A19 Infrastructure Phasing Plan

infrastructure & development consulting

Appin (Part 2) Precinct

Infrastructure Phasing Plan

October 2024

1 Introduction

1.1 The Proposal

The Proponent has prepared the subject submission to rezone 91.72 hectares of land (the Site) within the Appin Precinct from *RU2 Rural Landscape* to the following zones:

- **Urban Development Zone**
  Zone 1 Urban Development (UDZ)
- **Conservation Zone**
  Zone C2 Environmental Conservation (C2)

The Site is known as the Appin (Part 2) Precinct. The Site directly adjoins the Appin (Part 1) Precinct – refer to Figure 1.

1.2 The Appin (Part 1) Precinct Planning Proposal (PP-2022-3979)

In November 2022, Walker Corporation Pty Ltd and Walker Group Holdings Pty Ltd (the Proponent) lodged a Planning Proposal (PP-2022-3979) to rezone part of the Appin Precinct.

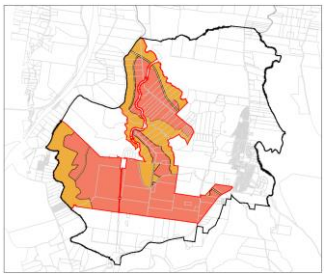
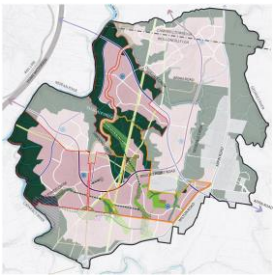
PP-2022-3979 (referred to as the Appin (Part 1) Precinct) proposes to rezone the land from RU2 Rural Landscape to Urban Development Zone (UDZ), C2 Environmental Conservation and SP2 Infrastructure via an amendment to *State Environmental Planning Policy (Precincts – Western Parkland City) 2021*.

The UDZ will facilitate approximately 12,000 dwellings. The C2 zone will facilitate the conservation of 470ha of endangered ecological community and help implement the Office of the NSW Chief Scientist & Engineer (NSW Chief Scientist) recommendations.

The new zones are accompanied by a structure plan outlining the intended land uses. In addition, the Proponent produced an Appin and North Appin Precincts Indicative Plan to illustrate how the new zones might fit within the broader precinct as land is developed. The Indicative Plan has no statutory weight and will be refined as further planning proposals are prepared.

These plans are summarised in Table 1.

Table 1 – PP-2022-3979 Title and Purpose of Plans

(1) APPIN & NORTH APPIN PRECINCTS INDICATIVE PLAN	(2) APPIN (PART 1) PRECINCT PLAN (*THE PRECINCT PLAN*)	(3) APPIN (PART 1) PRECINCT STRUCTURE PLAN (*THE STRUCTURE PLAN*)
Broader context and for information purposes only. It has no statutory weight. It identifies: • *Higher-order transport network* • *Centres hierarchy* • *School sites* • *Conservation areas* • *Residential areas* • *Cultural Sites and Connections*	*It shows the land proposed to be rezoned and incorporated into a new schedule in the Western Parkland City SEPP 2021.* *The precinct plan contains the development provisions (clauses and maps) applicable to the Site and is used in assessing development applications.*	*Structure plan for the Site, showing staging of release areas.* *Development is to be generally consistent with the structure plan. It illustrates land use components including (but not limited to):* • *Low and medium-density residential* • *Retail and employment centres* • *School* • *Open space* • *Drainage network/basins* • *Transport network*
 **(21,000 dwellings)**	 **(12,000 dwellings)**	 **(12,000 dwellings)**

1.3 Population Growth

Greater Sydney's population is projected to grow to approximately 6.1 million by 2041 – over a million more people than currently live in the Sydney region.

The NSW Government has identified Growth Areas to accommodate the population that will choose to live in greenfield areas (new suburbs). The Greater Macarthur Growth Area (GMGA) is one such growth area and is a logical extension of the urban form of south-west Sydney. The GMGA is divided into precincts. The Appin Precinct and North Appin Precinct are the southernmost land release precincts of the GMGA. The goal is to deliver 21,000 dwellings.

The rezoning and release of land for development will achieve this goal.

1.4 The Appin (Part 2) Precinct Planning Proposal

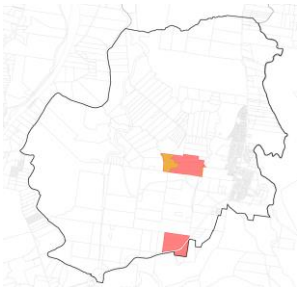
The Appin (Part 2) Precinct Plan (the precinct plan) shows the proposed new zones. 'The precinct plan' will be incorporated into the *State Environmental Planning Policy (Precincts – Western Parkland City) 2021* and contain the provisions (clauses and maps) that will apply to 'the Site.' 'The precinct plan' envisages the delivery of the following:

- 1,312 dwellings (as a mix of low-density, medium density and apartments)
- 30,312 sqm of gross lettable retail/commercial floor area
- 16.91ha conservation land

The planning proposal submission is aligned with strategic land use planning, State and local government policies, infrastructure delivery and PP-2022-3979. The development potential is tempered by a landscape-based approach that protects the environment and landscape values, shaping the character of new communities. A series of residential neighbourhoods are to be delivered within the landscape corridors of the Nepean and Cataract Rivers, supported by local amenities, transit corridors and community infrastructure.

The submission includes a hierarchy of plans. The plans and their purpose are summarised in Table 2.

Table 2 - The subject Planning Proposal's Plans and Proposal

(1) APPIN & NORTH APPIN PRECINCTS INDICATIVE PLAN	(2) APPIN (PART 2) PRECINCT PLAN (*THE PRECINCT PLAN*)	(3) APPIN (PART 2) PRECINCT STRUCTURE PLAN (*THE STRUCTURE PLAN*)
Broader context and for information purposes only. It has no statutory weight. It identifies: • *Higher-order transport network* • *Centres hierarchy* • *School sites* • *Conservation areas* • *Residential areas* • *Cultural Sites and Connections*	*It shows the land proposed to be rezoned and incorporated into a new schedule in the Western Parkland City SEPP 2021.* *The precinct plan contains the development provisions (clauses and maps) applicable to the Site and is used in assessing development applications.*	*Structure plan for the Site, showing staging of release areas.* *Development is to be generally consistent with the structure plan. It illustrates land use components including (but not limited to):* • *Low and medium-density residential* • *Retail and employment centres* • *School* • *Open space* • *Drainage network/basins* • *Transport network*
		
(21,000 dwellings)	**(1,312 dwellings)**	**(1,312 dwellings)**

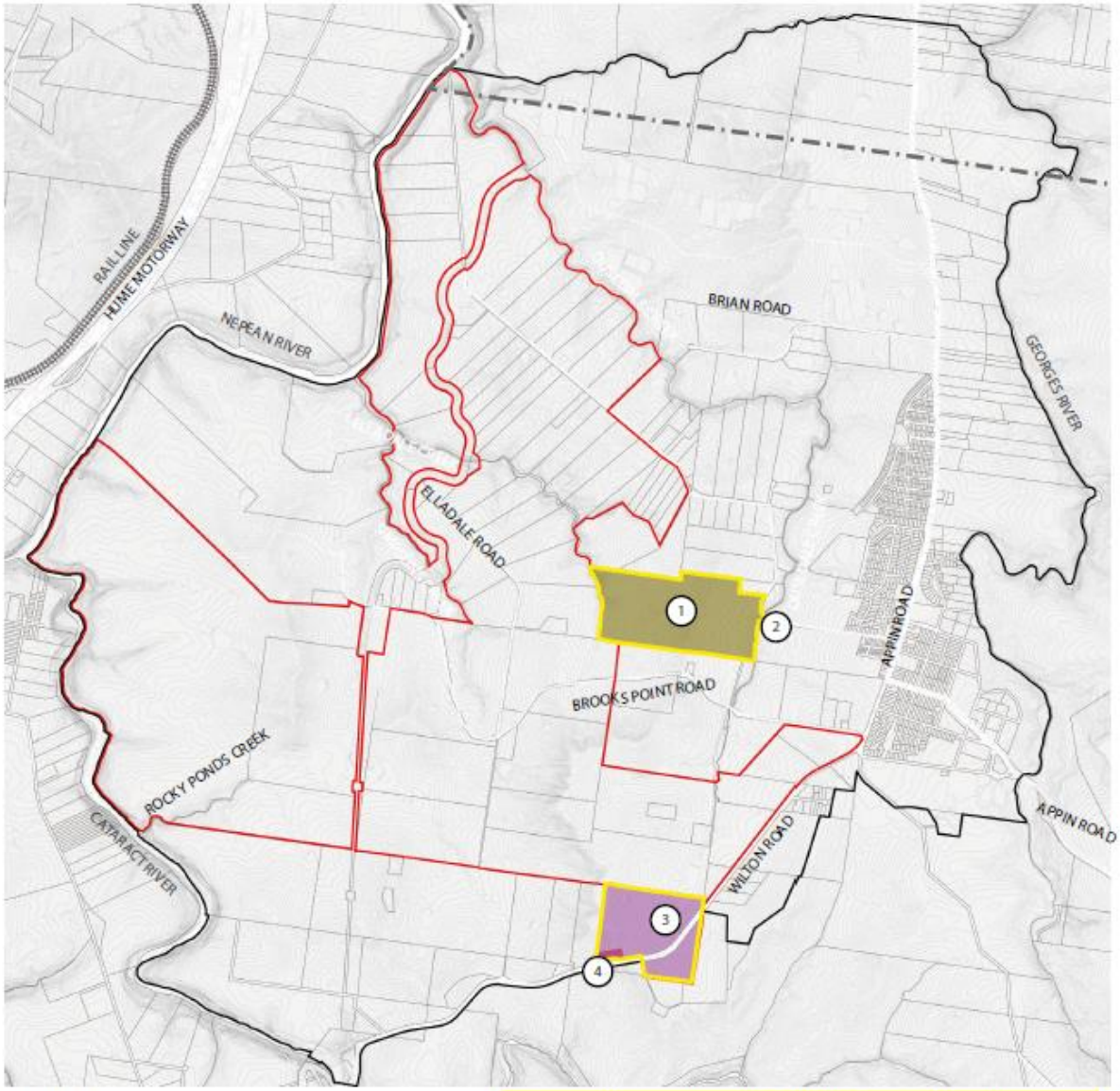
2 Purpose of the Report

IDC has been engaged by the Proponent to prepare an Infrastructure Phasing Plan to support the Appin (Part 2) Precinct Plan (the precinct plan) and Appin (Part 2) Precinct Structure Plan (the structure plan).

Refer to Figure 1 and Table 3 for key attributes of the precinct plan and structure plan area.

The Appin (Part 2) Precinct Plan zones land for conservation and urban development. It establishes the statutory planning framework permitting the delivery of a range of residential typologies, retail, education, business premises, recreation areas, and infrastructure services and provides development standards that development must fulfil. Within the proposed urban development zone, 1,312 dwellings and more than 30,000 sqm of gross lettable floor area for retail and commercial space can be delivered.

Figure 1 – Boundary of the Appin (Part 2) Precinct



LEGEND:

- Appin & North Appin Precinct Boundary
- Appin (Part) Precinct Plan
- Appin (Part 2) Precinct Boundary
- LGA Boundary

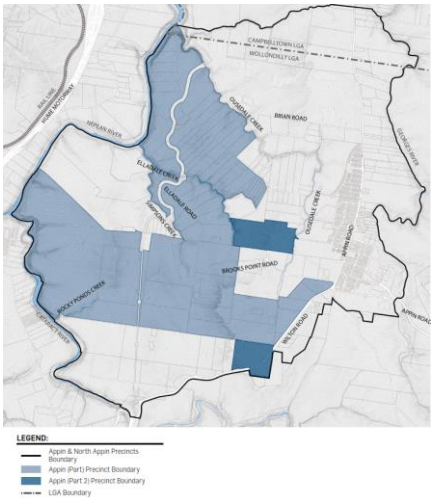
LAND OWNERSHIP

- Phillip Nelson Dunbier and Penny Grace Dunbier
- John Joseph McEvoy
- Glynis Rita Patrick

Properties forming the Appin (Part 2) Precinct

REF	LOT #	PLAN REF	ADDRESS	AREA (HA)
DUNBIER LAND				
1	32	DP736923	110 Macquariedale Road	61.18
2	1	DP1000355	90 Macquariedale Road	0.23
KINGS LAND				
3	3	DP804375	725 Wilton Road	36.61
4	1	DP 804375	525 Wilton Road	1.41

Table 3 - Appin (Part 2) Precinct - Summary of Key Attributes

Location		Key Attributes	
Appin (Part 2) Precinct		**Area**	- Total – 100.10 ha - Private Ownership – 100.10 ha
		LGA	Wholly Wollondilly LGA
		Proposed Dwellings	1,312
		Proposed retail & commercial floor space	30,000+
		Proposed Population	3,709

This report summarises the investigations relating to the staged implementation of trunk utilities and state and regional infrastructure, as identified in the draft GMGA Special Infrastructure Contribution (Draft SIC) for the Appin (Part 2) Precinct.

Specifically, this report will outline:

- The overall utilities servicing strategies previously developed for the Appin (Part 1) Precinct (as outlined in the *Appin & North Appin Precincts Infrastructure Phasing Plan* included in Appendix A)
- The expected demand on utilities generated by the development of the Appin (Part 2) Precinct
- A proposed servicing strategy for the Appin (Part 2) Precinct sites
- Commentary on how the Appin (Part 2) sites can be serviced in isolation of the broader Appin (Part 1) Precinct

The following analyses have been undertaken to provide a high-level strategy for servicing the precinct and to guide future detailed design. We note that the proposed servicing measures are strategic in nature and further refinement may be required during subsequent design phases of the project. However, the underlying principles and objectives of this report should be maintained.

Based on the analysis undertaken in this report, the rezoning can be supported in its current form.

3 Potable Water

3.1 Broader Appin (Part 1) Precinct Servicing Strategy

The Appin (Part 1) Precinct will receive potable water supply from the Macarthur Water Filtration Plant (WFP). New water mains will be constructed off the existing 300mm trunk main on Wilton Road to supply development fronts. It is envisaged that the Appin (Part 2) Precinct will also be serviced via the Macarthur WFP.

3.2 Calculated Demand

A high-level assessment was undertaken using the Water Supply Code of Australia (WSA) to determine the infrastructure requirements to support the proposed development. This involved calculating the peak-hour demand to estimate the likely trunk main size required.

The maximum water demand rates were extracted from the WSA. These rates were used to determine the peak hour demand for each land use type. The results of this assessment are provided in Table 4.

Table 4 - Proposed Water Demand Calculations

Land Use	Max Demand Rate (kL/Unit/Day)	Unit	Peak Demand (L/s)
Low & Medium Density Residential	1.4	Per Dwelling	36.8
Apartments	0.8	Per Dwelling	5.6
Commercial/Retail	41	Per Net Ha	2.9
Total			**45.3**

Based on the above assessment, a main of approximately 200mm diameter could support development of both Appin (Part 2) Precinct sites. To service the sites individually, a 150mm main would be required for each site.

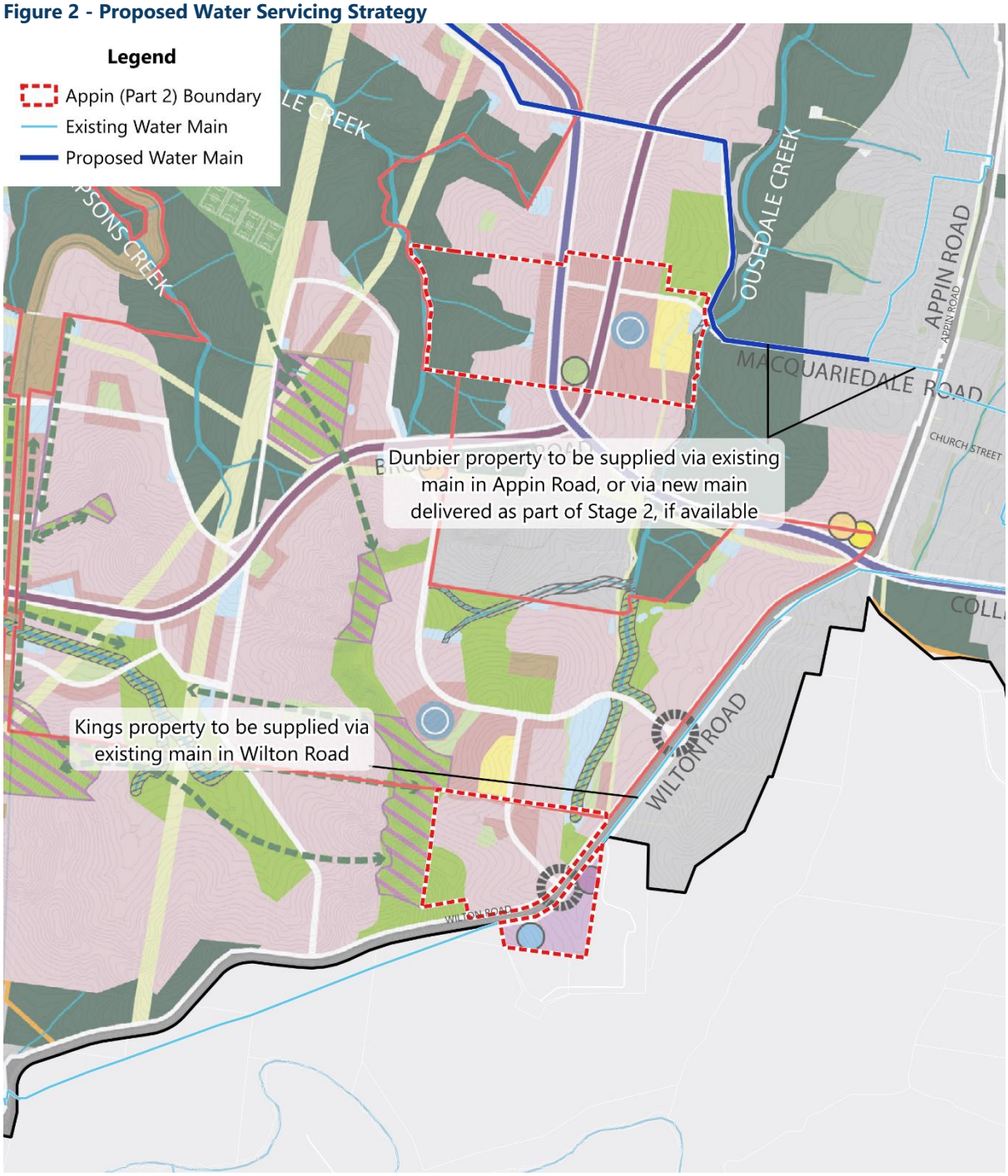
3.3 Appin (Part 2) Precinct Servicing Strategy

The sites could be serviced in isolation from the balance of the Appin (Part 1) Precinct. If the Appin (Part 2) sites are delivered prior to Stage 1, new 150mm diameter mains will be extended from the existing 300mm main in Wilton Road and Appin Road to the development sites.

If the Appin (Part 2) Precinct sites are delivered after Stage 1 but prior to their respective stages (3A and 4A), new mains will be extended from the closest available infrastructure to the sites. For the Dunbier site, reticulation mains will be extended from the existing infrastructure within Wilton Road. For the Kings site, mains will be extended from new infrastructure in Macquariedale Road,

delivered as part of Stage 2 (if available), or from existing infrastructure in Appin Road. These options are shown in Figure 2 below.

Figure 2 - Proposed Water Servicing Strategy



4 Sewer

4.1 Broader Appin (Part 1) Precinct Servicing Strategy

4.1.1 Short Term Servicing Strategy

The Appin (Part 1) Precinct will be serviced by the Glenfield Water Recycling Plan (WRP) in the short to medium term. Sewer flows from existing development within the Appin township are transferred to the Glenfield WRP via a pump station located in the bushland west of Heritage Drive. A rising main connects the pump station to existing sewer reticulation in Rosemeadow via Appin Road. This infrastructure does not have available capacity to support new development.

New trunk infrastructure will therefore be required to support development of the Appin (Part 1) Precinct. This will include a new pump station and rising main, to be located adjacent the existing infrastructure.

Alternatively, an on-site packaged wastewater treatment plant run by a third party could also be utilised. Wastewater is collected from dwellings via reticulation sewer mains and is pumped to a local treatment and water recycling plant.

Biosolids from the plant could be recycled as fertilizer for agricultural pursuits in the Sydney Basin and recycled water disposed of on-site via above or below ground irrigation or other re-use scheme.

It is envisaged that the Appin (Part 2) Precinct will be serviced using a similar arrangement to Appin (Part 1) Precinct.

4.1.2 Long Term Servicing Strategy

Sydney Water are planning for a new treatment plant to support development within the Appin precinct and surrounding area. Planning and delivery for a new treatment plant is expected to take between 7-10 years.

Once the Upper Nepean Treatment Plant (TP) is operational, it is expected that initial stages of development which previously utilised the Glenfield WRP will be switched over to the new treatment plant. All future development will also utilise the Upper Nepean TP. This report has focused on the servicing requirements for the site assuming they are delivered in the short to medium term and will be serviced by the Glenfield WRP.

Alternatively, an on-site packaged wastewater treatment plant run by a third party could also be utilised. Wastewater is collected from dwellings via reticulation sewer mains and is pumped to a local treatment and water recycling plant.

Biosolids from the plant could be recycled as fertilizer for agricultural pursuits in the Sydney Basin and recycled water disposed of on-site via above or below ground irrigation or other re-use scheme.

It is envisaged that the Appin (Part 2) Precinct will be serviced using a similar arrangement to Appin (Part 1) Precinct.

4.2 Calculated Demand

A high level assessment of the required trunk sewer infrastructure was undertaken using the Sewage Supply Code of Australia (SSA). The load on the sewer network is expressed in Equivalent Population (EP). The EP for each land use were extracted from the SSA. For residential uses, EP is expressed as a rate per dwelling and for non-residential uses, EP is expressed as a rate per hectare of development (gross). For schools the EP is related to the number of students. The approximate total EP for each catchment was then calculated using the EP rates tabulated below.

Table 5 - Calculated Sewer Demand

Land Use	Dwellings/GFA (m^2)	EP Rate	Total EP
Low Density Residential	595	3.5/Dwelling	2,083
Medium Density Residential	414	3.0/Dwelling	1,242
Apartments	302	2.5/Dwelling	755
Commercial/Retail	30,312	0.0075/m^2	227
Total			**4,307**

Based on the above assessment, a main of approximately 225mm diameter could support development of both Appin (Part 2) Precinct sites. Given the proposed sewer infrastructure will support a broader catchment, it is assumed proposed mains will be sized to support the full development of the catchment.

4.3 Appin (Part 2) Precinct Servicing Strategy

The Dunbier site falls into two sewer catchments, separated by a crest running in a north-south direction through the middle of the site. The western catchment drains towards Elladale Creek, while the eastern catchment drains towards Ousedale Creek.

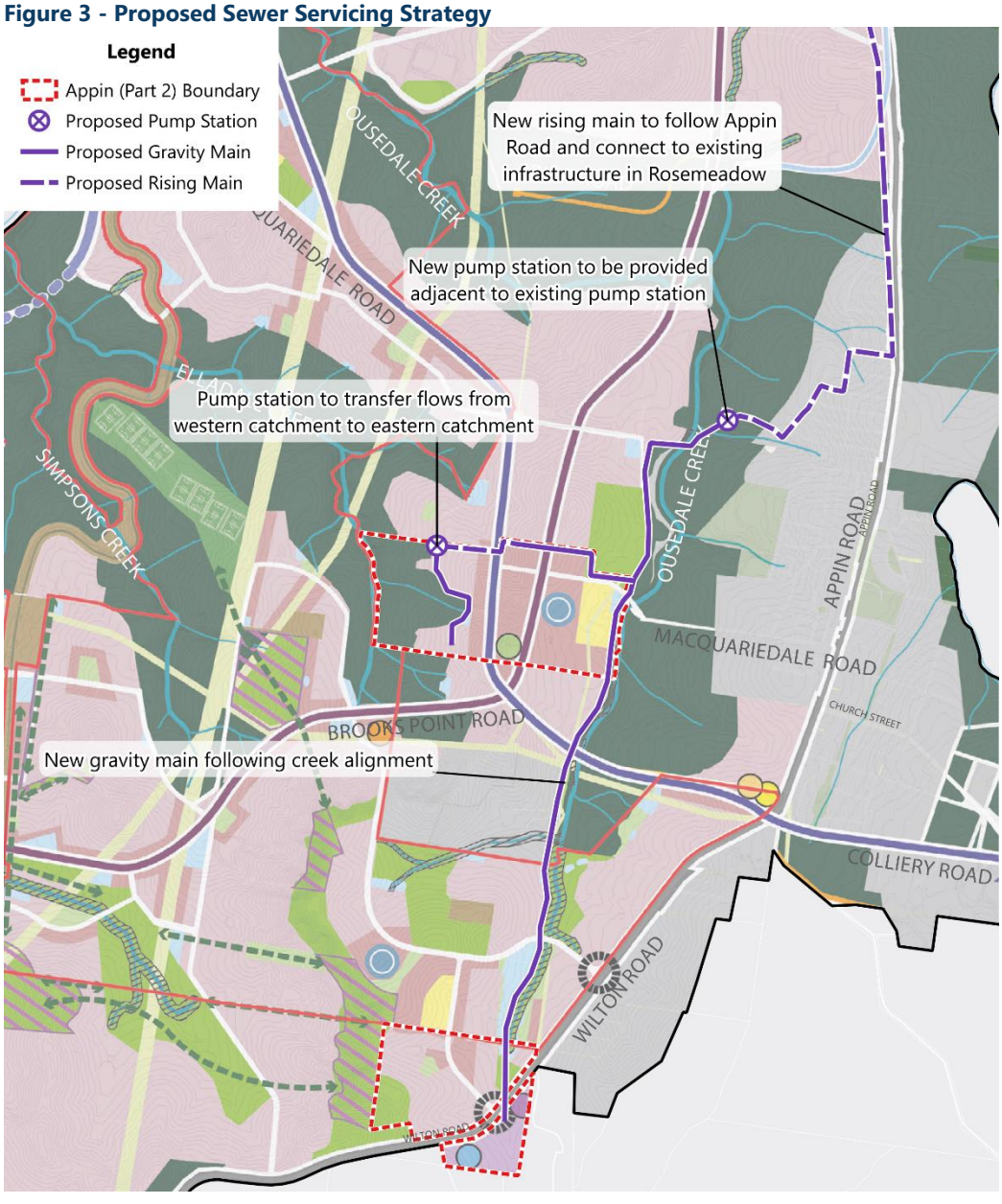
The Kings site also falls into two sewer catchments, with most of the site, including the areas to the south of Wilton Road, draining northwards to Ousedale Creek. A small portion in the western part of the site drains westwards to the Cataract River, however no development is proposed within this catchment.

The sites could be serviced in isolation from the balance of the Appin (Part 1) Precinct. If the Appin (Part 2) sites are delivered prior to Stage 1 of the Appin (Part 1) Precinct, new trunk infrastructure, including a pump station and rising main from the pump station to the existing sewer network in Rosemeadow would be required. If Stage 1 has been delivered, this infrastructure will already be available to connect to.

To service the Kings site and the eastern catchment of the Dunbier site, a new gravity main will be constructed along the Ousedale Creek alignment, originating from the southern side of Wilton Road and connecting to the proposed pump station to the north. If these sites are developed after Appin (Part 1) Precinct, this gravity main will have already been delivered and will be available for connection.

A new gravity main will be constructed along the western development boundary within the Dunbier site to service the western catchment. The gravity main will connect to a pump station located at the low point near the northern site boundary. From the pump station, flows will be transferred to infrastructure within the eastern catchment, draining to the proposed pump station to the north. This arrangement is shown in Figure 3.

Figure 3 - Proposed Sewer Servicing Strategy



5 Electricity

5.1 Broader Appin (Part 1) Precinct Servicing Strategy

Endeavour Energy have advised that the Appin Zone Substation (ZS), located within Stage 3A of the Appin (Part 1) Precinct, has capacity to supply an addition 1,200-1,400 dwellings. After this capacity is exhausted, a new zone substation will be required. The zone substation will be located to the west of the existing Appin ZS, close to the transmission lines and will be delivered in Stage 1.

5.2 Calculated Demand

A high-level assessment was undertaken to determine the electrical servicing requirements for the site. The electrical demand generated by the proposed development was calculated using electrical demand rates provided by Endeavour Energy. The results are tabulated below.

Table 6 - Calculated Electrical Demand

Land Use	Dwellings/GFA	Load/Unit (VA)	Diversified Load (MVA)
Low Density Residential	595	6500	3.1
Medium Density Residential	414	5000	1.7
High Density Residential	302	3500	0.9
Commercial/Retail	30,312	85	2.1
Total			**7.7**

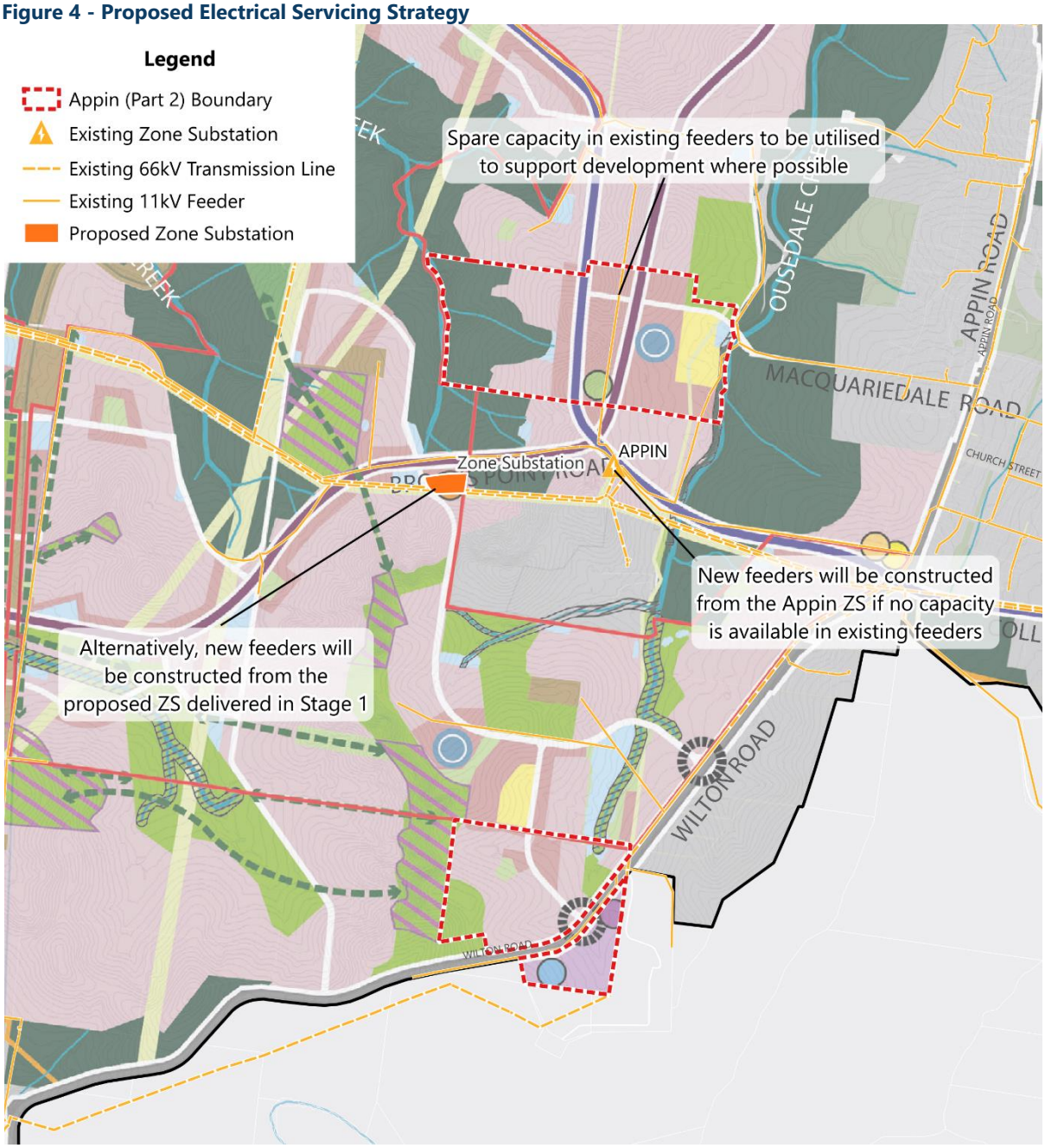
Based on the assumption that a single 11kV feeder can supply approximately 5MVA, the proposed development of the above sites would likely require 1-2 11kV feeders to supply all proposed development.

5.3 Appin (Part 2) Precinct Servicing Strategy

The sites could be serviced in isolation from the balance of the Appin (Part 1) Precinct. If the Appin (Part 2) sites are delivered prior to Stage 1, electrical supply would originate from the existing Appin ZS. There may be opportunities to utilise available capacity in existing feeders supplying surrounding land uses, however if no capacity is available new feeders will be constructed from the Appin ZS to the sites.

If the Appin (Part 2) Precinct sites are delivered after Stage 1 but prior to their respective stages (3A and 4A), feeders will be constructed from the proposed new zone substation to the development sites. Both servicing options are shown in Figure 4 below.

Figure 4 - Proposed Electrical Servicing Strategy



6 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

7 SIC Infrastructure

Given the scale of the proposed development within the Appin (Part 2) Precinct as a standalone development, it is not anticipated that any roads or schools would need to be delivered to support either site. The site will be serviced by existing and future education facilities in Appin and delivered as part of the broader Appin (Part 1) Precinct.

The existing Appin Public School is located on Appin Road and currently has 355 students enrolled. Given the maximum size of a primary school is 1,000 students, the Appin Public School has significant potential for upgrade and expansion and is likely to have capacity for primary school enrolments associated with the early stages of delivery of the Appin Structure Plan. Should the Appin (Part 2) Precinct be delivered ahead of other stages of the development, it is likely the existing school will have sufficient capacity to support the incoming population.

There are two SIC roads which bisect the Dunbier site:

- The Transit Corridor
- The East-West Connection Road

The potential delivery of SIC roads by the developer is dependent on the negotiation of a Voluntary Planning Agreement.

Appendix A - Appin & North Appin Precincts Infrastructure Phasing Plan

infrastructure & development consulting

Appin & North Appin Precincts

Infrastructure Phasing Plan

October 2022

Table of Contents

This Document has been prepared for the Party that has commissioned it, for the specific Purposes of this Project (or part thereof). It should not be relied upon by any other Party, or for any other Purpose.

Infrastructure & Development Consulting Pty Ltd accept no responsibility for any consequences of this being relied upon by any other Party or for any other Purpose, or for any errors or omissions which are due to errors, omissions or incomplete data being supplied to us for this Project.

