiversity value.

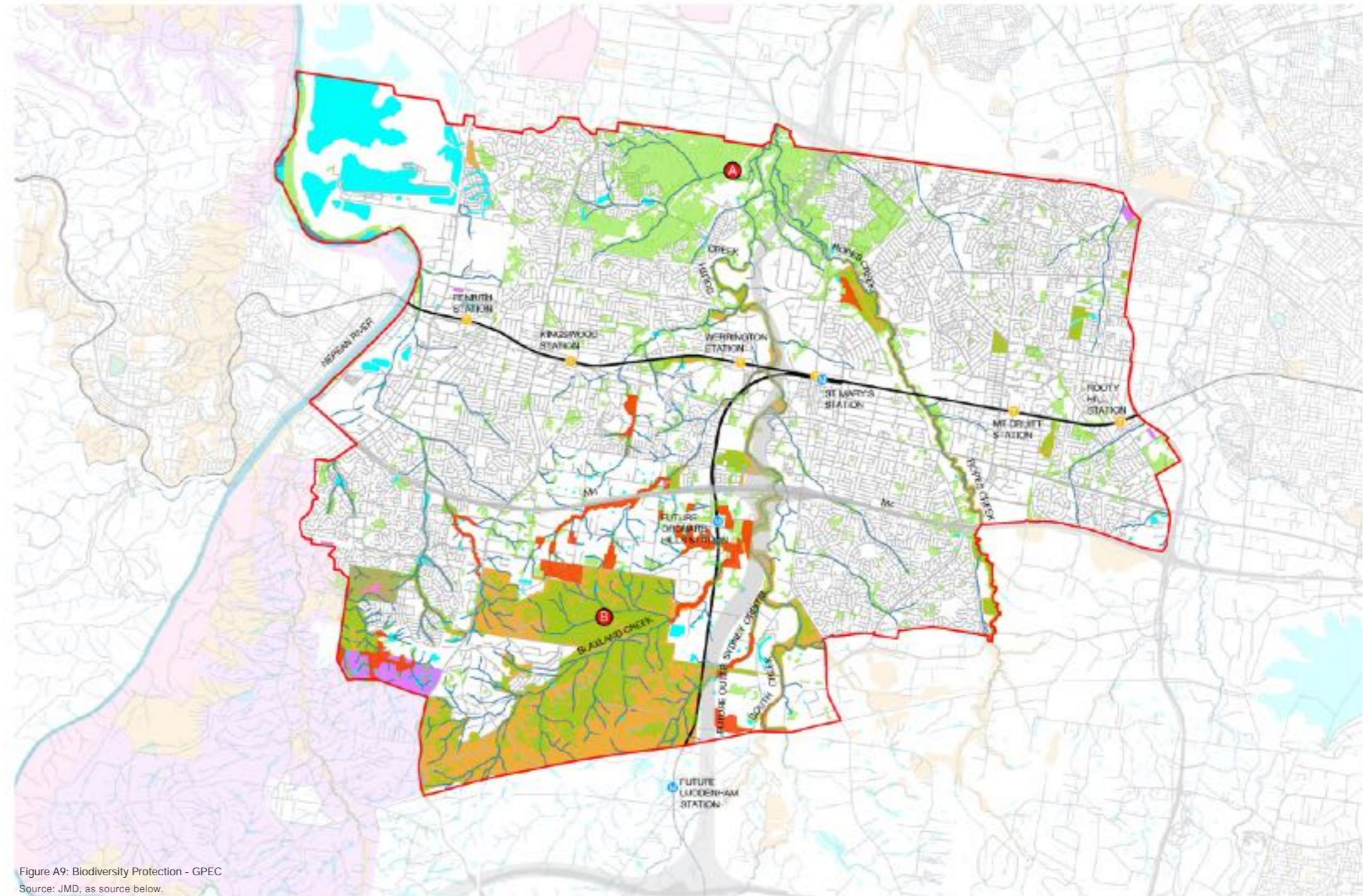
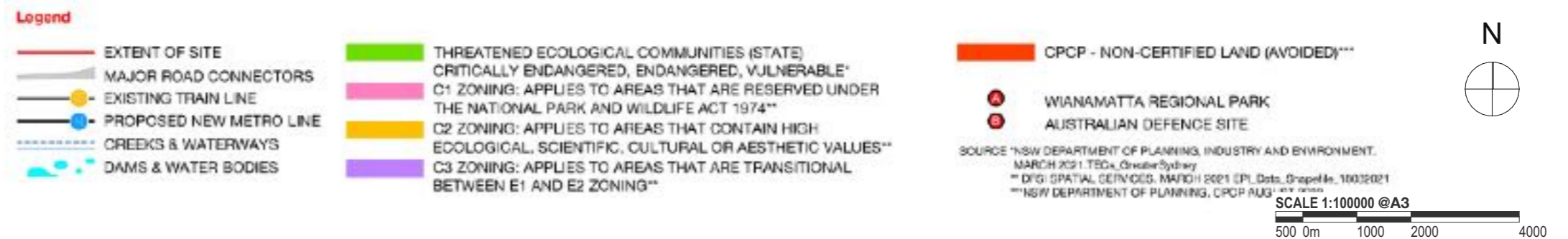


Figure A9: Biodiversity Protection - GPEC  
Source: JMD, as source below.





## 9.10 Ecological Communities

Vegetation in the GPEC area is mostly comprised of Shale Hill and Plain Woodlands based on the Wianamatta-South Creek, Blacktown, and Luddenham soil landscapes. Alluvial Woodlands, with Second Ponds Creek Soil, occur along the rivers and creeks while Cooks River Castlereagh Ironbark Forest and Shale Gravel Transition Forest is limited to the area around Ropes Crossing. Generally, the area is part of the Cumberland Plain, where biodiversity is threatened by virtue of it being Australia's fastest growing and most populous region.

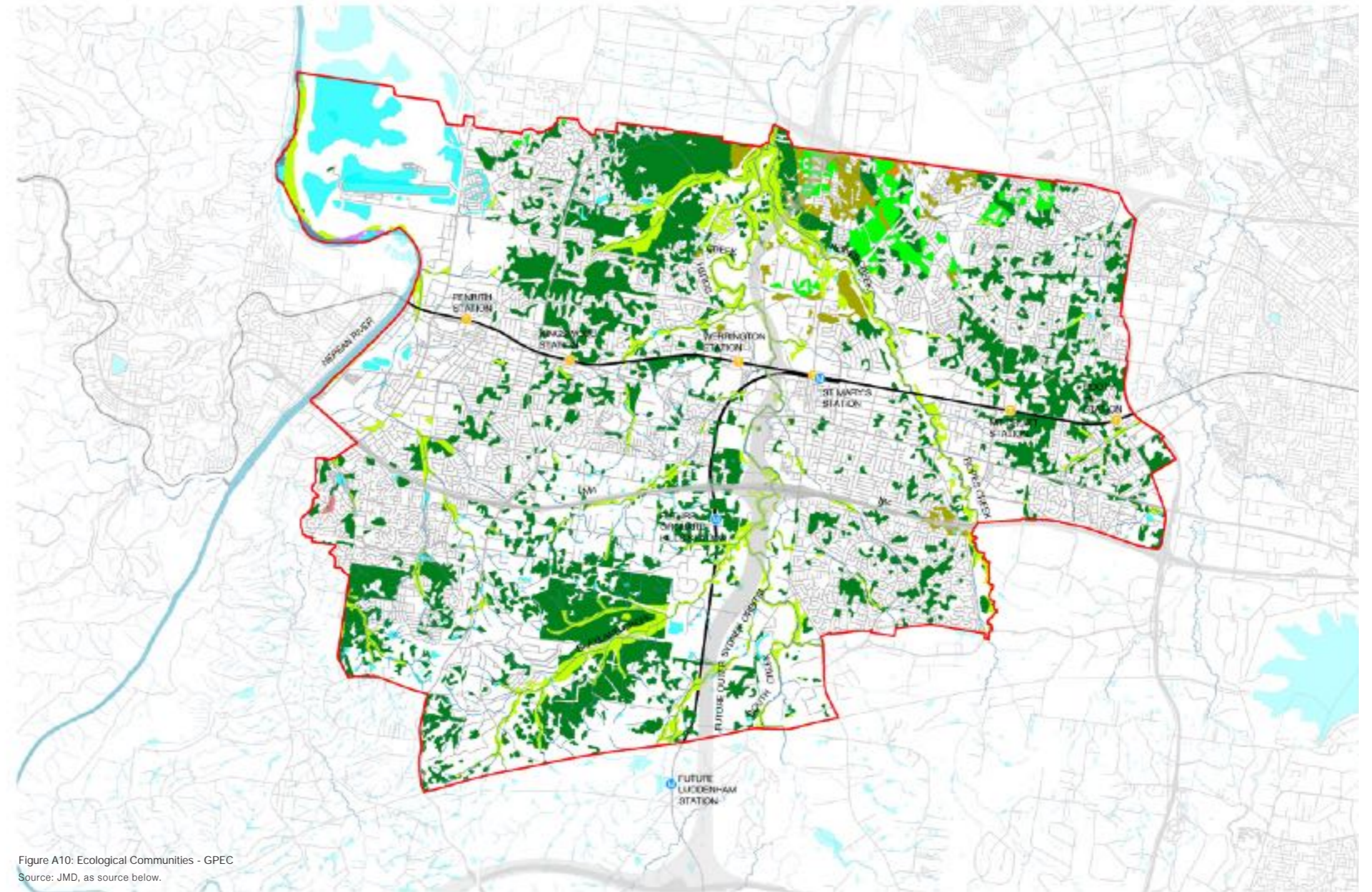
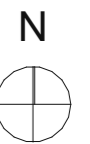


Figure A10: Ecological Communities - GPEC  
Source: JMD, as source below.

**Legend**

- |                         |  |                                    |
|-------------------------|--|------------------------------------|
| EXTENT OF SITE          | ALLUVIAL WOODLANDS*                      | SHALE GRAVEL TRANSITION FOREST*    |
| MAJOR ROAD CONNECTORS   | CASTLEREAGH WOODLANDS*                   | SHALE SANDSTONE TRANSITION FOREST* |
| EXISTING TRAIN LINE     | COOKS RIVER CASTLEREAGH IRONBARK FOREST* | SHALE WOODLANDS*                   |
| PROPOSED NEW METRO LINE | RIPARIAN FOREST*                         |                                    |
| CREEKS & WATERWAYS      |  |                                    |
| DAMS & WATER BODIES     |  |                                    |

SOURCE \*NSW GOVERNMENT SEED PORTAL, MARCH 2021, CUMBERLAND\_V2\_2008\_VISMAP



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



## 9.11 Vegetation Canopy Coverage

Tree canopy mitigates the urban heat island effect, modifying the microclimate, improving human amenity and providing ecological function.

Tree canopy coverage in GPEC is greatest in the biodiversity conservation areas of Wianamatta Regional Park in Ropes Crossing and Jordan Springs, and the Australian Defence site. To improve connectivity between natural habitats, tree canopy should be extended across the site, through to residential, urban cores and industrial areas.

The tree canopy areas in each modified mesh block (an Australian Bureau of Statistics statistical area), when combined, show that the existing tree canopy for the GPEC area is 12% of total land area. Visual comparison with current aerial imagery (Nearmap) shows that tree canopy coverage can change quickly or is not accurately reflected in the data. Further investigation using LIDAR point cloud data would provide more additional up-to-date data.

The table below provides vegetation canopy coverage percentages for each GPEC precinct based on the Modified Mesh Block data of 2019.

