

infrastructure & development consulting

Tuggerah Gateway

Utilities Report

May 2023

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Author	R. Higginson	Reviewed	C. Avis

1 Introduction

On behalf of Scentre Group, this utilities servicing strategy supports a Planning Proposal and Structure Plan prepared by Urbis. The Planning Proposal facilitates the proposed amendment to the Local Environment Plan at the Tuggerah Gateway Site, known as Lot 2 DP1056960 and Lot 3 DP1084221, which will enable residential, mixed-use and recreational land uses.

This report summarises the investigations relating to the utilities infrastructure strategies for the development site at Tuggerah which will be developed with a mix of residential and mixed-use typologies.

This report shows that the proposed development of the site can be adequately serviced and outlines a potential strategy for the provision of utility services for the site. Specifically, this report will outline:

- Existing utility services within the vicinity of the site
- Current and planned utility projects
- Implications of the above potential servicing strategies for the proposed development of the site

1.1 The Site

The site is located within the Central Coast Council LGA, to the south east of the intersection of the Pacific Motorway and Wyong Road. It lies directly to the west of the existing Westfield Tuggerah site, with heavily vegetated bushland located to the south. The site is approximately 41.6 hectares in size and generally falls from south to north, towards Mardi Creek which bisects the north west corner of the site. The site is currently zoned RU6 Transition, B4 Mixed Use and E2 Environmental Conservation. The site is shown in Figure 1 below.

Figure 1 - Site Boundary



1.2 Proposed Development

The Planning Proposal seeks to rezone land comprising (part) Lot 2 in DP1056960 and Lot 3 in DP1084221 from RU6 Transition to R1 General Residential. The B4 Mixed Use zone in the north-east of the site and E2 Environmental Conservation zone in the south-east is to be retained.

The long-term development yield capable of being accommodated on the site comprises of 2,112 dwellings including a mix of detached housing lots, medium density townhouses/terraces, apartments and seniors living. Consistent with the Structure Plan, the future development of the site is to be staged in accordance with market demand and infrastructure requirements. In the short-term employment uses in the form of bulky goods/large format retailing will be prioritised in part of the B4 Mixed Use zone. In the longer term this area is envisaged as a mixed-use precinct.

The proposed indicative layout plan for the site is shown in Figure 2.

Figure 2 - Proposed Development



A breakdown of the expected development typologies is provided in Table 1.