This Document must not be disclosed to any other Party without the prior consent of Infrastructure & Development Consulting and from the Party who has commissioned it.

Project Number	21-007	**Date**	12 October 2022
Project Name	Appin	**Status**	Final
Client	Walker Corp	**Revision**	D
Author	R. Higgisson	**Reviewed**	C. Avis

1 The Appin Project

Greater Sydney's population is projected to grow to approximately 6.1 million by 2041 – over a million more people than currently live in the region.

The NSW Government has identified Growth Areas as major development areas that will assist in accommodating this growth. The Greater Macarthur Growth Area (**GMGA**) is one such growth area and is a logical extension of the urban form of south-west Sydney. The GMGA is divided into precincts. The Appin Precinct and North Appin Precinct are the southernmost land release precincts of the GMGA. The goal is to deliver 21,000+ dwellings.

The land is to be rezoned and released for development to achieve this goal. A submission has been prepared by Walker Corporation Pty Limited and Walker Group Holdings Pty Limited (the **Proponent**) to rezone 1,378 hectares of land (**the site**) within the Appin Precinct from *RU2 Rural Landscape* to the following zones:

Urban Development Zone

Zone 1 Urban Development (UD)

Special Purposes Zone

Zone SP2 Infrastructure (SP2)

Conservation Zone

Zone C2 Environmental Conservation (C2)

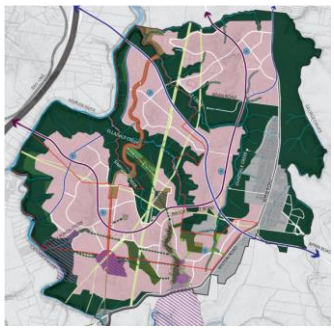
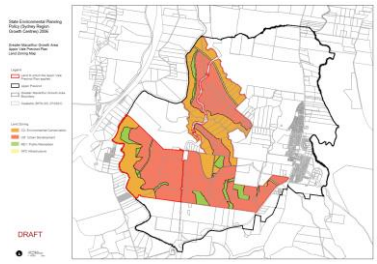
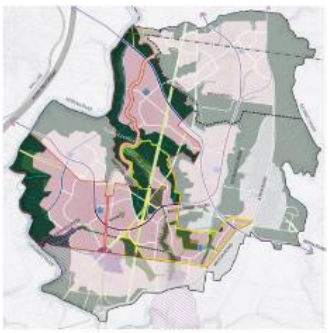
The zonings are shown on the Appin (Part) Precinct Plan (**the precinct plan**). 'The precinct plan' will be incorporated into the *State Environmental Planning Policy (Precincts – Western Parkland City) 2021* and contain the provisions (clauses and maps) that will apply to 'the site.' 'The precinct plan' envisages the delivery of 12,000+ new homes.

A structure plan has been prepared for the site and is shown on the Appin (Part) Precinct Structure Plan (**the structure plan**). It identifies staging and the first stage to be developed – Release Area 1. Release Area 1 is anticipated to deliver 3,500+ dwellings.

The submission is aligned with strategic land use planning, State and local government policies and infrastructure delivery. The development potential is tempered by a landscape-based approach that protects the environment and landscape values, shaping the character of new communities. A series of residential neighbourhoods are to be delivered within the landscape corridors of the Nepean and Cataract Rivers, supported by local amenities, transit corridors and community infrastructure.

The submission includes a hierarchy of plans. The plans and their purpose are summarised in Table 1.

Table 1 – Title and Purpose of Plans

(1) APPIN & NORTH APPIN PRECINCTS INDICATIVE PLAN	(2) APPIN (PART) PRECINCT PLAN (*THE PRECINCT PLAN*)	(3) APPIN (PART) PRECINCT STRUCTURE PLAN (*THE STRUCTURE PLAN*)
Broader context & for information purposes only. It has no statutory weight. It identifies: • *Higher-order transport network* • *Centres hierarchy* • *School sites* • *Conservation areas* • *Residential areas* • *Cultural sites and connections*	*It shows the land proposed to be rezoned (the site) and incorporated into a new schedule in the Western Parkland City SEPP 2021.* *The precinct plan contains the development provisions (clauses and maps) applicable to the site and is used in assessing development applications.*	*Structure plan for the site, showing staging of release areas.* *It illustrates land use components including (but not limited to):* • *Low and medium-density residential* • *Retail and employment centres* • *School* • *Open space* • *Drainage network/basins* • *Transport network*
		
(21,000+ dwellings)	**(12,000+ dwellings)**	**(12,000+ dwellings)** **(inc Release Area 1 - 3,500+ dwellings)**

2 Introduction

Infrastructure & Development Consulting (IDC) have been engaged by the Proponent to prepare an Infrastructure Phasing Plan to support the Appin and North Appin Precincts Indicative Plan.

The Appin and North Appin Precincts are the southernmost land release areas of the Greater Macarthur Growth Area (**GMGA**) – refer Figure 1 and Table 2 for key features of the precincts.

The Appin and North Appin Precincts immediately neighbour the suburbs of Gilead to the north, Wilton to the south and Douglas Park to the west. Dharawal National Park, a large protected national park, is located to the east. The precincts are predominately bound by waterways, with Mallaty Creek to the north, George's River to the east, Nepean River to the west and Cataract River to the south.

Figure 1 – Boundary of Appin and North Appin Precincts

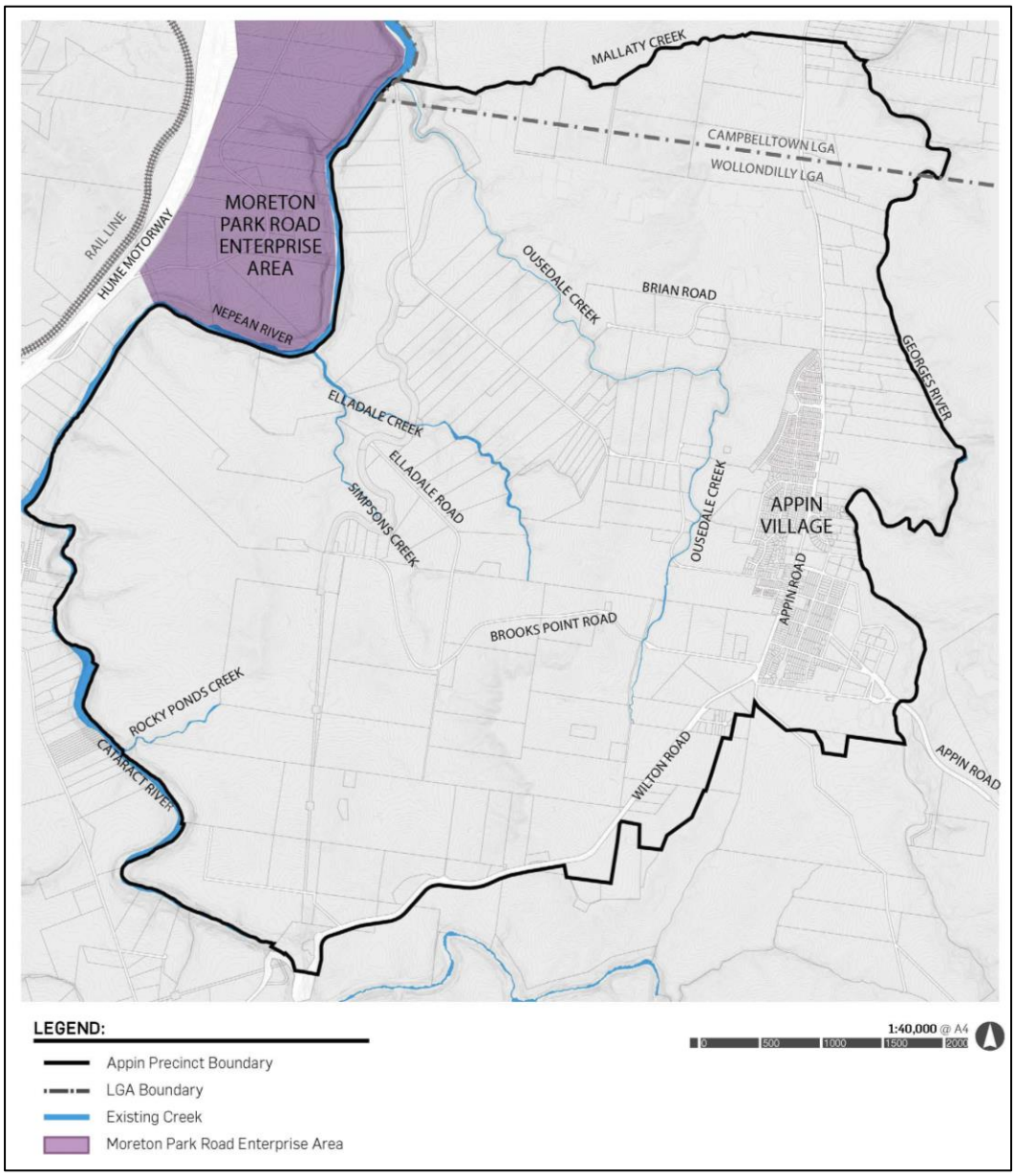
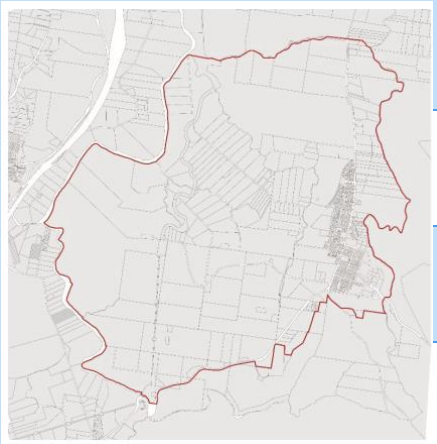


Table 2 - Summary of Appin and North Appin Precincts key attributes

	Location	Key Attributes	
Appin and North Appin Precincts		**Area**	3,826 ha
		LGA	Part Wollondilly Part Campbelltown
		Proposed # Dwellings	21,000+
		Proposed Population	65,000+

This report summarises the investigations relating to the staged implementation of trunk utilities and State and regional infrastructure, as identified in the draft GMGA Special Infrastructure Contribution (Draft SIC) for the Appin and North Appin Precincts.

Specifically, this report will outline:

- Existing utility services within the vicinity of the site
- Current and planned utility projects
- Planned infrastructure in the Draft SIC
- Implications of the above and potential servicing strategies for the proposed development within the precinct

The following analyses have been undertaken to provide a high-level strategy for servicing the precinct and to guide future detailed design. We note that the proposed servicing measures are strategic in nature and further refinement may be required during subsequent design phases of the project. However, the underlying principles and objectives of this report should be maintained.

Based on the analysis undertaken in this report, the rezoning can be supported in its current form.

2.1 Proposed Development

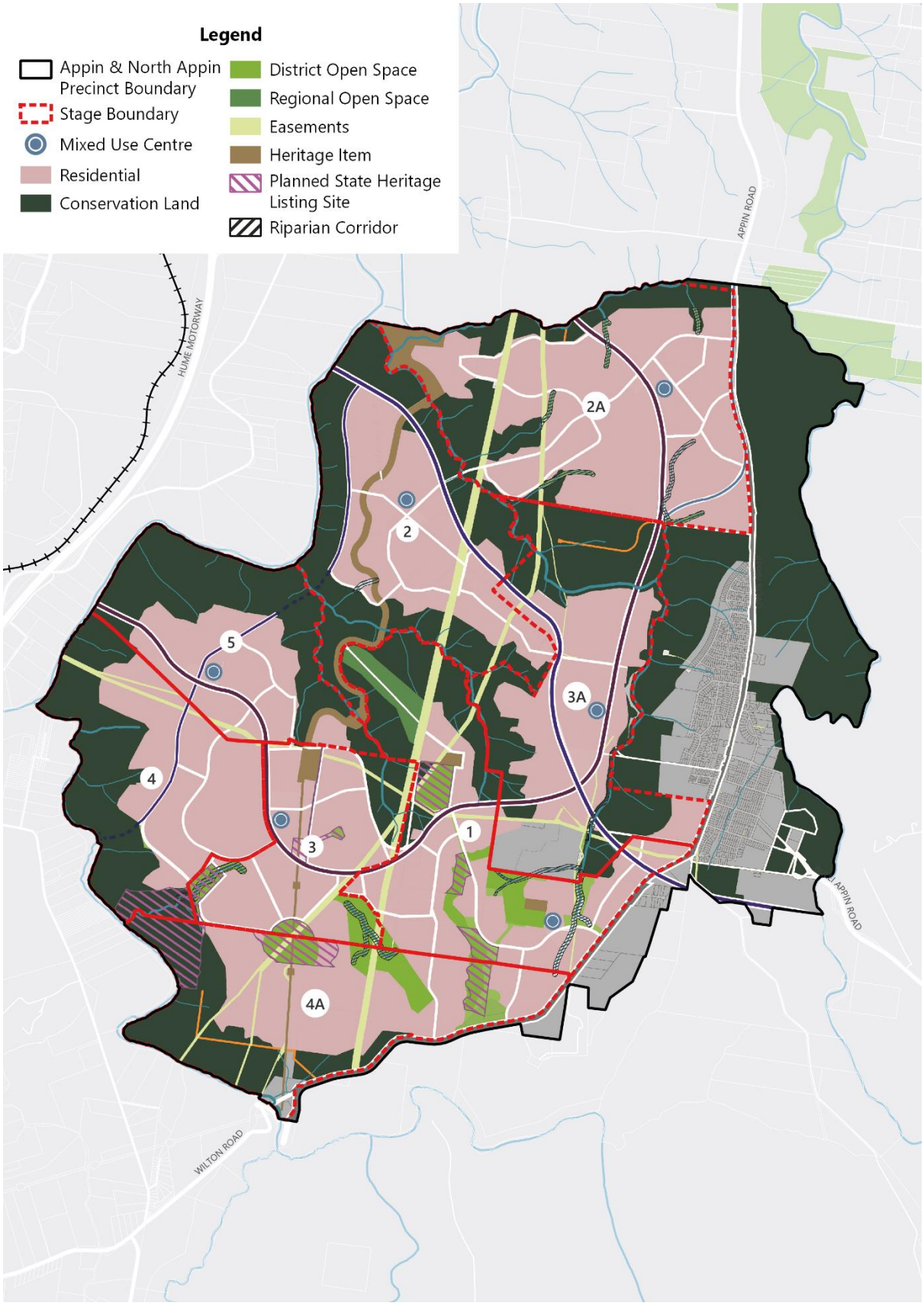
The Appin and North Appin Precincts will be rezoned to provide a mix of development typologies. Development will be delivered over eight stages and will provide approximately 21,000+ new dwellings. A breakdown of the staging is provided in Table 3 below. It is important to note that some of the development stages are not controlled by Walker Corp and as such the timing and delivery of the development of these stages is not guaranteed.

Table 3 - Proposed Development Staging

Stage	Delivery Years	Low Density Dwellings	Medium Density Dwellings	Total Dwellings
1	2026-2029	2,140	1,265	**3,405**
2	2030-2033	3,026	442	**3,468**
2A	2033-2037	4,166	188	**4,354**
3	2037-2040	1,287	2,064	**3,351**
3A	2041-2044	1,318	982	**2,300**
4	2045-2050	2,584	214	**2,798**
4A	2050-2051	630	-	**630**
5	2051-2056	1,559	-	**1,559**
TOTAL		**16,710**	**5,155**	**21,865**

The proposed layout and staging are shown in Figure 2 below. Dwelling numbers, delivery timing, stage boundaries and locations of proposed assets are indicative only and are subject to change during future phases of the project.

Figure 2 - Proposed Staging Plan



3 Stage 1

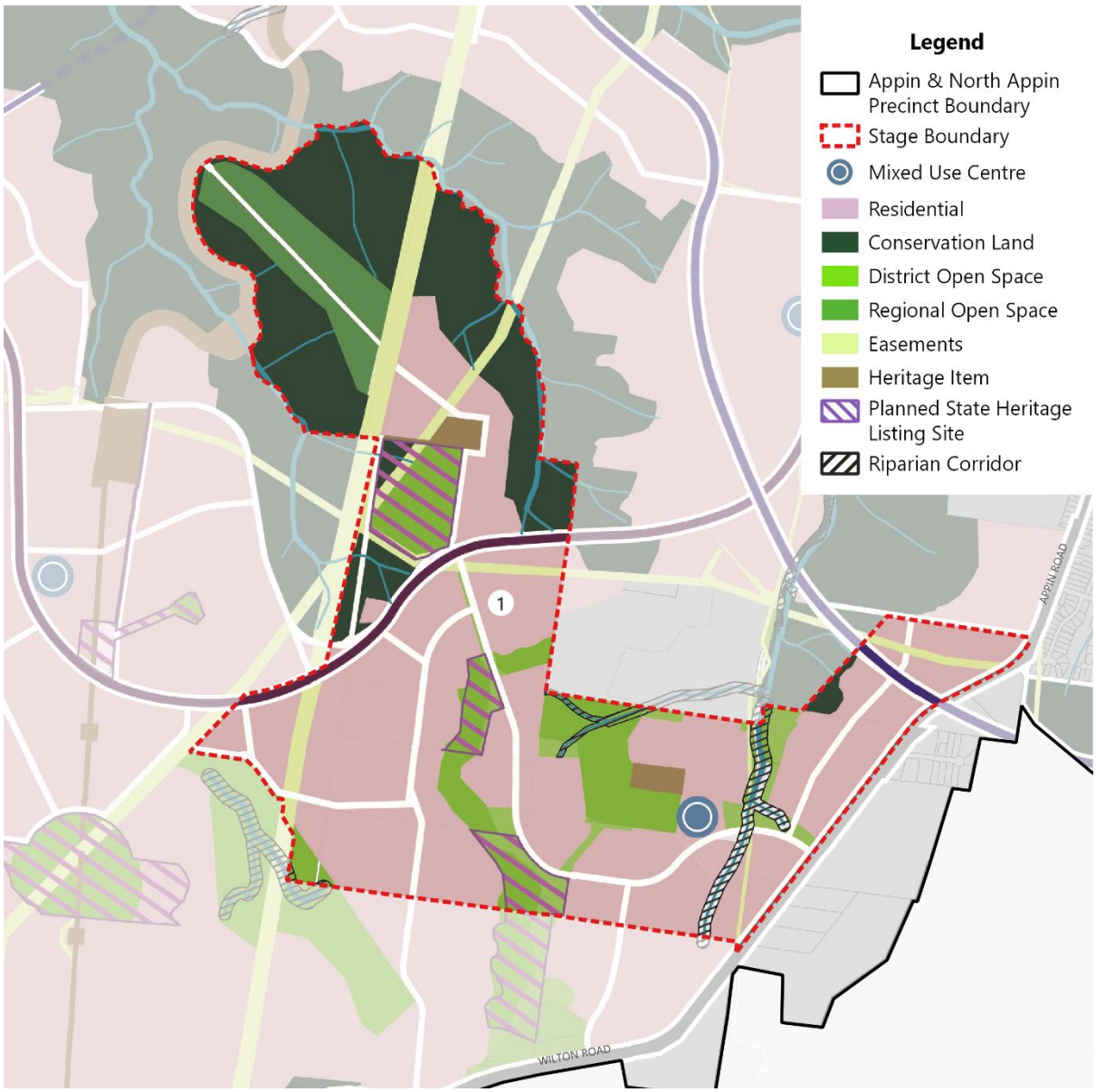
3.1 Development

Stage 1 includes the area bound by Appin Road to the east, Stage 4A to the south, Stage 3 to the west and Stages 2 and 3A to the north. Development within Stage 1 includes:

- 2,140 low density dwellings
- 1,265 medium density dwellings
- 3,750m^2 GFA retail/commercial
- Primary school (1,000 students)

Stage 1 is shown in Figure 3 below.

Figure 3 - Stage 1



3.2 Utilities Infrastructure

3.2.1 Electricity

Endeavour Energy (EE) have indicated that there is capacity for between 1,200-1,400 dwellings to be serviced using the existing Appin Zone Substation (ZS). After the initial 1,200-1,400 dwellings are delivered a new zone substation will need to be established to support further growth. Based on the current staging plan, it is anticipated that this zone substation will be required in Stage 1.

The new ZS would be located to the west of the existing Appin ZS, close to the transmission lines. EE have advised that the current design specification for a new zone substation require an approximately 8,280m^2 site. An indicative location is shown in Figure 4 below.

In addition to the zone substation, EE have noted that Transgrid will require a site for a future Bulk Supply Point (BSP). The BSP will be located north of the future Appin ZS and must be located close to transmission lines. Transgrid have not finalised the site requirements at this stage, however based on the land used at Macarthur BSP, to the north of Appin, a site roughly 26,000m^2 in size is possible.

While it is not expected that the new BSP would be required to support Stage 1, its location would likely be contained within the Stage 1 boundary. We therefore recommend the BSP site be dedicated with the Stage 1 works to ensure efficient delivery at a later date. The location of the future BSP and zone substation shown in Figure 4 below is conceptual only and is subject to change in location, and/or stage.

The anticipated electrical demand for Stage 1 has been calculated using standard After Diversity Maximum Demand (ADMD) rates per dwelling and per GFA for non-residential uses. These rates have been extracted from Endeavour Energy's Growth Servicing Plan. For the purpose of this assessment, we have assumed that schools will generate the same demand as commercial land uses.

High voltage feeders will be extended from the new ZS to development fronts. Based on an assumed 3,405 dwellings, three new 11kV feeders would be required to support development. Feeder locations have not been shown on Figure 4 for clarity.

Table 4 - Stage 1 Electricity Demand

Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	8.6	1.9
Medium Density Residential	4.0/dwelling	5.1	1.1
Retail	0.1/sqm GFA	0.3	0.1
Commercial	0.085/sqm GFA	0.1	0.0
School	0.085/sqm GFA	0.8	0.2
Total		**14.7**	**3.3**

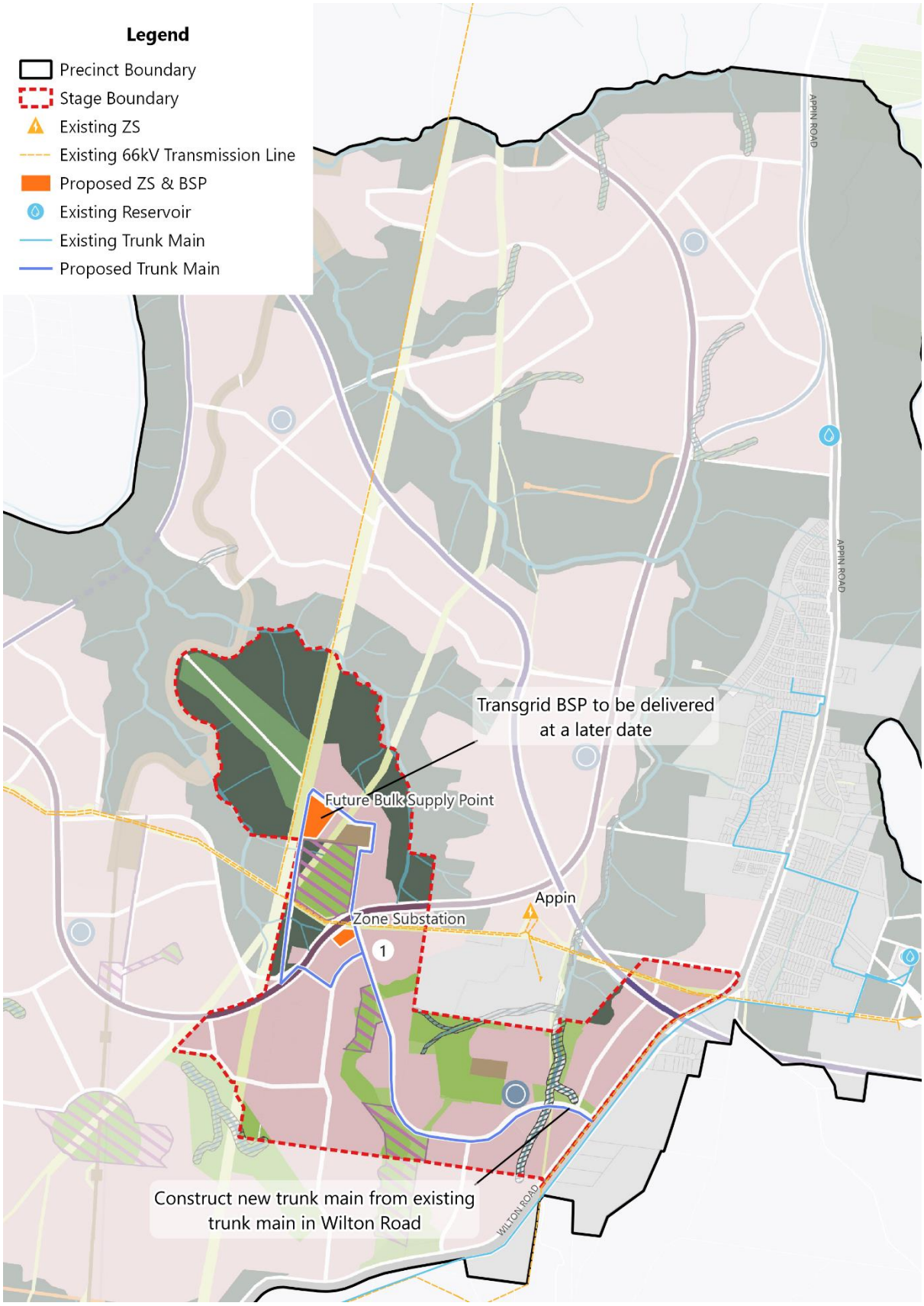
3.2.1 Potable Water

Sydney Water have indicated that the precinct will be serviced from the Macarthur Water Filtration Plant (WFP). The Macarthur WFP is located adjacent the employment lands, on the southern side of Wilton Road.

Sydney Water have indicated the Macarthur WFP is being upgraded to improve reliability. These works are due to be completed by 2026. The proposed development is not reliant on the upgrade, and it is expected that the Macarthur WFP will have sufficient capacity to support all development within the Appin Vale precinct.

To supply Stage 1, new mains will be constructed off the existing 300mm trunk main on Wilton Road.

Figure 4 - Stage 1 Water & Electricity Infrastructure



3.2.2 Sewer

Existing development in the Appin township is serviced by the Glenfield Water Recycling Plant (WRP), located approximately 23km north east of Appin. The existing infrastructure supporting Appin has not been sized to support the significant growth planned and Sydney Water have confirmed there is no available capacity in the existing Appin SPS to service additional dwellings.

Sydney Water have indicated that in the short to medium term, sewer flows from new dwellings should be treated at the Glenfield WRP. This arrangement is likely to operate for up to 10 years (until a new Treatment Plant is commissioned) and would therefore support development in Stages 1 and 2.

New trunk infrastructure will be required to transfer flows from Appin Vale to the existing sewer infrastructure located within Rosemeadow. This would include a new sewer pump station (SPS) adjacent the existing SPS in Appin, and a rising main following a similar alignment to the existing rising main in Appin Road.

Stage 1 falls into four sewer catchments:

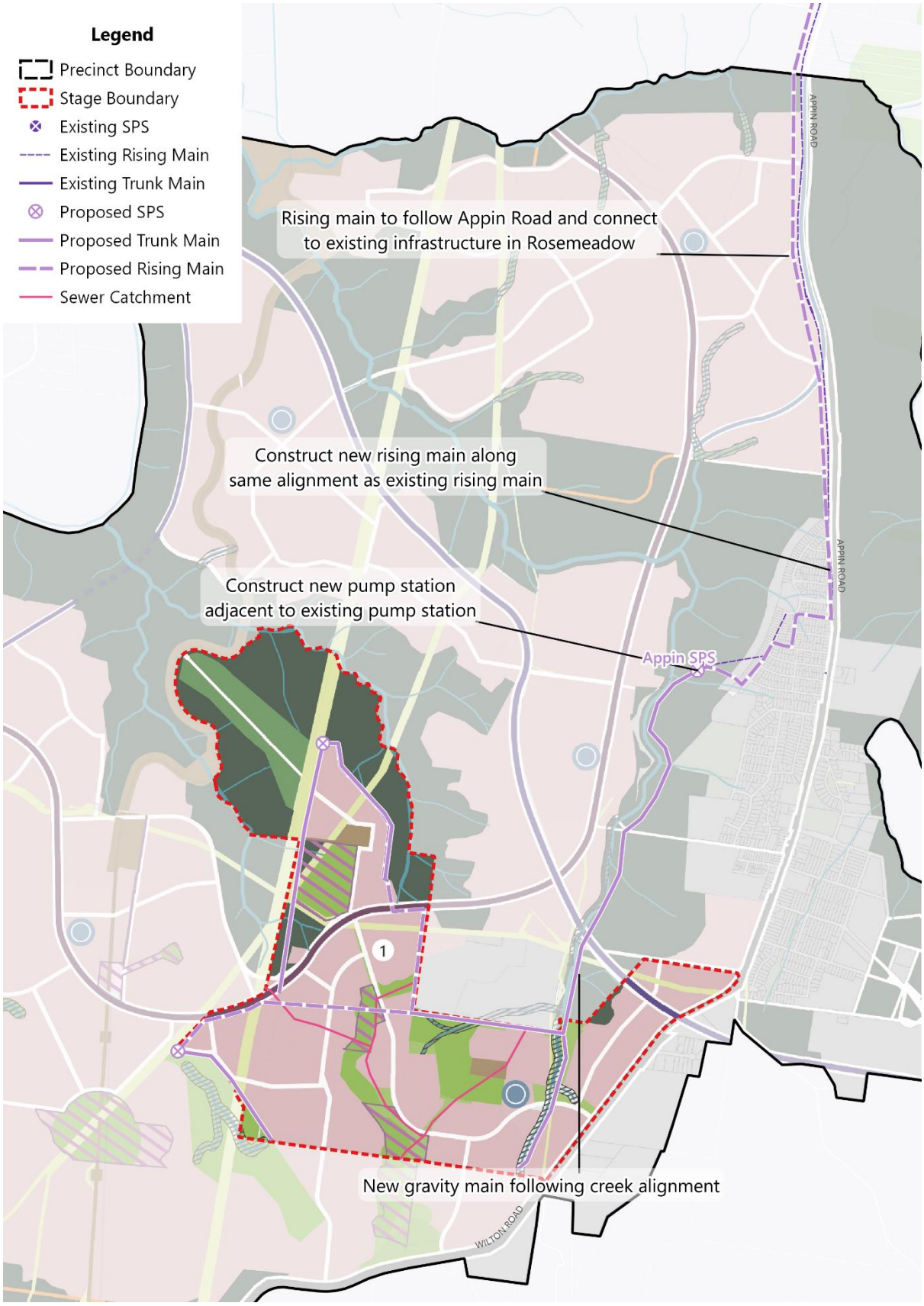
- The eastern catchment which drains to Ousedale Creek
- The central catchment which drains to Ousedale Creek
- The western catchment which drains to Rocky Ponds Creek, through Stage 3
- The northern catchment which drains to Simpsons and Elladale Creeks

Two pump stations would be required to transfer flows from the western and northern catchments to a single discharge point in the eastern catchment. From the eastern catchment, a gravity main would transfer flows to the new Appin SPS where flows would be pumped to the Glenfield WRP via Rosemeadow. This arrangement is shown in Figure 5 below.

3.2.3 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 5 - Stage 1 Sewer Infrastructure



3.3 SIC Infrastructure

3.3.1 Roads

WSP have prepared a Strategic Transport Assessment to support the development of the Appin Precinct. The report makes several recommendations regarding the staging and delivery of SIC roads supporting Appin.

To support development in Stage 1, Appin Road between North Appin and South Gilead will be upgraded from one lane per direction to two lanes per direction. Part of the North-South Transit Corridor will also be delivered. This road will include two lanes per direction, with the first stage including the extent within Stage 3A as well as a connection to Appin Road north of the Appin township. These works are required to be delivered by the 3,001st registered lot, which is expected to occur during Stage 1.

Site access in the south will occur via a new access road off Wilton Road, and the intersection at Appin Road and Church Street will be upgraded to a signalised intersection to support the additional dwellings, this is required by the 1,051st registered lot. Site access in the north will occur via a new access road off Brooks Point Road.

In addition to these works, two additional sections of Appin Road are expected to be upgraded by others:

- Appin Road north of Gilead will be duplicated to two lanes in each direction by 2026.
- Appin Road from South Gilead to Gilead will also be duplicated to two lanes in each direction by 2029, in line with the completion of Stage 1 lots.

3.3.2 Schools

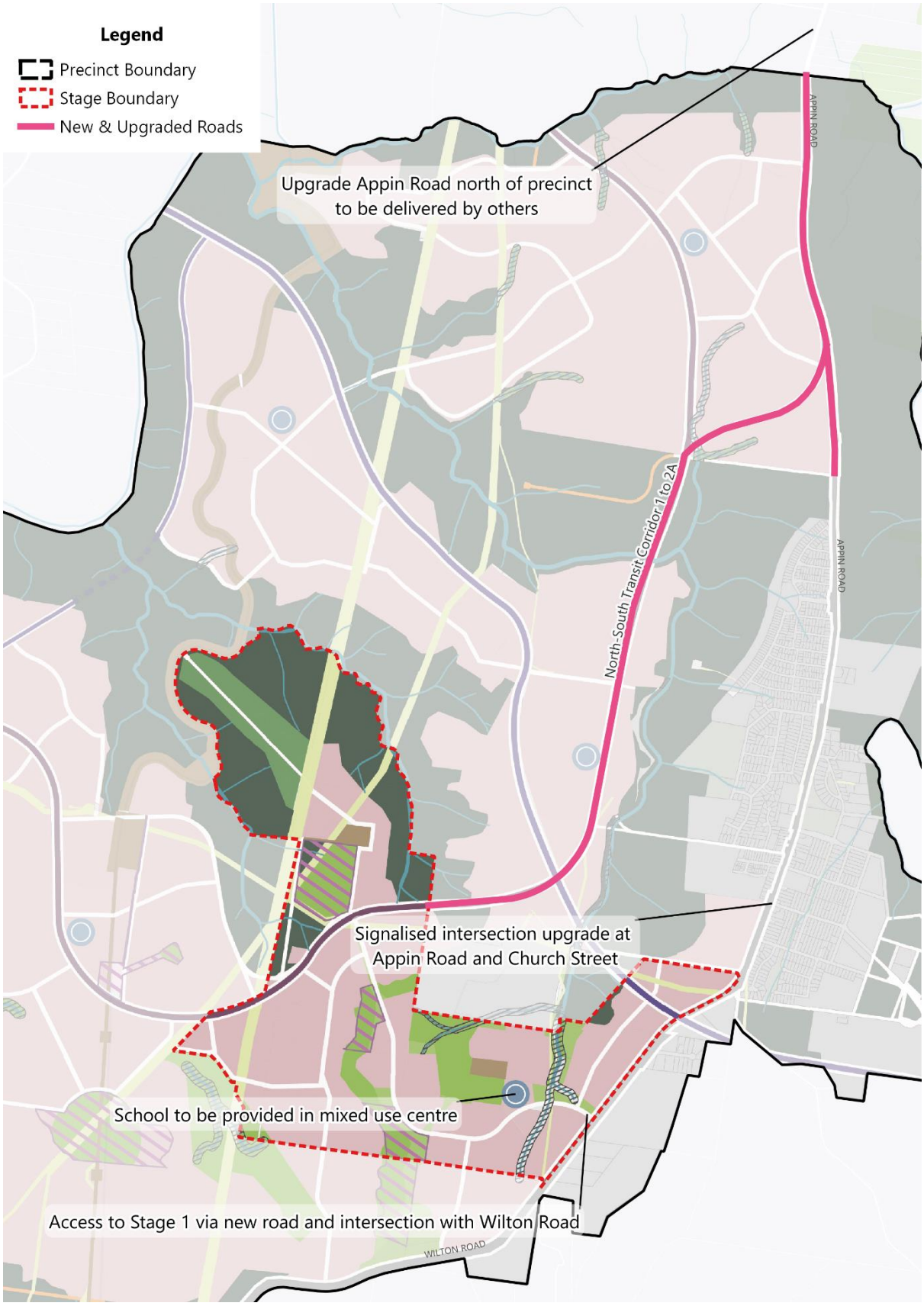
There is one existing primary school within the Appin precinct, Appin Public School, which is located on a 2.7ha site and has 355 students enrolled. The location of the school catchment is likely to cover part of the incoming population generated by the proposed development.