Precinct	Area (sqm)	Canopy Coverage (sqm)	Canopy Coverage (%)
Australian Defence	20,322,719	3,335,276	16%
Cranebrook	12,886,655	1,250,128	10%
Jordan Springs	9,832,021	1,894,960	19%
Kingswood and Werrington	12,562,334	1,039,356	8%
Luxford	20,913,963	1,946,004	9%
Mount Druitt Centre and Rooty Hill	15,725,255	1,382,120	9%
Orchard Hills	25,611,293	2,769,448	11%
Penrith Centre	4,086,632	341,288	8%
Penrith Lakes	11,092,546	1,350,836	12%
Penrith West	7,534,584	652,992	9%
Ropes Crossing	5,500,777	2,527,392	46%
South Penrith and Glenmore Park	19,891,990	1,807,424	9%
St Clair	10,936,364	785,908	7%
St Marys	17,516,651	2,358,220	13%
<b>Total</b>	<b>194,413,784</b>	<b>23,441,352</b>	<b>12%</b>

Figure A11: Mapped canopy coverage by Precinct  
Source: JMD, based on areas shown at right

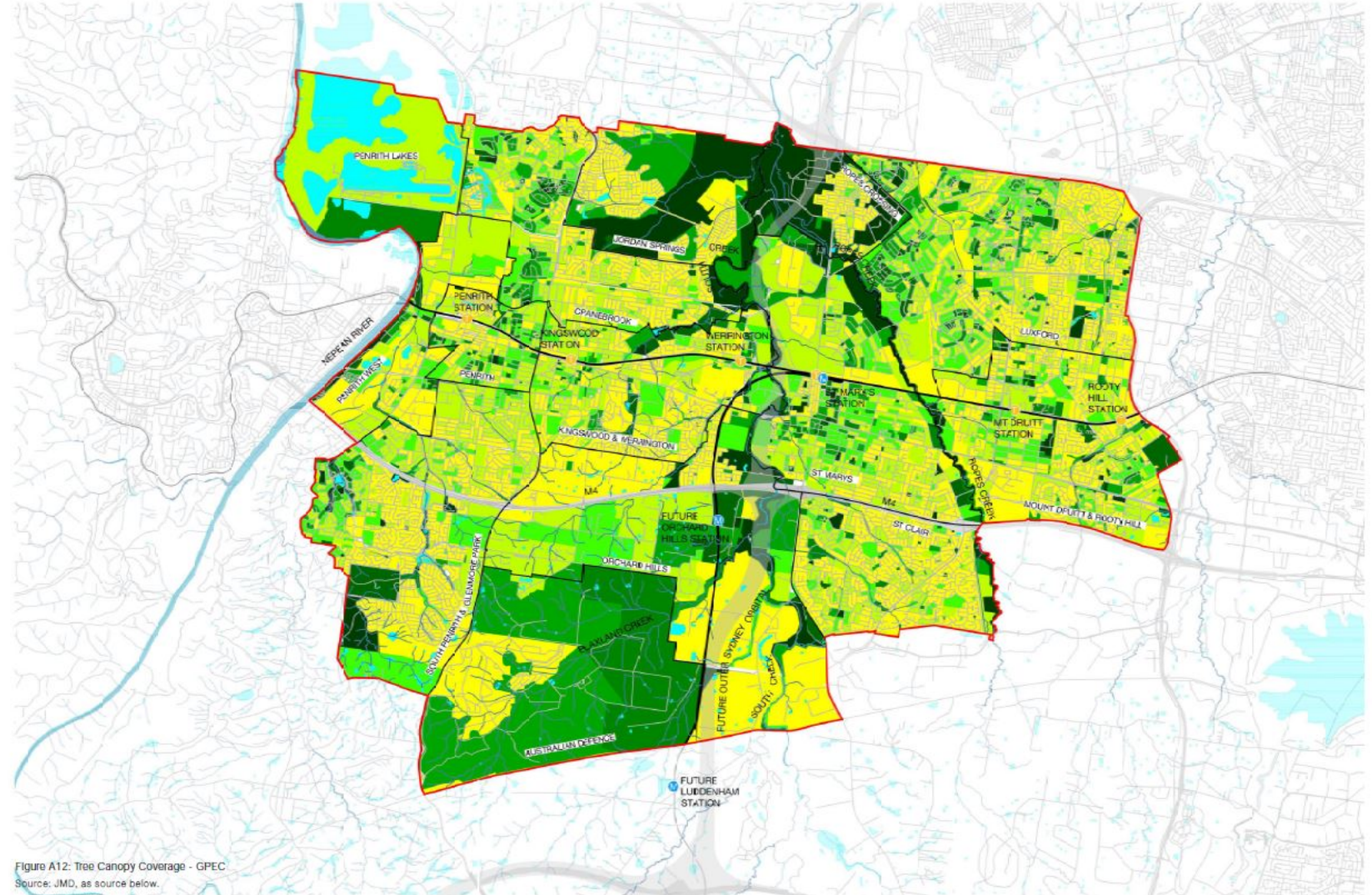
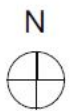
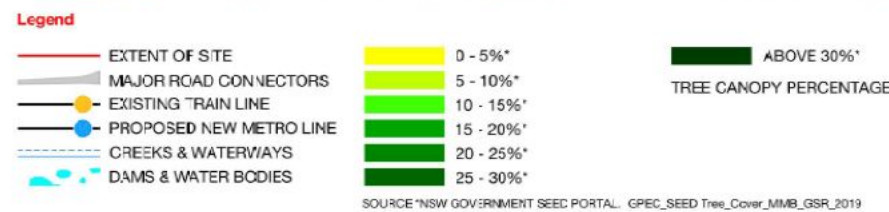


Figure A12: Tree Canopy Coverage - GPEC  
Source: JMD, as source below.





## 9.12 Vegetation Canopy Coverage and Ownership

Distinction has been made between GPEC areas held by private entities and government at Federal, State and Local Government levels. This allows for more targeted (either the public or private sector) strategies to working towards tree canopy targets across this part of Western Sydney, which is vulnerable to increasingly extreme climates, future urban growth and hardscaping, and fragmented land ownership and management.

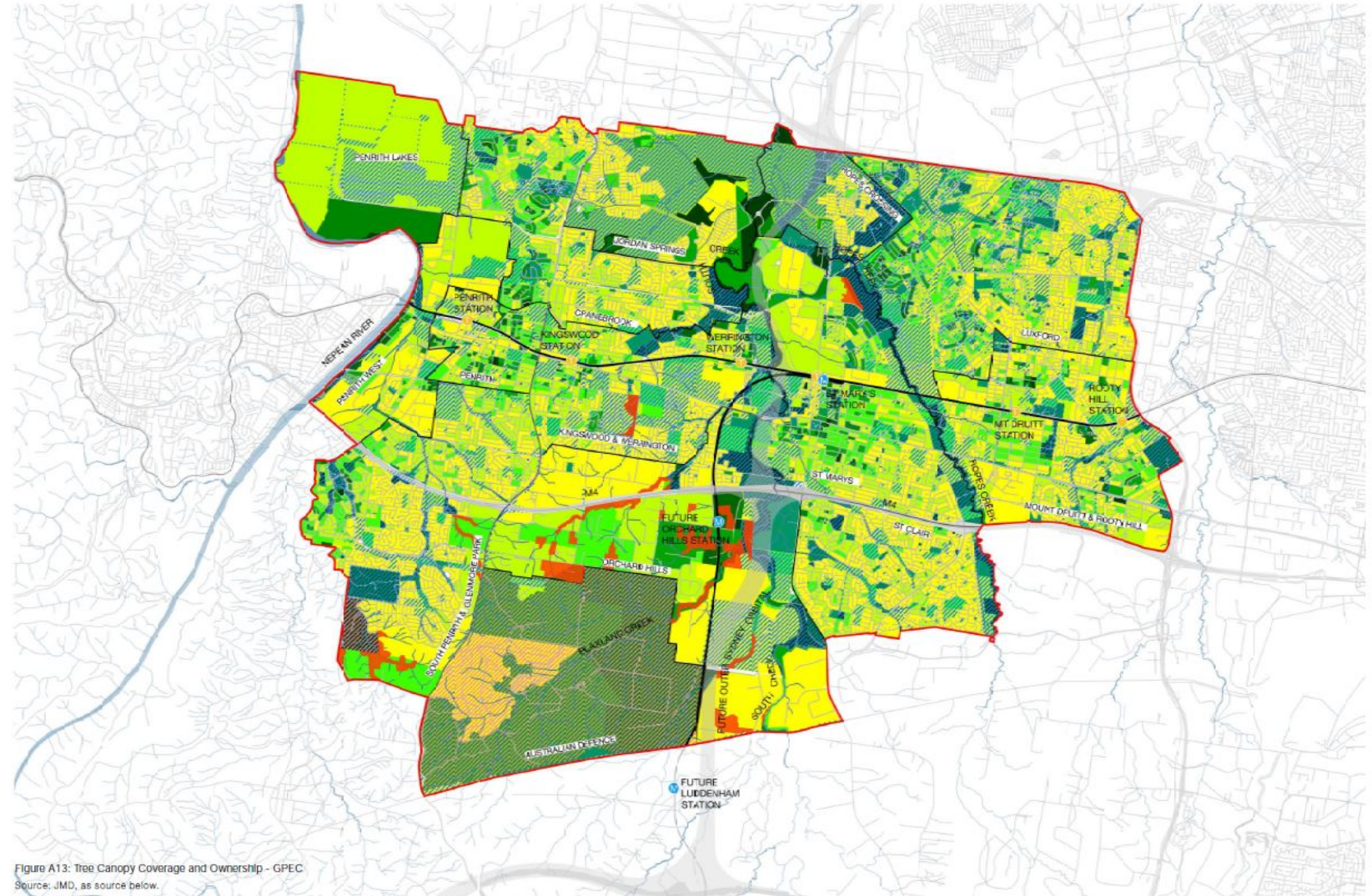


Figure A13: Tree Canopy Coverage and Ownership - GPEC  
Source: JMD, as source below.

### Legend

- EXTENT OF SITE
- MAJOR ROAD CONNECTORS
- EXISTING TRAIN LINE
- PROPOSED NEW METRO LINE
- CREEKS & WATERWAYS

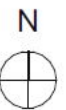
CPCP - NON-CERTIFIED LAND (AVOIDED)\*\*

0 - 5%\*  
 25 - 30%\*  
 ABOVE 30%\*

TREE CANOPY COVERAGE WITHIN PUBLIC LAND\*

0 - 5%\*  
 25 - 30%\*  
 ABOVE 30%\*

TREE CANOPY COVERAGE OTHER\*



SOURCE \*NSW GOVERNMENT SEED PORTAL, MARCH 2021: CLMBERLAND\_V2\_2008\_VISmap  
\*\*NSW GOVERNMENT SEED PORTAL, GPEC\_SEED Tree\_Cover\_MMB\_GSRL 2019  
\*\*\*NSW DEPARTMENT OF PLANNING, CPCP AUGUST 2022

SCALE 1:100000 @A3  
500 0m 1000 2000 4000



### 9.13 Public Transport

The GPEC area has multiple modes of public transport, including heavy rail, bus transport and a future metro line.

There are six train stations within GPEC on the existing T1 heavy rail network, connecting the Blue Mountains to the Sydney CBD via Penrith and Parramatta. Parking is abundant adjacent to existing heavy rail stations, servicing the commuter population.

The future Sydney Metro line to Western Sydney Airport due to open in 2026 will activate Orchard Hills providing opportunity for local transport links and a transport interchange. An interchange with heavy rail and bus transport with metro will also be delivered at St Marys.

There are established bus transport routes connecting most suburbs. Areas of low bus service are Orchard Hills, East Jordan Springs, North St Marys industrial area adjacent to South Creek and areas of Werrington / Kingswood around Western Sydney University.

Figure A14 adjacent shows areas not within a 200m radius to bus and public transport routes.

It should also be noted that the walking radius to metro and train stations are best case scenarios. In reality physical constraints significantly impact access. It is therefore possible that areas within these radii could benefit from improved connectivity.