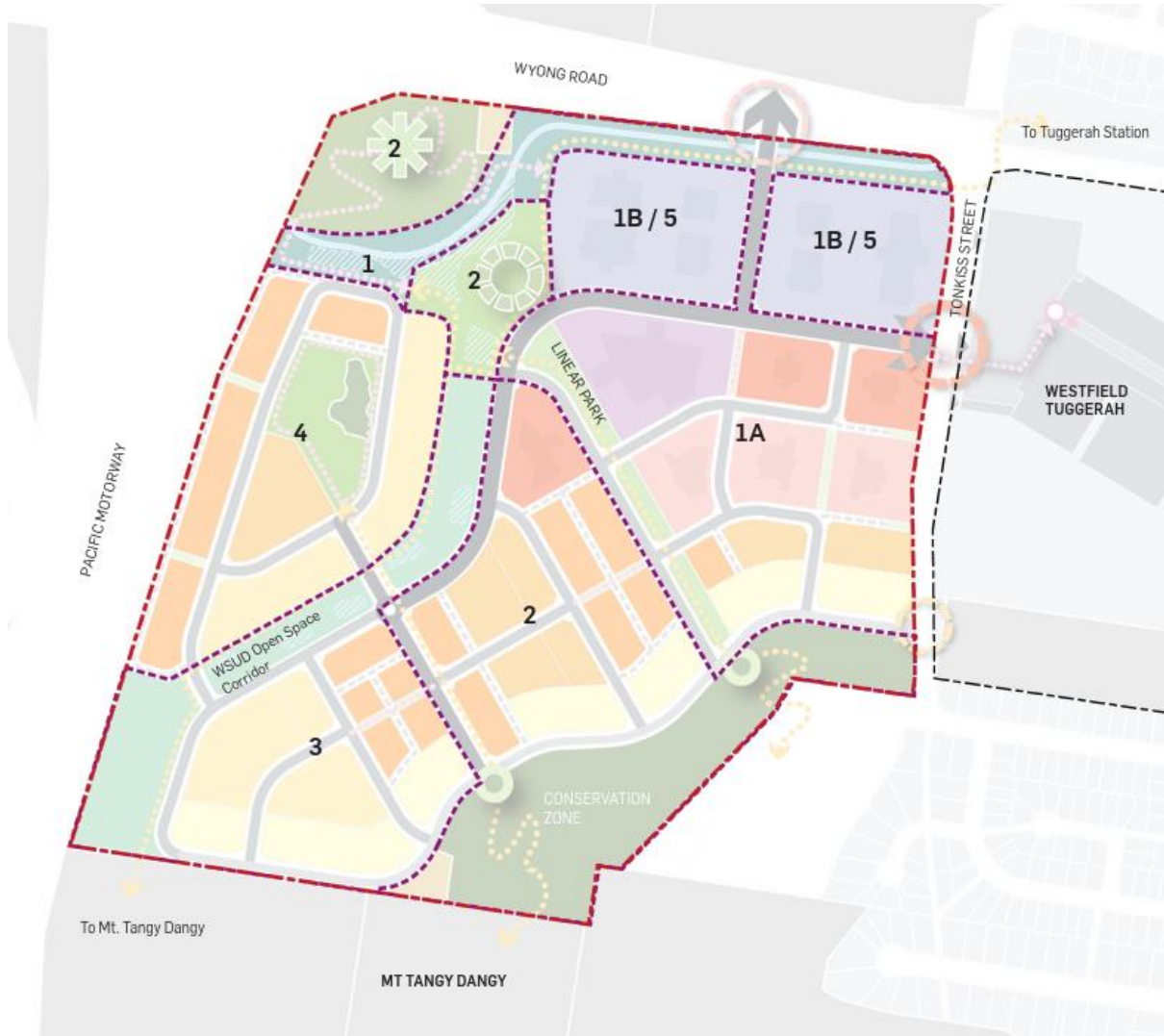
Table 1 - Proposed Development

Land Use	Land Area (Ha)	Dwellings
Low Density (Standard & Large Lots)	5.2	86
Medium Density (Townhouse, Duplex & Terraces)	5.6	298
High Density (Low – Medium Rise Apartments)	3.2	661
Independent Living Unit (Medium Rise Apartment)	1.2	261
Mixed Use	4.1	806
Total	19.6	2,112

1.3 Development Staging

The development will be staged, with the first stage expected to commence in the first quarter of 2024. The development staging plan is provided in Figure 3.

Figure 3 - Development Staging Plan



2 Water

2.1 Existing Infrastructure

Potable water is supplied to the area by the Central Coast Council potable water network. Trunk water supply originates from the Tuggerah Reservoir, located 400m southeast of the site. This reservoir is connected to a 525mm diameter main which traverses Tonkiss Street, crosses Wyong Road and moves west through the existing bushland. Residential development to the southeast of the site is supplied via a series of 100mm diameter reticulation mains located within the road reserve.

The Large Lot Residential land to the west of the Pacific Motorway is not currently serviced by the Council potable water network. The existing potable water network within the vicinity of the site is shown in Figure 4.

Figure 4 - Existing Water Network



2.2 Proposed Water Demand

A high-level assessment was undertaken to determine the peak day demand generated by the development, and the corresponding potable water infrastructure required to support this development. This was achieved using design parameters outlined in Central Coast Council's *Water Supply and Sewerage Development Servicing Plan 2019* and supplemented with information from the Water Supply Code of Australia (WSA).