Given the maximum size of a primary school is 1,000 students, the Appin Public School has significant potential for upgrade and expansion and is likely to have capacity for primary school enrolments associated with the early stages of delivery of the Appin Structure Plan. The school will also contribute to the long-term supply of primary school places across Appin.

The Structure Plan will provide six additional primary schools and three high schools. The schools will be provided as three standalone primary schools and three co-located primary and high schools. School sites to be delivered by land dedication or alternative delivery arrangement authorised by School Infrastructure NSW.

Stage 1 includes a primary school with capacity for 1,000 students which will be delivered in the initial stages to provide for growth as the development progresses. While the school in Stage 1 is being delivered it is expected that the existing capacity in Appin Public School would be increased to accommodate initial demand generated by the development. The proposed location is shown in Figure 6.

Figure 6 - Stage 1 SIC Infrastructure



3.4 Infrastructure Summary

A summary of the infrastructure requirements associated with Stage 1 is provided in Table 5 below.

Table 5 - Stage 1 Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Electricity	Transgrid Bulk Supply Point Land Dedication Only (approx. size)	26,000	m^2
	Endeavour Energy Zone Substation	8,280	m^2
	11kV Feeders (lengths tbc subject to subdivision design)	3	item
Water	Trunk Mains	5,200	m
Sewer	Trunk Gravity Mains	7,300	m
	Rising Mains (includes mains along Appin Road)	13,600	m
	Sewer Pump Station	3	Item
Roads	Appin Road Upgrade – North Appin to South Gilead	2,300	m
	North South-Transit Corridor Part 1 – Stage 1 to Stage 2	4,200	m
School	Primary School (1,000 students)	1.5	Ha

4 Stage 2

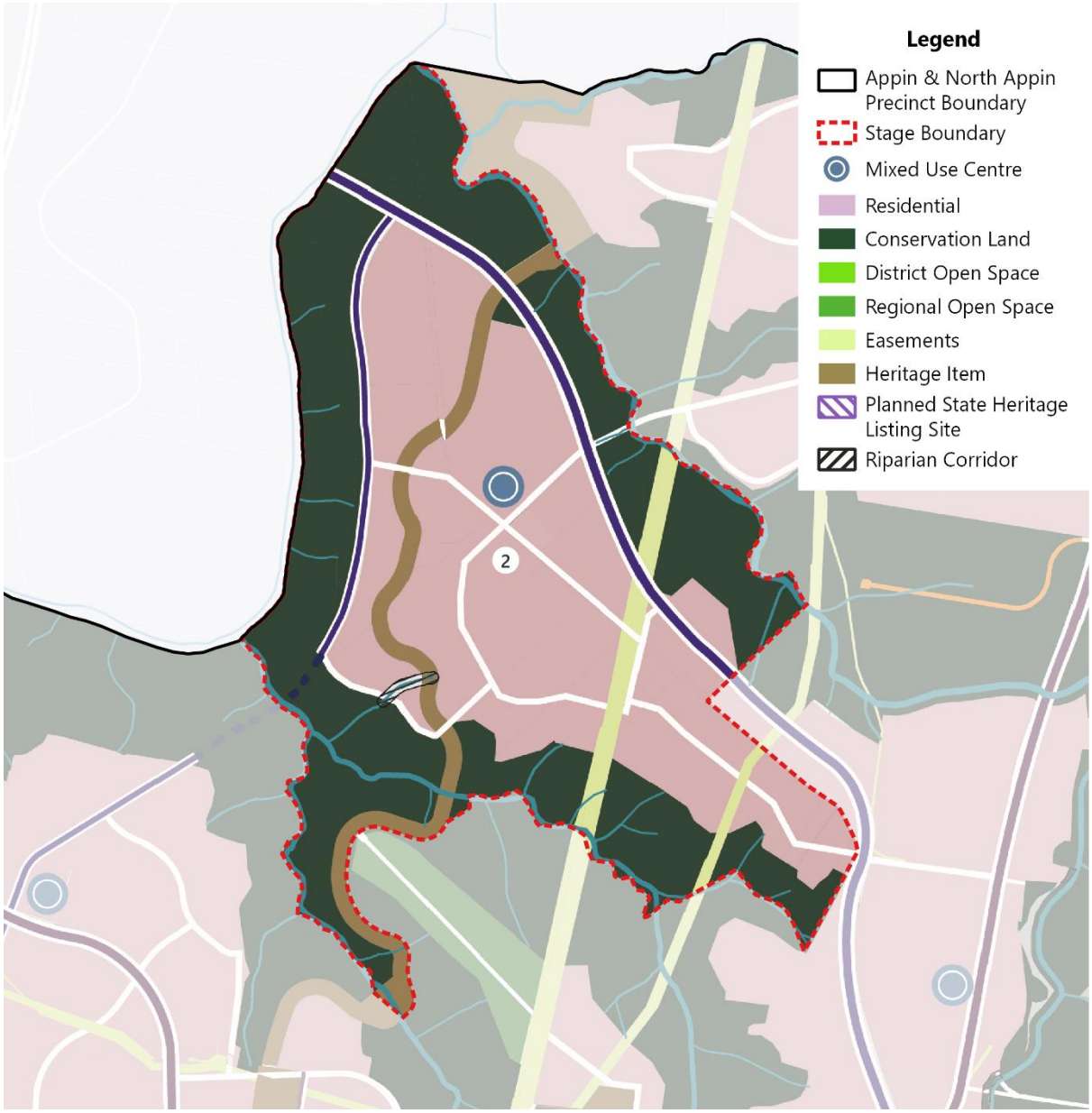
4.1 Development

Stage 2 includes the area bound by Stages 2A and 3A to the east, Stage 1 to the south and the Nepean River to the west and north. The stage includes the following development:

- 3,026 low density dwellings
- 442 medium density dwellings
- 3,000m^2 GFA retail/commercial
- Primary school (1,000 students)

Stage 2 is shown in Figure 7 below.

Figure 7 - Stage 2



4.2 Utilities Infrastructure

4.2.1 Electricity

Development within Stage 2 will be supplied via the new Appin ZS, located within Stage 1. High voltage feeders will be extended from the new ZS to development fronts. Based on an assumed 3,468 dwellings, three new 11kV feeders would be required to support development.

Table 6 - Stage 2 Electricity Demand

Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	12.1	2.7
Medium Density Residential	4.0/dwelling	1.8	0.4
Retail	0.1/sqm GFA	0.2	0.1
Commercial	0.085/sqm GFA	0.1	0.0
School	0.085/sqm GFA	0.8	0.2
Total		**14.9**	**3.3**

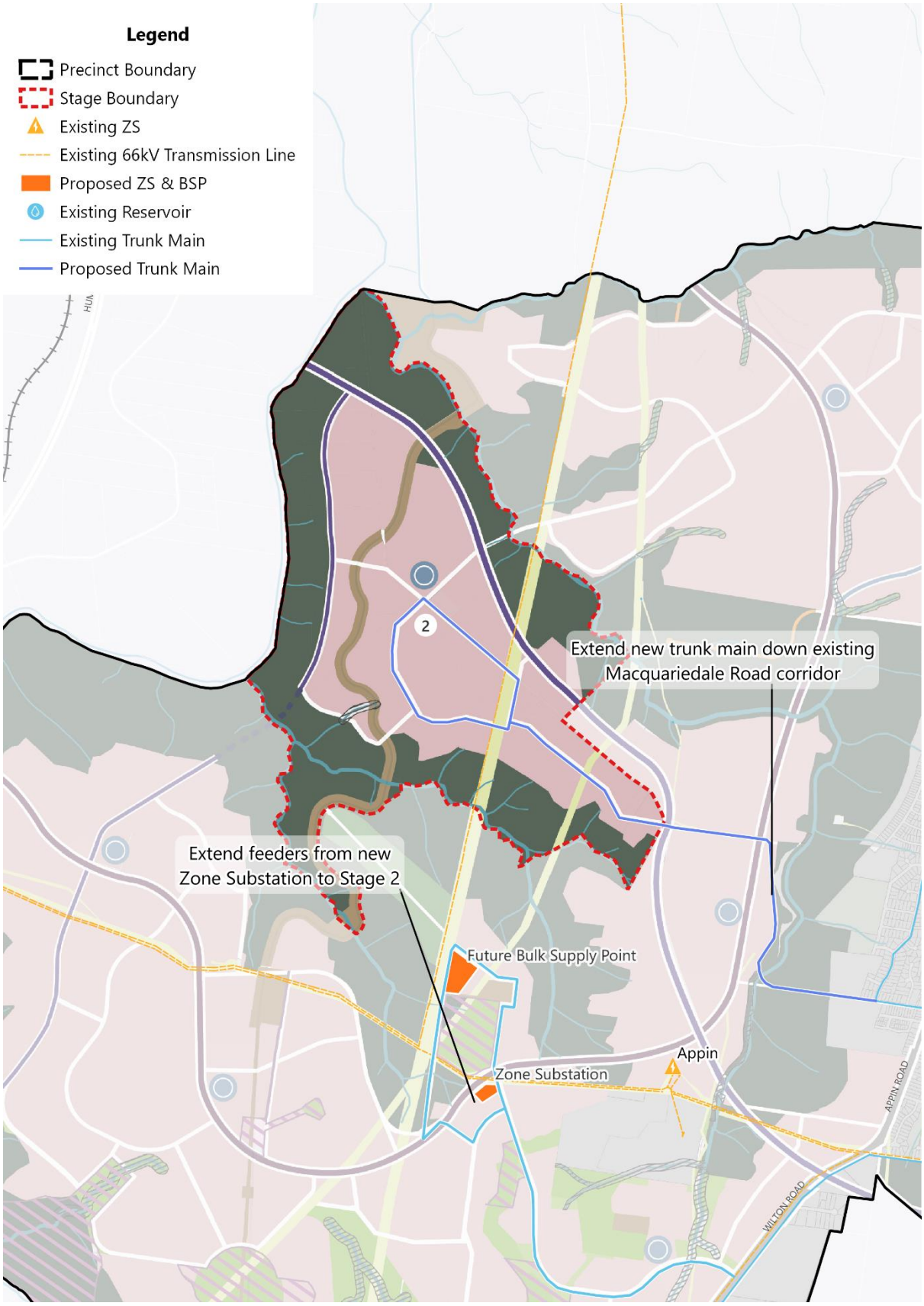
4.2.2 Potable Water

Stage 2 will likely be serviced by extending the existing 300mm trunk main located in Macquariedale Road along the existing road corridor to the development front. Smaller reticulation mains will extend from this trunk main to supply individual dwellings.

4.2.1 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 8 - Stage 2 Water & Electrical Infrastructure



4.2.2 Sewer

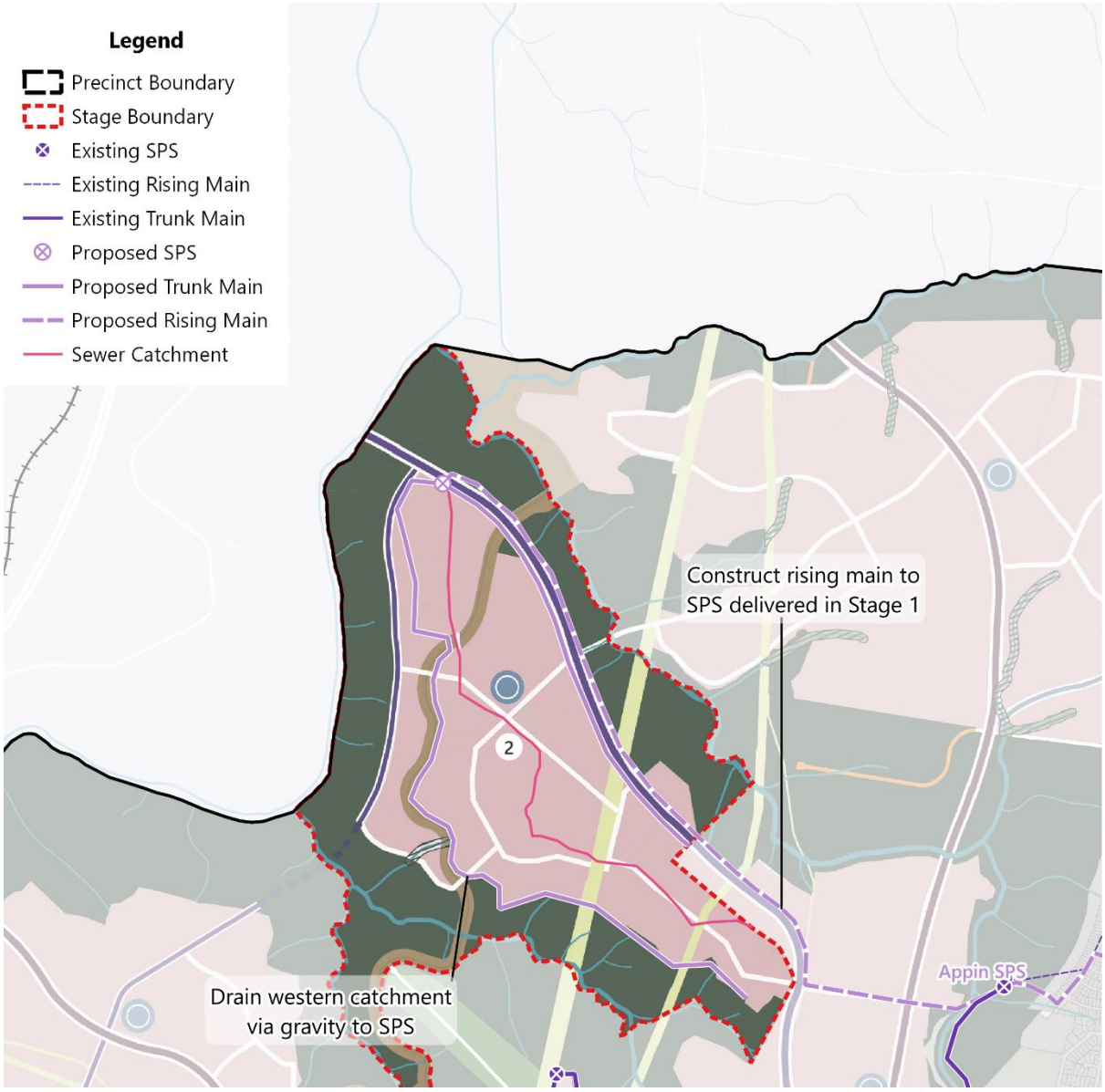
Stage 2 falls into two main sewer catchments:

- The northern catchment draining towards Ousedale Creek
- The western catchment draining towards the Nepean River

Both catchments can be drained via gravity to a low point at the northern end of development. From the low point, a new sewer pump station will transfer flows to the new Appin SPS via a rising main constructed along the existing Macquariedale Road corridor and crossing the Ousedale Creek corridor. This arrangement is shown in Figure 9 below.

The SPS within Stage 2 will ultimately transfer flows from the whole Appin precinct to a new wastewater treatment plant. This SPS should be sized sufficiently to support this growth (approximately 21,000+ dwellings).

Figure 9 - Stage 2 Sewer Infrastructure



4.3 SIC Infrastructure

4.3.1 Roads

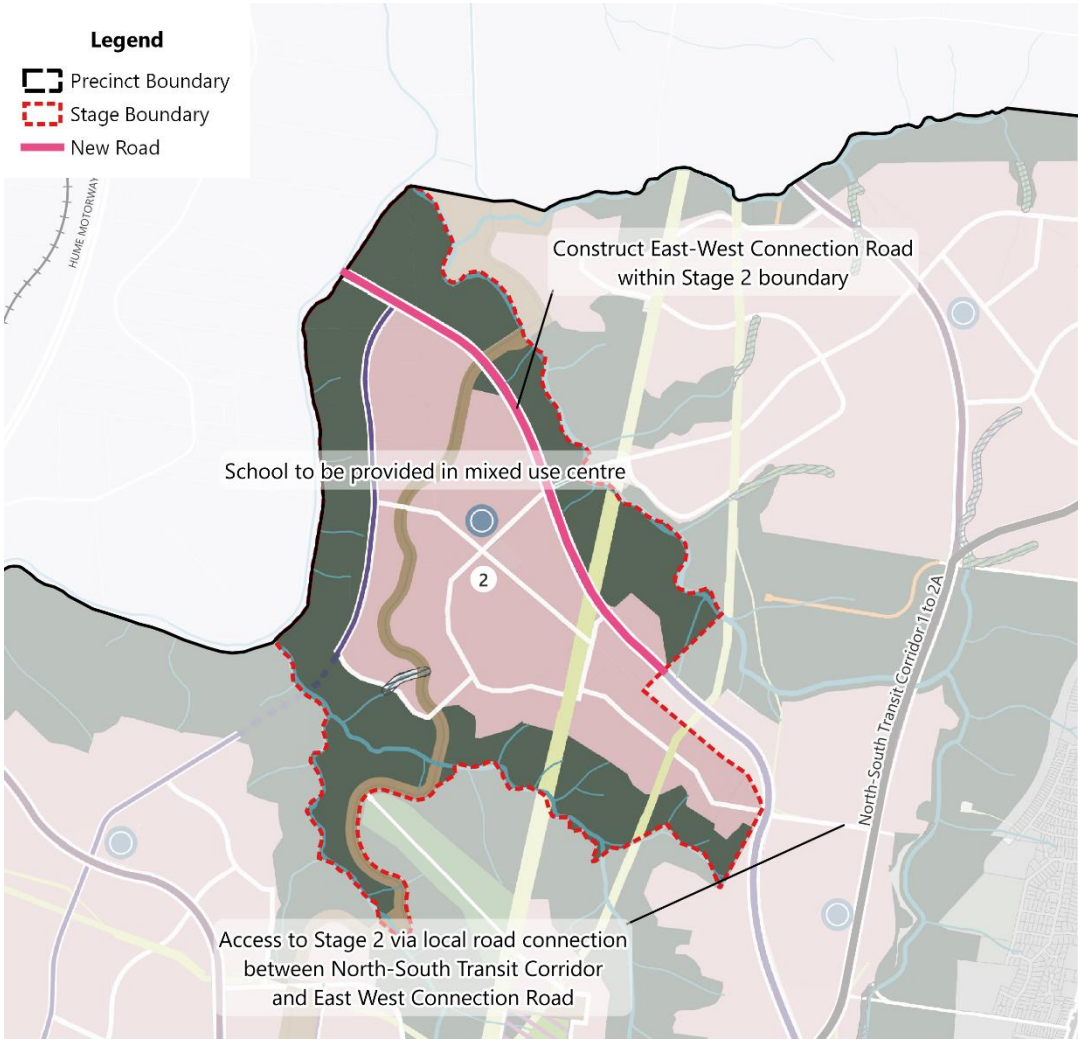
The key arterial road connection within Stage 2 is Part 1 of the East-West Connection Road, which will provide site access. The East-West Connection Road will provide two travel lanes in each direction and will extend the length of the Stage 2 boundary. Local road connections will be utilised to access Stage 2 from the east. The extents are shown in Figure 10 below.

Another development stage may be delivered simultaneously with Stage 2, which would bring forward the delivery of the link from the East-West Connection Road to the Hume Highway, this is required to support 8,000 dwellings.

4.3.2 Schools

Stage 2 includes a primary school with capacity for 1,000 students. The land for this school will be dedicated as part of the SIC (or delivered through alternative arrangements authorised by the state government). The proposed location is shown in Figure 10.

Figure 10 - Stage 2 SIC Infrastructure



4.4 Infrastructure Summary

A summary of the infrastructure required to support Stage 2 is provided in Table 7.

Table 7 - Stage 2 Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Electricity	11kV Feeders (lengths tbc subject to subdivision design)	3	item
Water	Trunk Mains	5,600	m
Sewer	Trunk Gravity Mains	6,400	m
	Rising Mains	4,100	m
	Sewer Pump Station	1	Item
Roads	East-West Connection Road Part 1	2,700	m
School	Primary School (1,000 students)	1.5	Ha

5 Stage 2A

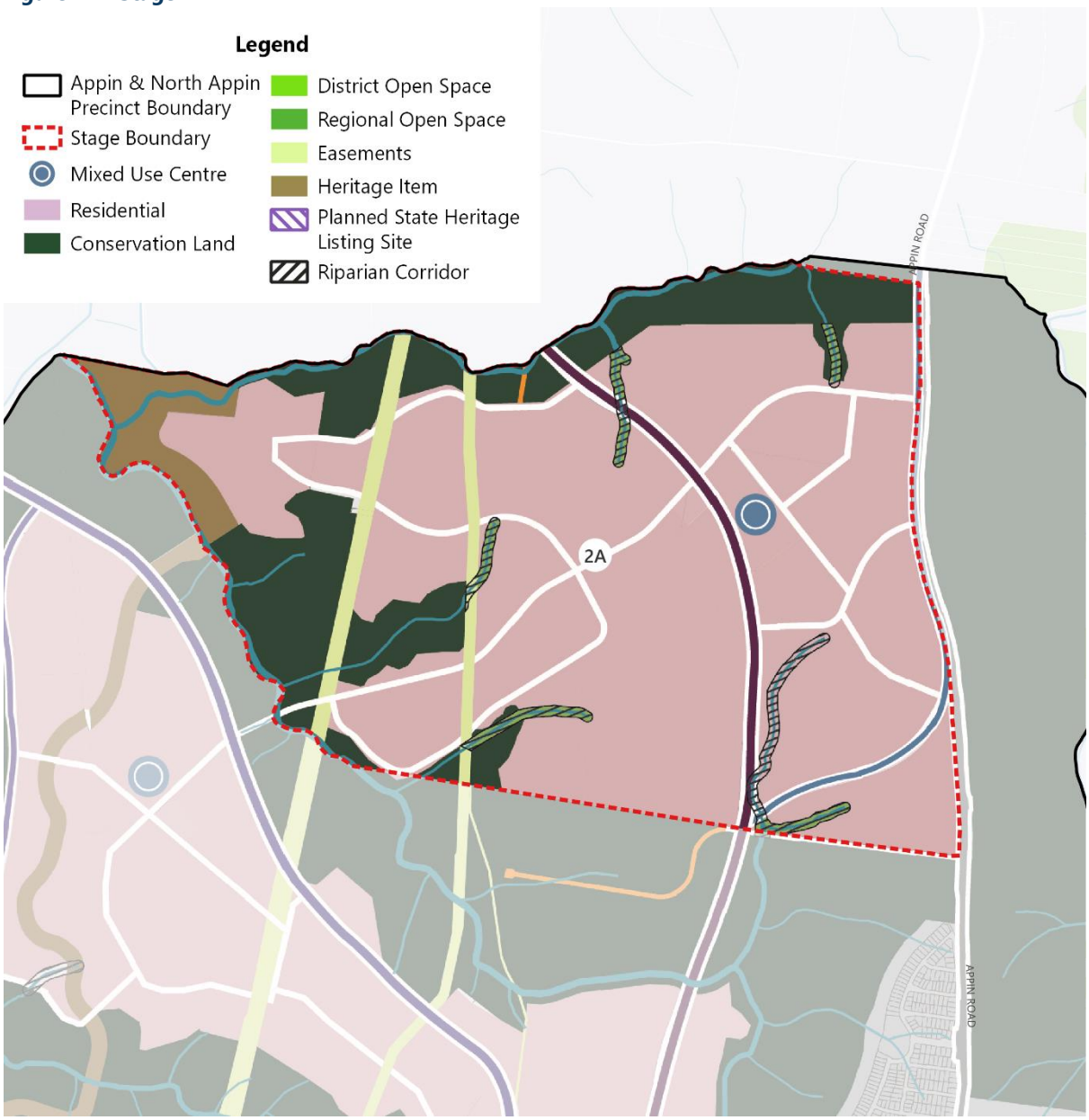
5.1 Development

Stage 2A includes the area bound by Mallaty Creek to the north, Appin Road to the east, Stage 3A to the south and Stage 2 to the west. Stage 2A includes the following development:

- 4,166 low density dwellings
- 188 medium density dwellings
- 3,000m^2 GFA retail/commercial
- Combined primary and secondary school (3,000 students)

Stage 2A is shown in Figure 11 below.

Figure 11 - Stage 2A



5.1 Utilities

5.1.1 Electricity

Endeavour Energy have indicated that a second zone substation will be required to support development in the northern part of the precinct. The North Appin ZS would be located within Stage 2A, adjacent the existing transmission lines. A minimum 8,280m^2 site would be required, with an indicative location shown in Figure 12 below.

High voltage feeders will be extended from the new ZS to development fronts. Based on an assumed 4,354 dwellings, four new 11kV feeders would be required to support development. Feeder locations have not been shown on Figure 12 for clarity.

Table 8 - Stage 2A Electricity Demand

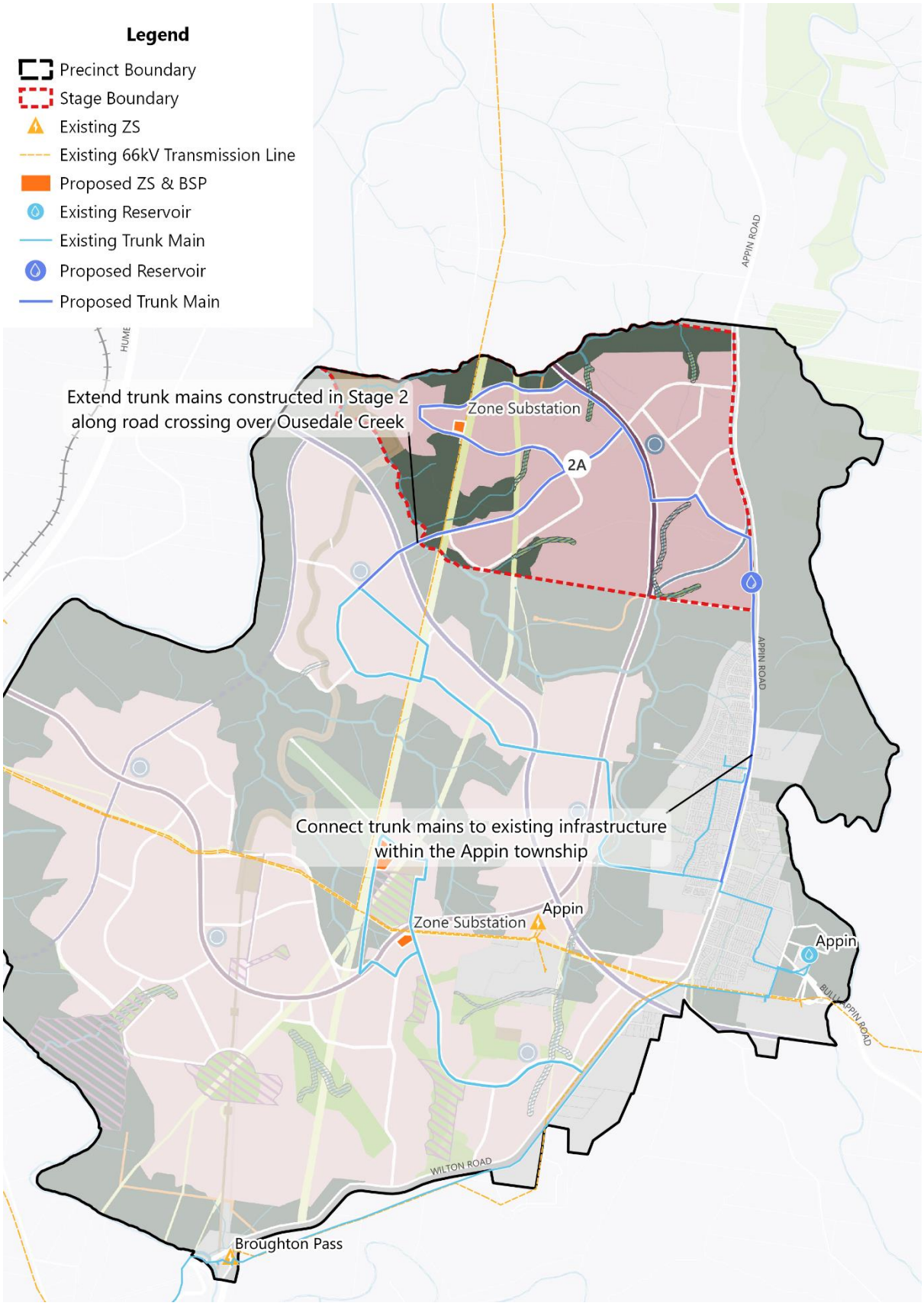
Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	16.7	3.7
Medium Density Residential	4.0/dwelling	0.8	0.2
Retail	0.1/sqm GFA	0.2	0.1
Commercial	0.085/sqm GFA	0.1	0.0
School	0.085/sqm GFA	2.2	0.5
Total		**19.9**	**4.4**

5.1.2 Potable Water

Sydney Water have indicated a new potable water reservoir will be required to support development in Appin. An indicative location for a new reservoir is shown in Figure 12, however the preferred location will be subject to Sydney Water assessment.

Stage 2A will be serviced by extending the recently constructed mains within Stage 2. A collector road crossing over Ousedale Creek will be used to connect potable water infrastructure between the stages. Trunk mains will connect to the new reservoir and extend along Appin Road to connect back to existing trunk infrastructure within the Appin township. Trunk mains will run along key road corridors within Stage 2A, with smaller reticulation mains provided in local roads to supply individual dwellings.

Figure 12 - Stage 2A Water & Electrical Infrastructure



5.1.3 Sewer

Sydney Water are planning for a new treatment plant to support development within the Appin precinct and surrounding area. Planning and delivery for a new treatment plant is expected to take between 7-10 years. To provide a conservative estimate for this assessment, as advised by Sydney Water, we have assumed the new treatment plant will be operational in 10 years, by 2032. This date aligns with the current delivery timing for Stage 2A.

No location has been determined for the Upper Nepean Treatment Plant (TP), however for the purpose of this assessment we have shown an indicative location near the Nepean River on Figure 13 below. Please note this location is indicative only and the final location will be subject to detailed assessment by Sydney Water.

Once the Upper Nepean TP is operational, it is expected that initial stages of development which previously utilised the Glenfield WRP will be switched over to the new treatment plant. All future development will also utilise the Upper Nepean TP.

To transfer flows to the Upper Nepean TP, the SPS constructed at the low point in Stage 2 will be utilised, with a new rising main constructed along the East-West Connection Road and Hume Highway. It is expected this rising main would need to cross the rail corridor, depending on the final location of the TP. A preferred configuration for this connection will be confirmed by Sydney Water and could be potentially located further to north to support adjacent developments.

Within Stage 2A, development falls into three sewer catchments:

- Northern catchment draining to Mallaty Creek
- South eastern catchment draining to Lily Ponds Gully, a tributary of Ousedale Creek
- Southern catchment draining to Ousedale Creek

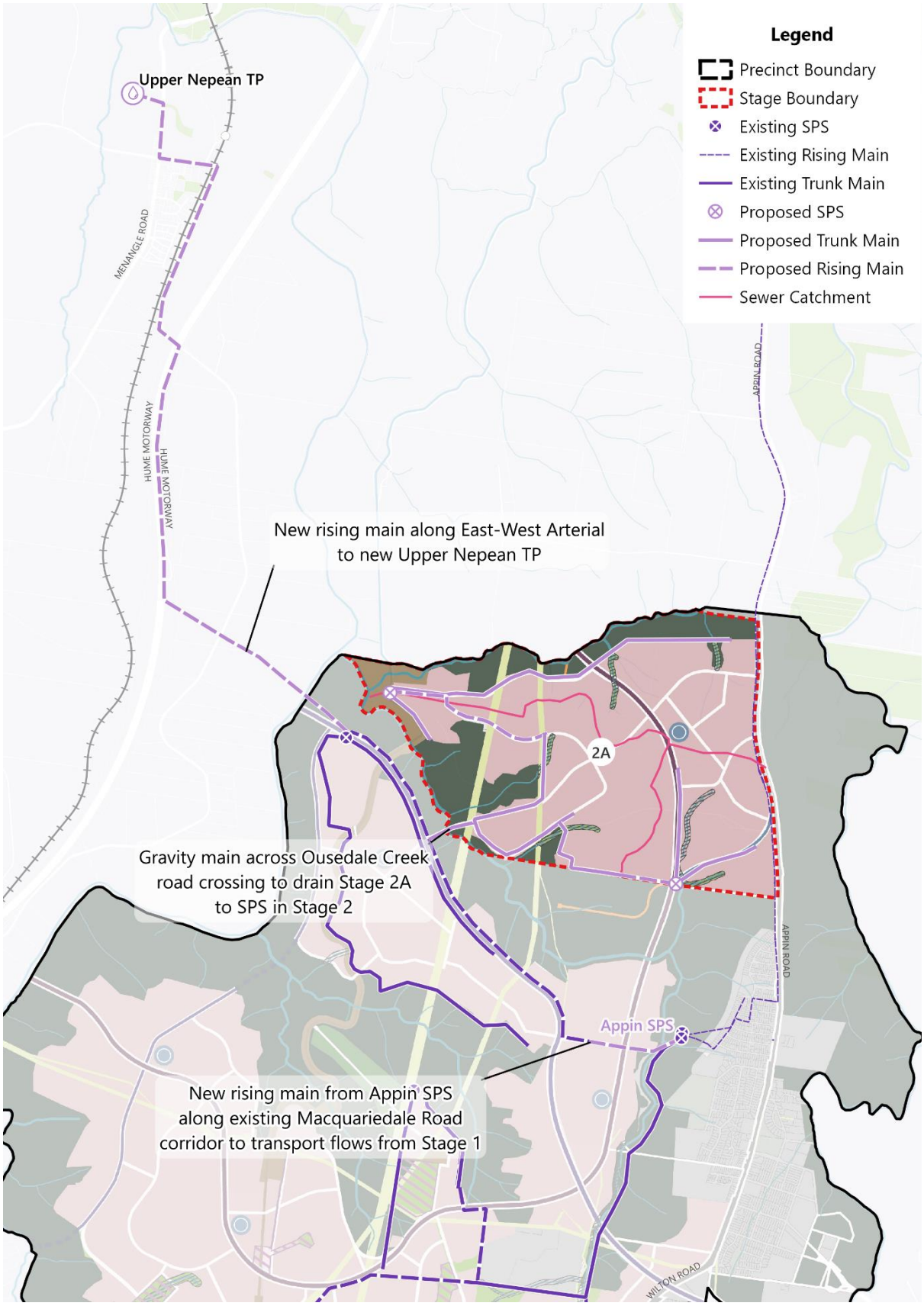
Two pump stations would be required to transfer flows from the northern and south eastern catchment to the discharge point in the southern catchment. From the southern catchments, a main would be constructed along the Ousedale Creek road crossing, connecting to the SPS in Stage 2. This arrangement is shown in Figure 5 below.