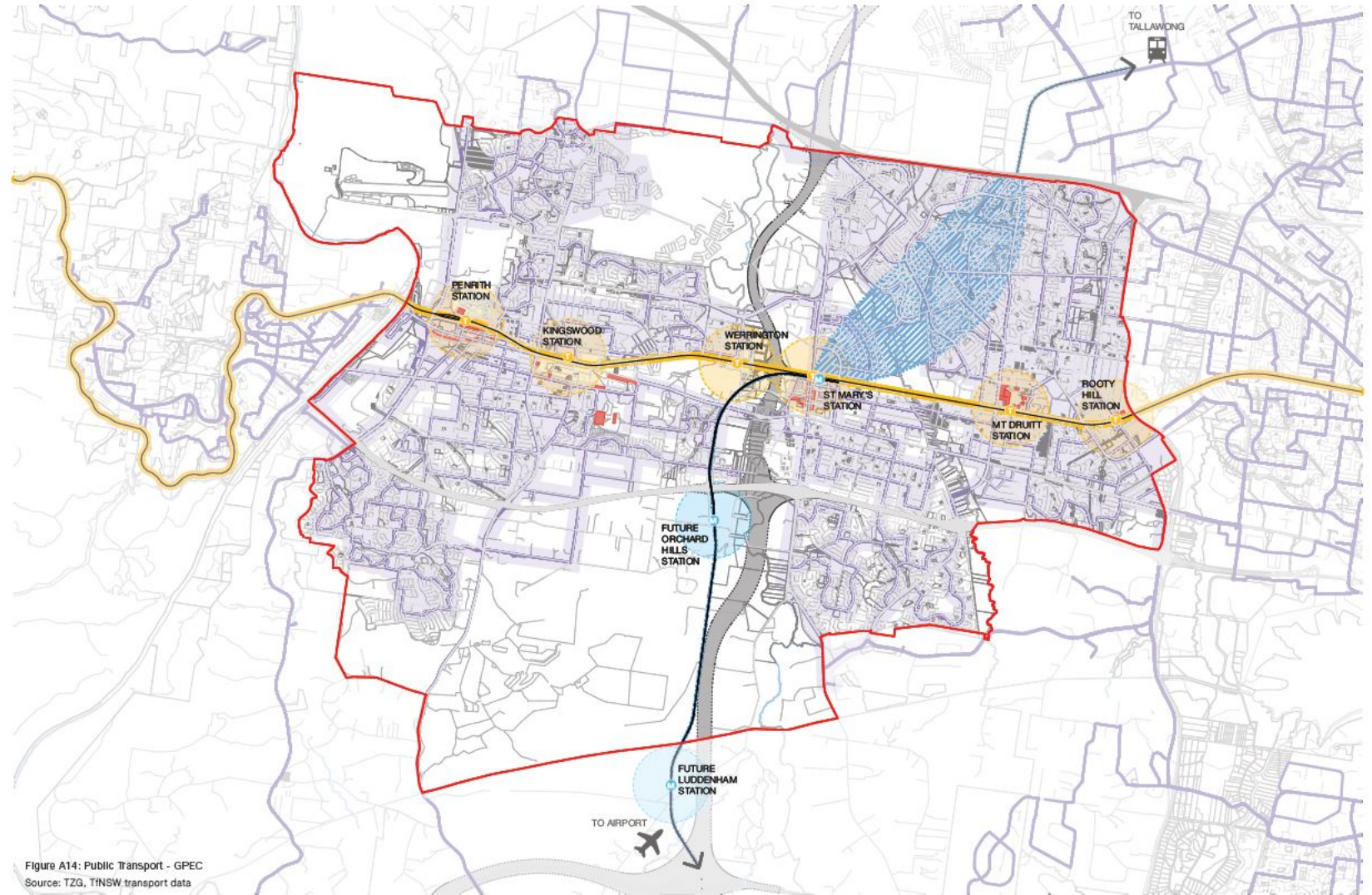
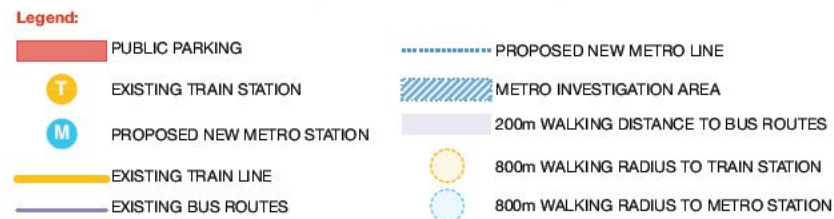


Figure A14: Public Transport - GPEC  
Source: TZG, TNSW transport data





### 9.14 Active Transport

Existing cycle paths within GPEC are fragmented, with active transport connections discontinuous and disjointed. These disjunct routes generally occur outside of town centre areas, where major rail infrastructure, highways or significant arterial roads prohibit crossing or continuity of paths or where residential suburbs are continuing to develop and be constructed.

There are limited inter suburb cycle connections within cul-de-sac suburbs and the larger Wianamatta-South Creek / Ropes Creek open space corridors.

Future planning for GPEC will need to evaluate the status of mapped existing cycleways to determine whether they are an off-road, separated or on-road shared cycleway and the true extent of the cycleway network.

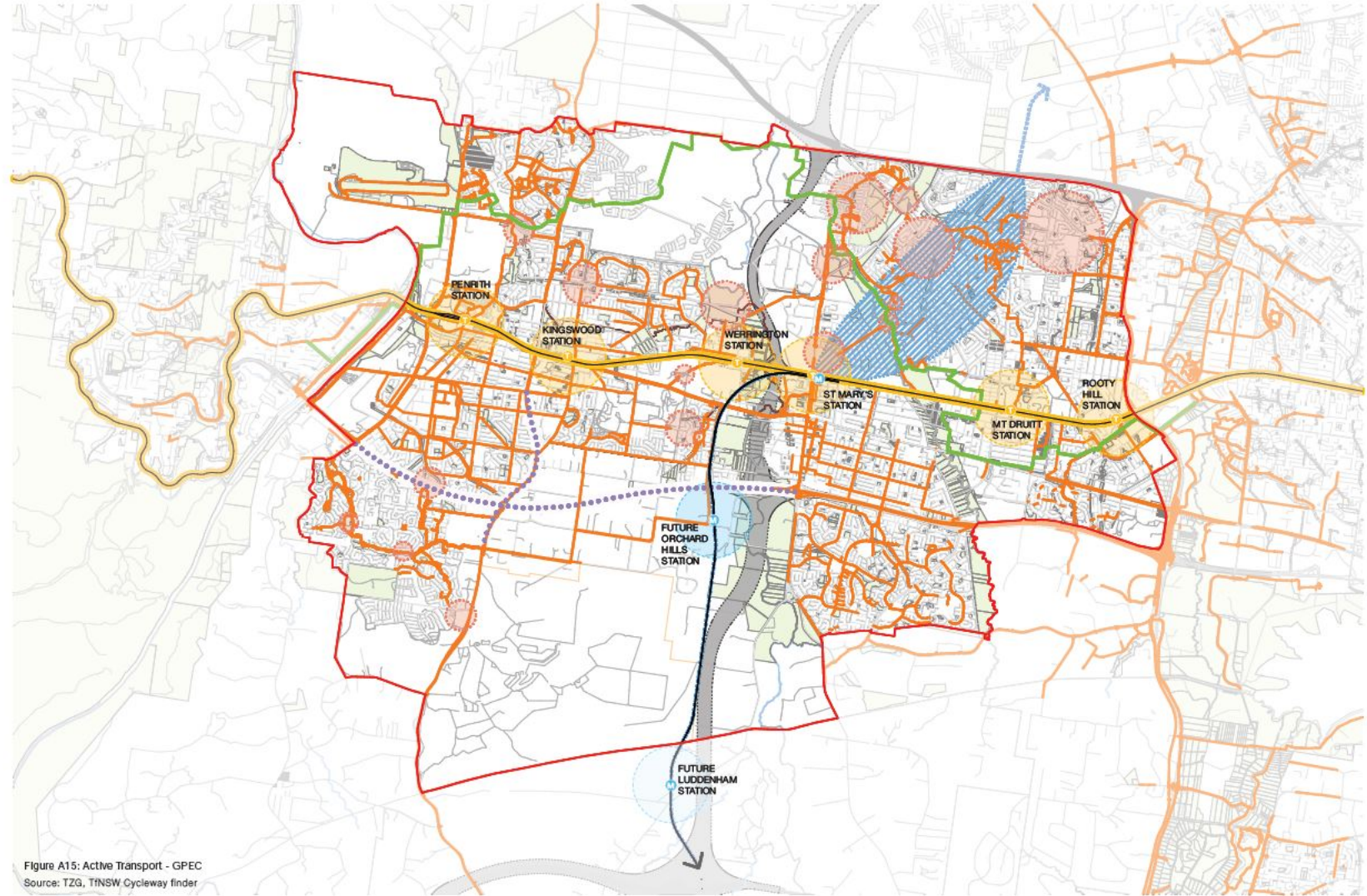


Figure A15: Active Transport - GPEC  
Source: TZG, TfNSW Cycleway finder

- Legend:**
- THE GREAT WEST WALK
  - EXISTING CYCLEWAYS
  - - - NO BIKE ACCESS
  - CYCLEWAY DISCONNECT
  - EXISTING TRAIN STATION
  - PROPOSED NEW METRO STATION
  - EXISTING TRAIN LINE
  - - - PROPOSED NEW METRO LINE
  - METRO INVESTIGATION AREA
  - 800m WALKING RADIUS TO TRAIN STATION
  - 800m WALKING RADIUS TO METRO STATION



## 9.15 Road Structure

The GPEC area is divided into self-contained precincts bounded by the M4 Western Motorway, Great Western Highway and the Great Northern Road highway corridors. These roads which originate from the Sydney Region Outline Plan (SROP) act dually as regional connectors to Greater Sydney and the Blue Mountains and as barriers to connectivity and movement between the GPEC's precincts.

The proposed Outer Sydney Orbital (OSO) would run north-south.

Grid road layouts around Penrith, St Marys, Kingswood, Mt Druitt and Rooty Hill train station indicate early settlement patterns and also provide these suburbs with a simple, easily navigated and easily adapted road structure.

Many newer suburbs are comprised of cul-de-sac layouts where complex, circuitous and dead end roads create confusing traffic connections, extend vehicle travel time to other suburbs and therefore currently restrict transport connectivity.

The distance between north-south connector roads varies between 800m-1km in grid layout suburbs and up to 5km within cul-de-sac suburbs.

Orchard Hills comprises a distinctly different road layout formed of few feeder 'spine' roads east-west - Lansdowne Road, Homestead Road and Wentworth Road - with smaller rural 'dead-end' roads often within private ownership and formed of unsealed dirt tracks or roughly sealed bitumen roads.

The Australian Defence precinct is uniquely comprised of inaccessible private roads, limiting access via roads within this precinct to Government uses only.

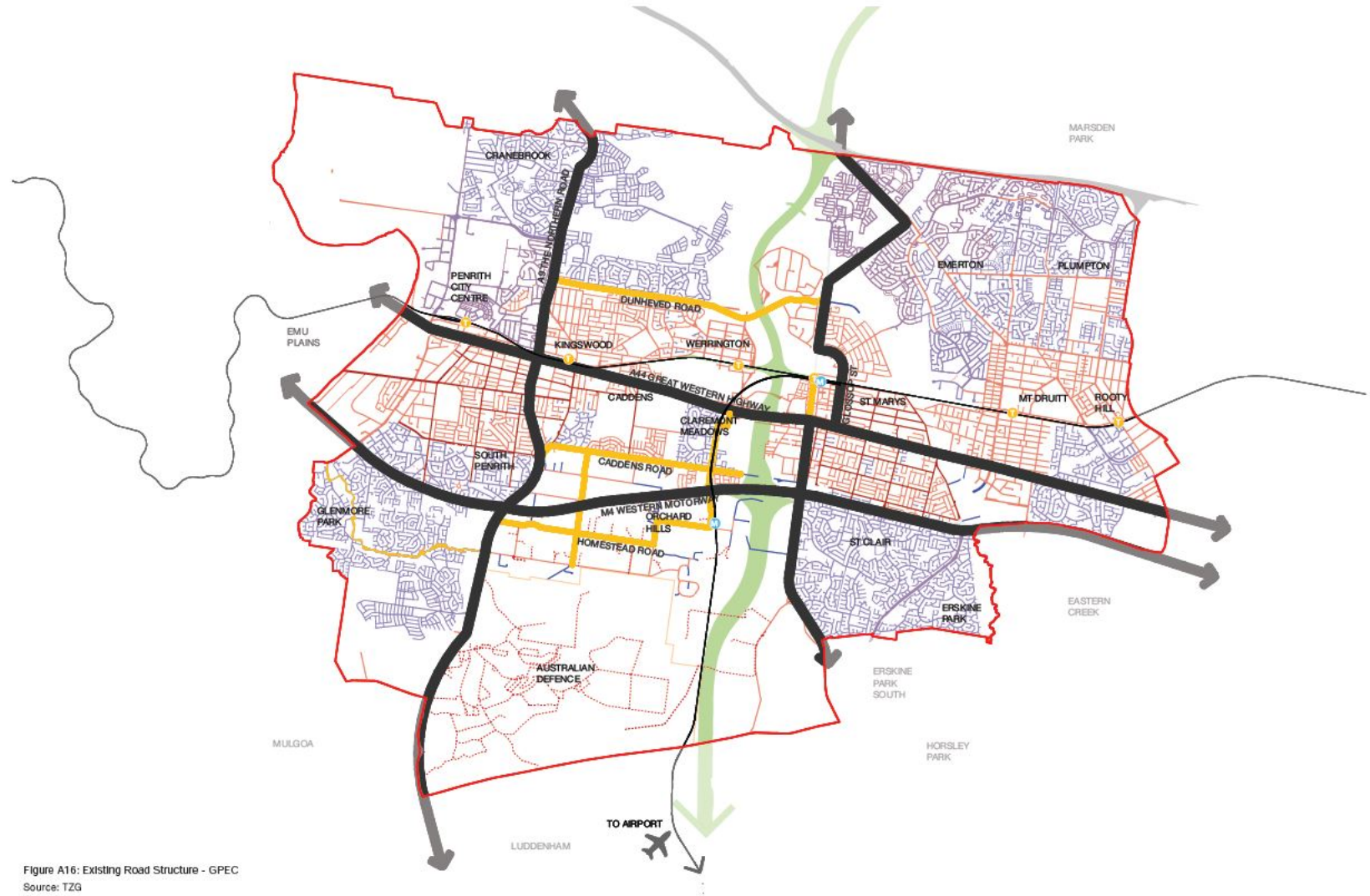


Figure A16: Existing Road Structure - GPEC  
Source: TZG

**Legend:**

- PRIMARY ROADS
- SECONDARY ROADS
- RURAL ROADS
- CUL DE SAC
- RECTILINEAR GRID
- STANDARD ROADS

- PROPOSED OUTER SYDNEY ORBITAL
- INACCESSIBLE OR PRIVATE ROADS



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



### 9.16 Connectivity - Regional

Figure A17 adjacent shows areas of good and poor connectivity from major intersections that access infrastructure corridors to connect the GPEC area with Greater Sydney. Intersections where good or disconnected connections are located are numbered as below:

- ① The Kingsway - Werrington
- ② A44 Great Western Highway - Werrington
- ③ M4 Western Motorway - Orchard Hills
- ④ From M7 overpass looking towards railway line - Rooty Hill
- ⑤ Luddenham Road - Orchard Hills
- ⑥ Durham Street - Oxley Park
- ⑦ Richmond Road - Colebee
- ⑧ Simms Road - Oakhurst - Bicycle and pedestrian access only
- ⑨ Samuel Marsden Road - Orchard Hills
- ⑩ Flinders Lane - Orchard Hills
- ⑪ Plumpton Road - Plumpton - No Access
- ⑫ Power Street - Glendenning
- ⑬ M4 - Eastern Creek
- ⑭ Eastern Creek Suez Public Dropoff - No access
- ⑮ Intersection of Chilton Ave & Florence St - Oakhurst - Bicycle and pedestrian access only

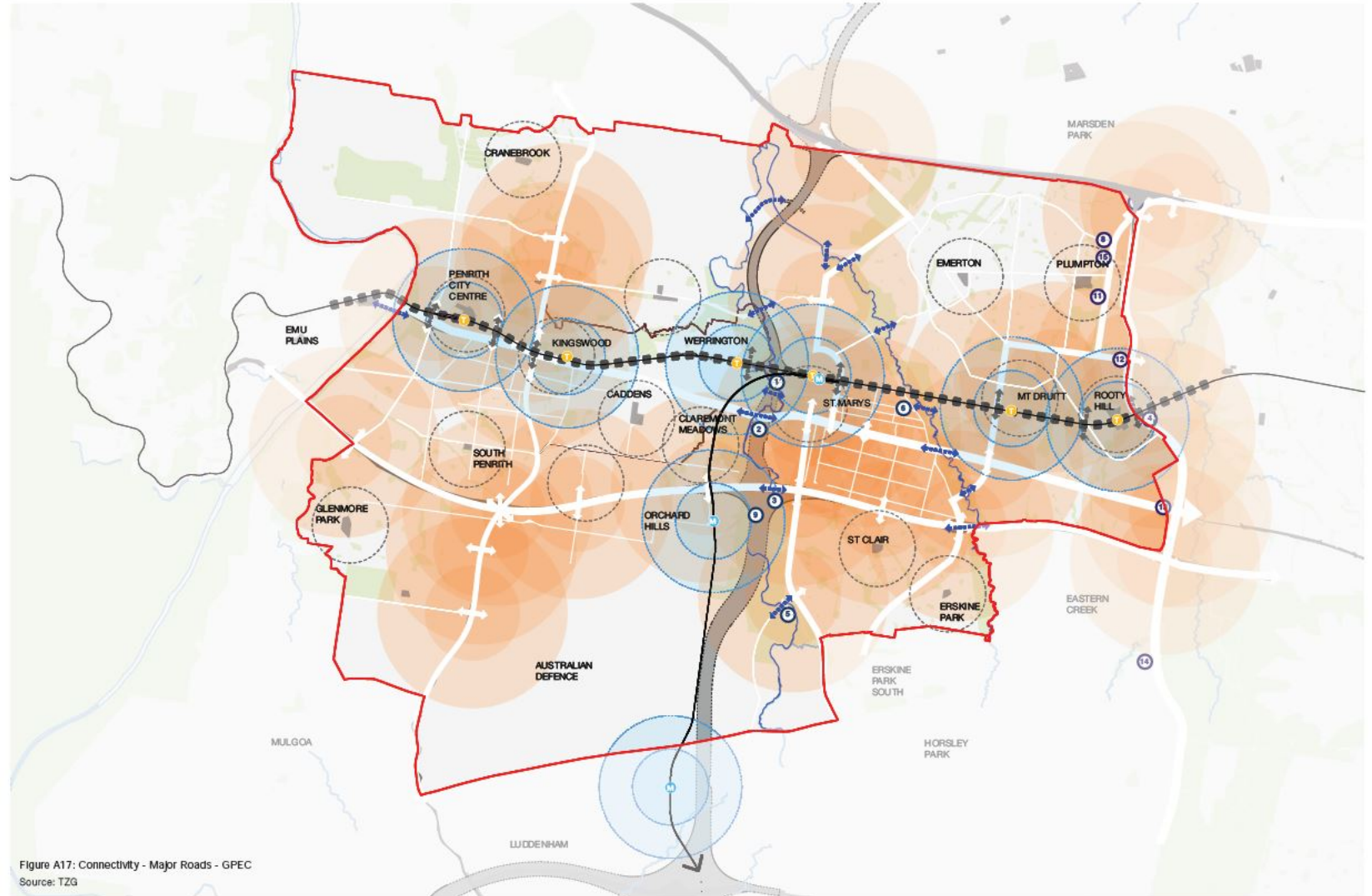


Figure A17: Connectivity - Major Roads - GPEC  
Source: TZG

**Legend:**

- CENTRE
- ARTERIAL AND PRIMARY ROADS
- PROPOSED OUTER SYDNEY ORBITAL / FUTURE CASTLEREAGH HIGHWAY & METRO LINE
- RAIL CORRIDOR
- ROPES CREEK - SOUTH CREEK
- EXISTING CONNECTIONS ACROSS CREEK
- EXISTING CONNECTIONS ACROSS RAIL CORRIDOR
- MAJOR INTERSECTIONS / ENTRY/EXIT TO ARTERIAL ROADS
- PROXIMITY TO MAJOR INTERSECTION 1km - 2km RADIUS
- PROXIMITY TO TRAIN/METRO STATION 1km - 2km RADIUS
- 800m RADIUS FROM TOWN CENTRE





### 9.17 Connectivity - Local

The figure adjacent shows areas of good connectivity from local road intersections that access infrastructure corridors connecting the GPEC area with Greater Sydney.

Unshaded areas have poor connectivity due to infrequent intersections allowing for change in directions or access to other locations when travelling via vehicle.

Intersections where good or disconnected connections are located are numbered as below:

- ① The Kingsway - Werrington
- ② A44 Great Western Highway - Werrington
- ③ M4 Western Motorway - Orchard Hills
- ④ From M7 overpass looking towards railway line - Rooty Hill
- ⑤ Luddenham Road - Orchard Hills
- ⑥ Durham Street - Oxley Park
- ⑦ Richmond Road - Colebee
- ⑧ Simms Road - Oakhurst - Bicycle and pedestrian access only
- ⑨ Samuel Marsden Road - Orchard Hills
- ⑩ Flinders Lane - Orchard Hills
- ⑪ Plumpton Road - Plumpton - No Access
- ⑫ Power Street - Glendenning
- ⑬ M4 - Eastern Creek
- ⑭ Eastern Creek Suez Public Dropoff - No access
- ⑮ Intersection of Chilton Ave & Florence St - Oakhurst - Bicycle and pedestrian access only

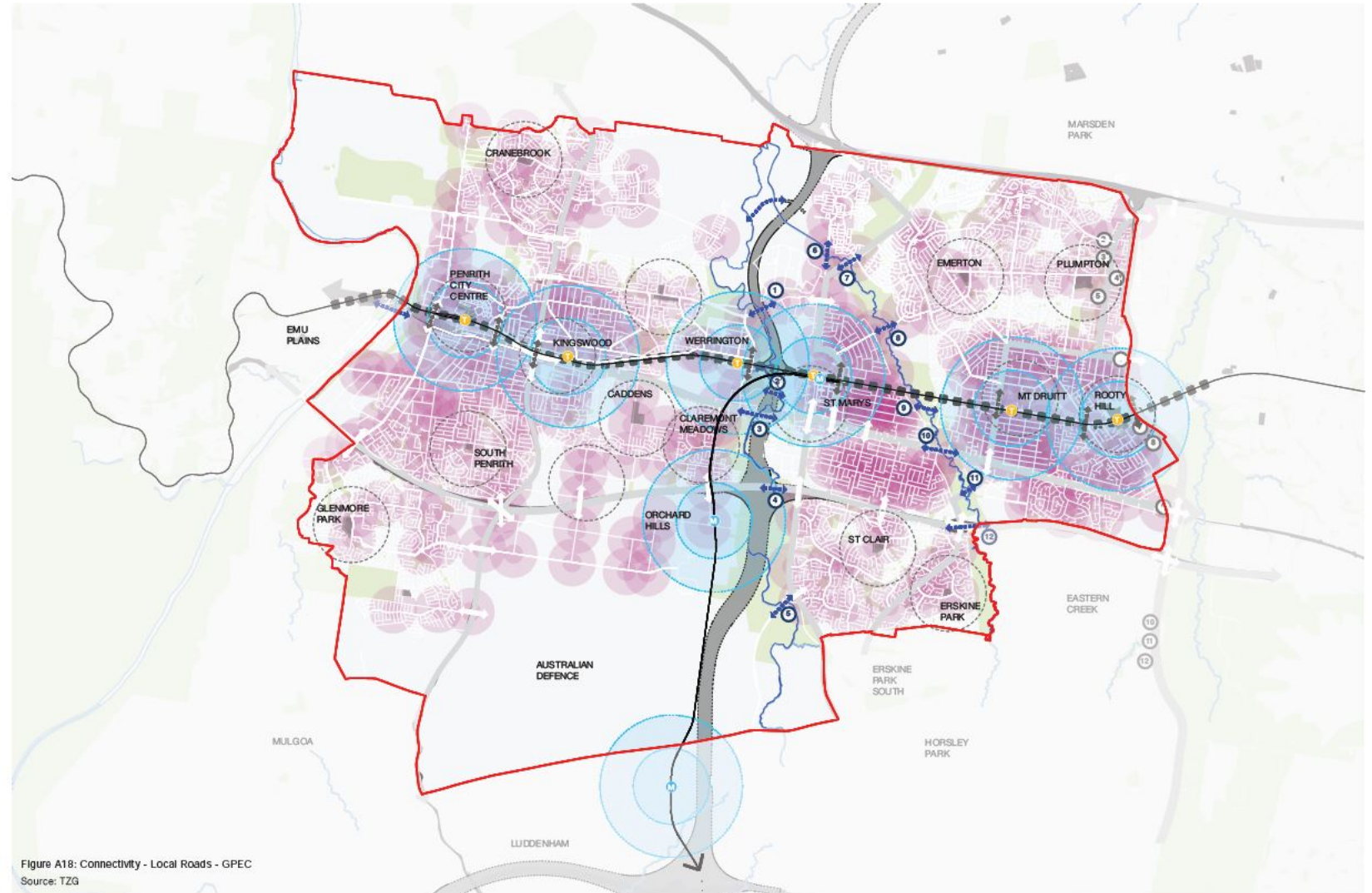


Figure A18: Connectivity - Local Roads - GPEC  
Source: TZG

**Legend:**

- CENTRE
- PROPOSED OUTER SYDNEY ORBITAL / FUTURE CASTLEREAGH HIGHWAY & METRO LINE
- RAIL CORRIDOR
- ROPES CREEK - SOUTH CREEK
- EXISTING CONNECTIONS ACROSS CREEK
- EXISTING CONNECTIONS ACROSS RAIL CORRIDOR

- HIGHWAY AND PRIMARY ROADS
- LOCAL ROADS
- MAJOR INTERSECTIONS / ENTRY/EXIT TO ARTERIAL ROADS
- PROXIMITY TO MAJOR INTERSECTION 200 - 500m RADIUS

- PROXIMITY TO TRAIN/METRO STATION 1km - 2km RADIUS
- 800m RADIUS FROM TOWN CENTRE





Connected and Disconnected Conditions

A good connected environment seeks to reduce car focused urban conditions by balancing walking, cycling or public transport connections and seeks to discourage car use and make local trips easier or more pleasant by foot or active transport.