Assuming a per capita water use of 236L/day and a PDD/ADD factor of 1.9, a peak day demand of 26.5L/s is expected to be generated by the proposed development. The results of the assessment are provided in Table 2.

Table 2 - Proposed Water Demand Calculations

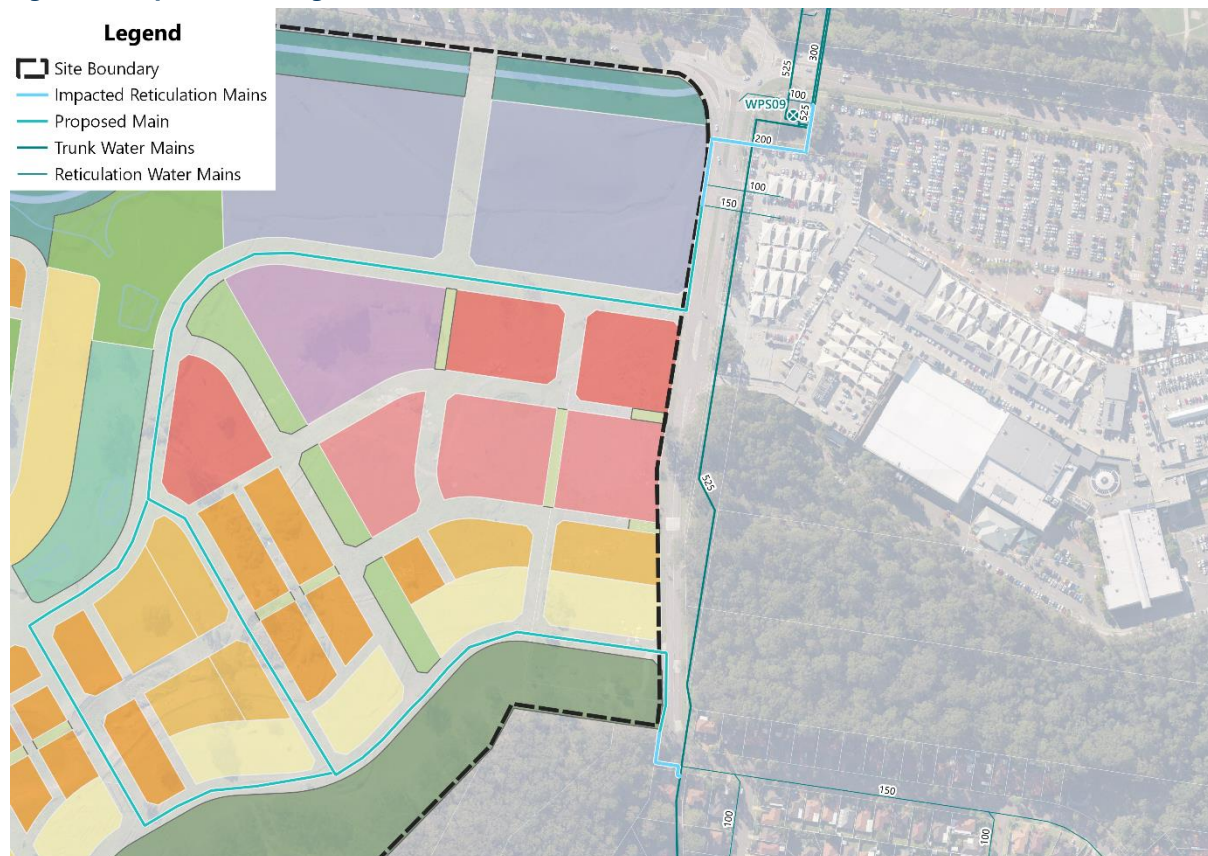
Land Use	EP Rate	Total EP	Average Day Demand (L/s)	Peak Day Demand (L/s)
Low Density Residential	3.0/Dwelling	258	0.7	1.3
Medium Density Residential	3.0/Dwelling	894	2.4	4.6
High Density Residential	2.1/Dwelling	3,765	10.3	19.5
Mixed Use (Non Residential)	0.2/Ha	187	0.5	1.0
Total		5,104	13.9	26.5

Based on the above assessment the equivalent of a 200mm diameter main could support the proposed development. This could be provided as either a single 200mm main or a series of smaller mains.