In addition, to transfer flows from Stage 1 to the Upper Nepean TP a new rising main from the Appin SPS would be constructed along the existing Macquariedale Road corridor, connecting to a gravity main in Stage 2. The rising main along Appin Road used to transfer flows to the Glenfield WRP would be decommissioned.

5.1.1 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 13 - Stage 2A Sewer Infrastructure



5.2 SIC Infrastructure

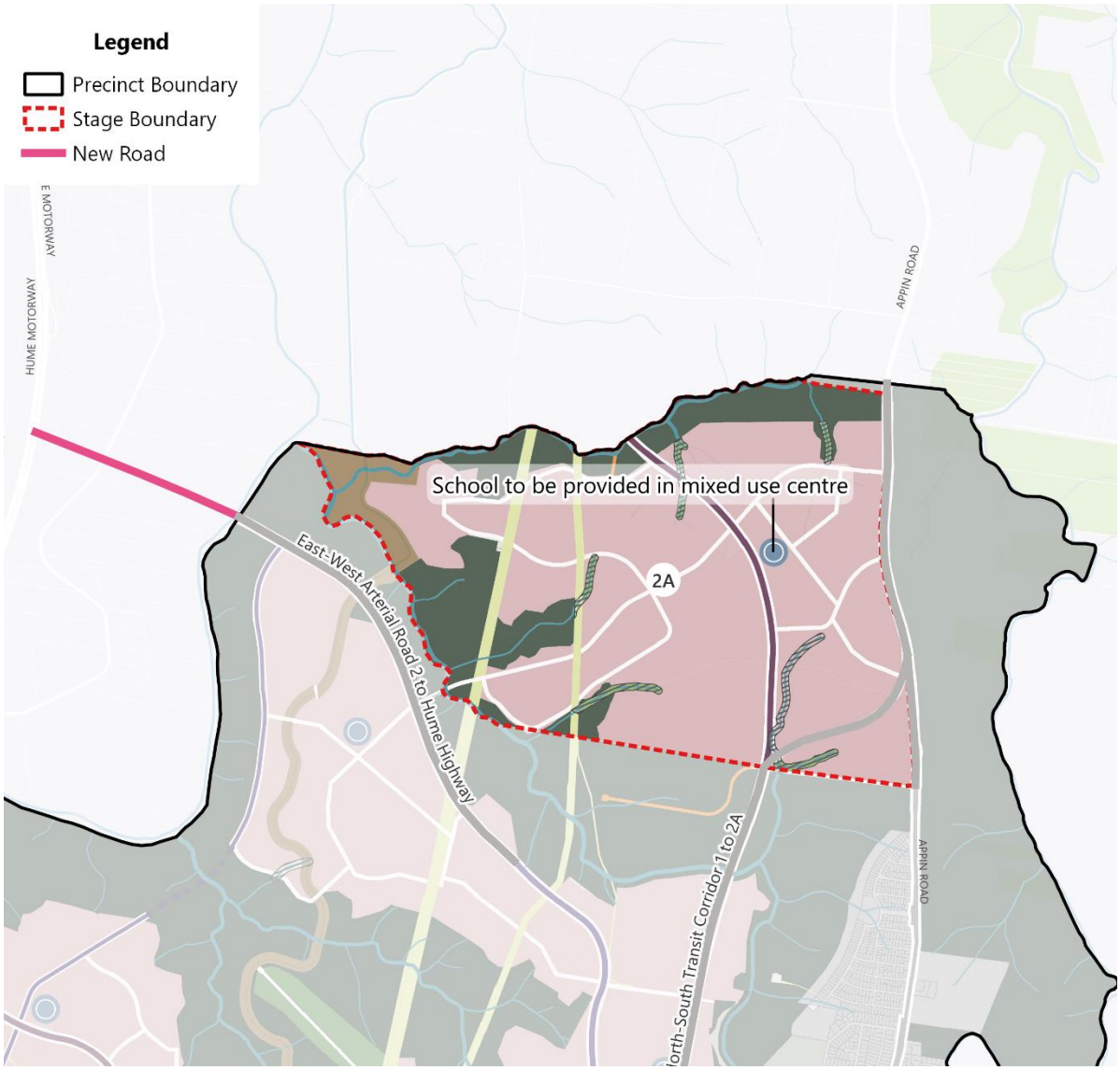
5.2.1 Roads

The connection of the East-West Connection Road to the Hume Highway will be required when the Appin Precinct reaches 8,000 new dwellings. This is anticipated to occur within Stage 2A; however it should be noted that if Stages 2 and 2A are developed concurrently, this infrastructure would be delivered earlier. This connection will relieve pressure on Appin Road and provide additional access to the development.

5.2.2 Schools

Stage 2A includes a combined primary and secondary school with capacity for 3,000 students. The land for this school will be dedicated as part of the SIC and the proposed location is shown in Figure 14.

Figure 14 - Stage 2A SIC Infrastructure



5.1 Infrastructure Summary

A summary of the infrastructure required to support Stage 2A is provided in Table 9 below.

Table 9 - Stage 2A Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Electricity	11kV Feeders (lengths tbc subject to subdivision design)	4	item
Water	Trunk Mains	10,200	m
	Reservoir	1	item
Sewer	Trunk Gravity Mains	8,400	m
	Rising Mains	9,300	m
	Sewer Pump Station	2	Item
Roads	East-West Connection Road Part 1 (Hume Highway Connection)	1,600	m
School	Combined Primary and Secondary School (3,000 students)	4.0	Ha

6 Stage 3

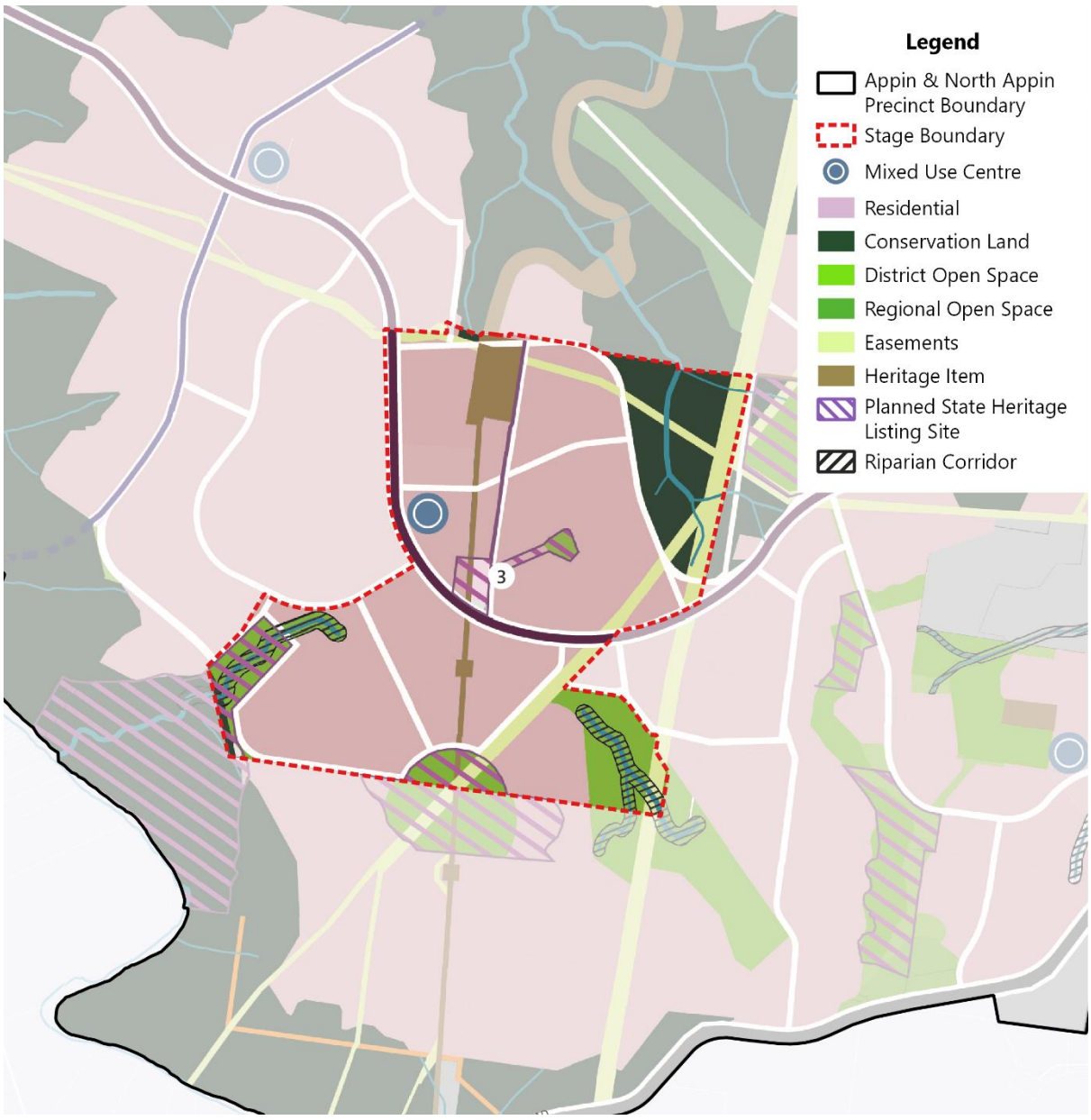
6.1 Development

Stage 3 includes the area bound by Stage 1 to the north and east, Stage 4A to the south and Stages 4 and 5 to the west. Development within Stage 3 includes:

- 1,287 low density dwellings
- 2,064 medium density dwellings
- 3,000m^2 GFA retail/commercial
- Combined primary and secondary school (3,000 students)

Stage 3 is shown in Figure 15 below.

Figure 15 - Stage 3



6.2 Utilities

6.2.1 Electricity

Development within Stage 3 will be supplied via the Appin ZS. The calculated electrical demands are provided in Table 14. Based on the below demands, we would expect three to four feeders would be required to support development in Stage 3. Feeders have not been shown on Figure 16 for clarity.

Table 10 - Stage 3 Electricity Demand

Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	5.1	1.1
Medium Density Residential	4.0/dwelling	8.3	1.8
Retail	0.1/sqm GFA	0.2	0.1
Commercial	0.085/sqm GFA	0.1	0.0
School	0.085/sqm GFA	2.0	0.5
Total		**15.7**	**3.5**

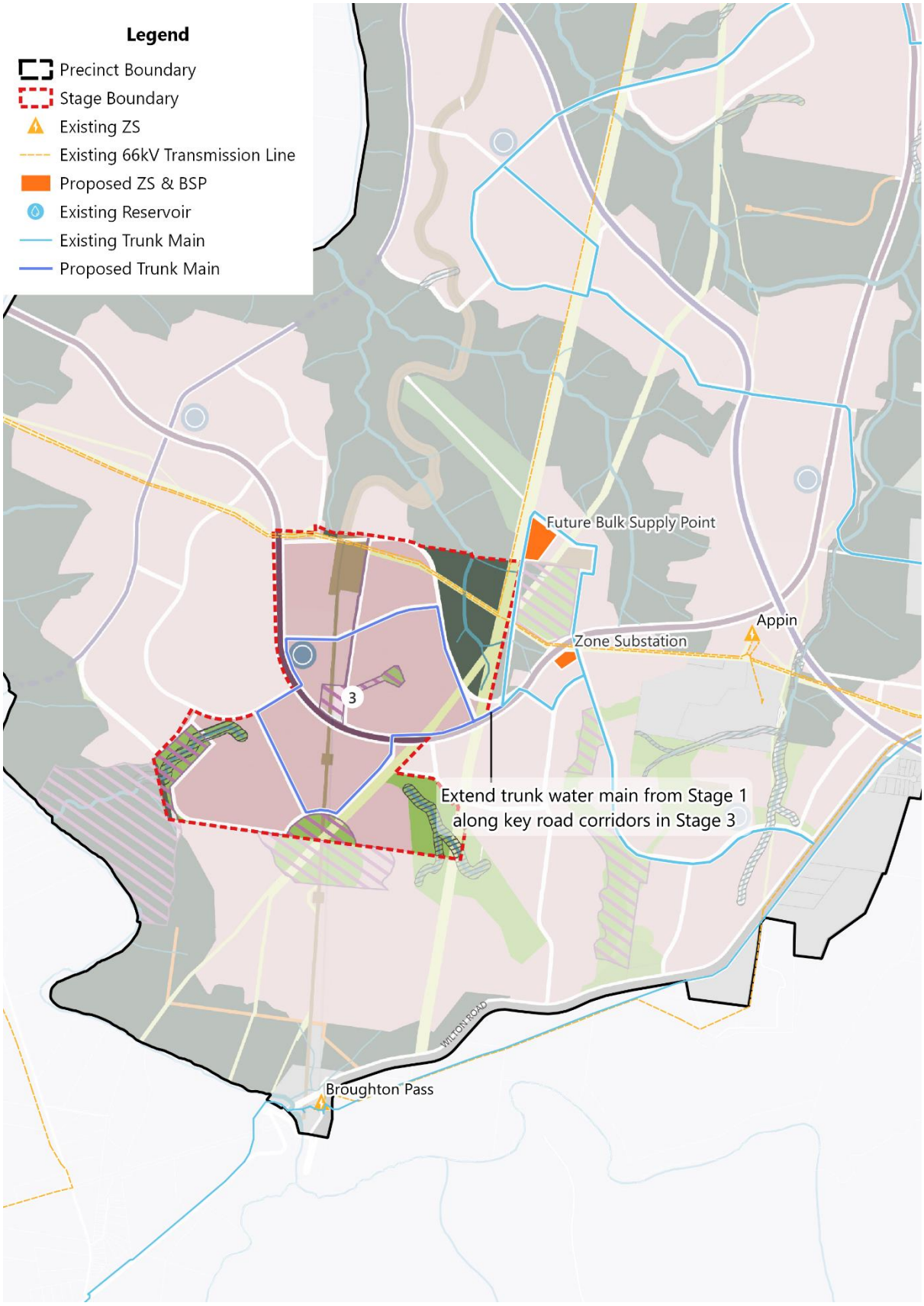
6.2.2 Potable Water

Stage 3 will receive potable water servicing by extending the mains in Stage 1. A 375mm trunk main will be constructed as a loop traversing collector roads. Smaller reticulation mains will extend from this trunk main along local roads to supply individual dwellings.

6.2.1 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 16 - Stage 3 Water & Electrical Infrastructure



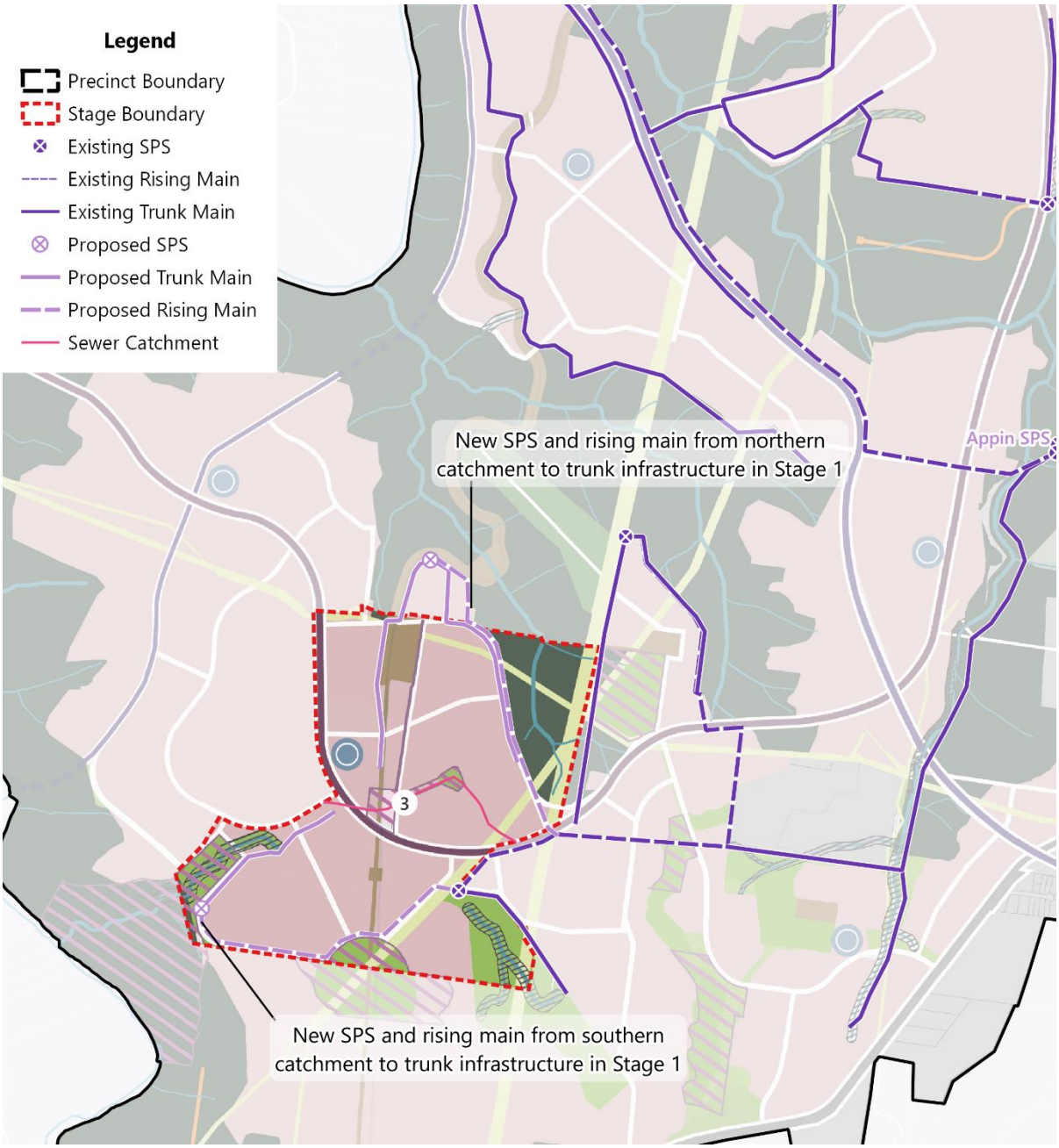
6.2.2 Sewer

Within Stage 3, development falls into two sewer catchments:

- Northern catchment draining to Simpsons Creek
- Southern catchment draining to the Nepean River

Two pump stations would be required to transfer flows from the northern and southern catchments to the trunk infrastructure located in Stage 1. From Stage 1, flows would be transferred via the Appin SPS and Stage 2 SPS to the Upper Nepean TP. This arrangement is shown in Figure 17 below.

Figure 17 - Stage 3 Sewer Infrastructure



6.3 SIC Infrastructure

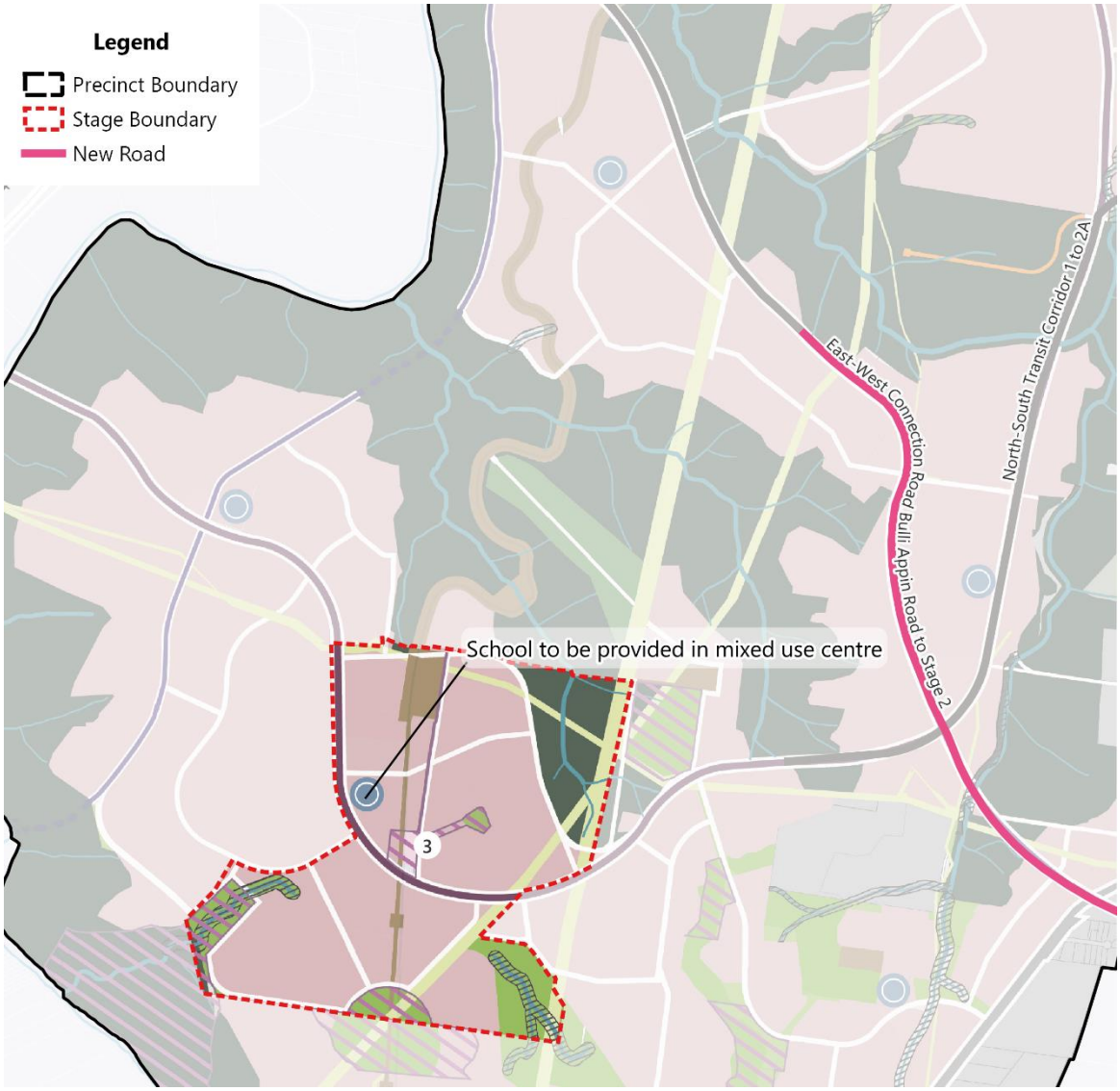
6.3.1 Roads

Stage 3 will include the construction of Part 2 of the East-West Connection Road. This section will connect Part 1 of the East-West Connection Road (constructed in Stage 2) to Appin Road and will be required to support 14,000 new dwellings, which is expected to occur towards the end of Stage 3. Delivery of this road is expected to relieve pressure on Appin Road through the Appin township. The extent of works is shown in Figure 18 below.

6.3.2 School

Stage 3 includes a combined primary and secondary school with capacity for 3,000 students. The land for this school will be dedicated as part of the SIC and the proposed location is shown in Figure 18.

Figure 18 - Stage 3 SIC Infrastructure



6.4 Infrastructure Summary

A summary of the infrastructure required to support Stage 3 is provided in Table 11 below.

Table 11 - Stage 3 Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Electricity	11kV Feeders (lengths tbc subject to subdivision design)	3	item
Water	Trunk Mains	4,300	m
Sewer	Trunk Gravity Mains	3,100	m
	Rising Mains	3,300	m
	Sewer Pump Station	2	Item
Roads	East-West Connection Road Part 2 – Stage 3 to Appin Road	5,900	m
School	Combined primary and secondary school (3,000 students)	4	Ha

7 Stage 3A

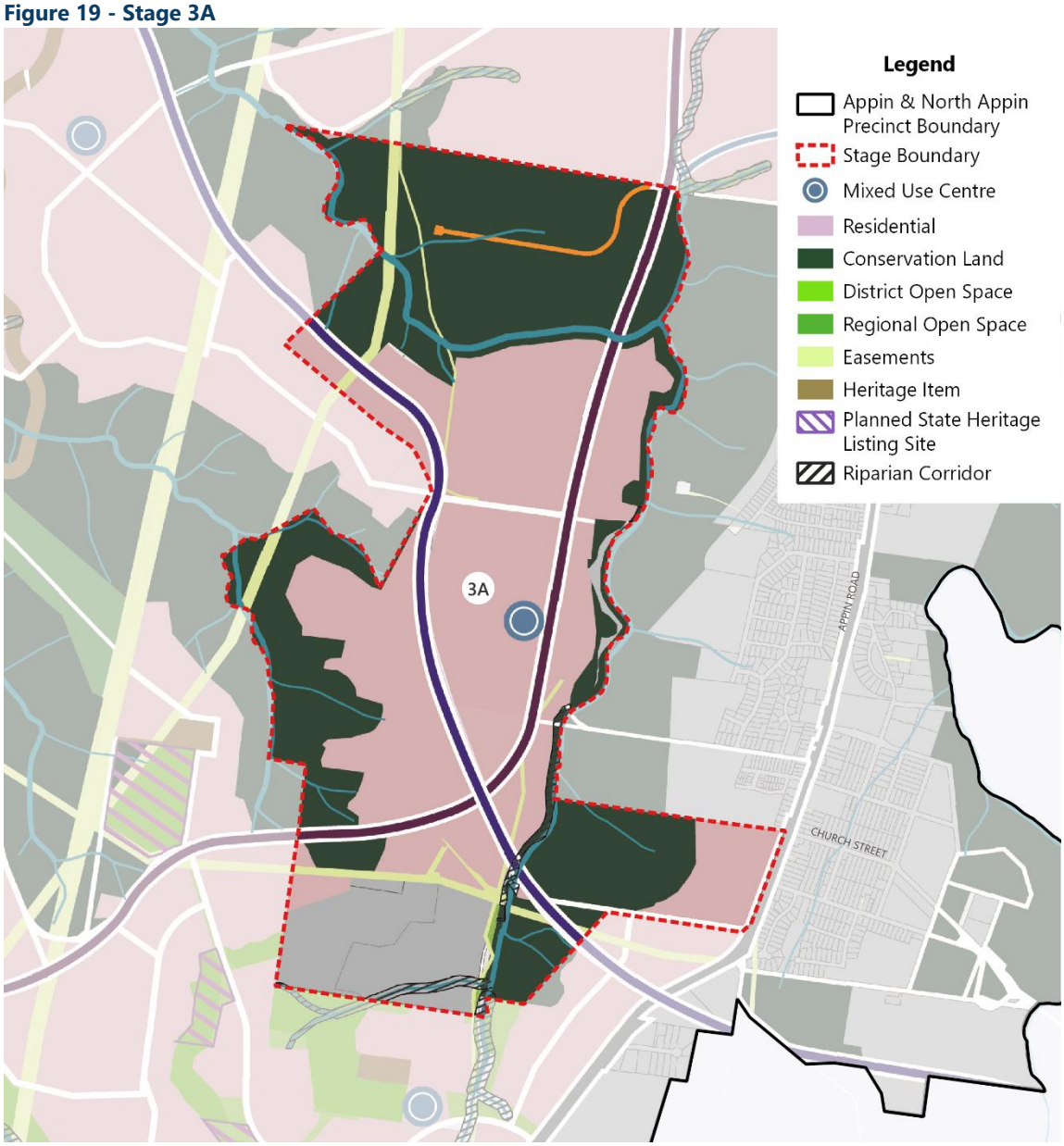
7.1 Development

Stage 3A includes the area on the eastern boundary of the precinct. The stage is bound by Stage 2A to the north, the existing Appin township to the east, Stage 1 to the south and Stage 2 to the west. Development within Stage 3A includes:

- 1,318 low density dwellings
- 982 medium density dwellings
- 30,000m^2 GFA retail/commercial
- Combined primary and secondary school (3,000 students)

Stage 3A is shown in Figure 19 below.

Figure 19 - Stage 3A



7.2 Utilities

7.2.1 Electricity

Development within Stage 3A will be supplied via the North Appin ZS. The calculated electrical demands are provided in Table 12. Based on the below demands, we would expect three feeders would be required to support development in Stage 3A.

Table 12 - Stage 3A Electricity Demand

Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	5.3	1.2
Medium Density Residential	4.0/dwelling	3.9	0.9
Retail	0.1/sqm GFA	2.5	0.6
Commercial	0.085/sqm GFA	0.4	0.1
School	0.085/sqm GFA	2.0	0.5
Total		**14.2**	**3.1**

7.2.2 Potable Water

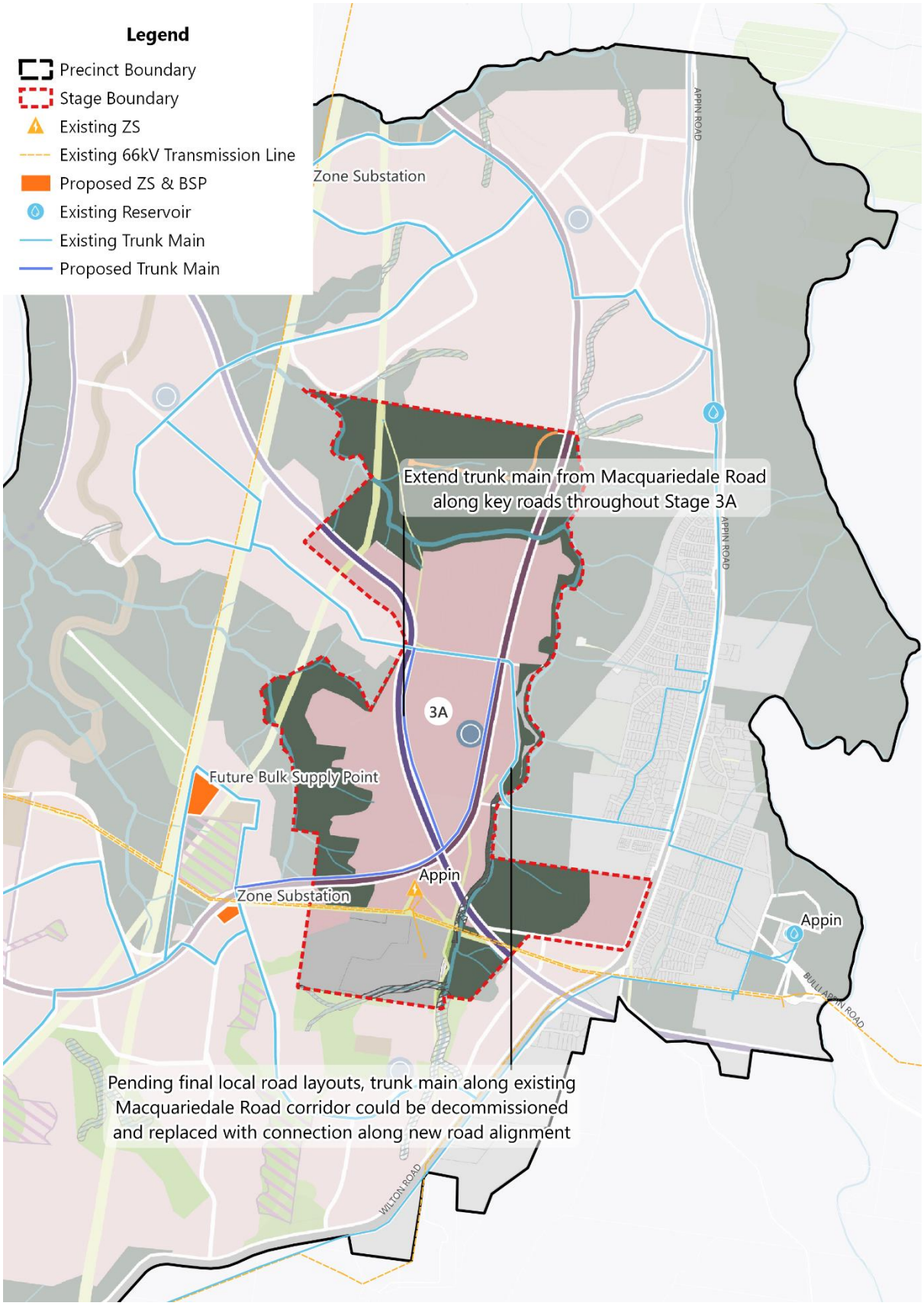
Stage 3A will leverage the trunk main constructed along Macquariedale Road to support Stage 2. The existing Macquariedale Road alignment appears to follow the lot boundaries on the eastern side of Stage 3A. The final local road layout is unknown at this stage, however should Macquariedale Road be demolished, the main along this road could be decommissioned and an alternative connection constructed along the collector road connecting the North-South Transit Corridor to the Macquariedale Road extents outside the precinct boundary.

Trunk mains will be extending along key roads throughout the stage, with smaller reticulation mains constructed along local roads to supply individual lots. The proposed trunk water infrastructure is shown in Figure 20 below.