Within GPEC, most 'connected' conditions comprise of roads with wider footpaths and separated cycle routes both sides of the road, are flanked by established vegetation and generally have calmer traffic conditions. Most connected conditions don't prioritise pedestrian crossing opportunities or have continuous pedestrian routes, so could be improved vastly to create a well-connected, attractive, and permeable network.

A disconnected condition often occurs at the intersection of a highway / transport corridor with local roads, waterways or green space. Permeability is inhibited for pedestrians and active transport by tall fences, cut and fill, raised embankments and blank walls on highway edges, and also the car dominated, wide traffic intersections that often lack safe pedestrian crossing opportunities.

Whilst most disconnected conditions have visual connection to green space, a lack of physical connection plus a lack of vegetation contribute to creating under utilised, poor quality, 'leftover' green space adjacent to transport corridors or within residential areas.



1 The Kingsway - Werrington



2 A44 Great Western Highway - Werrington



3 M4 Western Motorway - Orchard Hills



4 From M7 overpass looking towards railway line - Rooty Hill



5 Luddenham Road - Orchard Hills



6 Durham Street - Oxley Park



7 Richmond Road - Colebee



8 Simms Road - Oakhurst - Bicycle and pedestrian access only



9 Samuel Marsden Road - Orchard Hills



10 Flinders Lane - Orchard Hills



11 Plumptre Road - Plumptre - No Access



12 Power Street - Glendenning



13 M4 - Eastern Creek



14 Eastern Creek Suez Public Dropoff - No access



15 Intersection of Chilton Ave & Florence St - Oakhurst - Bicycle and pedestrian access only



### 9.18 Existing Centres and Employment Land

Penrith functions as one part of the Metropolitan Cluster within the Western Parkland City, and is the major location for employment, retail and services within GPEC. St Marys and Mount Druitt are identified as strategic centres, and many other local centres exist within GPEC that provide for the daily needs of residents in the local neighbourhood.

Local centres are typically at the middle point of local suburbs, roughly equidistant between surrounding arterial roads, creating 'self contained' residential suburbs. These local centres often contain local-focused community services, small local 'high streets' with a retail focus, and local education or social amenities within 800m distance. Orchard Hills North and Orchard Hills town centre are future local amenity points. Marsden Park residential growth area will provide for more local services to the north of GPEC.

The established centres comprise larger scale 'high streets' and provide opportunities for continuous active frontages with more mixed retail / commercial focus. They typically contain regional services including higher education, justice, health facilities, regional entertainment or recreation facilities and regional social or community services.

Non-residential centres comprise a majority of industrial or low density employment lands within Erskine Park south, Eastern Creek, St Marys North, Emu Plains (across the Nepean) and Penrith North and are located within close proximity to transport corridors.

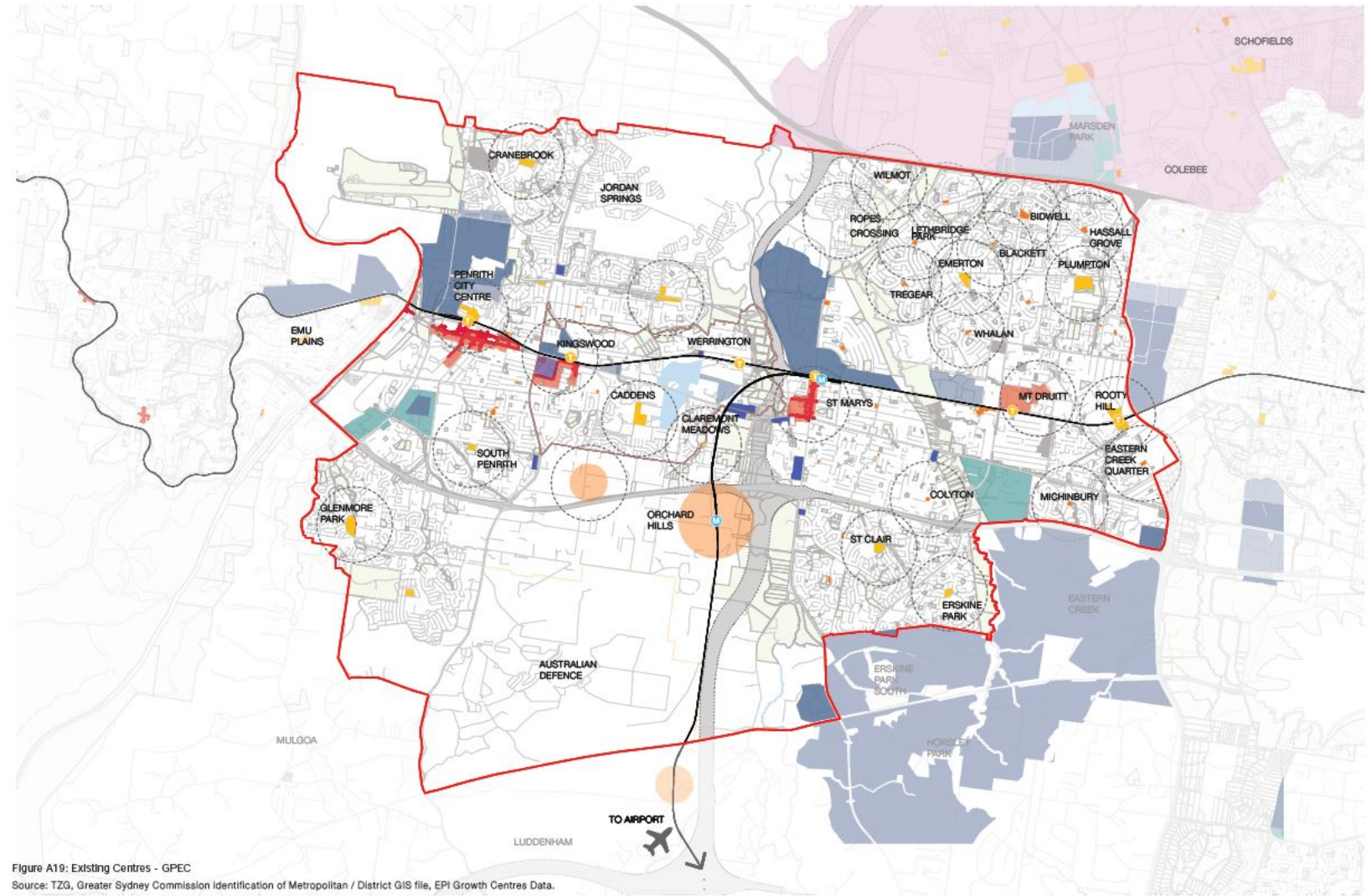


Figure A19: Existing Centres - GPEC  
 Source: TZG, Greater Sydney Commission Identification of Metropolitan / District GIS file, EPI Growth Centres Data.





## 9.19 Housing Diversity

The adjacent map shows the predominant housing types located within SA1 zones across the GPEC area.

A few clear trends in existing housing type across GPEC are prevalent including:

- The majority of housing stock across GPEC is single dwelling or separate house stock, resulting in a relatively low density across most of the study area.
- Some pockets of medium density dwellings are primarily located in larger town centres such as Penrith, Mount Druitt and St Marys. There is a trend of medium density dwellings developing along the T1 train line from St Marys to Penrith.
- Pockets of high density dwelling types exist but are not common within the study area. Where they do occur they are usually directly adjacent to train station infrastructure or on the edge of larger town centres such as Mt Druitt or Penrith.
- Blacktown Council LGA is generally of lower density than Penrith Council LGA, with less pockets of medium and high density dwellings being located at regular intervals.
- Pockets of 'no dominant dwelling types' generally include business, commercial, retail or industrial uses when compared to the Zoning maps and aerial maps. Often medium or high density is located within close proximity to these areas.

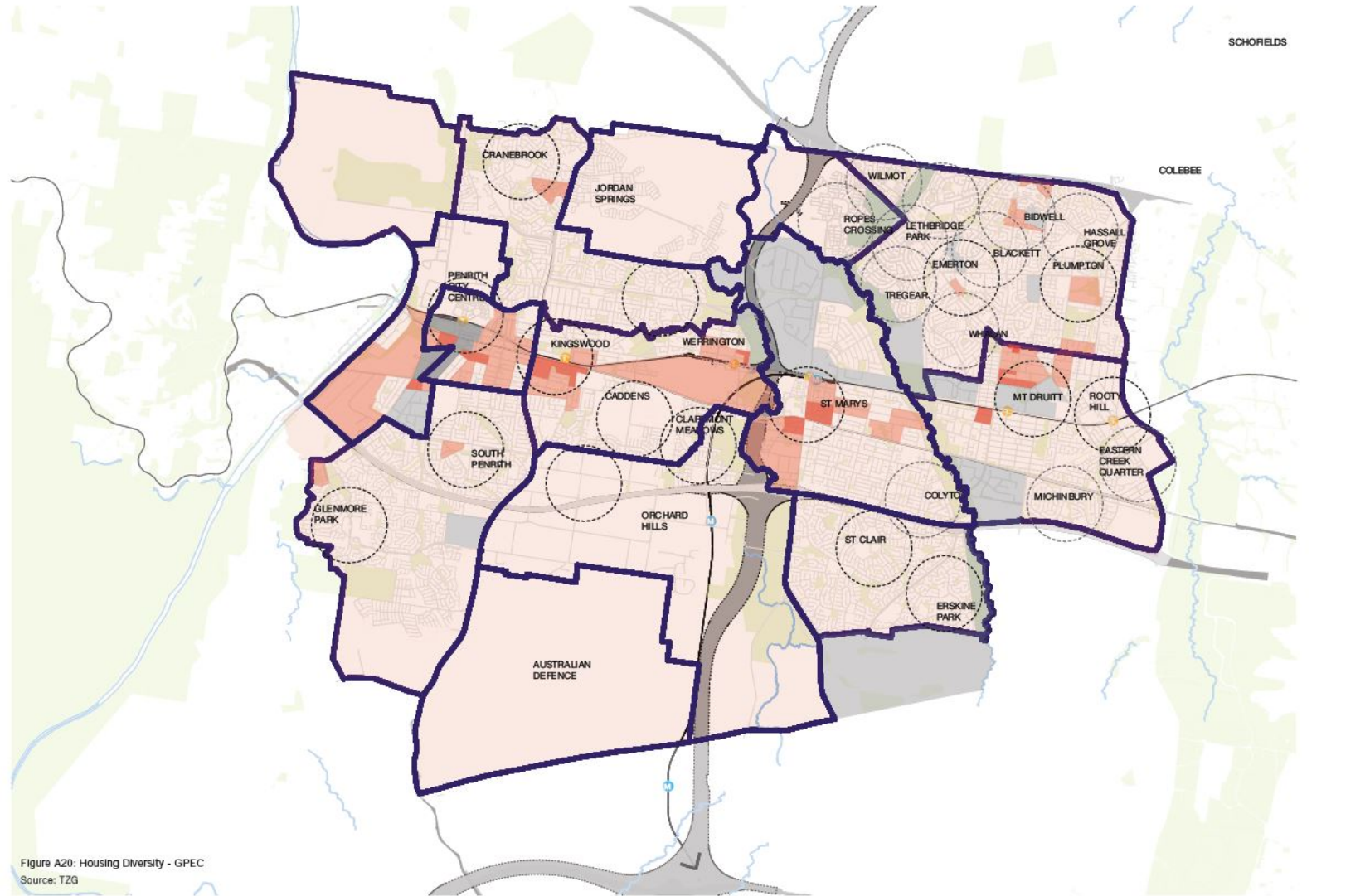
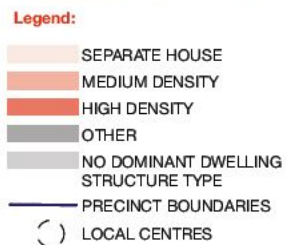


Figure A20: Housing Diversity - GPEC  
Source: TZG





## 9.20 Existing Land Zoning

The GPEC area comprises a mix of land use zones, with each precinct containing a unique distribution of urban, rural and environmental uses.

While for GPEC's urban zoned lands, employment-generating uses account for 13% of this area in comparison to residential uses which account for over 40%.\*

The majority of land zoned for residential uses in the GPEC investigation area is zoned low-density residential, with 1% of this area being zoned for medium to high density residential and another 1% zoned rural/village residential.\*

A key finding from the GPEC PIC is that land rezoned or under investigation in the initial PIC area will exceed the amount of land required in the next 15 to 20 years. There will be a need to strike a balance as to how long-term growth occurs within GPEC to ensure growth patterns can be coordinated with the necessary infrastructure and services to accommodate future demand.