2.3 Impacted Infrastructure

Given the proximity of the development to the Tuggerah Reservoir, provision of potable water supply to the site is not expected to pose a constraint to development. It is unlikely that existing infrastructure would need to be upgraded to supply the site, however detailed hydraulic modelling will be undertaken to determine the extent and size of any required upgrades at the DA phase in consultation with Council. The existing infrastructure which will be impacted by the proposed development has been highlighted on Figure 5 below.

Figure 5 - Impacted Existing Water Infrastructure



2.4 Development Staging

Council have indicated their preference is that the development will connect to the 200mm potable watermain adjacent the Westfield site and extend this water main into the development site. These mains will connect back to the existing 150mm water main on the southern end of Tonkiss Street.

Within the site, a 200mm ring main will be constructed along key collector roads, with smaller reticulation mains constructed along local roads to supply dwellings. These works would be delivered in stages to align with the development rollout.

Stages 1 and 2 of the proposed potable water servicing strategy are shown in Figure 6 and Figure 7 respectively (no reticulation has been shown for clarity). Stage 1 will yield 612 dwellings (including 225 apartment dwellings), while Stage 2 will yield 401 dwellings (including 393 apartment dwellings). Stages 1 and 2 account for approximately 50% of the residential development of the site. Future stages will be supplied by further extending the reticulation network shown in the Figures below.