7.2.1 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 20 - Stage 3A Water & Electrical Infrastructure



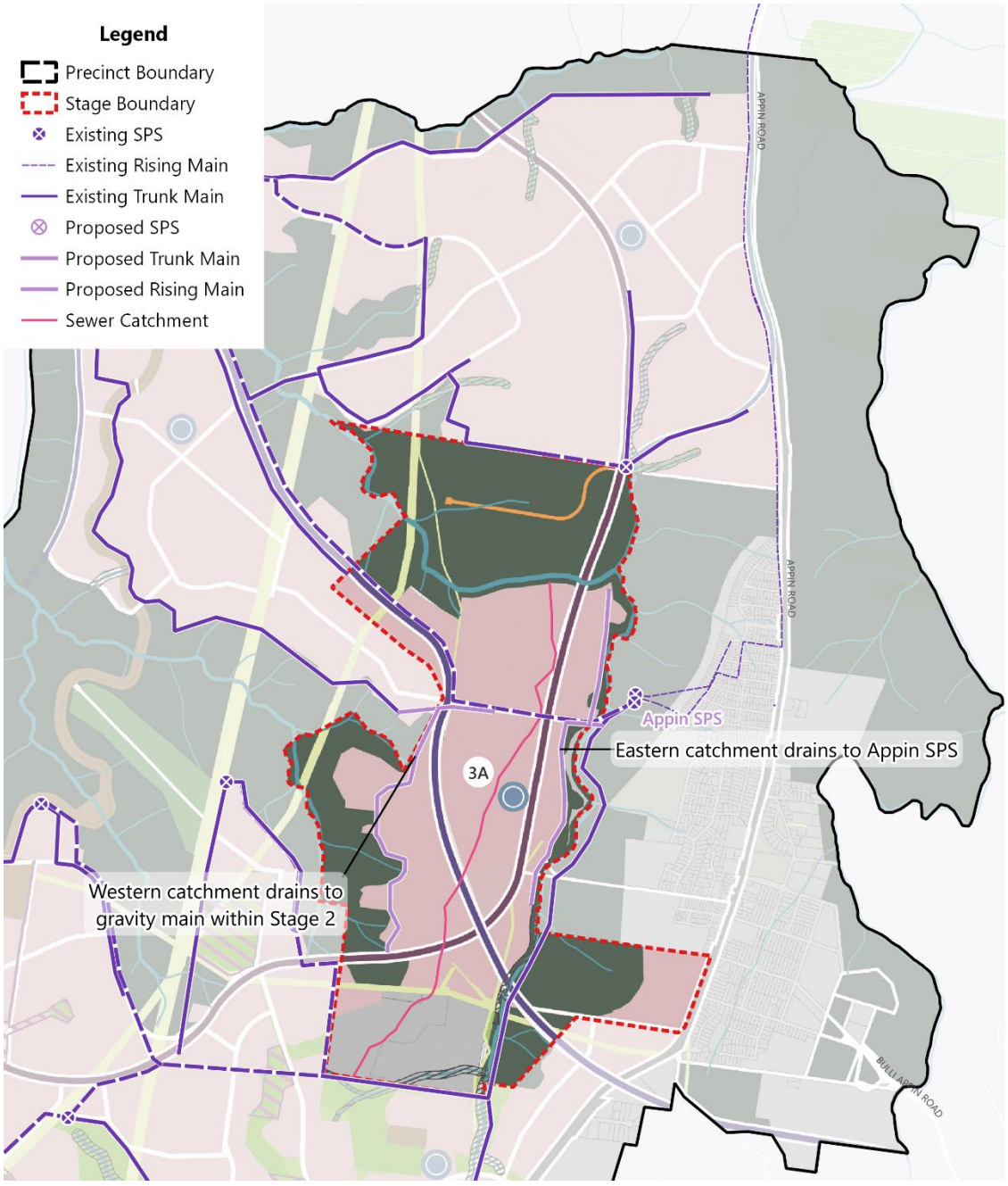
7.2.2 Sewer

Stage 3A falls into two sewer catchments:

- Western catchment draining to Elladale Creek
- Eastern catchment draining to Ousedale Creek

The western catchment will drain to the gravity main along Macquariedale Road. The eastern catchment will drain via gravity to the Appin SPS. A new gravity main will be constructed along the development boundary before crossing the creek to connect to the trunk main draining to the Appin SPS. This arrangement is shown in Figure 21 below.

Figure 21 - Stage 3A Sewer Infrastructure



7.3 SIC Infrastructure

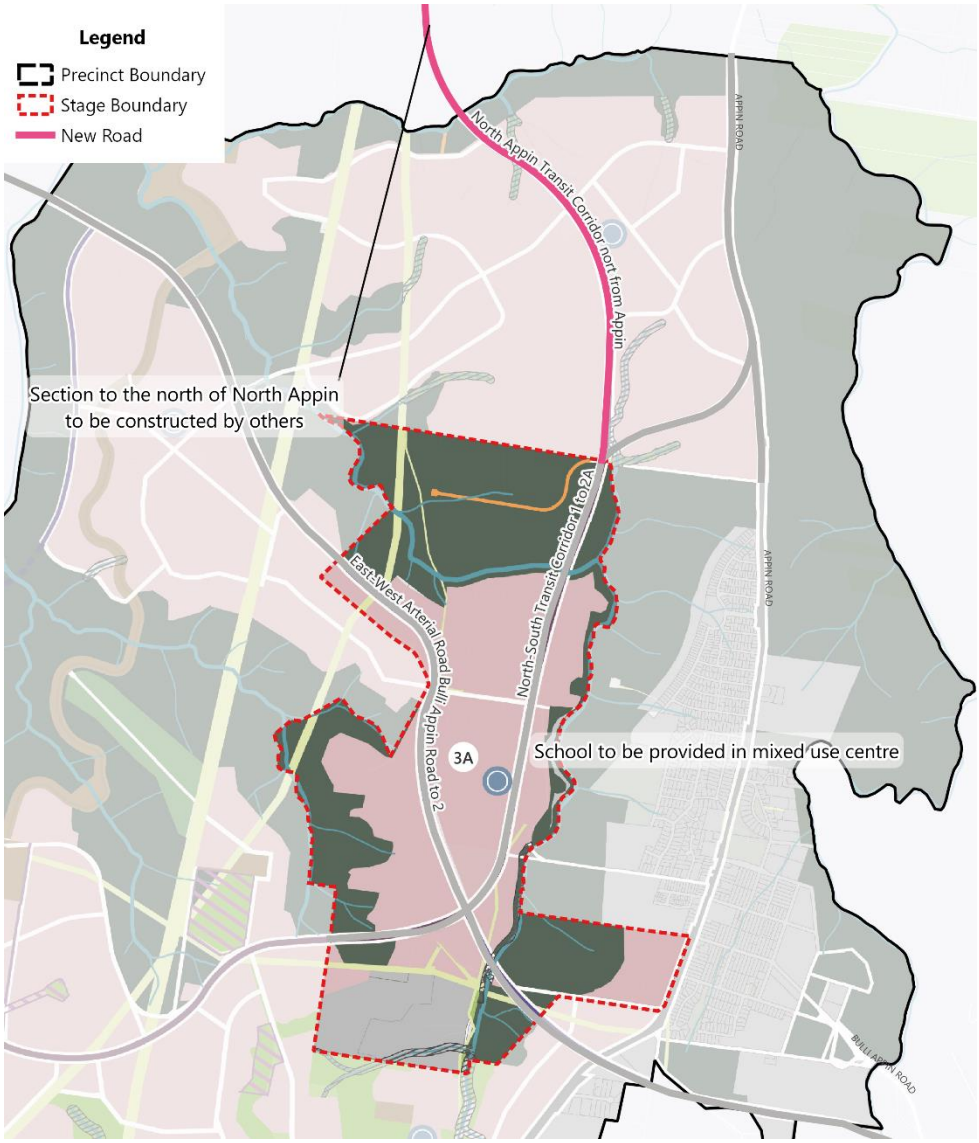
7.3.1 Roads

Stage 3A works will include Part 2 of the North-South Transit Corridor which will be constructed within Stage 2A. This connection will enable high quality and efficient public transport services to operate to Macarthur Station once sections to the north are completed by other developers. Part 2 of the North-South Transit Corridor is required to support 14,600 dwellings, however it may be delivered earlier, to align with development within Stage 2A.

7.3.2 School

Stage 3A includes a combined primary and secondary school with capacity for 3,000 students. The land for this school will be dedicated as part of the SIC and the proposed location is shown in Figure 22.

Figure 22 - Stage 3A SIC Infrastructure



7.4 Infrastructure Summary

A summary of the infrastructure required to support Stage 3A is provided in Table 13.

Table 13 - Stage 3A Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Electricity	11kV Feeders (lengths tbc subject to subdivision design)	3	item
Water	Trunk Mains	3,600	m
Sewer	Trunk Gravity Mains	3,600	m
Roads	North-South Transit Corridor Part 2 – Stage 2A & North	2,200	m
School	Combined primary and secondary school (3,000 students)	4	Ha

8 Stage 4

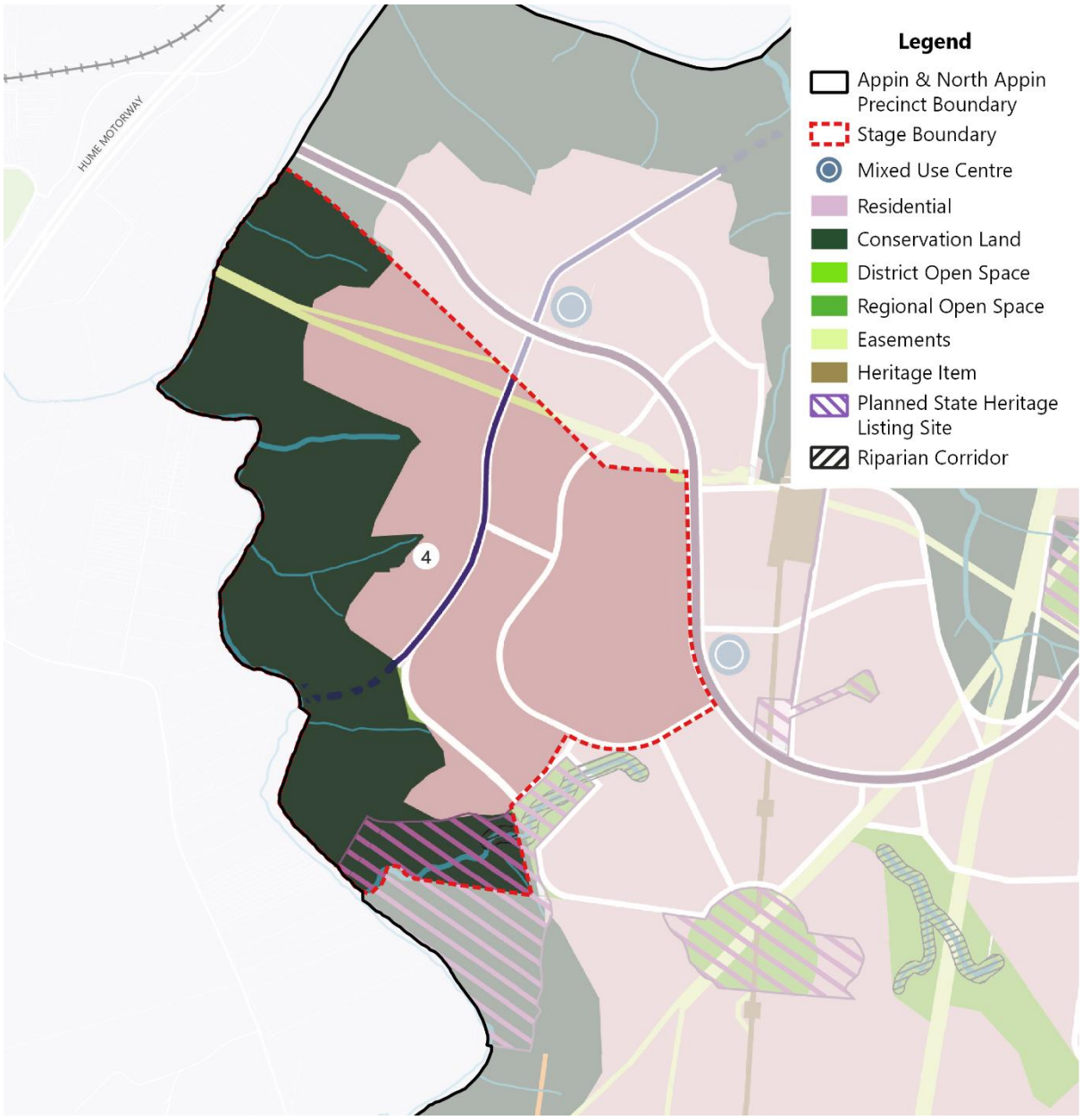
8.1 Development

Stage 4 includes the area on the western boundary of the precinct. Stage 4 is bound by Stage 5 to the north, Stage 3 to the east, Stage 4A to the south and the Cataract and Nepean Rivers to the west. Development within Stage 4 includes:

- 2,584 low density dwellings
- 214 medium density dwellings

Stage 4 is shown in Figure 23.

Figure 23 - Stage 4



8.2 Utilities

8.2.1 Electricity

Development within Stage 4 will be supplied via the Appin ZS. The calculated electrical demands are provided in Table 14. Based on the below demands, we would expect 2-3 feeders would be required to support development in Stage 4. Feeder locations have not been shown in Figure 24 for clarity.

Table 14 - Stage 4 Electricity Demand

Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	10.3	2.3
Medium Density Residential	4.0/dwelling	0.9	0.2
Total		**11.2**	**2.5**

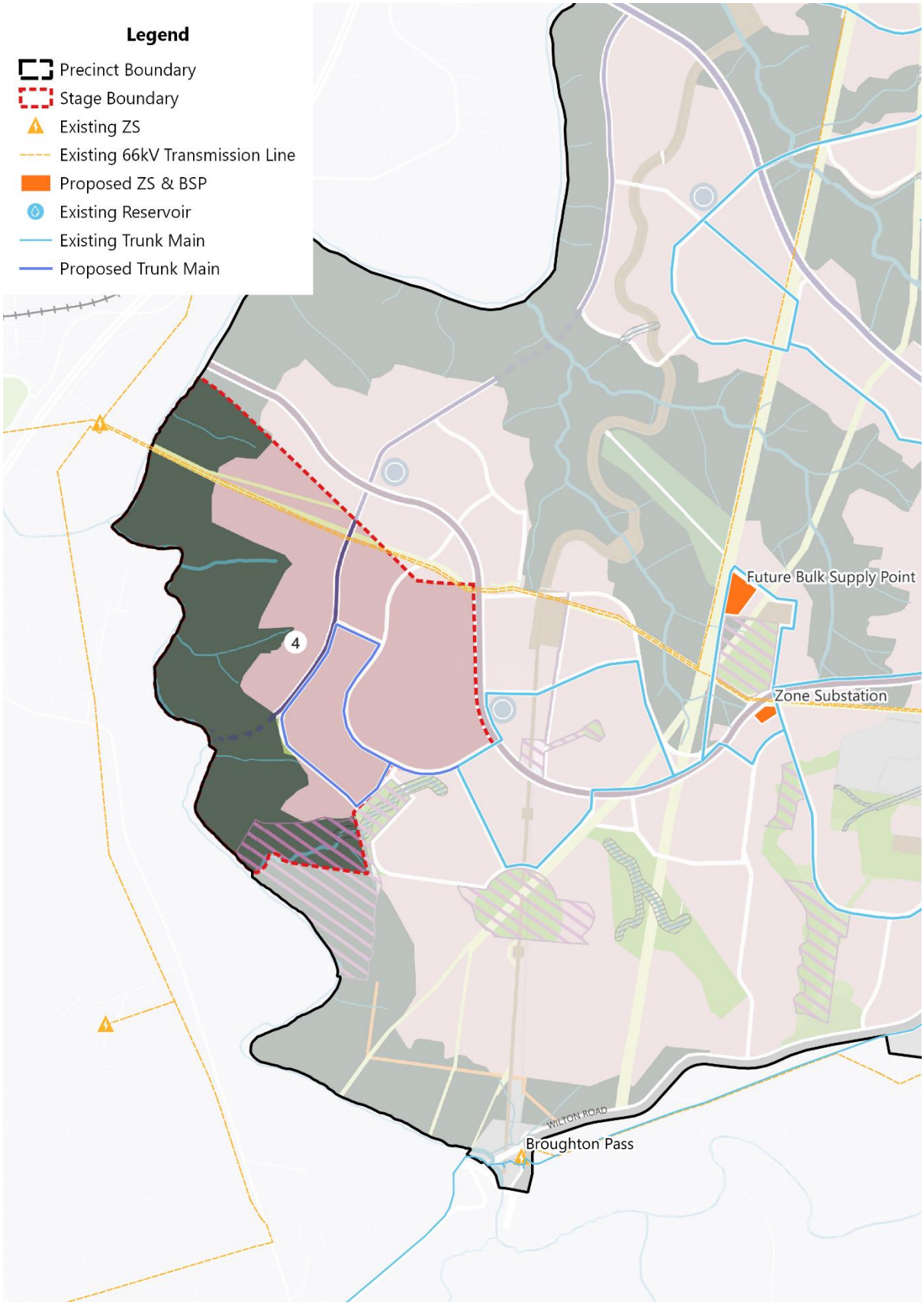
8.2.2 Potable Water

Trunk mains constructed within Stage 3 will be extended along the proposed collector roads within Stage 4. Smaller reticulation mains will extend from this trunk main along local roads to supply individual dwellings.

8.2.1 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 24 - Stage 4 Water & Electrical Infrastructure

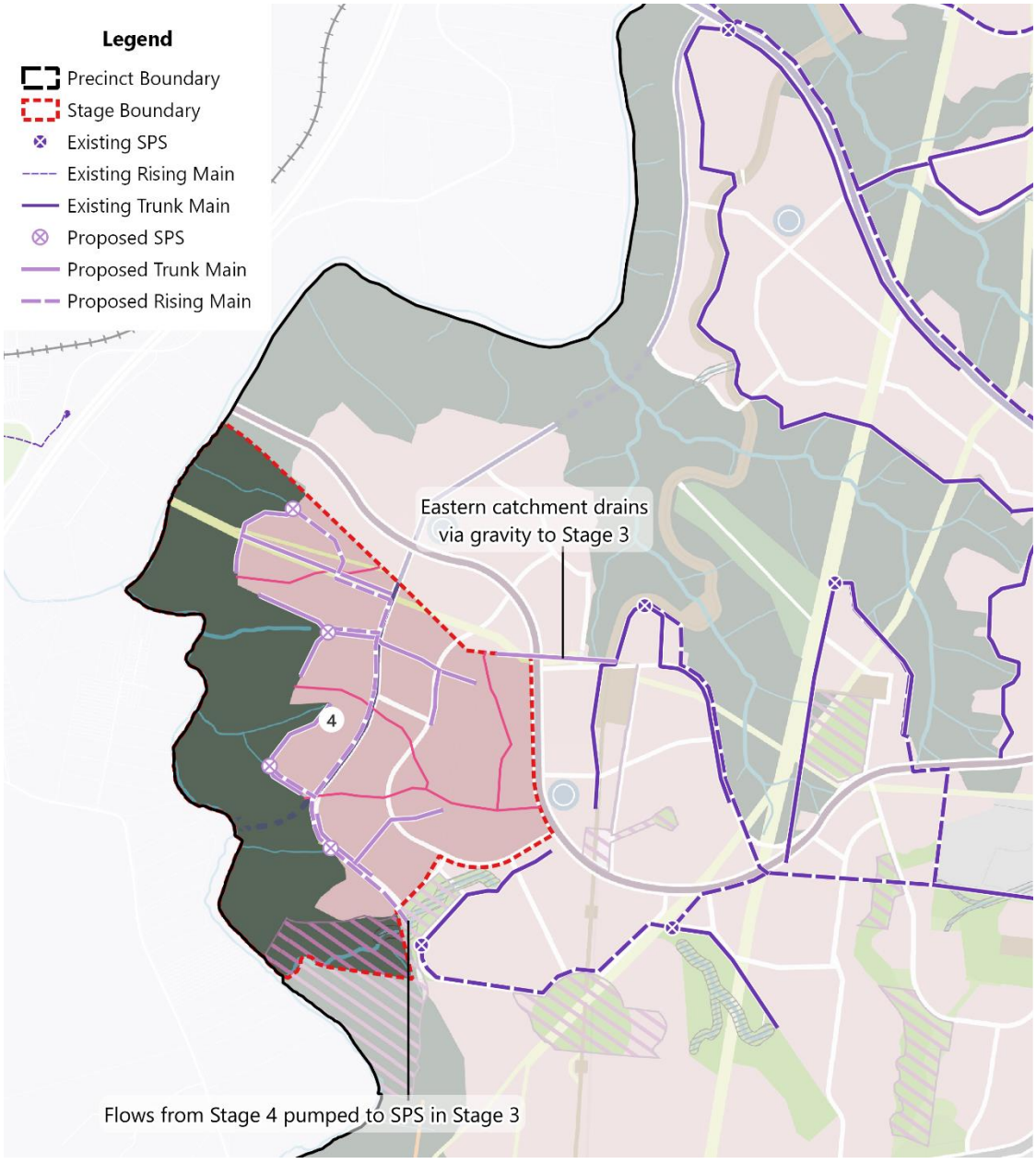


8.2.2 Sewer

Development in Stage 4 falls into five sewer catchments, four of which drain towards the Cataract and Nepean Rivers, with a small catchment on the eastern stage boundary draining towards Stage 3. Sewer from Stage 4 will be transferred to the Appin SPS via Stages 3 and 1, then to the Nepean TP.

Each catchment draining towards the Cataract and Nepean Rivers will include a small SPS which will pump flows to the SPS within the western catchment in Stage 3. There may be opportunities to minimise the number of pump stations required through site grading. This will be confirmed during the detailed design phase. A potential sewer servicing arrangement (assuming each catchment requires a pump station) is shown in Figure 25.

Figure 25 - Stage 4 Sewer Infrastructure



8.3 Infrastructure Summary

A summary of the infrastructure required to support Stage 4 is provided in Table 15 below.

Table 15 - Stage 4 Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Electricity	11kV Feeders (lengths tbc subject to subdivision design)	2-3	item
Water	Trunk Mains	3,200	m
Sewer	Trunk Gravity Mains	5,000	m
	Rising Mains	3,300	m
	Sewer Pump Station	4	Item

9 Stage 4A

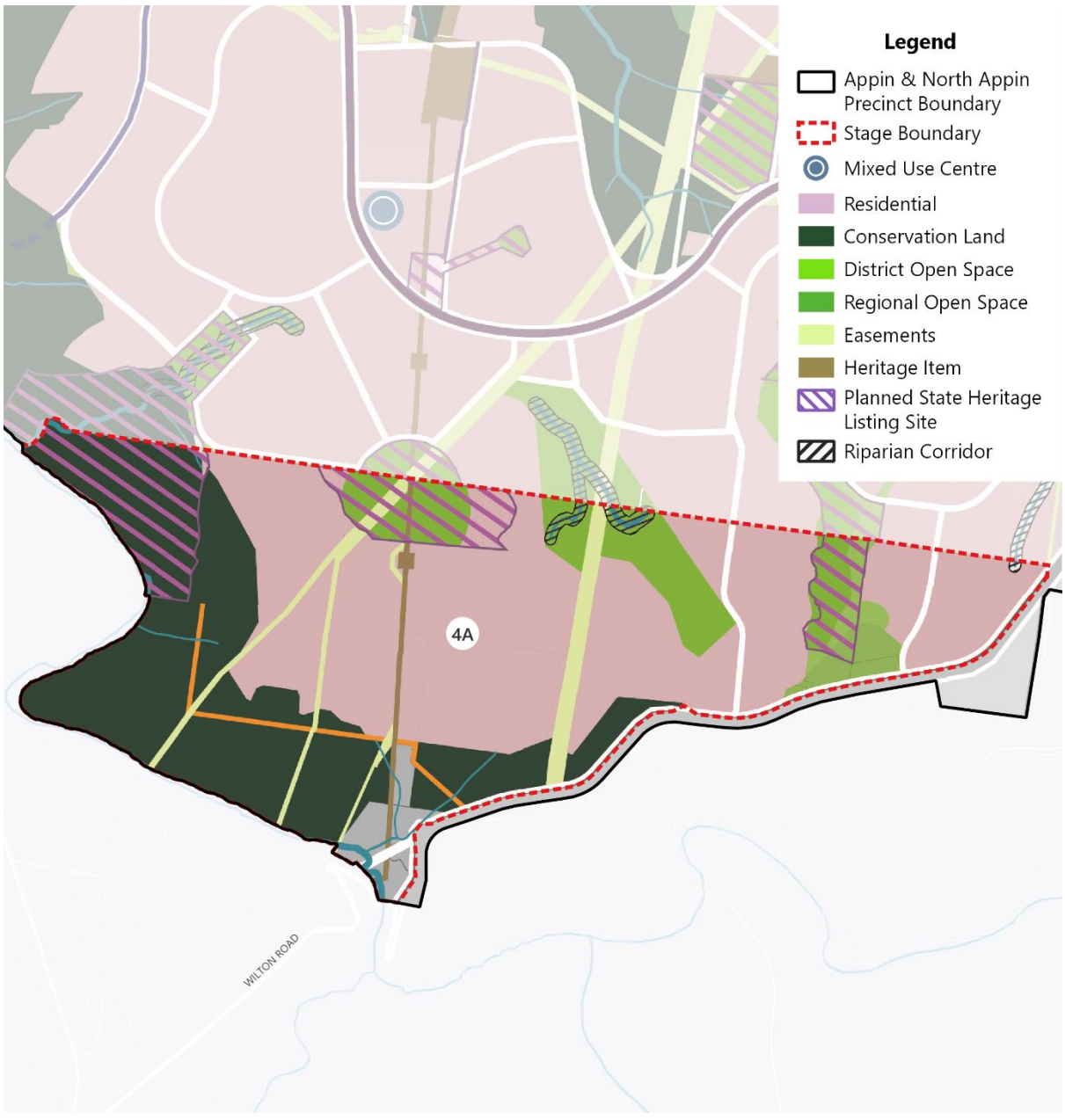
9.1 Development

Stage 4A includes the area at the southern end of the precinct. It is bound by Stages 1, 3 and 4 to the north, Wilton Road to the south and east and the Nepean River to the west. Development within Stage 4A includes:

- 630 low density dwellings

Stage 4A is shown in Figure 26 below.

Figure 26 - Stage 4A



9.2 Utilities

9.2.1 Electricity

Development within Stage 4A will be supplied via the Appin ZS. The calculated electrical demands are provided in Table 16. Based on the below demands, we would expect that the proposed development could likely be supported using spare capacity in existing feeders delivered in Stages 3 and 4. If a new feeder is required, it would likely originate from the Appin ZS.

Table 16 - Stage 4A Electrical Demand

Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	2.5	0.6
Total		**2.5**	**0.6**

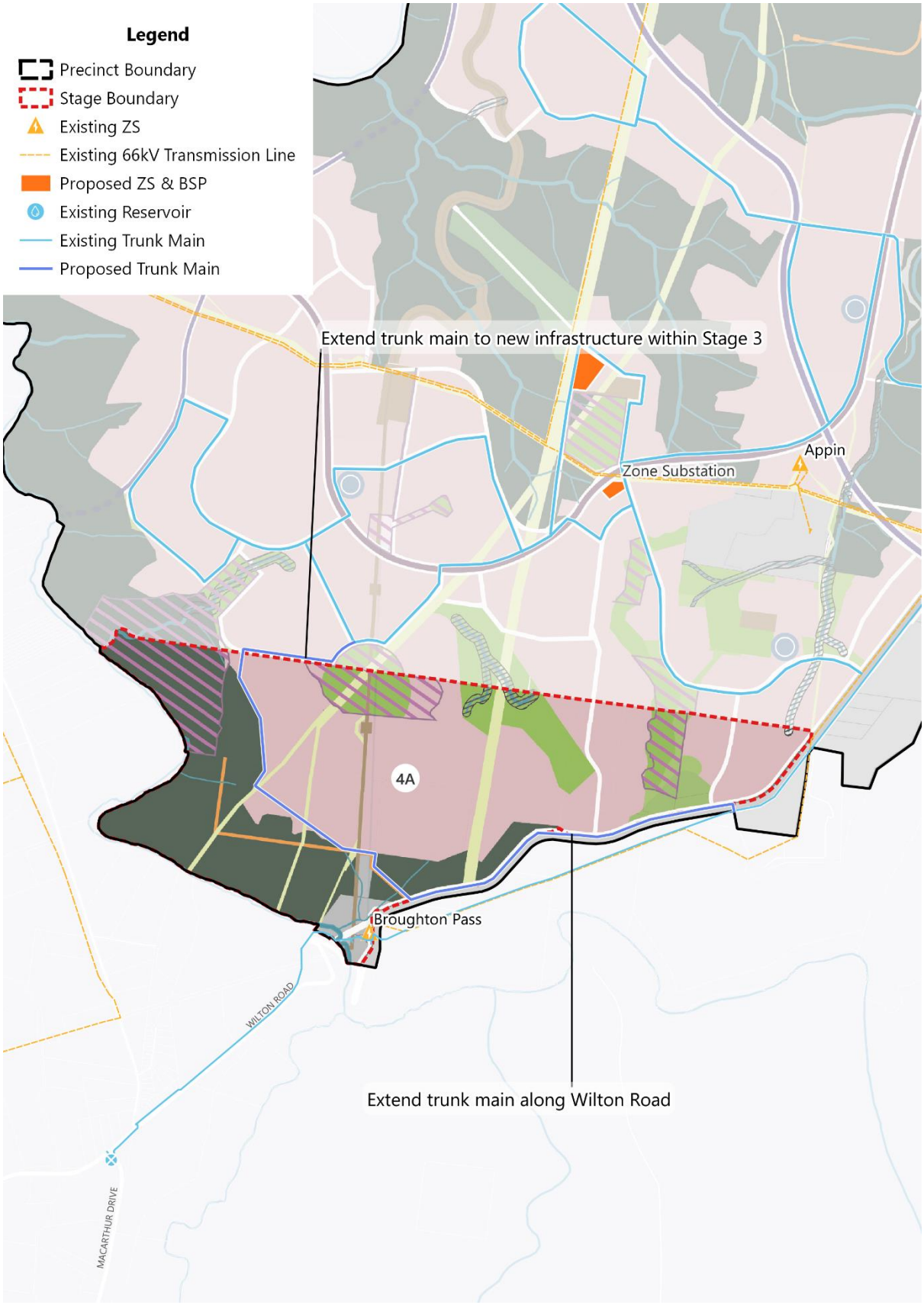
9.2.2 Potable Water

Existing water mains will be extended down Wilton Road to supply development in Stage 4A. No local road network has been developed at this stage, however an indicative watermain network is shown in Figure 27 below. Mains within Stage 4A will be connected back to trunk infrastructure within Stage 3 to create a loop.

9.2.1 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 27 - Stage 4A Water & Electrical Infrastructure



9.2.2 Sewer

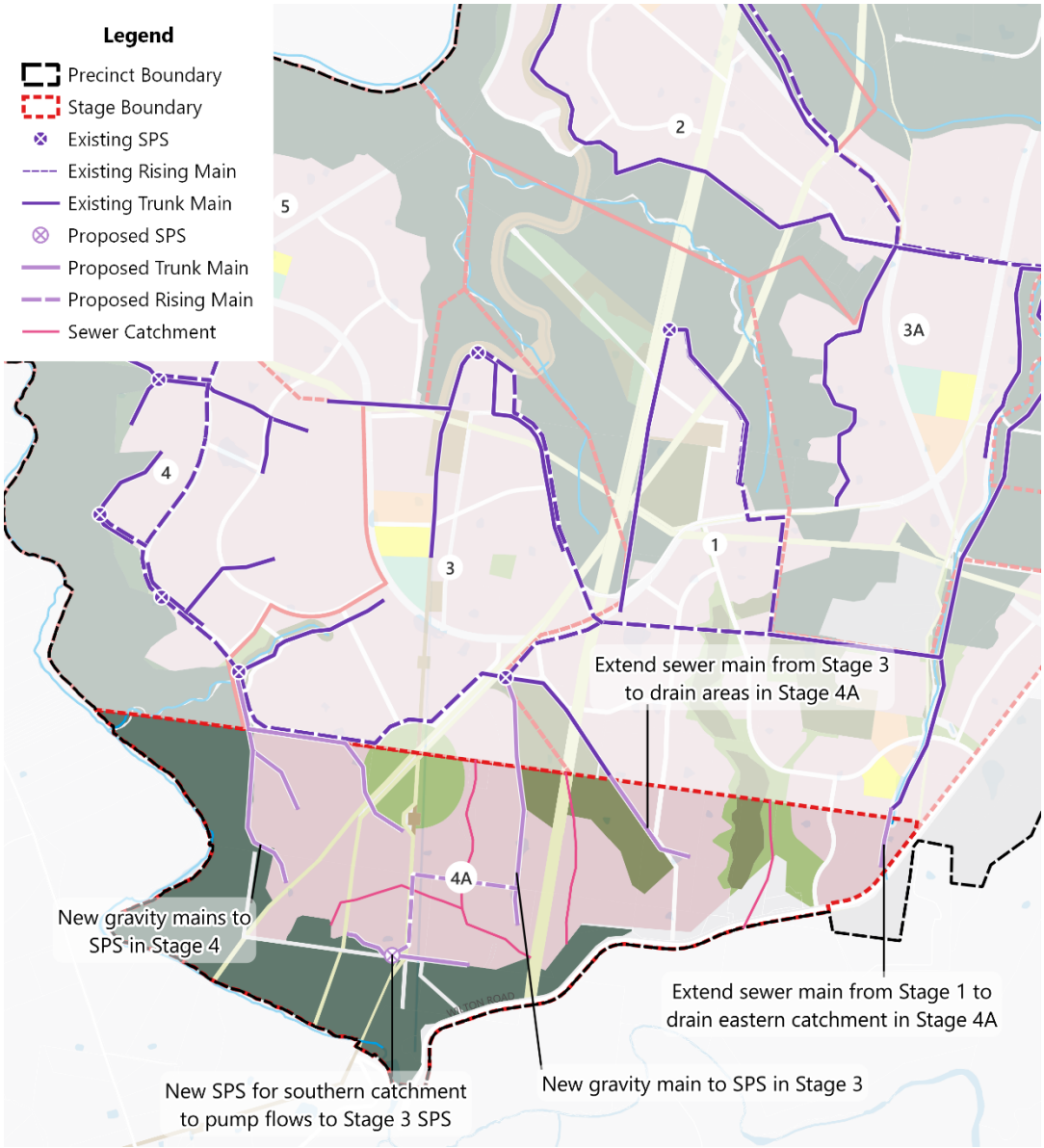
Stage 4A falls into four sewer catchments:

- Western catchment draining northwards to an SPS in Stage 4
- Central catchment draining northwards to an SPS in Stage 1
- Southern catchment draining southwards to the Cataract River
- Eastern catchment draining northwards to a trunk main in Stage 1

The western, central, and eastern catchments can be serviced by extending gravity mains constructed to support the adjacent stages.

The southern catchment will require a sewer pump station located at the catchment low point, near the southern boundary. This pump station will transfer flows to the central catchment where it will drain via gravity to a SPS in Stage 1. This arrangement is shown in Figure 28.

Figure 28 - Stage 4A Sewer Infrastructure



9.3 Infrastructure Summary

A summary of the infrastructure required to support Stage 4A is provided in Table 17 below.