Source: GPEC PIC Analysis Report page 40-41.

\*Note these percentages need to be confirmed with measurement specific for GPEC.

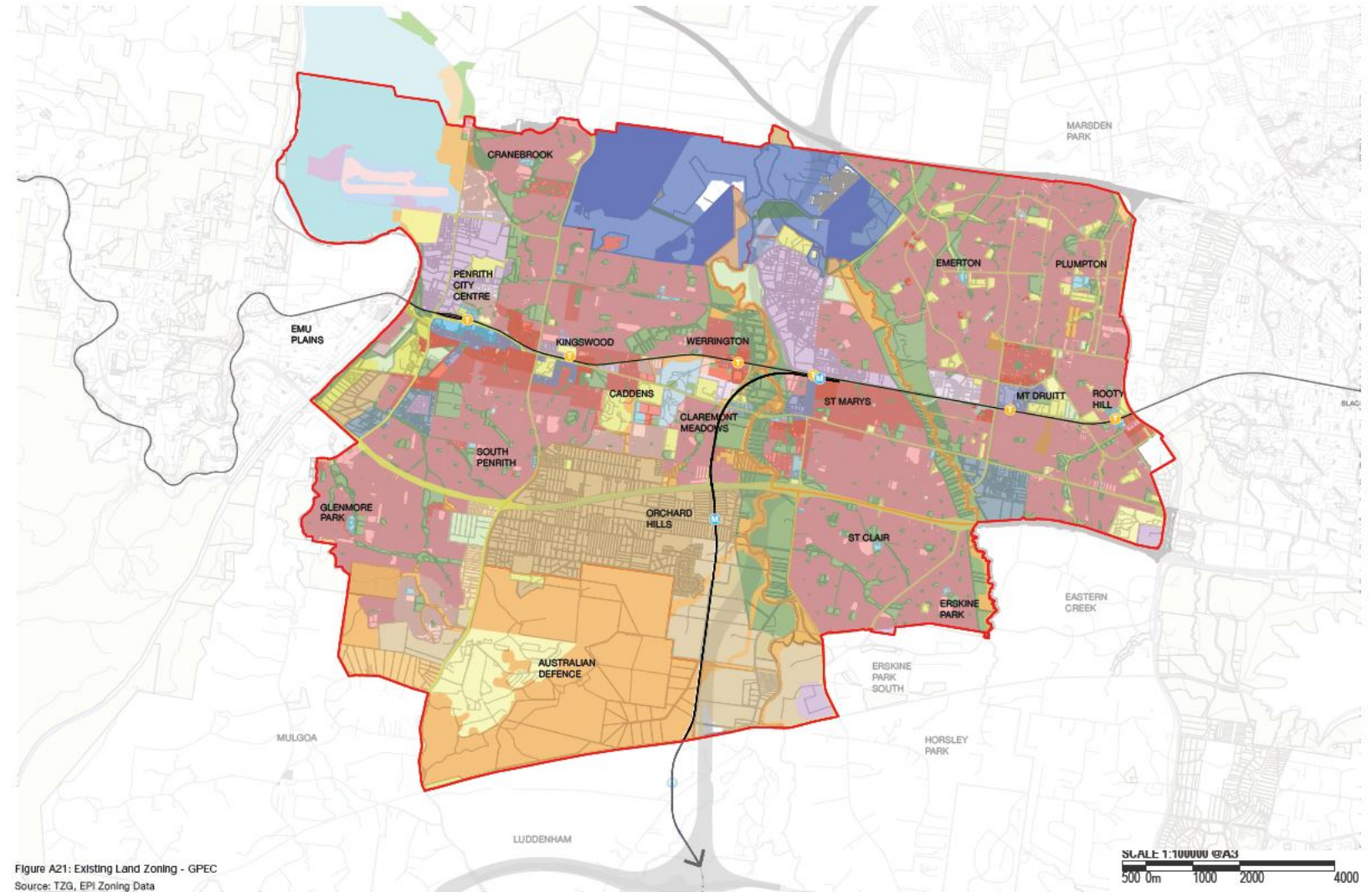


Figure A21: Existing Land Zoning - GPEC  
Source: TZG, EPI Zoning Data

**Legend:**

<span style="display:inline-block; width:15px; height:15px; background-color:#ADD8E6; border:1px solid black;"></span> B1 NEIGHBOURHOOD CENTRE	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> C2 ENVIRONMENTAL CONSERVATION	<span style="display:inline-block; width:15px; height:15px; background-color:#FF6347; border:1px solid black;"></span> R4 HIGH DENSITY RESIDENTIAL	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> W1 NATURAL WATERWAYS	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> ENVIRONMENT
<span style="display:inline-block; width:15px; height:15px; background-color:#4682B4; border:1px solid black;"></span> B2 LOCAL CENTRE	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> C3 ENVIRONMENTAL MANAGEMENT	<span style="display:inline-block; width:15px; height:15px; background-color:#F08080; border:1px solid black;"></span> R5 LARGE LOT RESIDENTIAL	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> W2 RECREATIONAL WATERWAYS	<span style="display:inline-block; width:15px; height:15px; background-color:#ADD8E6; border:1px solid black;"></span> UNZONED
<span style="display:inline-block; width:15px; height:15px; background-color:#4682B4; border:1px solid black;"></span> B3 COMMERCIAL CENTRE	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> C4 ENVIRONMENTAL LIVING	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> RE1 PUBLIC RECREATION	<span style="display:inline-block; width:15px; height:15px; background-color:#ADD8E6; border:1px solid black;"></span> DM DEFERRED MATTER	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> RESIDENTIAL
<span style="display:inline-block; width:15px; height:15px; background-color:#4682B4; border:1px solid black;"></span> B4 MIXED USE	<span style="display:inline-block; width:15px; height:15px; background-color:#9370DB; border:1px solid black;"></span> IN1 GENERAL INDUSTRIAL	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> RE2 PRIVATE RECREATION	<span style="display:inline-block; width:15px; height:15px; background-color:#4169E1; border:1px solid black;"></span> RP	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> TOURISM
<span style="display:inline-block; width:15px; height:15px; background-color:#4682B4; border:1px solid black;"></span> B5 BUSINESS DEVELOPMENT	<span style="display:inline-block; width:15px; height:15px; background-color:#9370DB; border:1px solid black;"></span> IN2 LIGHT INDUSTRIAL	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> RU4 PRIMARY PRODUCTION SMALL LOTS	<span style="display:inline-block; width:15px; height:15px; background-color:#4169E1; border:1px solid black;"></span> UR	<span style="display:inline-block; width:15px; height:15px; background-color:#ADD8E6; border:1px solid black;"></span> WATERWAY
<span style="display:inline-block; width:15px; height:15px; background-color:#4682B4; border:1px solid black;"></span> B6 ENTERPRISE CORRIDOR	<span style="display:inline-block; width:15px; height:15px; background-color:#FF6347; border:1px solid black;"></span> R1 GENERAL RESIDENTIAL	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> SP1 SPECIAL ACTIVITIES	<span style="display:inline-block; width:15px; height:15px; background-color:#9370DB; border:1px solid black;"></span> EM	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> PARKLAND
<span style="display:inline-block; width:15px; height:15px; background-color:#4682B4; border:1px solid black;"></span> B7 BUSINESS PARK	<span style="display:inline-block; width:15px; height:15px; background-color:#FF6347; border:1px solid black;"></span> R2 LOW DENSITY RESIDENTIAL	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> SP2 INFRASTRUCTURE	<span style="display:inline-block; width:15px; height:15px; background-color:#9370DB; border:1px solid black;"></span> RO	<span style="display:inline-block; width:15px; height:15px; background-color:#FFD700; border:1px solid black;"></span> EMPLOYMENT
<span style="display:inline-block; width:15px; height:15px; background-color:#FF6347; border:1px solid black;"></span> C1 NATIONAL PARKS AND NATURE RESERVES	<span style="display:inline-block; width:15px; height:15px; background-color:#FF6347; border:1px solid black;"></span> R3 MEDIUM DENSITY RESIDENTIAL	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> SP3 TOURIST	<span style="display:inline-block; width:15px; height:15px; background-color:#90EE90; border:1px solid black;"></span> RW	
			<span style="display:inline-block; width:15px; height:15px; background-color:#FF6347; border:1px solid black;"></span> DR	





## 9.21 Floor Space Ratio

There are few Floor Space Ratio (FSR) controls applying to land within the GPEC area. The majority of FSR Controls are located around Penrith Town Centre, Kingswood Station, St Marys Station. These controls are generally between 3:1 and 5:1.

A few scattered locations outside town centres contain low FSR controls of 0.4-0.5:1 such as at Werrington town centre's local shops, South Penrith local shops, scattered low residential land release areas within Kingswood or existing commercial / retail / community uses located outside of town centre areas.

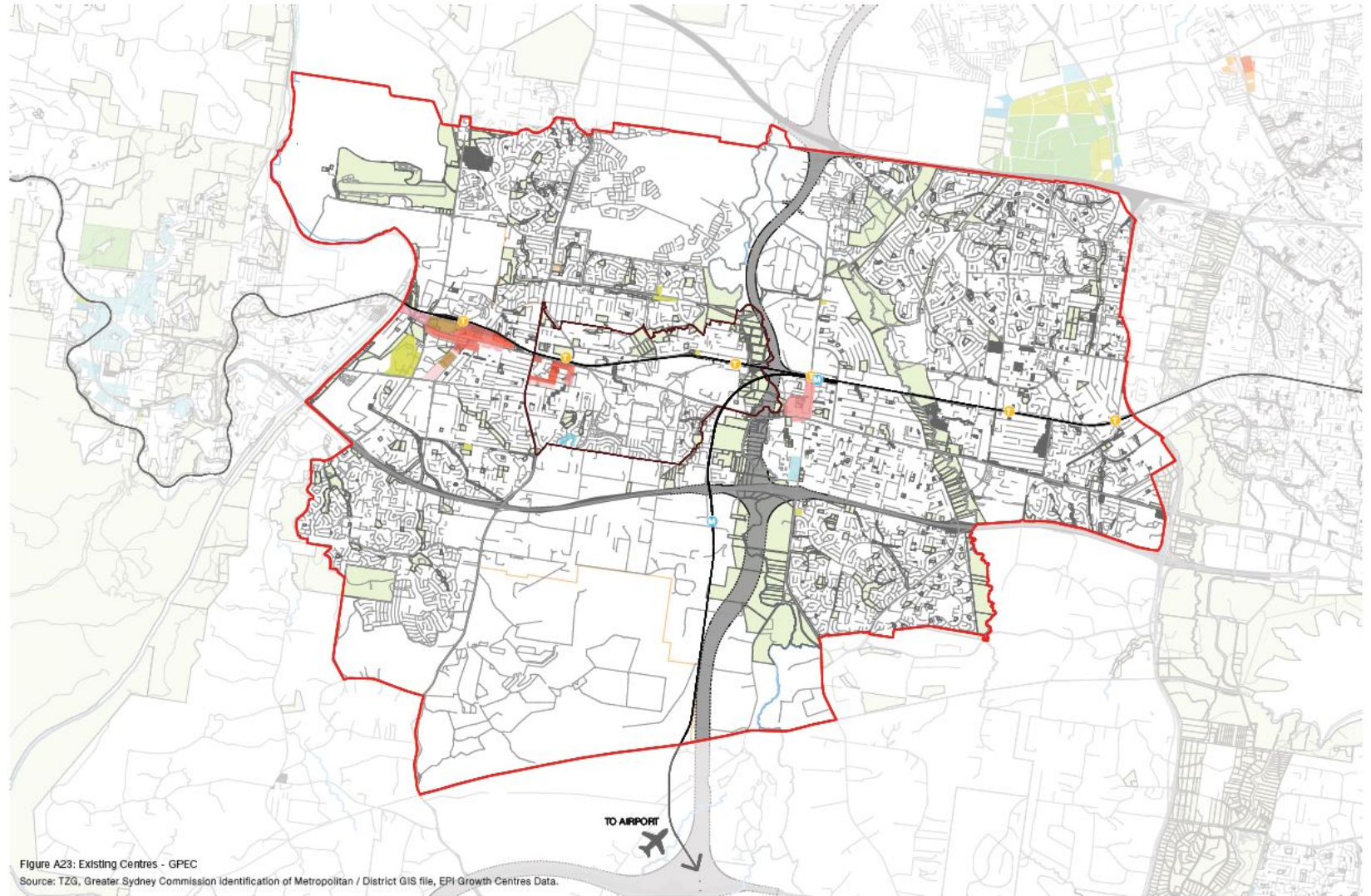
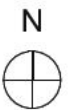


Figure A23: Existing Centres - GPEC  
Source: TZG, Greater Sydney Commission Identification of Metropolitan / District GIS file, EPI Growth Centres Data.