Figure 6 – Proposed Indicative Water Servicing Strategy – Stage 1

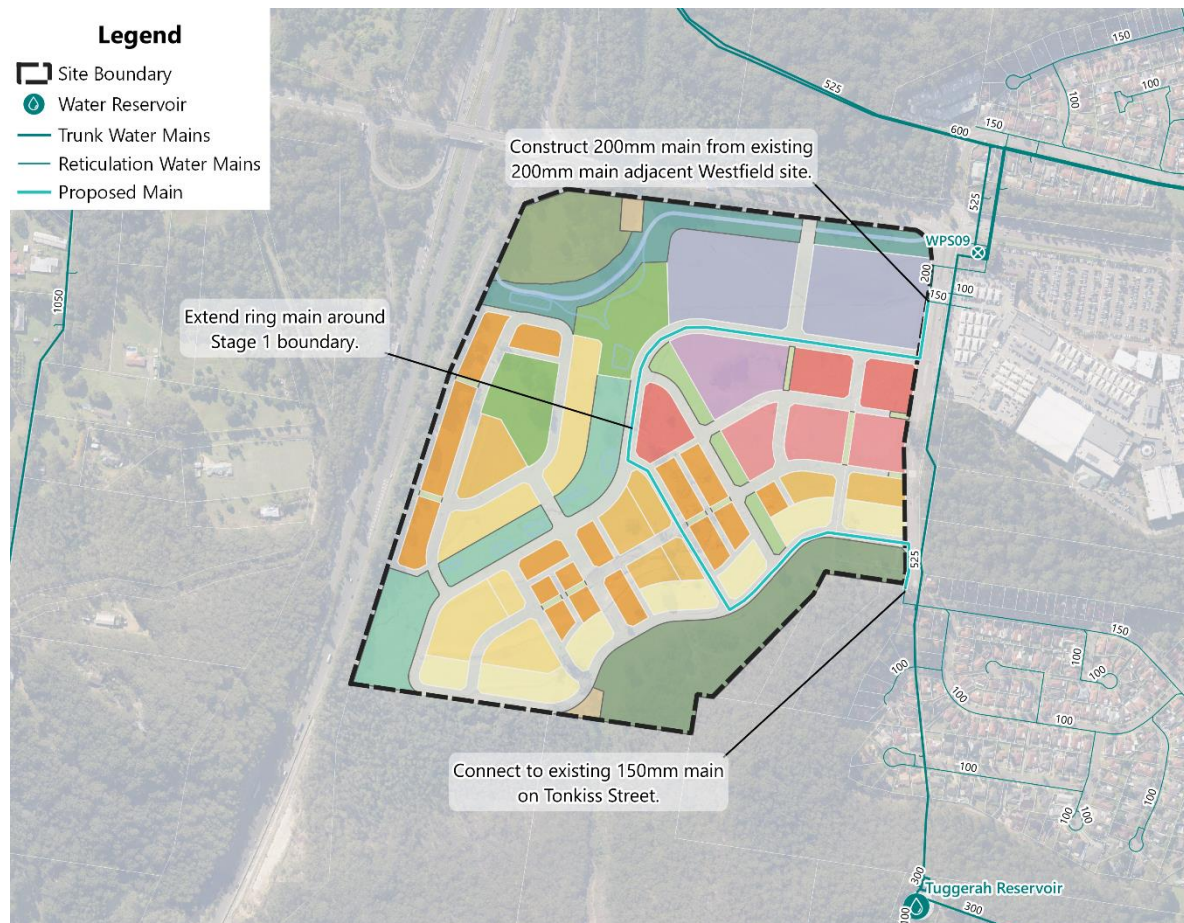
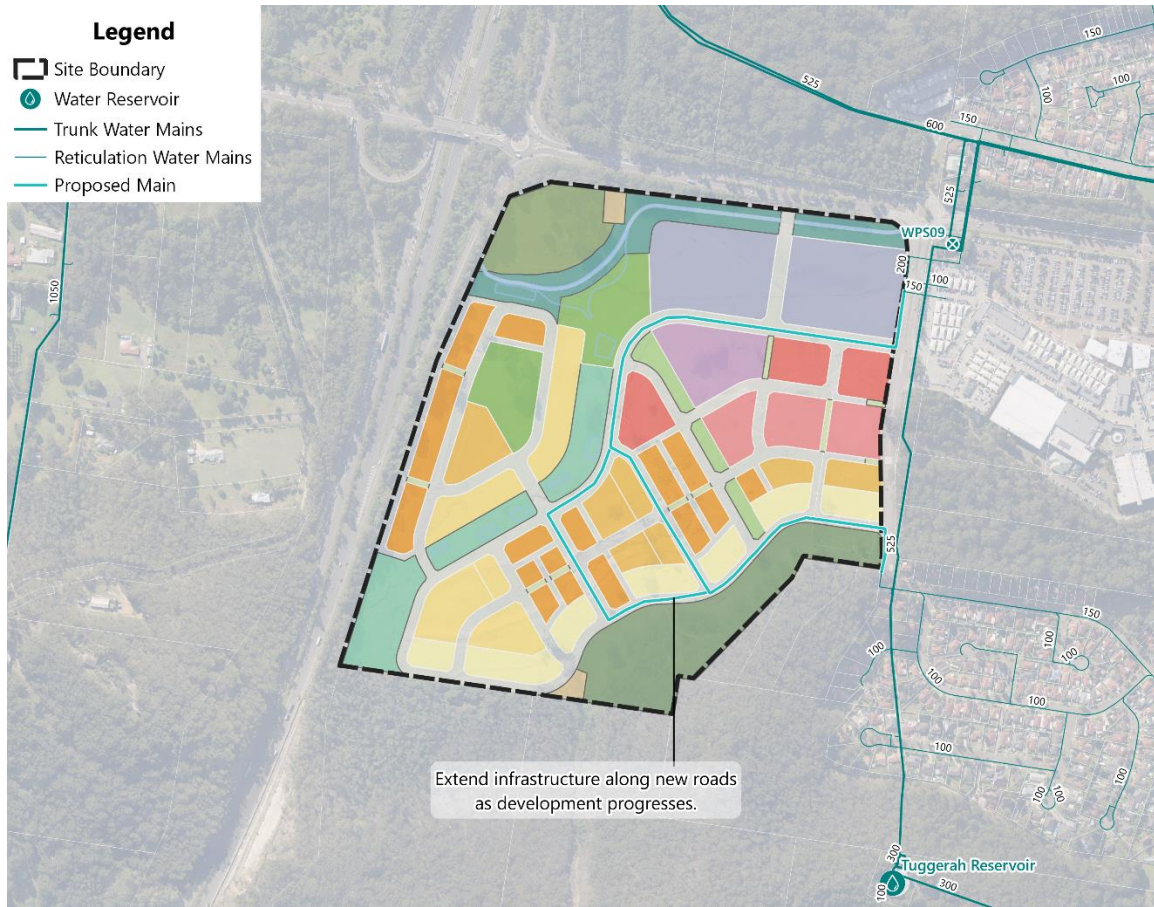