Table 17 - Stage 4A Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Water	Trunk Mains	5,000	m
Sewer	Trunk Gravity Mains	5,400	m
	Rising Mains	1,000	m
	Sewer Pump Station	1	Item

10 Stage 5

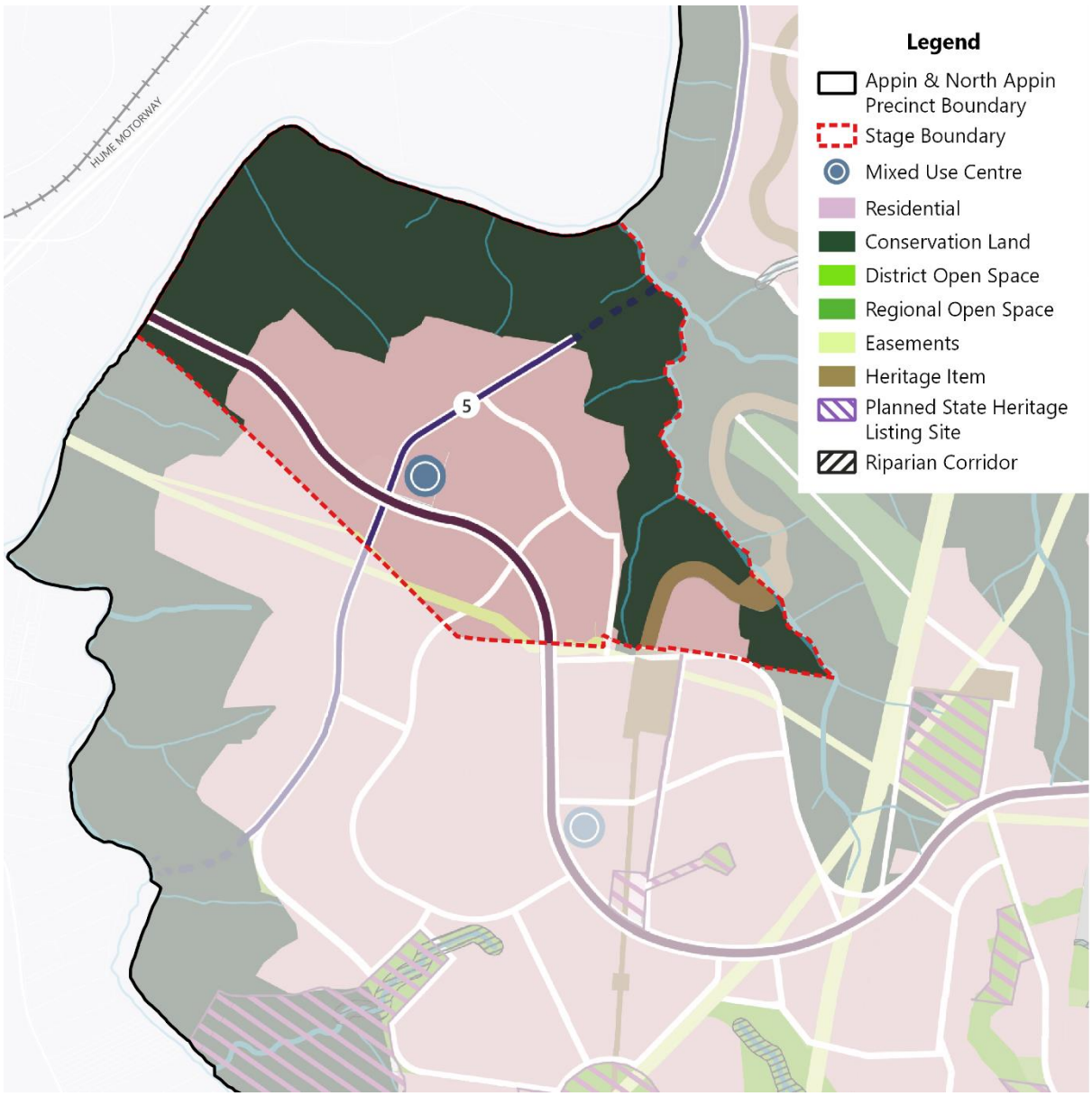
10.1 Development

Stage 5 includes the area bound by Stages 1 and 2 to the east, Stage 3 to the south, Stage 4 to the west and the Nepean River to the north. Development within Stage 5 includes:

- 1,559 low density dwellings
- 2,250m^2 GFA retail
- 750m^2 GFA commercial
- Primary school (1,000 students)

Stage 5 is shown in Figure 29 below.

Figure 29 - Stage 5



10.2 Utilities

10.2.1 Electricity

Development within Stage 5 will be supplied via the Appin ZS. The calculated electrical demands are provided in Table 18. Based on the below demands, we would expect one or two feeders would be required to support development in Stage 5. Feeder locations are not shown in Figure 30 for clarity.

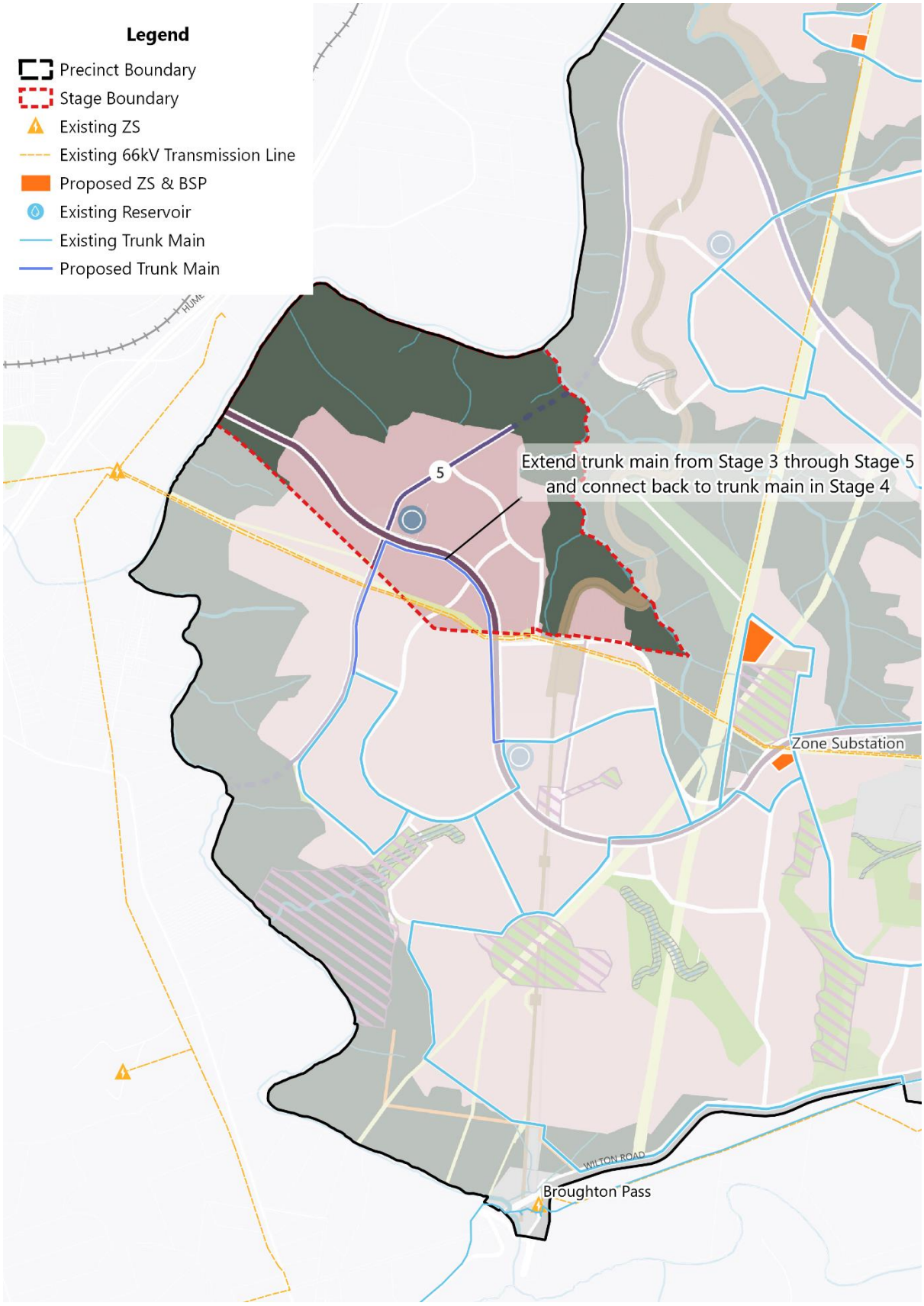
Table 18 - Stage 5 Electricity Demand

Development Type	ADMD Rate (kVA)	Total ADMD (MVA)	Approx. Feeders
Low Density Residential	4.0/dwelling	6.2	1.4
Retail	0.1/sqm GFA	0.2	0.1
Commercial	0.085/sqm GFA	0.1	0.0
School	0.085/sqm GFA	0.8	0.2
Total		**7.3**	**1.6**

10.2.2 Potable Water

Trunk potable water infrastructure within Stages 3 and 4 will be extended along key road corridors within Stage 5 to support development. An indicative layout of trunk water mains is shown in Figure 30 below.

Figure 30 - Stage 5 Water & Electrical Infrastructure



10.2.3 Sewer

Stage 5 drains to three sewer catchments:

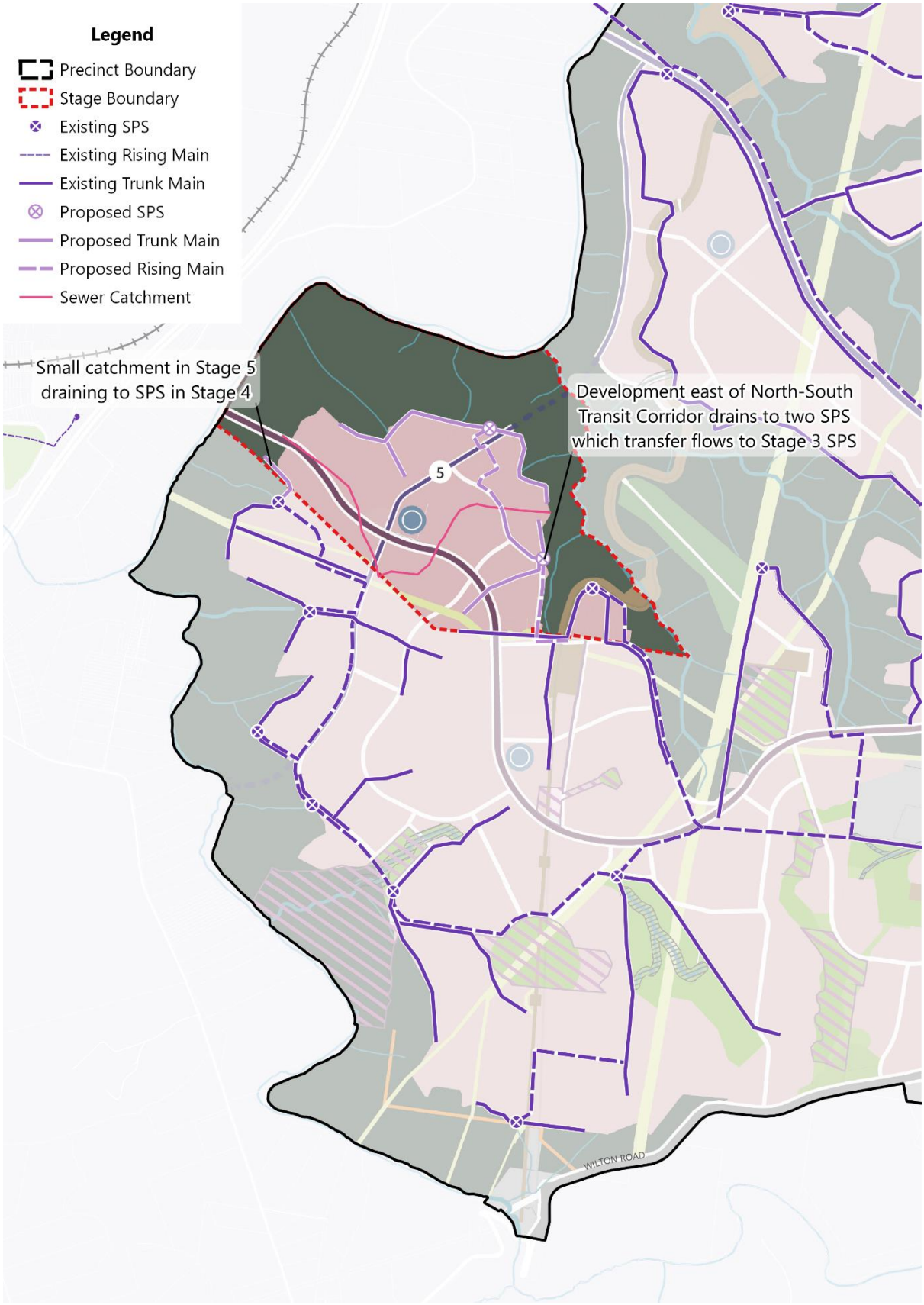
- Western catchment draining to a pump station located in Stage 4
- Northern catchment draining towards the Nepean River
- Eastern catchment draining towards Simpsons Creek

Two new SPS will be required to transfer flows from the northern and eastern catchments to the SPS in Stage 3. The western catchment will drain via gravity to a SPS in Stage 4. The trunk infrastructure required to support Stage 5 is shown in Figure 31.

10.2.1 Telecommunications

NBN Co. telecommunications infrastructure is available in the Appin region. It is anticipated that fixed line technology will be extended from the existing Appin township to supply new development in the Appin Precinct. New infrastructure will be constructed within the standard trench allocation within the road reserve of all new roads and will be provided to match the pace of development.

Figure 31 - Stage 5 Sewer Infrastructure



10.3SIC Infrastructure

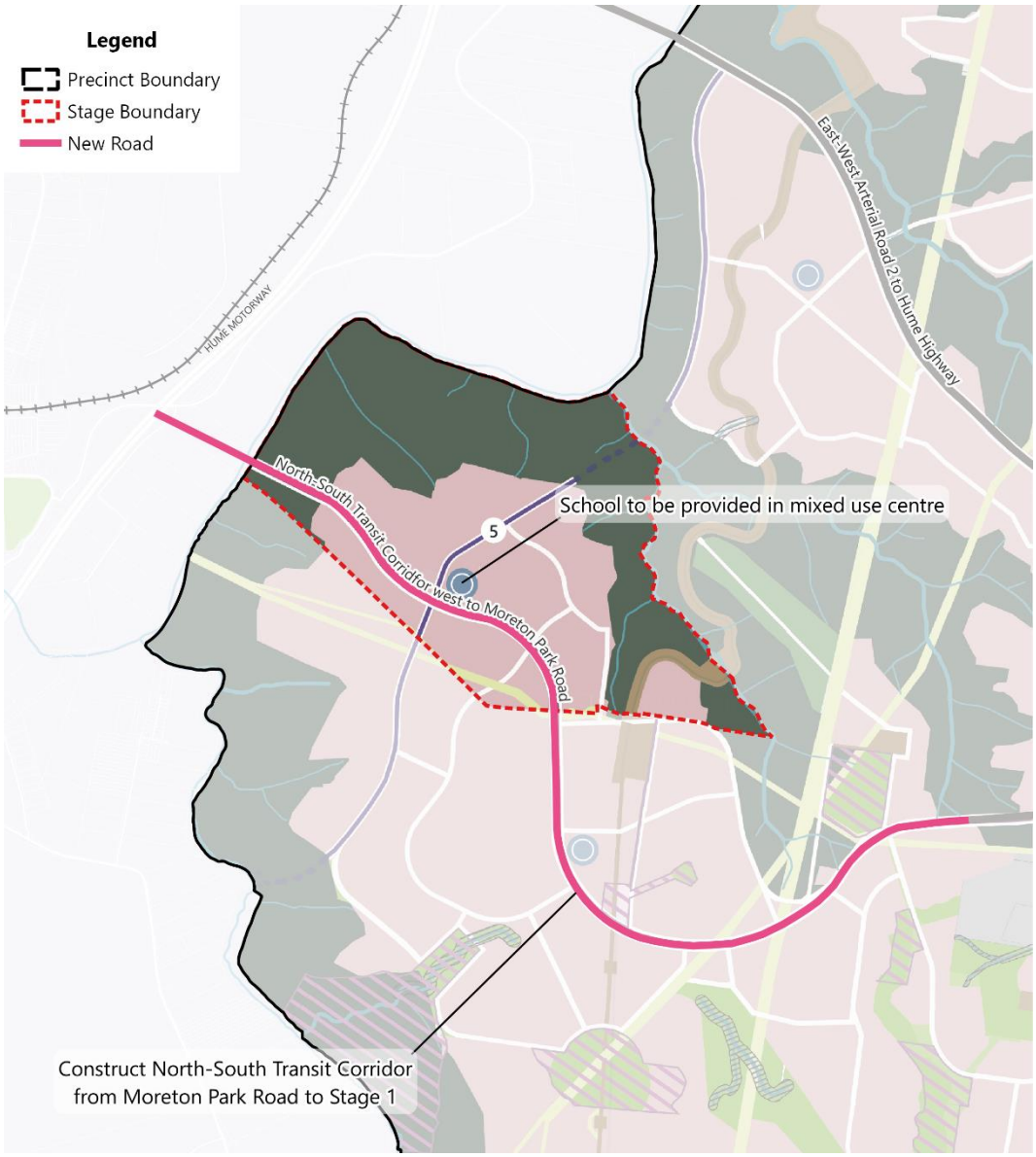
10.3.1 Roads

Stage 5 works will include Part 3 of the North-South Transit Corridor, which will connect Part 1 (delivered in Stage 1) with Moreton Park Road. This section of the road will complete the transit corridor and will enable public transport services to extend to Douglas Park Station. Delivery of this part of the corridor is subject to government strategy and connections to existing Train Stations.The extents are shown in Figure 32 below.

10.3.2 School

Stage 5 includes a primary school with capacity for 1,000 students. The land for this school will be dedicated as part of the SIC and the proposed location is shown in Figure 32.

Figure 32 - Stage 5 SIC Infrastructure



10.4 Infrastructure Summary

A summary of the infrastructure required to support Stage 5 is provided in Table 19 below.

Table 19 - Stage 5 Infrastructure Summary

Infrastructure Type	Description	Quantity	Unit
Electricity	11kV Feeders (lengths tbc subject to subdivision design)	1	item
Water	Trunk Mains	2,300	m
Sewer	Trunk Gravity Mains	3,500	m
	Rising Mains	1,500	m
	Sewer Pump Station	2	Item
Roads	North-South Transit Corridor Part 3 – Stage 5 to Morton Park Road	5,900	m
School	Primary School (1,000 students)	1.5	Ha

11 Conclusion

The above infrastructure phasing plan outlines how utilities, key roads and school infrastructure will be delivered across the Appin Precinct to match the development rollout. Based on current advice from Sydney Water and Endeavour Energy, the proposed development could be adequately serviced using the infrastructure strategy outlined in the report above.

A20 Infrastructure Delivery Plan

gln.
planning
consulting
strategy

INFRASTRUCTURE DELIVERY PLAN – APPIN (PART 2) PRECINCT

Walker Corporation

GLN Planning Pty Ltd Trading as GLN Planning
ABN 39 585 269 237

A Level 10, 70 Pitt Street Sydney NSW 2000
P GPO Box 5013, Sydney NSW 2001
E info@glnplanning.com.au
T (02) 9249 4109 F (02) 9249 4111

glnplanning.com.au

Infrastructure Delivery Plan – Appin (Part 2) Precinct

Walker Corporation

Prepared for

By

ABN 39 585 262 237

A Level 10, 70 Pitt Street, Sydney 2000 P GPO Box 5013, Sydney NSW 2001

T (02) 9249 4100 F (02) 2949 4111 E info@glnplanning.com.au

ABN 39 585 262 237
A Level 10, 70 Pitt Street, Sydney 2000 P GPO Box 5013, Sydney NSW 2001
T (02) 9249 4100 F (02) 2949 4111 E info@glnplanning.com.au

Planning Institute Australia
Registered Planner

Date of final issue:

File Path:	C:\Users\Peter McKenna\GLN Planning\GLN - Documents\Projects\Active\11917 Walker Appin Part 2 IDP\IDP
Project Manager:	Peter McKenna
Client:	Walker Corporation
Project Number:	11917

Document History and Status

Version	Issue To	Qty	Date	Prepared by	Reviewed by
V1 Draft	AA/NC	1-e	22/6/2023	PM/AC	PM
V2 Draft	AA/NC	1-e	5/7/2023	PM/AC	PM
Final	AA/NC	1-e	8/9/2023	PM/AC/JH	PM
Updated final	AA/RO	1-e	9/10/2024	PM/AC/JH	PM

Table of Contents

Tables

Figures

Executive Summary

Walker Corporation Pty Ltd and Walker Group Holdings Pty Ltd (together the **Proponent**) has prepared a Proposal to support the rezoning of 91.72 hectares of land (the **site**) within the Greater Macarthur Growth Area's Appin Precinct from rural to urban.

The Appin and Appin North Precincts have been identified by the NSW Department of Planning and Environment (**DPE**) as having capacity to deliver approximately 21,000+ new homes to accommodate Sydney's population growth. The Appin (Part 2) Precinct can contribute approximately 1,312 of these new homes.

New and augmented utilities and State and local infrastructure will need to be provided to support the development stages.

GLN Planning has been engaged by the Proponent to prepare this Appin (Part 2) Precinct Infrastructure Delivery Plan (**IDP**) which:

- identifies the infrastructure required to support the entire Appin and Appin North precincts, with more specific detail for the proposed Appin (Part 2) Precinct rezoning,
- describes the required infrastructure by infrastructure type and responsibility,
- sets out how the infrastructure will be provided and the particular legislative mechanisms that can be used to ensure they are provided,
- outlines a preliminary staging schedule for the infrastructure that aligns with the development of the land for housing and other purposes,
- identifies the local infrastructure for Appin (Part 2) Precinct that may be included in a site-specific section 7.11 contributions chapter of the Wollondilly Shire Council's (**Council's**) current contributions plan, or in a planning agreement negotiated between the proponent and the Council, and
- outlines a proposed arrangement and assignment of responsibility for the ongoing management, ownership and maintenance of different types of local infrastructure following the completion of each stage of the development.

While the IDP is comprehensive in that it covers all the infrastructure needs of the development, it focuses on what, when and how local infrastructure will be provided and maintained over the life of the infrastructure.

The IDP has been prepared based upon the draft master plan and supporting studies for the Proposal, and as such, the details contained in the report and the proposed infrastructure schedule including size, location, staging/timing of delivery, and responsibility for maintenance and ownership are draft and may be subject to further review and amendment during the planning proposal process.

The IDP articulates the infrastructure delivery pathways to deliver the proponent's vision for the Appin (Part 2) Precinct and confirms that the proposal is able to be supported in its current form.

1 Background

1.1 IDP purpose and scope

The primary purpose of this IDP is to support the Council and DPE in assessing the Proposal which seeks to rezone land in the Appin (Part 2) Precinct for urban purposes as discussed in more detail in **Section 2** of this report. The IDP does this by:

- providing an overall picture of the infrastructure needed (both on-site and off-site) to support the proposed Appin development, with a particular focus on the Appin (Part 2) Precinct development, and
- proposing how the site's local infrastructure will be provided and maintained into the future.

The core of the IDP is a schedule of proposed infrastructure that is intended to:

- assist the Council in preparing a site-specific s7.11 infrastructure contributions plan for Appin (Part 2) Precinct and/or consideration of a planning agreement to deliver the infrastructure for Appin (Part 2) Precinct, concurrent with the consideration of the planning proposal, and
- assist the proponent, Council and other infrastructure providers when negotiating agreements for the provision of infrastructure.

The IDP and infrastructure schedule also address the following:

- proposed responsibilities and mechanisms for the delivery of the required infrastructure,
- proposed infrastructure ownership and maintenance responsibilities following the delivery of the infrastructure, and
- likely staging of the urban development on the site, to inform the alignment and timing of the components of the proposed infrastructure network.

The IDP does not include cost estimates for the infrastructure required to support the proposed development given the likelihood that further refinement will be required to address matters raised during the assessment of the planning proposal by Council and DPE. The proponent expects to provide the Council with indicative draft costing information under separate cover to help inform Council's contributions plan preparation process and will collaborate with Council to refine these details during the assessment of the planning proposal.

Wollondilly Shire Council staff were previously consulted and provided advice on what the recent IDP prepared for Appin should address. This advice has been taken into consideration in the preparation of this document for the Appin (Part 2) Precinct.

1.2 Documents referenced in this report

The IDP is informed by the following specialist studies and planning and infrastructure reports that have been prepared to support the proposal:

Table 1 - Documents referenced in this report

Supporting Report	Prepared by	Ref and dated
Urban context report	Urbis	October 2024
Social Infrastructure and Open Space Assessment	Urbis	October 2024
Strategic Transport Assessment	WSP	October 2024
Appin Precinct Transport Management & Accessibility Plan (TMAP)	Pentelic Advisory	February 2024
Infrastructure Phasing Plan	IDC	August 2024
Water Cycle Management Report	J. Wyndham Prince	October 2024

1.3 Methodology and approach

The preparation of this IDP has been informed by the following key steps:

- Consulting with the proponent and project consultants.
- Reviewing feedback received from staff from Wollondilly Shire Council on the Appin IDP.
- Review of the planning proposal documentation and relevant specialist studies and reports, including details of consultations with infrastructure agencies.
- Reviewing and confirming the proposed residential development dwelling and lot mix, forecast dwelling occupancy rates and total population on the planning proposal site.
- Reviewing the existing local and State infrastructure contributions plans which are relevant to the site and region.
- Listing the on-site and off-site infrastructure required to support the development, establishing the timing of delivery where possible (linked to development staging), responsibility for delivery/funding, and proposed ownership/maintenance responsibilities for the proponent's Appin (Part 2) Precinct development.

1.4 Assumptions and limitations

This IDP brings together the information currently available from the specialist studies and reports prepared for the Proposal, along with the results of engagement with key infrastructure agencies regarding the infrastructure needs and provision for the Proposal.

It is important to note the following assumptions and limitations when reviewing this IDP:

- IDPs are prepared in an iterative manner. The infrastructure requirements and proposals are based upon the draft master plan and supporting studies submitted with the planning proposal and may be subject to further refinement as the planning proposal is assessed and updated over time, including changes to infrastructure requirements, scope and staging.

- Further consultation with Council and infrastructure agencies may alter the timing and scope of the enabling infrastructure to support the Proposal.
- The framework for determining and levying contributions for State and regional infrastructure and the identification of key regional infrastructure priorities remains unclear and could change during the course of the Council and DPE considering the Proposal.

2 The Proposal and anticipated development

2.1 The Proposal

Greater Sydney's population is projected to grow to approximately 6.1 million by 2041 – over a million more people than currently live in the region.

The NSW Government has identified Growth Areas as major development areas that will assist in accommodating this growth. The GMGA is one such growth area and is a logical extension of the urban form of south-west Sydney. The GMGA is divided into precincts. The Appin Precinct and North Appin Precinct are the southernmost land release precincts of the GMGA. The goal is to deliver 21,000+ dwellings.

The land is to be rezoned and released for development to achieve this goal. The Proponent has prepared the subject submission to rezone 100.10 hectares of land (the **site**) within the Appin Precinct from RU2 Rural Landscape to the following zones:

Urban Development Zone

Zone 1 Urban Development (UD)

Conservation Zone

Zone C2 Environmental Conservation (C2)

2.2 The Appin (Part 1) Precinct Planning Proposal (PP-2022-3979)

In November 2022, Walker Corporation Pty Ltd and Walker Group Holdings Pty Ltd (the **Proponent**) lodged a Planning Proposal (PP-2022-3979) to rezone part of the Appin Precinct.

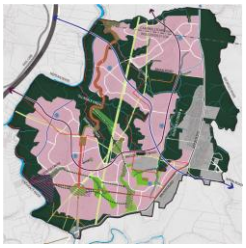
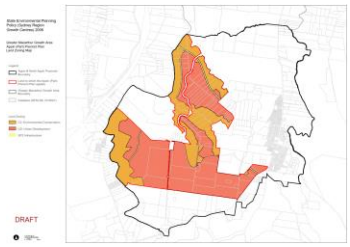
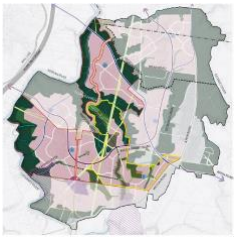
PP-2022-3979 (referred to as the **Appin (Part 1) Precinct**) proposes to rezone the land from RU2 Rural Landscape to Urban Development Zone (UDZ), C2 Environmental Conservation and SP2 Infrastructure via an amendment to *State Environmental Planning Policy (Precincts – Western Parkland City) 2021*.

The UDZ will facilitate approximately 12,000 dwellings. The C2 zone will facilitate the conservation of 470ha of endangered ecological community and help implement the Office of the NSW Chief Scientist & Engineer (NSW Chief Scientist) recommendations.

The new zones are accompanied by a structure plan outlining the intended land uses. In addition, the Proponent produced an Appin and North Appin Precincts Indicative Plan to illustrate how the new zones might fit within the broader precinct as land is developed. The Indicative Plan has no statutory weight and will be refined as further planning proposals are prepared.

The submission includes a hierarchy of plans. The plans and their purpose are summarised in **Table 2.**

Table 2 – PP-2022-3979 Title and Purpose of Plans

(1) APPIN & NORTH APPIN PRECINCTS INDICATIVE PLAN	(2) APPIN (PART 1) PRECINCT PLAN (*THE PRECINCT PLAN*)	(3) APPIN (PART 1) PRECINCT STRUCTURE PLAN (*THE STRUCTURE PLAN*)
Broader context & for information purposes only. It has no statutory weight. It identifies: • *Higher-order transport network* • *Centres hierarchy* • *School sites* • *Conservation areas* • *Residential areas* • *Cultural sites and connections*	*It shows the land proposed to be rezoned (the site) and incorporated into a new schedule in the Western Parkland City SEPP 2021.* *The precinct plan contains the development provisions (clauses and maps) applicable to the site and is used in assessing development applications.*	*Structure plan for the site, showing staging of release areas.* *Development is to be generally consistent with the structure plan. It illustrates land use components including (but not limited to):* • *Low and medium-density residential* • *Retail and employment centres* • *School* • *Open space* • *Drainage network/basins* • *Transport network*
		
(21,000 dwellings)	**(12,000 dwellings)**	**(12,000 dwellings)**

Source – Urbis

2.3 The Appin (Part 2) Precinct Planning Proposal

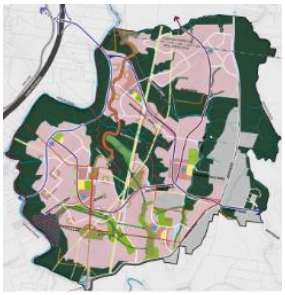
The Appin (Part 2) Precinct Plan (**the precinct plan**) shows the proposed new zones. The precinct plan will be incorporated into the *State Environmental Planning Policy (Precincts – Western Parkland City) 2021* and contain the provisions (clauses and maps) that will apply to the Site. The precinct plan envisages the delivery of the following:

- 1,312 dwellings (as a mix of low-density, medium density and apartments)
- 30,312 sqm of gross lettable retail/commercial floor area
- 17.64 ha of conservation land

The planning proposal submission is aligned with strategic land use planning, State and local government policies, infrastructure delivery and PP-2022-3979. The development potential is tempered by a landscape-based approach that protects the environment and landscape values, shaping the character of new communities. A series of residential neighbourhoods are to be delivered within the landscape corridors of the Nepean and Cataract Rivers, supported by local amenities, transit corridors and community infrastructure.

The submission includes a hierarchy of plans. The plans and their purpose are summarised in **Table 3**.

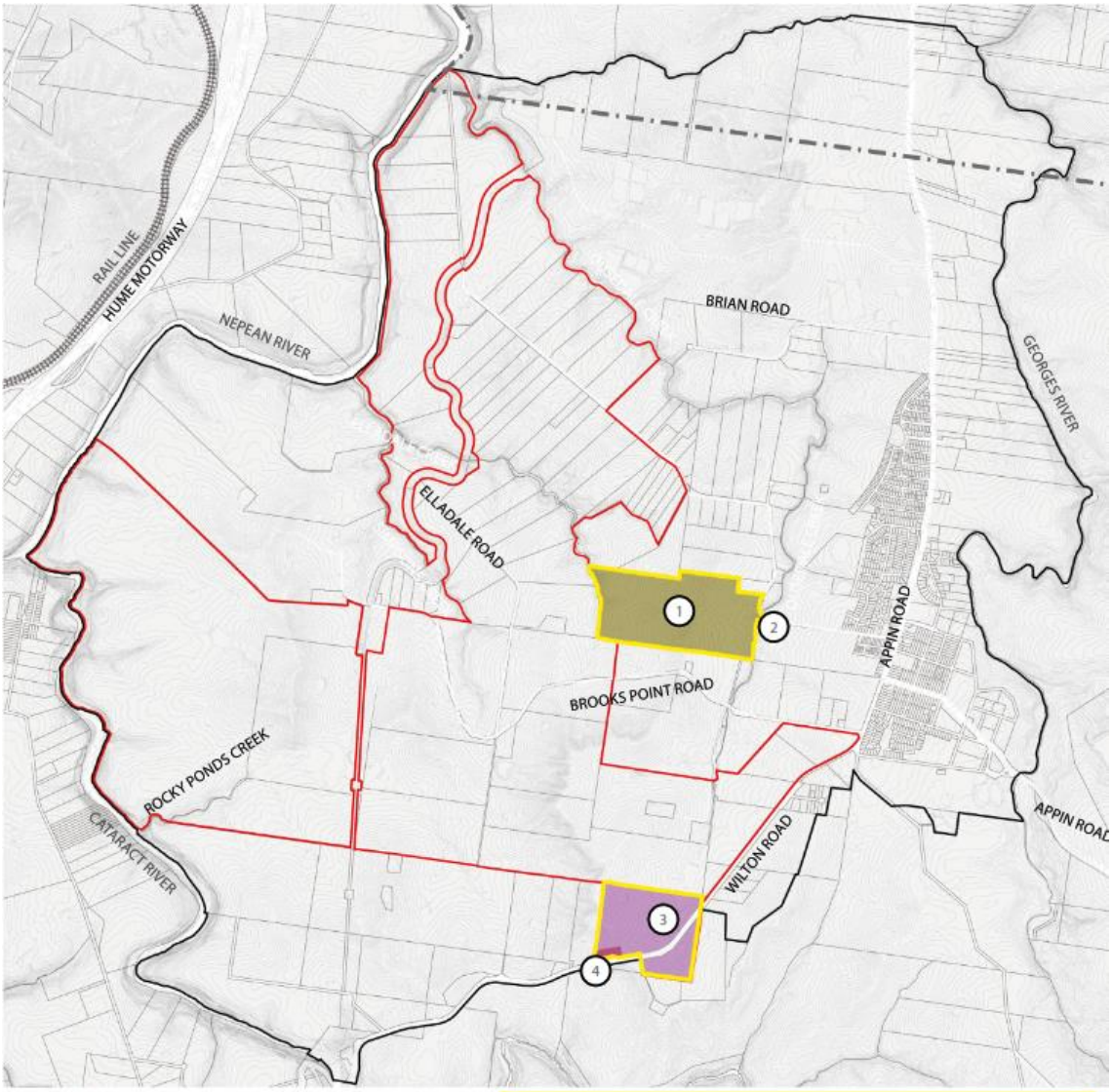
Table 3 - The subject Planning Proposal's Plans and Proposal

(1) APPIN & NORTH APPIN PRECINCTS INDICATIVE PLAN	(2) APPIN (PART 2) PRECINCT PLAN (*THE PRECINCT PLAN*)	(3) APPIN (PART 2) PRECINCT STRUCTURE PLAN (*THE STRUCTURE PLAN*)
Broader context and for information purposes only. It has no statutory weight. It identifies: • *Higher-order transport network* • *Centres hierarchy* • *School sites* • *Conservation areas* • *Residential areas* • *Cultural Sites and Connections*	*It shows the land proposed to be rezoned and incorporated into a new schedule in the Western Parkland City SEPP 2021.* *The precinct plan contains the development provisions (clauses and maps) applicable to the Site and is used in assessing development applications.*	*Structure plan for the Site, showing staging of release areas.* *Development is to be generally consistent with the structure plan. It illustrates land use components including (but not limited to):* • *Low and medium-density residential* • *Retail and employment centres* • *School* • *Open space* • *Drainage network/basins* • *Transport network*
		
(21,000 dwellings)	**(1,312 dwellings)**	**(1,312 dwellings)**

Source - Urbis

The Appin (Part 2) Precinct Plan zones land for conservation and urban development. It establishes the statutory planning framework permitting the delivery of a range of residential typologies, retail, education, business premises, recreation areas, and infrastructure services and provides development standards that development must fulfil. Within the proposed urban development zone, 1,312 dwellings and more than 30,000 sqm of gross lettable floor area for retail and commercial space can be delivered.