**Legend:**

0.35:1	0.65:1	0.95:1	1.5:1	3.5:1
0.4:1	0.7:1	1:1	1.6:1	4:1
0.45:1	0.75:1	1.1:1	1.75:1	4.5:1
0.5:1	0.8:1	1.2:1	2:1	5:1
0.55:1	0.85:1	1.3:1	2.5:1	5.5:1
0.6:1	0.9:1	1.4:1	3:1	



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



## 9.22 Land Ownership

Large private land holdings within GPEC include various university or higher education land holdings, various industrial or employment land holdings. Large land holdings outside and adjoining to GPEC include the future Sydney Science Park and the Aerotropolis to the south.

The GPEC Area has a wide variety of government owned land by scale and government level ownership including:

- Transport corridors.
- Large parcels of land within various nature reserves, creek corridors and localised public open space used for conservation and recreation purposes.
- Land reservations for utility corridors.
- Social Housing in developed suburbs owned by the Land and Housing Corporation (LAHC) is largely located within the Mt Druitt - Rooty Hill and the Luxford precinct across scattered land subdivisions, with smaller areas of scattered LAHC ownership throughout Cranebrook, Kingswood, St Marys, St Marys North, St Clair, Colyton and Glenmore Park.
- Significant land holdings of the Australia Defence Establishment and Penrith Lakes.

While government owned open space, conservation or recreational lands have no development potential, there are opportunities for these areas to integrate with the Green Grid where this is compatible with conservation objectives.

Established urban areas are constrained by fragmented land ownership, while large rural holdings have the capacity to develop rapidly once services are provided and the landholder is willing to cease their existing land use.

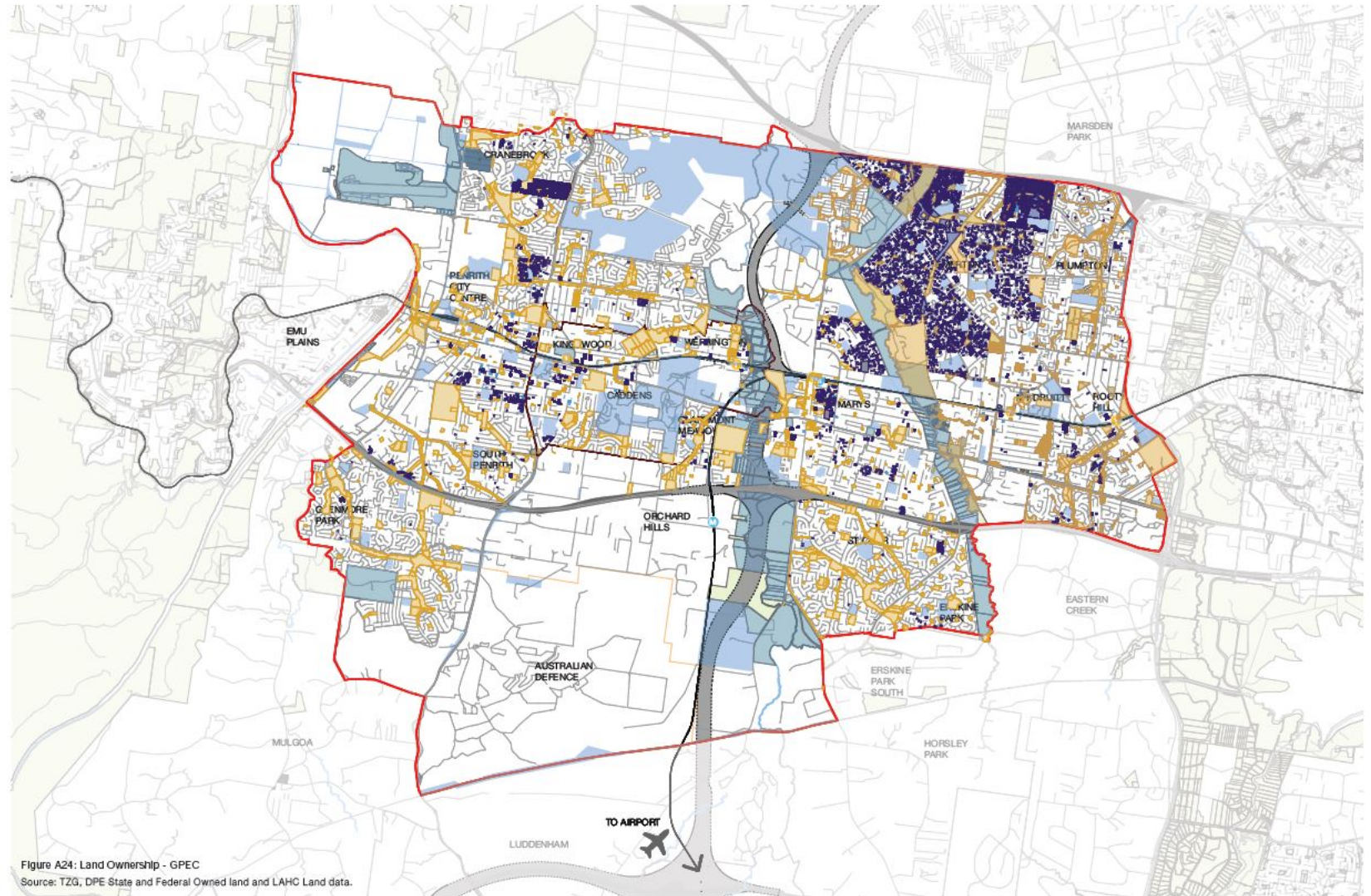
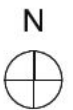


Figure A24: Land Ownership - GPEC  
Source: TZG, DPE State and Federal Owned land and LAHC Land data.





### 9.23 Existing Maximum Building Heights

The maximum building heights controls shown in Figure A25 adjacent are defined by the Penrith and Blacktown LEP's applicable to the GPEC area.

Generally, existing maximum building heights across GPEC are:

- Capped at 12m across industrial, employment, commercial or retail areas.
- Between 6-9m outside town centre areas.
- At existing strategic town centres of St Marys, Penrith and Mt Druiitt heights are between 15m and 27m in fringe areas.
- Between 27m – 64m applicable to lots adjacent to Penrith, St Marys and Mt Druiitt stations.
- Up to 12.5m at the Western Sydney University campus.

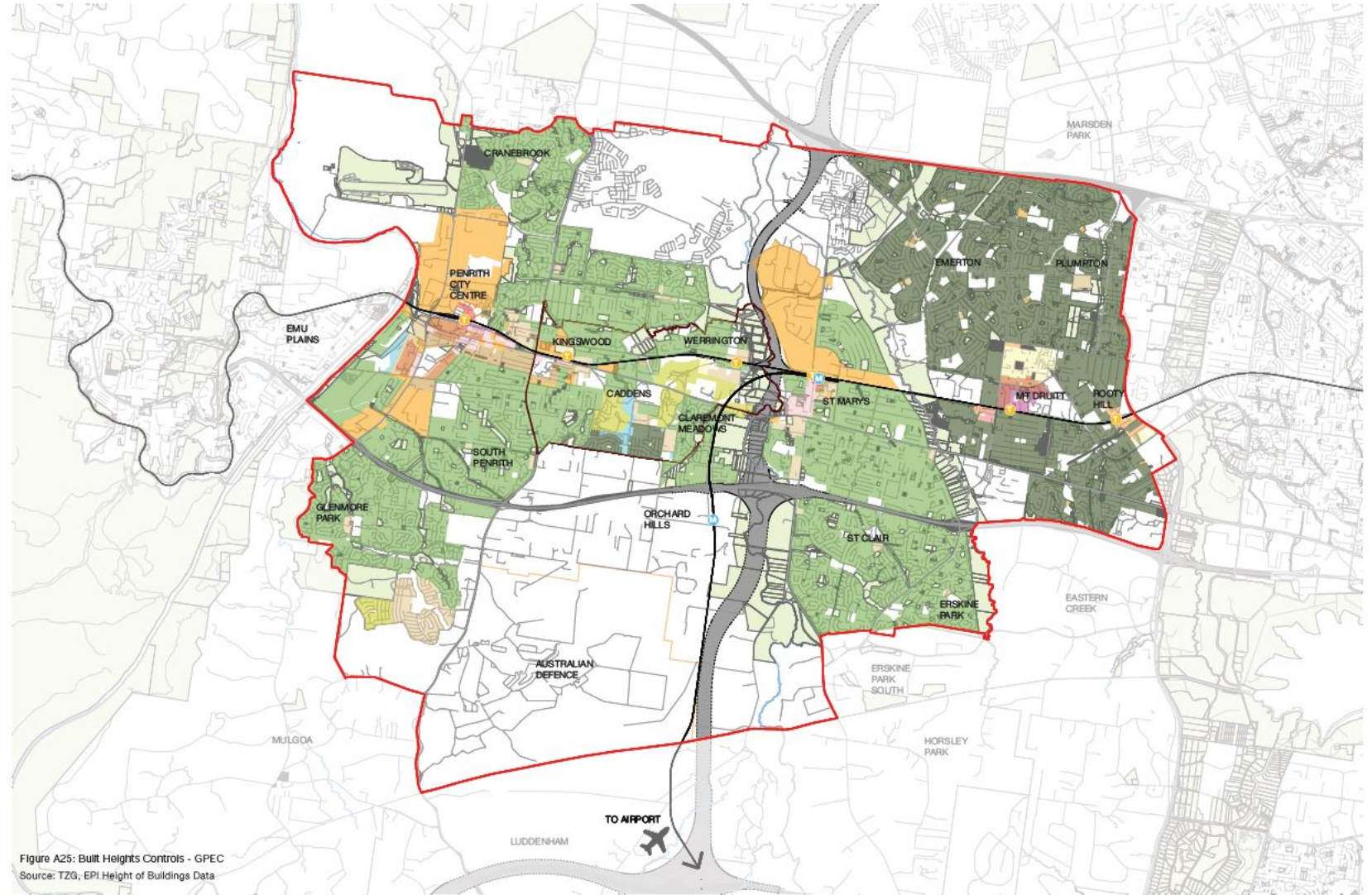


Figure A25: Built Heights Controls - GPEC  
Source: TZG, EPI Height of Buildings Data

**Legend:**

<span style="display:inline-block; width:15px; height:15px; background-color:lightblue;"></span> 5m	<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span> 14m	<span style="display:inline-block; width:15px; height:15px; background-color:pink;"></span> 24m	<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span> 61m
<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen;"></span> 8.5m	<span style="display:inline-block; width:15px; height:15px; background-color:lightorange;"></span> 15m	<span style="display:inline-block; width:15px; height:15px; background-color:lightred;"></span> 26m	<span style="display:inline-block; width:15px; height:15px; background-color:lightpurple;"></span> 64m
<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span> 9m	<span style="display:inline-block; width:15px; height:15px; background-color:yelloworange;"></span> 16m	<span style="display:inline-block; width:15px; height:15px; background-color:lightcoral;"></span> 27m	<span style="display:inline-block; width:15px; height:15px; background-color:mediumpurple;"></span> 80m
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span> 10m	<span style="display:inline-block; width:15px; height:15px; background-color:gold;"></span> 18m	<span style="display:inline-block; width:15px; height:15px; background-color:coral;"></span> 32m	
<span style="display:inline-block; width:15px; height:15px; background-color:orangeyellow;"></span> 12m	<span style="display:inline-block; width:15px; height:15px; background-color:darkorange;"></span> 20m	<span style="display:inline-block; width:15px; height:15px; background-color:firebrick;"></span> 40m	
<span style="display:inline-block; width:15px; height:15px; background-color:yellowgreen;"></span> 12.5m	<span style="display:inline-block; width:15px; height:15px; background-color:darkred;"></span> 21m	<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span> 50m	



SCALE 1:100000 @A3  
500 0m 1000 2000 4000



### 9.24 Minimum Lot Size

The lot sizes shown in Figure A26 adjacent are defined by the Penrith and Blacktown LEP within the GPEC area. This figure indicates the minimum lot size for subdivision that currently applies to these land holdings. These controls determine the minimum size of any lot resulting from a subdivision of land to which these clauses applies is not to be less than the minimum size shown on the lot size map.