Figure 1 shows the boundary of the Appin (Part 2) Precinct and **Table 4** shows the key attributes of the precinct plan and structure plan area.



LEGEND:

- Appin & North Appin Precinct Boundary
- Appin (Part) Precinct Plan
- Appin (Part 2) Precinct Boundary
- LGA Boundary

LAND OWNERSHIP

- Phillip Nelson Dunbier and Penny Grace Dunbier
- John Joseph McEvoy
- Glynis Rita Patrick

Properties forming the Appin (Part 2) Precinct

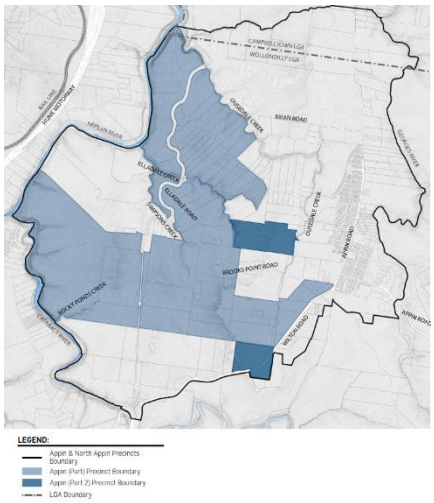
REF	LOT #	PLAN REF	ADDRESS	AREA (HA)
DUNBIER LAND				
1	32	DP736923	110 Macquariedale Road	61.18
2	1	DP1000355	90 Macquariedale Road	0.23
KINGS LAND				
3	3	DP804375	725 Wilton Road	36.61
4	1	DP 804375	525 Wilton Road	1.41

APPIN (PART 2) PRECINCT - LAND OWNERSHIP PLAN

1:40,000 @ A4
0 500 1000 1500 2000
DATE: 23-03-23
REVISION NO: -

Figure 1 - Boundary of the Appin (Part 2) Precinct

Table 4 - Appin (Part 2) Precinct - summary of key attributes

	Location	Key Attributes	
Appin (Part 2) Precinct		**Area**	- Total – 100.1 ha - Private Ownership – 100.1 ha
		LGA	Wholly Wollondilly LGA
		Proposed Dwellings	1,312
		Proposed retail & commercial floor space	30,000+
		Proposed Population	3,709

2.4 Anticipated development and population

A total of **1,312 dwellings** are expected to be ultimately developed on across the Appin (Part 2) sites, including 596 low density dwellings and 716 medium density dwellings.

The Social Infrastructure and Open Space Report[1] recommends the following benchmarked occupancy rates for these dwelling typologies:

- Low density dwelling – 3.1 persons
- Medium density dwelling – 2.6 persons

Applying these occupancy rates results in a total anticipated population of **approximately 3,709 residents**.

[1] Refer Table 1

3 Infrastructure planning context

3.1 Greenfield development infrastructure

The site is currently used for rural activities and is described in planning and infrastructure terms as a "greenfield" development site.

The site will therefore require a full range of infrastructure so that it can be become an urban area.

Table 5 shows the generic infrastructure needs for a greenfield development such as Appin. It shows whether such infrastructure is located within or outside the development site (as this has implications for how new infrastructure or upgrade(s) may be done – i.e. through developer works or monetary contribution). It also shows whether the infrastructure is driven by the development of the land itself, or by the incoming population.

Table 5 - Infrastructure required to support greenfield development

Infrastructure type	Location(s)	Infrastructure to support the subdivision and development of land	Infrastructure to support the future population
Water and wastewater supply			
Sewage treatment plants, sewage pumping stations, sewer rising mains, sewer reticulation, reservoirs, water gravity mains	On and off site	✓	✓
Energy and telecommunications			
National Broadband Network, zone substations, TransGrid bulk supply point, electricity sub stations, feeder transmission lines, electricity reticulation, gas supply pipelines and reticulation, street lighting	On and off site	✓	
Stormwater management			
Flood levees, Pipes and pits, detention basins, bioretention facilities, gross pollutant traps, drainage channels, riparian corridors, swales, culverts, bridges, on-lot detention basins, rainwater tanks	Generally on site	✓	
Transport			
Arterial roads, sub arterial roads, arterial intersection, arterial road widening, grade separated arterial interchange, bridges	On perimeter or off site	✓	✓
Local roads, collector roads, road widening, intersection treatments, traffic management devices,	Generally on site or on-site perimeter	✓	

Infrastructure type	Location(s)	Infrastructure to support the subdivision and development of land	Infrastructure to support the future population
Car parking, footpaths, street trees, shared pedestrian and cycleways	Generally on site	✓	✓
Dedicated Public Transport corridors, Bus shelters, bus facilities, passenger rail facilities, road crossings	On and off site	✓	✓
Social infrastructure			
Schools, hospitals, emergency services, justice services, medical centres	On and off site	✓	✓
Multi-purpose community floor space, libraries and cultural facilities, community services	On and off site	✓	✓
Local parks, playgrounds, picnic shelters, amenities blocks, playing fields, outdoor courts, skate parks, passive recreation, walking trails	On and off site	✓	✓

Source – GLN Planning

3.2 Infrastructure delivery process and mechanisms

Developer's role

Infrastructure requirements for a greenfield development area are identified by State infrastructure agencies, public utility authorities, and the local Council during the rezoning stage.

Provision of the infrastructure required to directly serve a greenfield development area will usually be the developer's responsibility.

Infrastructure is either directly provided by the developer (as Works in Kind) or the developer will arrange its provision by the relevant infrastructure authority. Arranging provision may simply be the payment of a charge, contribution or levy to the authority (this is the case when the required infrastructure is outside of the developer's land, or the infrastructure serves multiple developments).

Consent conditions

Developers are required to meet the requirements through undertaking works, dedicating land and paying cash contributions to the relevant authority usually at some point in the subdivision application and certificate process.

Requirements are set out in development consents for successive stages of a greenfield development. These consents include conditions that:

- require infrastructure works to be undertaken,
- include or refer to detailed requirements (such as works specifications), and

- identify the particular infrastructure authority responsible for certifying that the requirements of the consent condition have been met.

The developer may be required to enter into an agreement with an authority to ensure that any infrastructure physically delivered by a developer is fit for the purpose it was intended. Agreements also set out the conditions to be met before ownership of a completed infrastructure asset is transferred from the developer to the relevant authority.

Developer commitments to providing infrastructure may also be documented in a 'planning agreement' negotiated with State or local government, which may be entered into at or following rezoning of the land. Where such an agreement has been negotiated and an offer accepted by the planning authority, a consent condition will require the agreement to be entered into.

Table 6 shows the different mechanisms that can be used by planning authorities and consent authorities to require developments to make adequate provision for infrastructure to serve their developments.

Table 6 - Infrastructure delivery mechanisms

Mechanism	Brief description of mechanism
Direct developer provision	Conditions imposed on a development consent under s4.17(1)(a) or (f) of the EP&A Act requiring the developer to: (a) provide evidence (e.g. a compliance certificate) that satisfactory arrangements have been made with the relevant infrastructure agencies concerning the provision of utility infrastructure (whether provided directly on site or by a fee or charge), and (b) provide, replace or upgrade infrastructure needed as a result of a single development – e.g. roads and footpaths within a residential subdivision, new or upgraded intersections with the public road network to enable safe access to / from the site.
S7.11 contributions	A contribution of money or land imposed as a condition on a development consent or complying development certificate. The contribution cannot be more than an amount that reflects the relationship (or nexus) between the development and the infrastructure the subject of the contribution. The contribution is applied to any public service or public amenity that is the local council's responsibility (excluding water and wastewater).
S7.12 fixed rate levies	Fixed rate levy imposed as a condition on a development consent or complying development certificate and applied by a council toward providing public services or public amenities excluding water and wastewater. It as an alternative to a s7.11 contribution. Maximum levy rate is set by regulation and is generally 1% of development cost.
S7.24 Housing and Productivity Contribution (HPC) and Special Infrastructure Contributions (SICs)	A contribution of money imposed as a condition on a DA consent or complying development certificate to be applied toward the provision of State or regional public infrastructure identified in an Infrastructure Opportunities Plan prepared under the HPC framework, strategic biodiversity offsets under the Strategic Biodiversity Contribution (SBC) or transport projects under the Transport Project Component (TPC). SIC contributions are also continuing to be levied under two remaining SICs which will be repealed by 1 July 2026 (Western Sydney Aerotropolis and Western Sydney Growth Areas).

Mechanism	Brief description of mechanism
Planning agreements (State and Local)	An agreement voluntarily negotiated between a developer and the one or more planning authorities in which the developer commits to providing contributions of land, works or money for public purposes.

Source – GLN Planning

Figure 2 shows a flow-chart of the process for planning, funding and delivering greenfield development infrastructure.

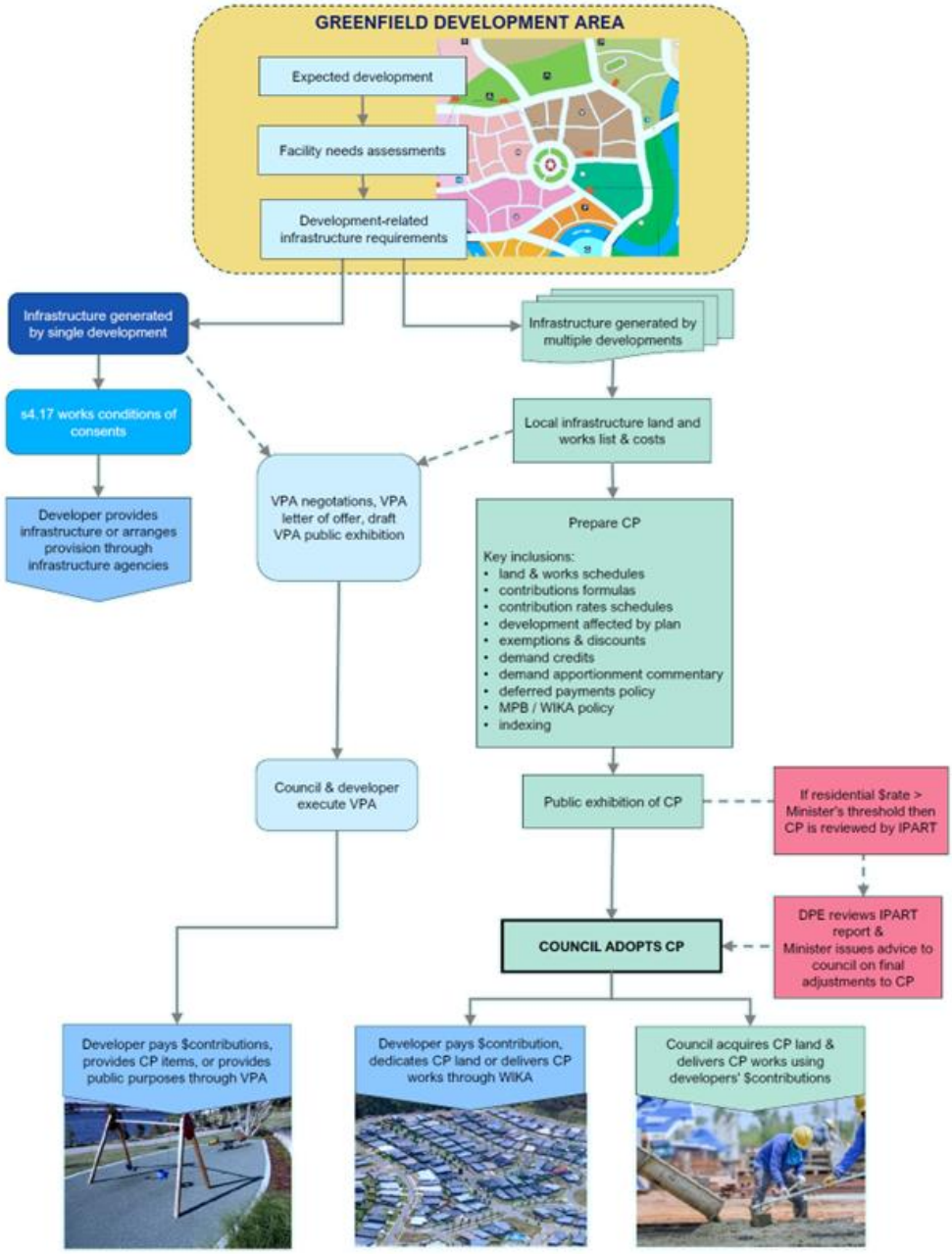


Figure 2 - Greenfield infrastructure identification and delivery process

Source – GLN Planning

3.3 Infrastructure contributions reforms

3.3.1 Proposed infrastructure contributions reforms – 2021/2022

The NSW Government publicly exhibited a package of infrastructure contributions reforms in late 2021 which were intended to deliver a contributions system which is more certain, efficient, simple, transparent and consistent. The reforms were the practical implementation of the twenty-nine recommendations identified in the NSW Productivity Commissioner's review into the infrastructure contributions system and proposed legislative changes via the *Environmental Planning and Assessment Amendment (Infrastructure Contributions) Bill 2021* and accompanying regulation (which has yet to be passed) and other policy changes.

In September 2022 the NSW Government announced that the components of the reforms which were reliant upon the passing of the Bill and Regulation would **not** be progressed at this stage.

The following elements of the reforms do not require legislative change to be implemented:

Alignment of planning proposals and the preparation of contributions plans – these reforms required the planning proposal authority to prepare and exhibit a draft contributions plan or contributions mechanism alongside the planning proposal. Separate to the reforms, the NSW Government has updated its LEP making guidelines to require up-front consideration of infrastructure demand and mechanisms for delivery early in the planning proposal process. This IDP and supporting information is being prepared to provide Council and the proponent with the necessary infrastructure contributions context to support the preparation of a future planning agreement offer and is therefore consistent with this objective.

Essential works list (EWL) and benchmark costs – The Independent Pricing and Regulatory Tribunal (IPART) exhibited a revised suite of benchmark costs for infrastructure delivery, "efficient design" principles for infrastructure delivery, and changes to the EWL relating to community infrastructure. The introduction of the changes to the EWL have been postponed until at least July 2025, when a review of the proposals will take place.

The implications of this are that any section 7.11 local infrastructure contributions plan prepared for the site would be subject to existing review and approval arrangements – i.e. - likely need to be reviewed by IPART.

3.3.2 Housing and Productivity Contribution Bill and Order – 2023

On 23 May 2023 the NSW government introduced the *Environmental Planning and Assessment Amendment (Housing and Productivity Contributions) Bill 2023* to the NSW Parliament for consideration. The Bill proposed to introduce a new State infrastructure contribution known as the Housing and Productivity Contribution (**HPC**) which is similar to the previously exhibited Regional Infrastructure Contribution (**RIC**) and is broadly consistent with the recommendations of the Productivity Commissioner on reforms to the infrastructure contributions system.

On 28 June 2023 the HAP Contribution Bill passed through both Houses of the NSW Parliament. The *Environmental Planning and Assessment (Housing and Productivity Contribution) Order 2023* commenced on 1 October 2023 to give effect to the HPC. The details and implications of the HPC are discussed in **Section 3.5.2** of this report.

3.4 Local infrastructure contributions

3.4.1 Infrastructure in existing s7.11 plans

The Wollondilly Contributions Plan (**WCP**), which commenced on 1 July 2020, applies to the entire Wollondilly LGA and identifies infrastructure to support the forecast growth across the LGA to 2036 and beyond.

The WCP includes detailed technical provisions which apply to the LGA as follows:

- **Area A – The Shire** applies to the entire LGA except for the land to which Area B applies as shown in **Figure 7**. The Area A provisions identify infrastructure to support forecast growth across the LGA of approximately 4,729 dwellings to 2036. Of these growth, Area A assumes that an additional 260 dwellings will be constructed in Appin to 2036, most of which are expected to be constructed in the Appin township itself. This confirms that the existing Area A provisions of the WCP do not cater for the proposed growth within the Appin precinct.

- **Area B – Wilton Growth Area** applies specifically to the Wilton Growth Area and contains a comprehensive schedule of infrastructure to meet the needs of the existing and future population of Wilton.

The WCP's population assumptions and infrastructure schedule do not envisage the population growth and corresponding demand for new and augmented infrastructure resulting from development within the Appin Precinct.

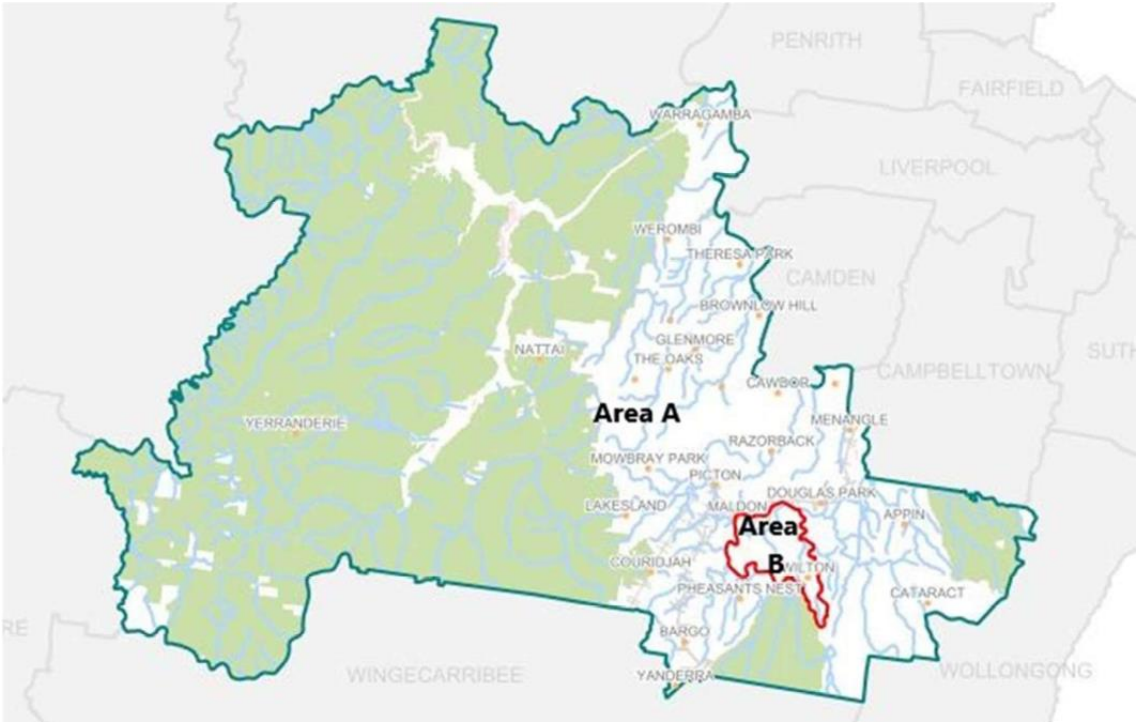


Figure 3 – Application of Wollondilly Contributions Plan (Areas A and B)

Source – Wollondilly Contributions Plan

3.4.2 Draft Appin Growth Area Contributions Plan

Following the initial drafting of this IDP in September 2023, Council has prepared the Draft Appin Growth Area Contributions Plan (**Draft Appin CP**) which identifies infrastructure required to support the growth planned in the Appin Precinct. At the time that this report was prepared, the exhibition of the Draft Appin CP is complete and the contributions plan package has been forwarded to IPART for review.

The August 2024 version of the IDP has not been re-drafted to fully reflect the Draft Appin CP. Instead, it reflects the findings and recommendations of the technical studies prepared for the Appin (Part) Precinct rezoning and the current Appin (Part 2) planning proposal and outlines the suite of infrastructure required to support the proposal.

GLN and the proponent welcome further discussions with Council regarding the alignment of the Draft Appin CP and the Appin (Part 2) planning proposal.

3.5 State and regional contributions plans

3.5.1 Draft Greater Macarthur Special Infrastructure Contribution

In late 2018 the NSW Government exhibited the draft Greater Macarthur Special Infrastructure Contribution (**SIC**) which identified a suite of infrastructure to support the development of the Greater Macarthur Growth Area, including Gilead, Appin and Menangle Park. Given the commencement of the HPC the draft SIC will not be progressed, however in the absence of the HPC's Infrastructure Opportunities Plan it remains the only published document outlining the State and regional infrastructure needs of Greater Macarthur. The SIC area is divided into the North, Central and South contribution areas as shown in **Figure 4**.

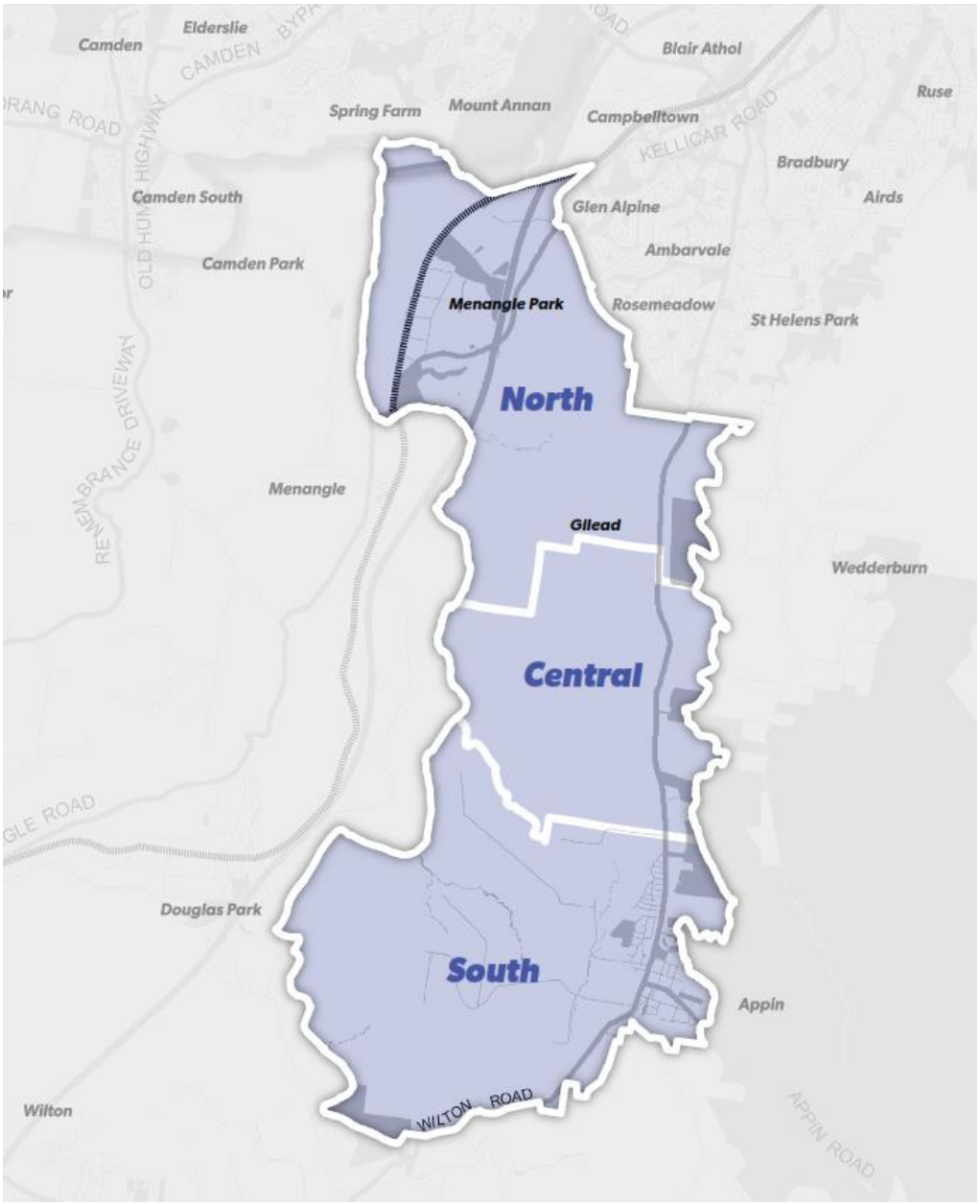


Figure 4 - Draft Greater Macarthur SIC boundary

Source – Department of Planning

The infrastructure schedule and location map included in the draft Greater Macarthur SIC are shown in **Table 7** and **Figure 5** respectively. It is noted that the map is diagrammatic in nature and the location of the infrastructure is subject to refinement through the planning process.

Table 7 - Draft Greater Macarthur SIC infrastructure items

Identifier	Description
R1	Spring Farm Parkway – new 4 lane arterial road between Appin Road and Liz Kernohan Drive
R2	Appin Road North – upgrade to 4 lanes between Kellerman drive and Malatty Creek

Identifier	Description
R3	Spring Farm Parkway – interchange ramps to Hume Highway
R4	Mt Gilead North – new 4 lane sub-arterial road
R5	Mt Gilead South – new 4 lane sub-arterial road
R6	Appin Road North – widened to 6 lanes – Malatty Creek to Narellan Road
R7	Appin Road South – Widened to 4 lanes – Malatty Creek to Brooks Point Road
R8	Menangle Road – widened to 4 lanes – Picton Road to Englorie Drive
R9	Macquariedale Road – sub-arterial upgrade Appin Road to Menangle Road
R10	Link Road B – New sub-arterial 4 lane road
R11	Macquariedale Road – interchange ramps to Hume Highway
R12	Link Road A – New sub-arterial 4 lane road
R13	Link Road A – interchange ramps to Hume Highway
R14	Spring Farm Parkway East – widened to 6 lanes
H1-2	2 x integrated health hubs – land acquisition
P1	Transit corridor north – land acquisition
P2	Transit corridor south – land acquisition
ES1	Fire and Rescue station Mt Gilead – land acquisition
ES2	Police Station Menangle Park – land acquisition
ES3	Fire and Rescue station Appin – land acquisition
-	9 x primary schools - land acquisition
-	2 x secondary schools – land acquisition
-	Biodiversity Certification

Source – Department of Planning

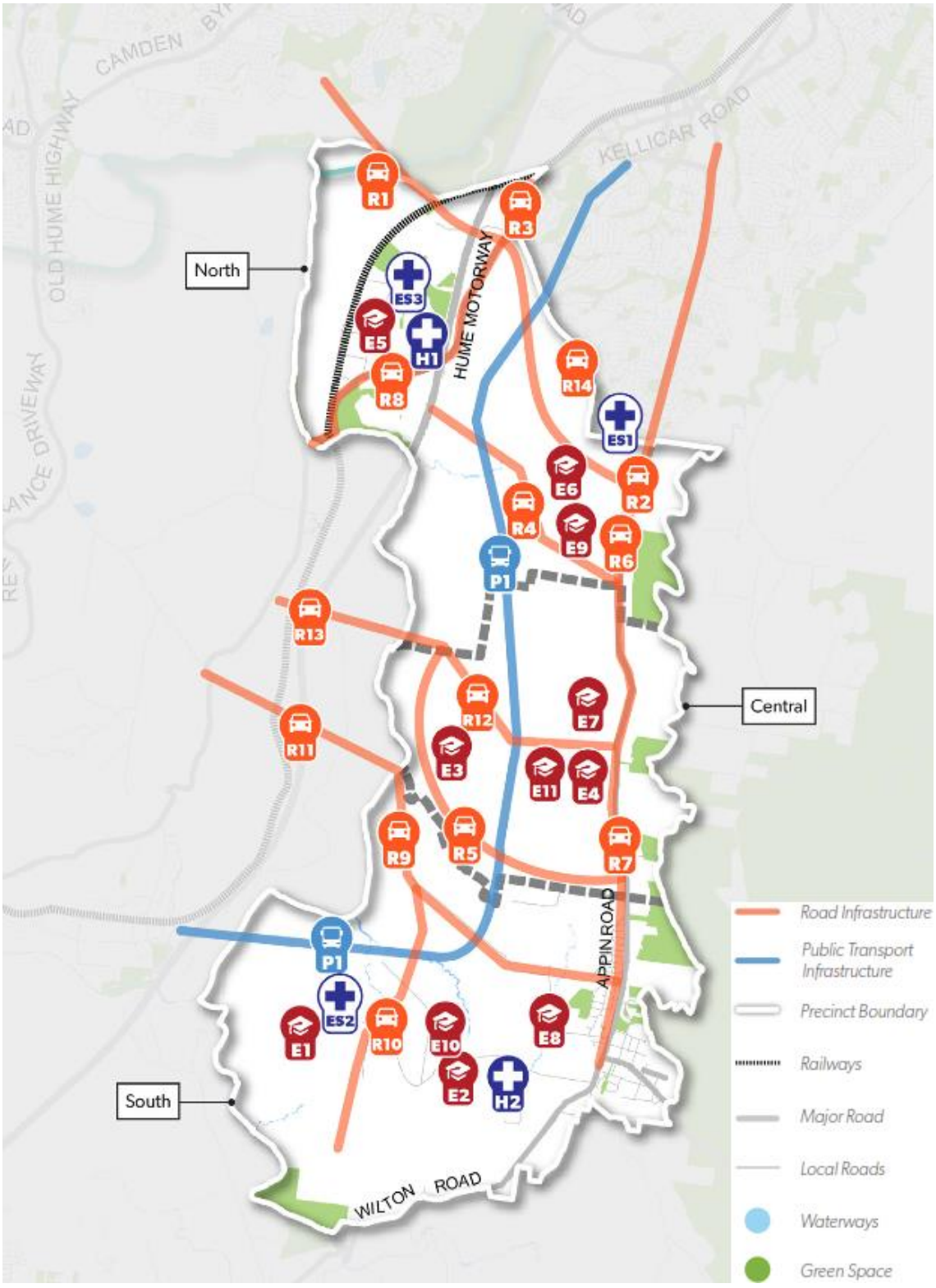


Figure 5 - Draft Greater Macarthur SIC infrastructure map

Source – Department of Planning

3.5.2 Housing and Productivity Contributions

Following the passing of the HAP Contribution Bill on 28 June 2023, the *Draft Environmental Planning and Assessment (Housing and Productivity Contribution) Order 2023* was published in late August 2023 and the final Order was published on 1 October 2023 to enable the HPC to be levied. The HPC applies across the HPC regions shown in **Figure 6**, including areas where SICs currently apply but excluding the Western Sydney Growth Areas and Western Sydney Aerotropolis SICs. SICs in these areas will be replaced by the HPC by 1 July 2026.

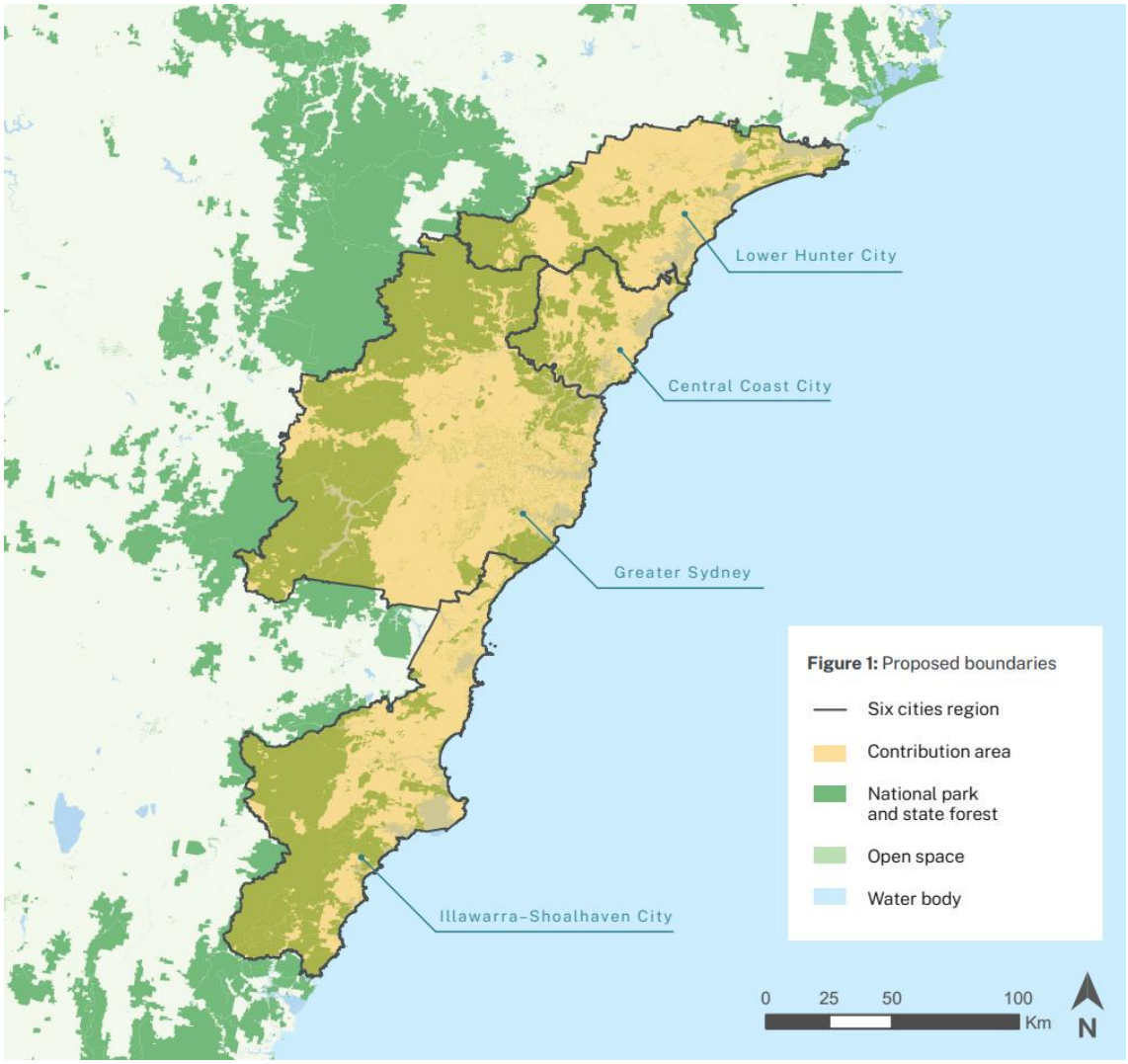


Figure 6 - Proposed HAP Contribution regions

Source – Department of Planning

As noted in **Section 3.5.1**, the subject site is not subject to an existing adopted SIC and therefore the HPC applies from 1 October 2023.