Minimum lot sizes are currently applicable to most land holdings within the GPEC area and are implemented to:

- Ensure that lot sizes are compatible with the environmental capabilities of the land being subdivided,
- Minimise any impact of subdivision and development on the amenity of neighbouring properties,
- Ensure that lot sizes and dimensions allow developments to be sited to protect natural or cultural features,
- Regulate the density of development, or
- To ensure that lot sizes and dimensions are able to accommodate development consistent with relevant development controls.

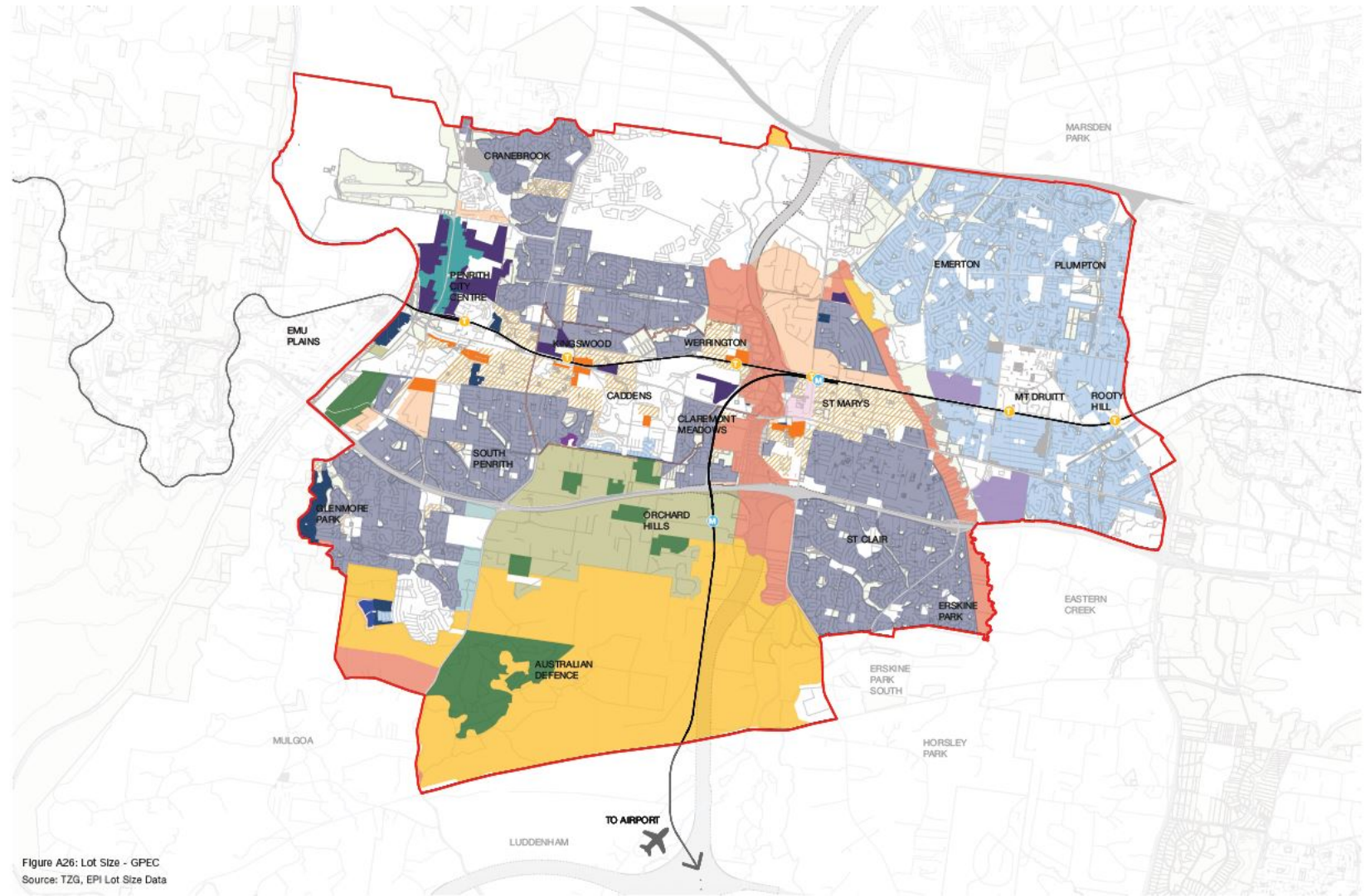
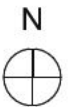


Figure A26: Lot Size - GPEC  
Source: TZG, EPI Lot Size Data

**Legend:**

	LOT SIZE 400m2		LOT SIZE 1000m2		LOT SIZE 200,000m2 (20 ha)
	LOT SIZE 450m2		LOT SIZE 1200m2		LOT SIZE 400,000m2 (40 ha)
	LOT SIZE 550m2		LOT SIZE 1500m2		LOT SIZE 10,000,000m2 (100 ha)
	LOT SIZE 600m2		LOT SIZE 2000m2		LOT SIZE 20,000,000m2 (200 ha)
	LOT SIZE 650m2		LOT SIZE 10,000m2		
	LOT SIZE 750m2		LOT SIZE 12,500m2		
	LOT SIZE 800m2		LOT SIZE 20,000m2		





## 9.25 Community, Social and Recreation

Social infrastructure in the GPEC area is largely concentrated in existing urbanised areas and is closely aligned with transport corridors and strategic centres.

Most health and education assets are located along railway corridors, reflecting older patterns of development in the GPEC area. Smaller scale health and education facilities are located in the rural villages with the concentration of high school, tertiary education and major health services within the larger regional centres of St Marys, Penrith, Mt Druiitt and in Werrington.

The GPEC area has 15 high schools, (1 high school located outside of the boundary but with a catchment inside GPEC), 12 non-government schools, 27 pre-schools and 46 primary schools.

Two hospitals sit within the GPEC area including the Nepean Hospital and the Mt Druiitt Campus of Blacktown & Mt Druiitt Hospital. Several hospitals surrounding the GPEC area are committed for redevelopment, including Campbelltown, Liverpool, Nepean and Westmead hospitals.

There are 8 state and regionally significant cultural infrastructure assets currently within GPEC, a strong performing and visual arts sector within Penrith.

Justice facilities are generally located close to higher population and are often close to major transport corridors. There are four NSW Department of Justice (DoJ), six Fire and Rescue NSW (FRNSW) and three NSW Police facilities in the GPEC area. Within the GPEC area there is a Correctional Facility at Emu Plains and the Cobham Juvenile Justice Centre at Werrington. The GPEC area is primarily serviced by two courthouses at Penrith and Mount Druiitt.

Source: GPEC PIC

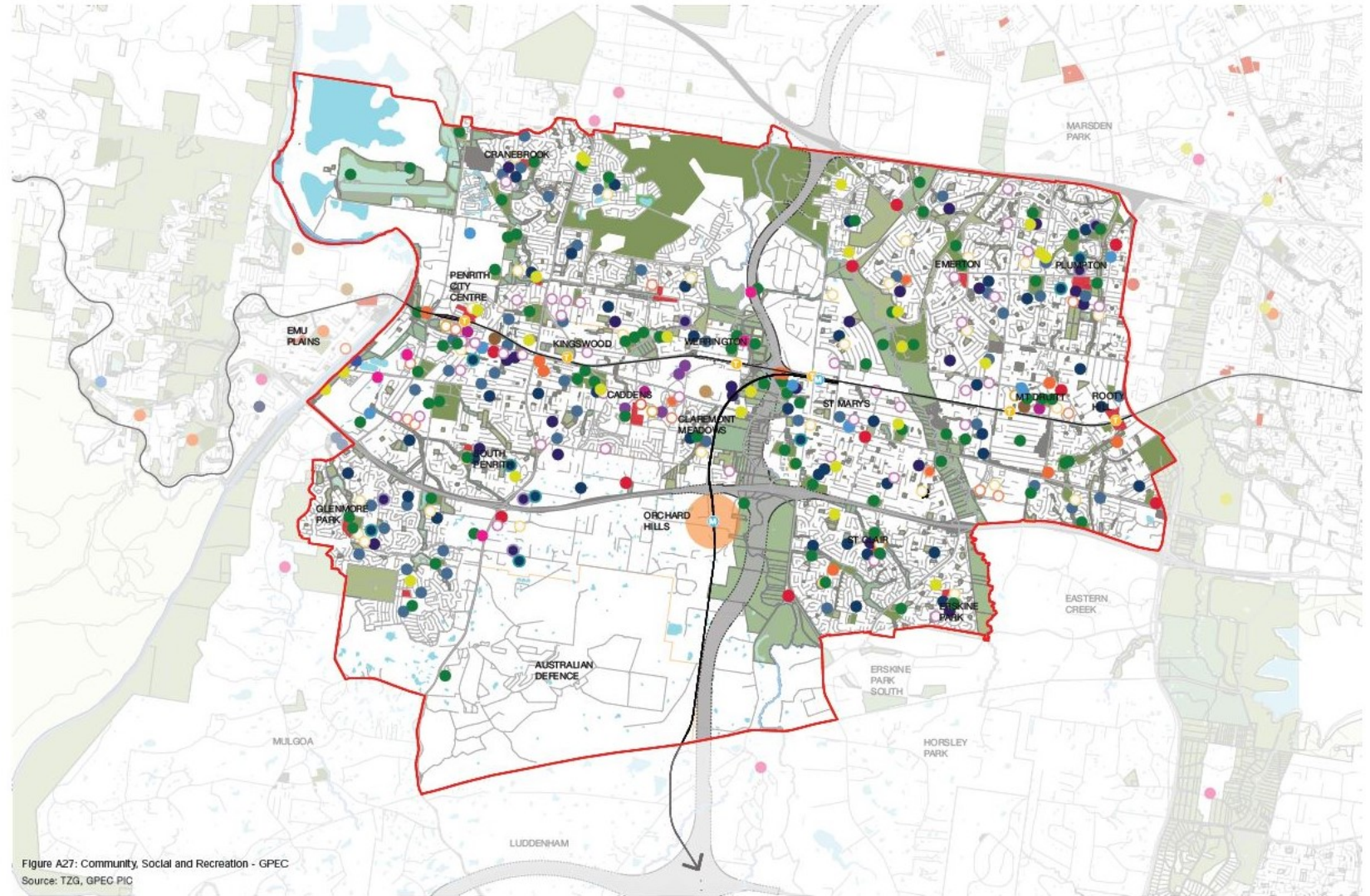


Figure A27: Community, Social and Recreation - GPEC  
Source: TZG, GPEC PIC

**Legend:**

**ESSENTIAL SERVICES**

- FIRE STATION
- POLICE STATION
- JUSTICE FACILITIES
- COURTHOUSE
- HOSPITAL
- AMBULANCE

**EDUCATION**

- PRIMARY SCHOOL
- PRIVATE PRIMARY SCHOOL
- HIGH SCHOOL
- PRIVATE HIGH SCHOOL
- PRE SCHOOL
- TAFE
- UNIVERSITY

**COMMUNITY**

- LIBRARY
- COMMUNITY CENTRE
- ART GALLERY
- PERFORMING ARTS
- PLACE OF WORSHIP
- COMMUNITY SPORTS FIELDS
- SWIMMING POOLS

- LOCAL OPEN SPACE - COUNCIL OWNED\*
- REGIONAL OPEN SPACE - FEDERAL & STATE OWNED\*
- TENNIS COURT
- PLAYGROUNDS
- GREAT RIVER WALK
- EXISTING TOWN CENTRE
- PLANNED TOWN CENTRE



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500 0m 1000 2000 4000



## 9.26 Major Infrastructure and Contamination

While the majority of utility services are clustered in the existing urban areas of the GPEC, a number of Sydney's core service corridors pass through the non-urban areas including primary water supply channels and pipelines linking the water supply dams to treatment plants, an underground gas pipeline and overhead high-voltage transmission lines.

The Wianamatta-South Creek and Ropes Creek corridors contain regional use Electricity Transmission lines.

The southern boundary of the GPEC area is bounded by Sydney's fresh water pipeline which creates a barrier to development and connectivity

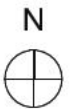
Figure A28 adjacent shows contaminated site locations identified on the NSW Environment Protection Authority (EPA) register as well as a number of key contaminated sites regulated under the CLM Act.



Figure A28: Infrastructure - GPEC  
Source: TZG, DPE Electricity Transmission line data, GPEC PIC Contamination

**Legend:**

- ..... ELECTRICITY TRANSMISSION LINES OVERHEAD
- WATER PIPELINE
- UTILITY WATER SUPPLY
- WESTERN SYDNEY PRIMARY MAIN
- GAS PIPELINE
- EPA WASTE INFRASTRUCTURE
- EPA CONTAMINATED SITE
- EPA ENVIRO PROTECTION



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ETHOS  
URBAN

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JMD design