The HPC is levied on:

- residential development that intensifies land-use where new dwellings are created, such as houses, apartments, terraces and dual occupancies.
- commercial and retail development such as shops, neighbourhood shops, supermarkets, and commercial office buildings where new floorspace is created.
- industrial development such as warehouses and industrial buildings, where new floorspace is created.

Infrastructure that is intended to be funded via the HPC (and potentially eligible for developer-delivery to reduce/offset HPC payments) will be identified in an Infrastructure Opportunities Plan. These plans will be prepared for each HPC area and will outline 0–20-year growth expectations and contain a 'long list' and 'shorter list' of infrastructure projects that will be eligible for funding under the HPC. The infrastructure lists have not been prepared at this time, however it is anticipated that the infrastructure schedule for the draft Greater Macarthur SIC will inform on the infrastructure lists under the HPC.

Anticipated HPC rates

Figure 7 below shows the base HPC rate applicable to all development types within the Greater Sydney Region, and Illawarra, Shoalhaven, Central Coast and Lower Hunter, subject to quarterly indexation to the Australian Bureau of Statistics' Producer Price Index (PPI).

The HPC will be phased in by the NSW government to reduce the impact on development. Under these arrangements a 50% reduction will apply from 1 October 2023 to June 2024, a 25% reduction in from July 2024 to June 2025, and the full rate will apply from July 2025.

Greater Sydney		
Development class	Amount	Unit
Residential subdivision	$12,000	new dwelling lot
Residential strata subdivision	$10,000	new strata dwelling lot
Non-strata multi-dwelling development	$10,000	new non-strata dwelling
Commercial development	$30	square metre of new GFA
Industrial development	$15	square metre of new GFA

Figure 7 - HPC base rates – Greater Sydney Region (subject to indexation)

Source – Department of Planning

Biodiversity and transport contributions

The HAP Contribution Bill also enables the levying of a Strategic Biodiversity Component (**SBC**) contribution towards biodiversity offsets and conservation if a region is biodiversity certified. The site is subject to the Cumberland Plain Conservation Plan (**CPCP**) and the *Draft Environmental Planning and Assessment (Housing and Productivity Contribution) Order 2023* proposes to levy the contribution rates outlined in **Figure 8** on new development on urban-capable biodiversity certified CPCP lands.

Greater Sydney CPCP biodiversity certified land		
Development class	**Amount**	**Unit**
Residential subdivision	$10,000	new dwelling lot
Residential strata subdivision	$10,000	new strata dwelling lot
Non-strata multi-dwelling development	$10,000	new non-strata dwelling
Commercial development	$60	square metre of new GFA
Industrial development	$30	square metre of new GFA

Figure 8 - SBC base rates - Greater Sydney CPCP biodiversity certified land (subject to indexation)

Source – Department of Planning

The *Draft Environmental Planning and Assessment (Housing and Productivity Contribution) Order 2023* does not identify the application or amount of any proposed Transport Project Contribution (**TPC**) to the site or its immediate surroundings at this time, and it is not possible to estimate whether a TPC would be required for the proposal.

3.5.3 Sydney Water Development Servicing Plan charges

Sydney Water has adopted new Development Servicing Plans (**DSPs**) which levy charges on new development towards the provision of drinking and wastewater infrastructure works across Greater Sydney and surrounds.

The site is located within the Greater Sydney Drinking Water DSP and the Malabar Wastewater DSP with the following charges proposed per Equivalent Tenement (ET) as outlined in **Table 8**:

Table 8 - Potential DSP charges

DSP	Rate per ET
Greater Sydney Drinking Water	$833.68
Malabar Wastewater	$3,399.99
Total	**$4,233.67**

The DSP contributions came into effect from 1 July 2024 with the contributions capped at 25 per cent of the full charge during 2024-25 and 50 per cent during 2025-26, with full contributions levied from 1 July 2026, in line with a transition plan approved by the NSW Government.

There are opportunities to reduce or offset DSP charges through a Commercial Agreement with Sydney Water which involves the developer-led delivery of upgrades to trunk infrastructure required to support the development.

4 Infrastructure requirements

4.1 Utility / site servicing infrastructure

The Infrastructure Phasing Plan prepared for the planning proposal[2] assessed the capacity of existing utility services within the vicinity of the site, current and planned utility projects, planned Special Infrastructure Contribution (SIC) infrastructure, and potential servicing strategies for the proposed development within the precinct.

The Infrastructure Phasing Plan includes a detailed stage-by-stage breakdown of utility and site servicing requirements and should be consulted in conjunction with this IDP if further detail is required. A summary of the key outcomes is provided below.

Section 3.5.3 of this report notes that Sydney Water is currently exhibiting draft DSPs for potable and waste water. Future opportunities for developer-led delivery of enabling infrastructure via a Commercial Agreement which allows the offsetting of the costs against DSP charges will be sought by the Proponent.

4.1.1 Potable water

Sydney Water has indicated that the Appin (Part 1) Precinct will be serviced from the Macarthur Water Filtration Plant (MWFP) with new water mains to be constructed off the existing 300mm trunk main on Wilton Road to supply development fronts. A main of approximately 200mm diameter could support the development of both Appin (Part 2) Precinct sites, or of each site was to be serviced individually, a 150mm main would be required for each site. The exact sizing and location of potable water infrastructure would depend upon the timing of delivery of Appin (Part 2) relative to Stage 1 in Appin (Part 1) Stage 1 sub-precinct and other stages of Appin (Part 1).

4.1.2 Sewer

The existing Appin township is serviced by the Glenfield Water Recycling Plant (WRP) which is located approximately 23km northeast of Appin. The existing infrastructure needs to be upgraded to support the growth planned in the Appin (Part) Precinct.

Sydney Water have indicated that in the short to medium term, sewer flows from new dwellings in Appin (Part 1) will be treated at the Glenfield WRP via new trunk infrastructure which transfers flows to existing sewer infrastructure located at Rosemeadow, including a new sewer pump station (SPS) and rising main. This arrangement is likely to operate for up to 10 years until a new Treatment Plant is commissioned down near the lower parts of the Nepean River and additional SPS are provided. The Appin (Part 2) Precinct is able be serviced by a combination of sewer mains, pump stations and rising mains depending upon the timing of delivery of Appin (Part 2) relative to Stage 1 in Appin (Part 1) Stage 1 sub-precinct and other stages of Appin (Part 1).

4.1.3 Electricity and gas

A technical review by Endeavour Energy has identified that there is capacity for between 1,200-1,400 dwellings to be serviced using the existing Appin Zone Substation (ZS), after which a new zone

[2] Refer Table 1

substation will need to be established to support further growth. Endeavour Energy have also advised that TransGrid will require a site for a future Bulk Supply Point (BSP) to service the development. However, subject to the timing of development in Appin (Part 2) relative to Appin (Part 1), it may be possible to use available capacity in existing feeders which supply surrounding land uses.

Gas reticulation servicing will be subject to further analysis and negotiation with the supplier at the detailed planning stage. It is noted however that gas is not an essential utility service and is not proposed to be reticulated within the development.

4.1.4 Telecommunications

It is anticipated that the NBN servicing to the site can be achieved from existing infrastructure fronting Appin Road with minimal cable backhaul required. Existing NBN infrastructure is located in close proximity to the site and there are no forecast servicing issues.

4.2 State and regional infrastructure

The following section outlines the state and regional infrastructure required to support the development of the Appin (Part 2) Precinct. Further details on the infrastructure requirements are included in the infrastructure schedules contained in **Section 5** this report.

4.2.1 Transport and access

The Strategic Transport Assessment[3] references both the initial assessment undertaken for Appin to support Appin (Part 1) and the subsequent Transport Management and Accessibility Plan (**TMAP**) which was prepared for the entire Appin precinct in February 2024 and was endorsed by Transport for NSW (**TfNSW**) in May 2024. The TMAP is the higher-order transport and access planning strategy for Appin and it takes precedent over the earlier assessments undertaken for Appin.

The TMAP found that the transport network could accommodate the proposed development within the Appin and North Appin Precinct (including the Appin (Part 2) precinct) and the Greater Macarthur Growth Area with an appropriate set of transport improvements.

The Strategic Transport Assessment found that by 2026 the regional road network is sufficient to cater the forecast traffic demands, aided by the opening of the Spring Farm Parkway extension that will help to relieve traffic congestion on Narellan Road through Campbelltown and the Hume Motorway, along with the northern part of Appin Road.

The timing of key upgrades will match the anticipated development staging and available road network capacity.

From the perspective of the Appin (Part 2) Precinct, most of the transport improvements are expected to be in place by the time the development starts to generate trips:

- Macquariedale Road east-west link (proposed), assumed by 2031, will be in place before development starts in the planning proposal lots

[3] Refer Table 1

- Greater Macarthur Transit Corridor (planned), assumed by 2041, will provide the spine of public transport services, linking the residential development to the local centre and the Appin Precinct to the north.

- Local access intersections along Wilton Road, assumed by 2031, will provide access into Lot 1 DP 804375 and Lot 3 DP 804375.

The key State and regional transport upgrades required to support Appin (Part 2) are shown in **Figure 9**

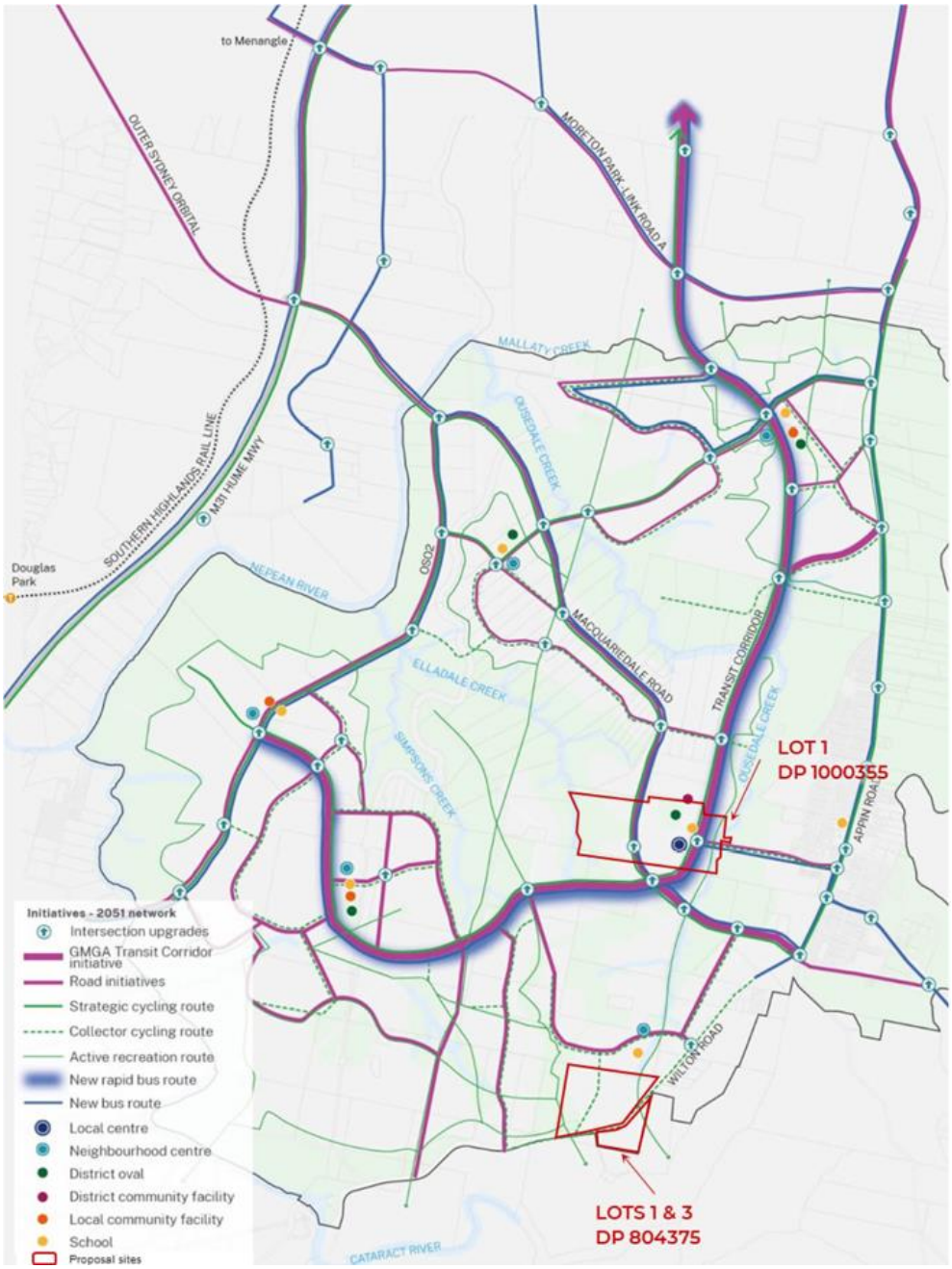


Figure 9 - Appin and North Appin Precincts strategic road network upgrades

Source – Appin Precinct Transport Management & Accessibility Plan, Pentelic Advisory, February 2024

4.2.2 Education

The Social Infrastructure and Open Space Assessment[4] identifies the following education requirements to support the development as shown in **Table 9**:

Table 9 - Education infrastructure

Education Item	Mechanism	Timing
One co-located primary and high school of approximately 4ha. Future provision of educational facilities in the Precinct will be subject to DoE's *'School Site Selection and Development Guidelines'*, which outline the site-based requirements for any new school site as well as ongoing consultation with DPE and the Proponent. Opportunities for shared use of facilities should be actively explored with the relevant Government agency	Land dedication via State planning agreement or funded through State contributions (if government school) or via transaction with non-government school provider. School construction by NSW Government or non-government school provider.	Subject to consultation with NSW Government and/or non-government school providers

Source – Urbis

The proposed new school site is aligned with SINSW site selection requirements and may be co-located with open space with the expectation that the school providers will explore a shared use arrangement with Council. There may also be further opportunity for the Council to explore shared use arrangements with the school provider for out-of-school-hours use of indoor school facilities for community purposes to augment the proposed on and off-site community facilities discussed in **Section 4.3.5** of this report.

4.3 Local infrastructure

The following section outlines the local infrastructure required to support the Appin (Part 2) Precinct development. Further details on the infrastructure required for the development are included in the infrastructure schedules contained in **Section 5** this report.

4.3.1 Transport and access

Section 4.21 of this report identifies the key regional transport network upgrades required to support the proposed development, both within and external to the site. In addition to that infrastructure, a high-level internal road network including collector roads is shown at **Figure 10** and **Table 10.** A corresponding road network hierarchy will be adopted within the site which ensures the efficient movement of vehicles within the precinct and includes local roads and collector road intersection treatments. The details of the local road network will be further revised during the assessment of the planning proposal and reflected on a future detailed indicative layout plan for the site and to inform the Council's preparation of a local contributions plan.

[4] Refer Table 1

Table 10 - Local transport and access

Transport and access item	Mechanism	Timing
Local roads	Delivered by developers via conditions of development consent	In conjunction with the delivery of the relevant stage of the development
Collector roads and intersections	S7.11 contributions plan (with potential for developer delivery via future planning agreement)	In conjunction with the delivery of the relevant stage of the development

Source: WSP

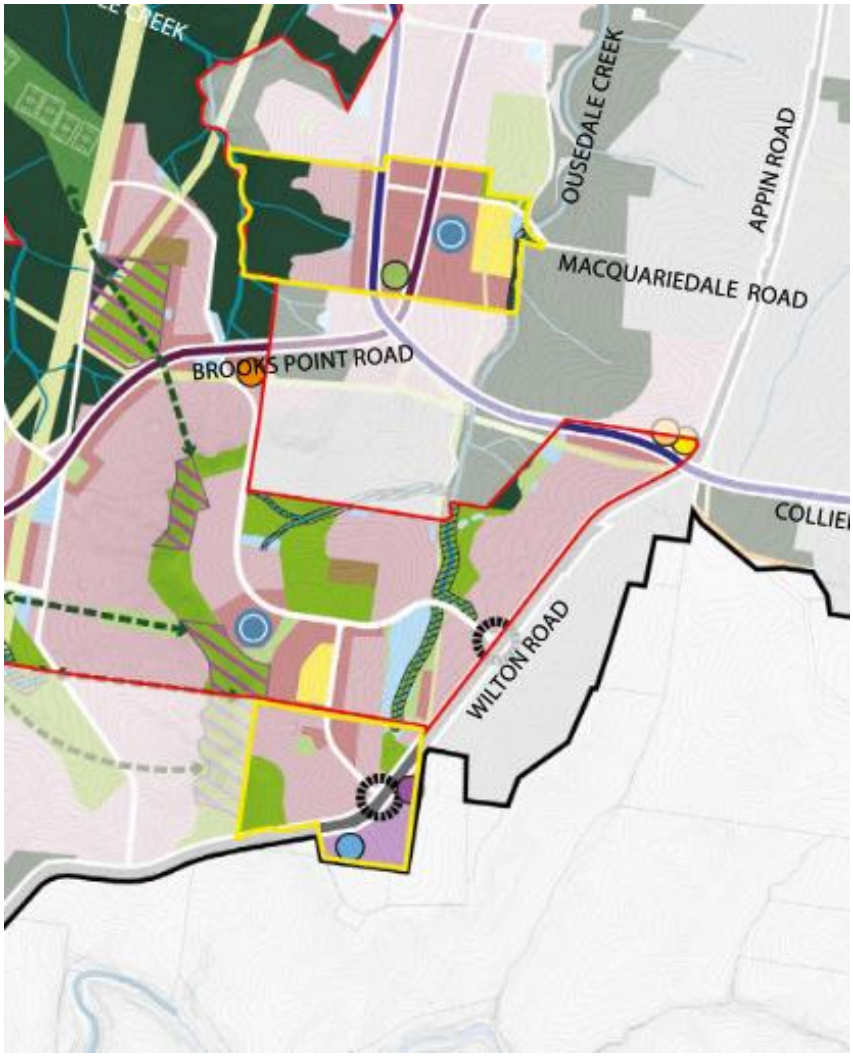


Figure 10 - Collector Roads within Appin (Part 2) Precinct (shown white)

Source – Urbis

4.3.2 Water cycle management strategy

The Water Cycle Management Strategy Report[5] features a package of water quality and quantity infrastructure including basins and raingardens as outlined in **Table 11** and shown in **Figure 11** below.

The ownership and maintenance of the water cycle management system is further discussed in **Section 4.3.6** of this report.

Table 11 - Water cycle management infrastructure

Water cycle management item	Mechanism	Timing
Delivery of two basins and seven raingardens	S7.11 contributions plan (with developer delivery proposed via future planning agreement)	In conjunction with the delivery of the relevant stage or substage of the development

Source: J. Wyndham Prince

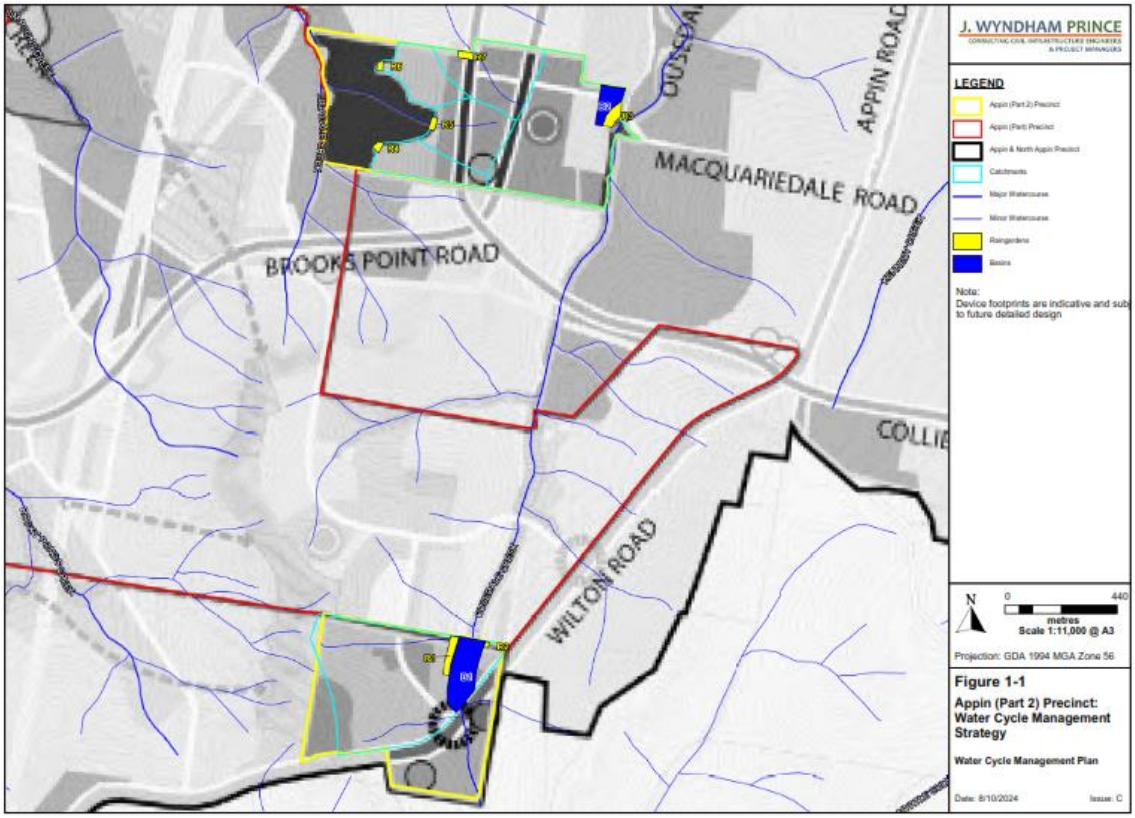


Figure 11 – Appin (Part 2) Precinct water cycle management plan

Source: J. Wyndham Prince

[5] Refer Table 1

4.3.3 Open space and recreation

The Social Infrastructure and Open Space Assessment[6] establishes the demand and provision of open space in Appin (Part 2) Precinct 1 as outlined in **Table 12** below:

Table 12 - Open space area and rate of provision

Benchmark	Quantity of open space required	Quantity of open space provided
10% of NDA as local and district open space (does not include regional space)	5.7ha	10.48ha
2.83ha per 1,000 people (includes regional space)	9.75ha	3.04ha per 1,000 people

Source: Urbis

The Assessment notes that the incoming Appin (Part 2) Precinct population will have immediate access to three district open space areas and that all district open spaces located across the Appin (Part 2) Precinct meet the minimum size requirements in the draft Greener Places Design Guide, with all residents also within 2km of a district space and 10km of the regional space.

The November 2022 Social Infrastructure and Open Space Strategy prepared for the Appin (Part 1) Precinct provides recommendations to guide planning for local spaces across the Appin and North Appin Precincts during subsequent detailed design stages. This includes distributing local open space within 400m of residents, and providing adequate embellishment to support play and urban respite opportunities. These recommendations are supported for the Appin (Part 2) Precinct when the detailed design stage commences.

The planned open space facilities throughout the Appin and Appin North precincts are outlined in **Table 13**.

Table 13 - Open space and recreation

Facility type	Benchmark application	Planned provision and timing (if known)	Mechanism
Aquatic centres	1 for every 30,000 – 60,000 people (No centre)	Demand for a public facility will be met through the development of a planned indoor aquatic centre at Wilton. It is recommended a private learn to swim facility be provided to within the Appin (Part 1)Precinct to supplement this provision and accommodate some needs of the incoming population.	Public facility through existing S7.11 contributions plan; private facility through private market processes

[6] Refer Table 1

Facility type	Benchmark application	Planned provision and timing (if known)	Mechanism
Indoor recreation facilities	1 for every 50,000 – 100,000 people (No centre)	The incoming population for the Appin (Part 2) Precinct will not generate the need for a standalone. Demand will likely to be met through planned facilities at Menangle Park and Wilton.	S7.11 contributions plan (with developer delivery proposed via future planning agreement)
Playspaces	1 playground for every 500 children aged 0-4 years 50 sqm minimum within a park 1 playground for every 500 children aged 5-11 years 100 sqm minimum within a park (no playspaces)	As identified in the November 2022 Social Infrastructure and Open Space Strategy, it is strongly recommended there be a range of play spaces distributed across the Appin (Part 2) Precinct. This includes distribution across the proposed regional, district and local open space network.	S7.11 contributions plan (with developer delivery proposed via future planning agreement)
District sportsgrounds	Two double playing fields and amenities per 10,000 people (no playing fields)	While the incoming population of the Appin (Part 2) Precinct will not generate benchmark demand for a sportsground, a double playing field is recommended to be located adjacent to the school site.	S7.11 contributions plan (with developer delivery proposed via future planning agreement)
Multipurpose outdoor courts	1 for every 4,200 people 0.05ha per court plus runoff space and amenities (one court)	To be distributed among district and some well-located local spaces. Some of the latter may be half court facilities for informal local games. Consideration should also be given to potential joint use arrangements with schools.	S7.11 contributions plan (with developer delivery proposed via future planning agreement)
Riparian corridors	N/A	Embellished riparian corridors which form a passive open space, ecology and water cycle management function.	Planning agreement

Sources: Urbis

4.3.4 Community facilities

The Social Infrastructure and Open Space Strategy prepared in November 2022 for the Appin and Appin North development identifies the community infrastructure required for the entirety of the Appin and Appin North precincts, using the Wilton Priority Growth Area Community Needs Assessment 2018 as a benchmark.

The Social Infrastructure and Open Space Assessment prepared for this Proposal implements the recommendations of the earlier Strategy and recommends the provision of community facilities for the Appin (Part 2) Precinct as shown in **Table 14**.

Table 14 - Community facility demand and provision

Facility type	Benchmark application	Planned provision and timing (if known)	Mechanism
District multipurpose community facility and library	Multipurpose community centres - 1 for every 20,000 30,000 people Branch libraries - 42 sqm for every 1,000 people	One multipurpose district community centre with an integrated library of approximately 4,420sqm, comprising of approximately: ▪ 2,000sqm multipurpose community space ▪ 2,000sqm library space ▪ 420sqm shared meeting spaces, staff spaces and amenities. Located within the local mixed-use centre, with direct access to the public transport corridor. The District multipurpose community facility and library will be located within the Dunbier land in the Appin (Part 2) Precinct.	Land acquisition can be included in future s7.11 contributions plan; alternative funding or delivery mechanism for buildings (e.g. planning agreement with developer, grants, joint use arrangements)
Local multipurpose community facility	Local community centres - 1 for every 10,000 20,000 people	Three local level multipurpose facilities of approximately 935 sqm. Locate facilities within the neighbourhood mixed use centres. Facilities should be located close to public transport and co-located with other services such as the school sites, recreational facilities or retail services. No local community facilities are proposed to be located within the Appin (Part 2) Precinct, however the incoming population will benefit from the district facility outlined above.	Land acquisition can be included in future s7.11 contributions plan; alternative funding or delivery mechanism for buildings (e.g. planning agreement with developer, grants, joint use arrangements)

Source: Urbis

4.3.5 Post-development ownership and maintenance

The proposed post-development local infrastructure ownership and maintenance responsibility regimes across the Appin Precinct, and Appin (Part 2) Precinct more specifically, include Council and the NSW Government. **Table 15** provides a possible post-development management arrangement, which will be the subject of further discussion between the proponent, the NSW Government and Council:

Table 15 - Local infrastructure delivery and post-development management arrangement

Local Infrastructure type	Delivery mechanism	Ownership post delivery	Maintenance costs responsibility	Estimated defects period timing	Estimated maintenance period timing*
Internal roads – collector	s7.11	Council	Council	1 year	1 year
Internal roads – other	Conditions of consent	Council	Council	1 year	1 year
Laneways	Conditions of consent	Council	Council	1 year	1 year
External roads	s7.11	Council or TfNSW	Council or TfNSW	1 year	1 year
Stormwater drainage	S7.11	Council	Council	1 year	1 year
Riparian corridors	Planning agreement	Council	Developer (maintenance contribution to Council at asset handover)	5 years	5 years
Open space including playing fields, outdoor courts, and playspaces	s7.11	Council	Council	1 year	1 year

Local Infrastructure type	Delivery mechanism	Ownership post delivery	Maintenance costs responsibility	Estimated defects period timing	Estimated maintenance period timing*
Community facilities	s7.11 for land acquisition; alternative funding or delivery mechanism for buildings (e.g. planning agreement with developer, grants, joint use arrangements)	Council	Council	1 year	1 year

Source – GLN

Notes:

a Infrastructure listed in the table does not include State or regional infrastructure

b S7.11 plan would contain essential works and base level embellishment only

* Defects period and maintenance occurs concurrently

The proponent welcomes further discussions with Council and the NSW Government regarding the delivery, ownership and maintenance of the stormwater drainage and riparian corridors which form part of the Appin (Part 2) Precinct development.

4.3.6 Other social infrastructure

The Social Infrastructure and Open Space Assessment[7] identifies the following requirements for other social infrastructure to support the proposal, including health services and childcare facilities to support the entire Appin and Appin North Precincts as shown in **Table 16.**

Table 16 - Other social infrastructure – Appin and North Appin Precincts

Facility type	Mechanism	Timing
Look to provide adaptable spaces within community facilities to accommodate health services	Via private and public providers	TBC in conjunction with the development of commercial floorspace or co-location opportunities with community facilities, and subject to consultation with private and public providers and LHDs
Provision of one medical centre/general practice clinic within the mixed use centre to accommodate health services facilities	Via private providers	In line with market demand
Approximately one to two long day care centres with an average of 80 children (104 places)	Via private providers	In line with market demand
Approximately two out of hours school care places with an average of 80 children (147 places)	Via private providers	In line with market demand

Source – Urbis

[7] Refer Table 1

5 Infrastructure schedules

5.1 Local infrastructure for Appin (Part 2) Precinct

Table 17 – Local infrastructure schedule for Appin (Part 2) Precinct

Description	Qty	Responsibility for delivery	Mechanism for delivery	Future asset owner	Staging / priority
Transport and Access					
Collector roads within the site	TBC	The proponent	Included in future s7.11 contributions plan and will be delivered by the proponent via a voluntary planning agreement.	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development
Signalised intersections and roundabouts on collector roads	TBC	The proponent	Included in future s7.11 contributions plan and will be delivered by the proponent via a voluntary planning agreement.	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development
Local road network	TBC	The proponent	Delivered via conditions of development consent	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development
Open space and recreation					
Local parks and play spaces	TBC	The proponent	Included in future s7.11 contributions plan and will be delivered by the proponent via a voluntary planning agreement.	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development

Description	Qty	Responsibility for delivery	Mechanism for delivery	Future asset owner	Staging / priority
Double playing fields	1	The proponent	Included in future s7.11 contributions plan and will be delivered by the proponent via a voluntary planning agreement.	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development
Other open space connections and corridors	TBC	The proponent	Included in future s7.11 contributions plan and will be delivered by the proponent via a voluntary planning agreement.	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development
Riparian corridors	TBC	The proponent	Embellishment works delivered by the proponent via a voluntary planning agreement.	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development
Water cycle management					
Delivery of a water cycle management network including basins and raingardens	2 x basins 7 x raingardens	The proponent	Included in future s7.11 contributions plan and will be delivered by the proponent via a voluntary planning agreement.	Wollondilly Shire Council	Delivered in conjunction with the relevant stage or substage of the development

5.2 State, regional and other infrastructure for Appin (Part 2) Precinct

Table 18 – State, regional and other infrastructure for Appin (Part 2) Precinct

Description	Qty	Responsibility for delivery	Mechanism for delivery	Future asset owner	Staging / priority
Transport and Access					
Transit corridor	1	TfNSW/ proponent/ landowner	The arterial road corridor will be dedicated to TfNSW via a proposed State VPA which will offset the value of the land against State infrastructure contributions.	TfNSW	TBC
Arterial road corridor	1	TfNSW/ proponent/ landowner	The arterial road corridor will be dedicated to TfNSW via a proposed State VPA which will offset the value of the land against State infrastructure contributions.	TfNSW	TBC
Education					
Land to accommodate future K-6 school site	4ha	NSW Government	The school site land will be dedicated to the NSW Government via a proposed State VPA which will offset the value of the land against State infrastructure contributions. The school will be delivered by the NSW Government	NSW Government or non-government provider	To be determined via ongoing consultation with Schools Infrastructure NSW
Site servicing					
Electricity - Endeavour Energy zone substation	TBC – subject to timing of Appin (Part 2) relative to other stages	The proponent/asset owner	TBC	Endeavour Energy	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing

Description	Qty	Responsibility for delivery	Mechanism for delivery	Future asset owner	Staging / priority
					subject to staging of development
Electricity - 11kV feeders	TBC – subject to timing of Appin (Part 2) relative to other stages	The proponent/asset owner	TBC	Endeavour Energy	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development
Water - Trunk mains	TBC – subject to timing of Appin (Part 2) relative to other stages	The proponent/asset owner	TBC	Sydney Water	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development
Sewer – pump station	TBC – subject to timing of Appin (Part 2) relative to other stages	The proponent/asset owner	TBC	Sydney Water	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development
Sewer - Trunk gravity mains	TBC – subject to timing of Appin (Part 2) relative to other stages	The proponent/asset owner	TBC	Sydney Water	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development
Sewer - rising mains (includes mains along Appin Road)	TBC – subject to timing of Appin (Part 2) relative to other stages	The proponent/asset owner	TBC	Sydney Water	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development

Description	Qty	Responsibility for delivery	Mechanism for delivery	Future asset owner	Staging / priority
Electrical - internal reticulation	TBC	The proponent/asset owner	TBC	Endeavour Energy	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development
Telecommunication - lead in	TBC – subject to timing of Appin (Part 2) relative to other stages	The proponent/asset owner	TBC	TBC	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development
Telecommunication - reticulation	TBC	The proponent/asset owner	TBC	TBC	Enabling infrastructure works to support Appin (Part 1) and Appin (Part 2) – timing subject to staging of development