Figure 7 - Proposed Indicative Water Servicing Strategy – Stage 2



3 Sewer

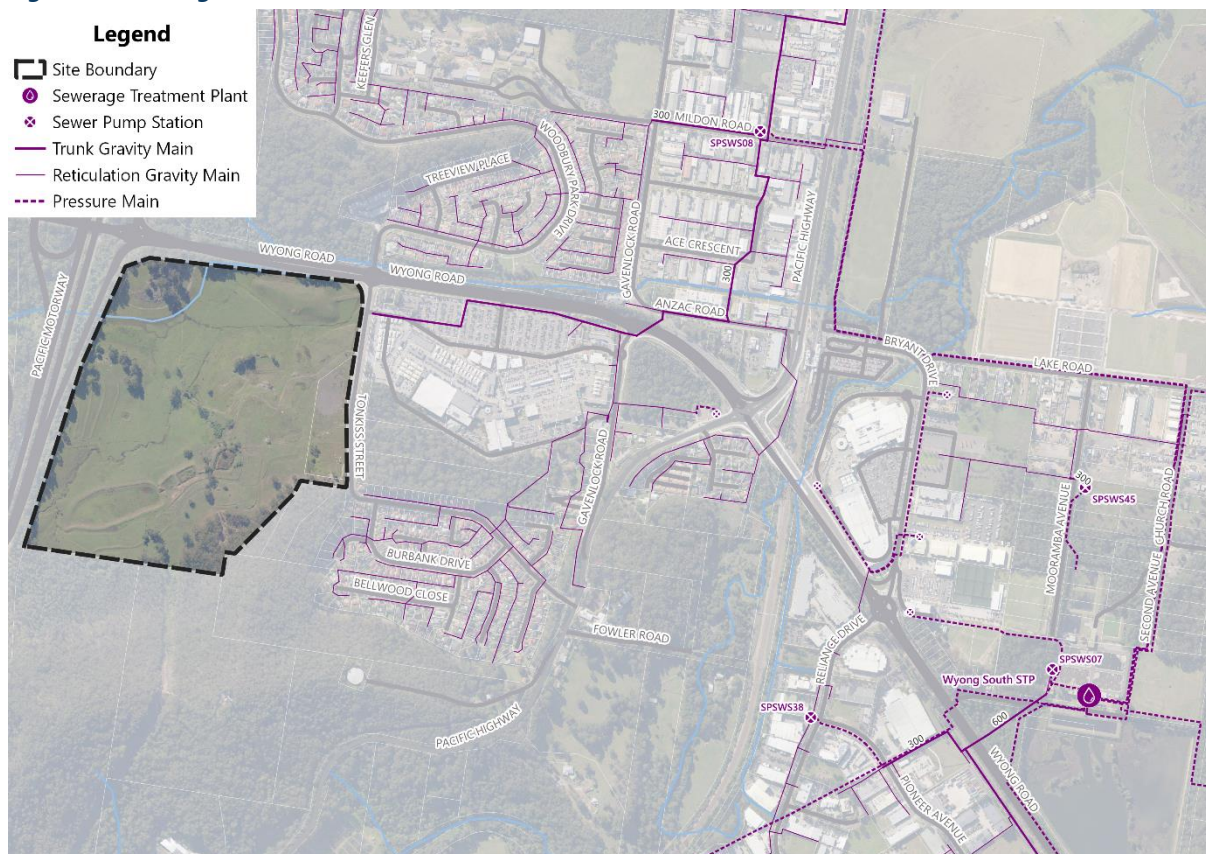
3.1 Existing Infrastructure

The site is not currently serviced by the Central Coast Council sewer network. Adjacent developments are connected to council infrastructure via a series of gravity mains, which drain to the Wyong South Sewerage Treatment Plant (STP). The Wyong South STP is located on Ibis Road, approximately 1.6km east of the site.

Council operate eight STPs. Most sewerage undergoes secondary treatment and is discharged into the ocean at either Norah Head or Wonga Point ocean outfalls in the north or Winne Bay in the south.

To the east of the study area, a 300mm trunk gravity main traverses the Westfield shopping centre site and runs along the southern side of Wyong Road. This trunk main drains to a sewer pump station (SPSWS08) on Mildon Road. A 375mm pressure main then transfers flows from the pump station to the Wyong South STP. The existing sewer infrastructure within the vicinity of the site is shown in Figure 8 below.

Figure 8 - Existing Sewer



3.2 Proposed Sewer Loading

A high-level assessment was undertaken to determine the sewer loading generated by the development, and the corresponding sewer infrastructure required to support this development. This was achieved using design parameters outlined in Central Coast Council's *Water Supply and Sewerage Development Servicing Plan 2019* and supplemented with information from the Sewerage Supply Code of Australia.

A sewer loading of 125kL/year per ET and an ADWF to PDWF factor of 3.0 for residential uses and 2.0 for non-residential uses were adopted for this assessment, per Council's guidelines. A PDWF to PWWF factor of 2.0 was used for all land use types based on our experience in planning sewer infrastructure. In subsequent and more detailed phases of investigation and modelling, PWWF factors would be determined to include allowances for pipe conditions, stormwater connections and soil conditions. The results of the assessment are provided in Table 3.

Table 3 – Proposed Sewer Loading Calculations

Land Use	ET Rate	Total ET	ADWF (L/s)	PDWF (L/s)	PWWF (L/s)
Low Density Residential	1.0/Dwelling	86.0	0.3	1.0	2.0
Medium Density Residential	1.0/Dwelling	298.0	1.2	3.5	7.1
High Density Residential – 1 Bedroom Apartment (assumed 10%)	0.5/Dwelling	89.7	0.4	1.1	2.1
High Density Residential – 2 Bedroom Apartment (Assumed 60%)	0.75/Dwelling	806.9	3.2	9.6	19.2
High Density Residential – 3 Bedroom Apartment (Assumed 30%)	1.0/Dwelling	537.9	2.1	6.4	12.8
Mixed Use (Assumed Shops/Offices)	0.005/sqm	124.4	0.3	0.6	1.2
Total		1,942.8	7.5	22.2	44.4

Based on the above, a peak wet weather flow (PWWF) of 44.4 L/s is expected to be generated by the development of the site. A minimum 300mm diameter gravity main would be required to service the site in its entirety.

3.2.1 Impacted Infrastructure

The site is located within a single sewer catchment, generally draining from south to north, towards Mardi Creek. Reticulation mains within the site will connect to the existing 300mm diameter main on the eastern side of Tonkiss Street, within the Westfield site. This trunk main drains to SPSWS08 on Mildon Road where it is transferred to the Wyong South STP via a 375mm pressure main. The existing infrastructure which will be impacted by the proposed development has been highlighted on Figure 9 below.

Figure 9 - Impacted Existing Sewer Infrastructure

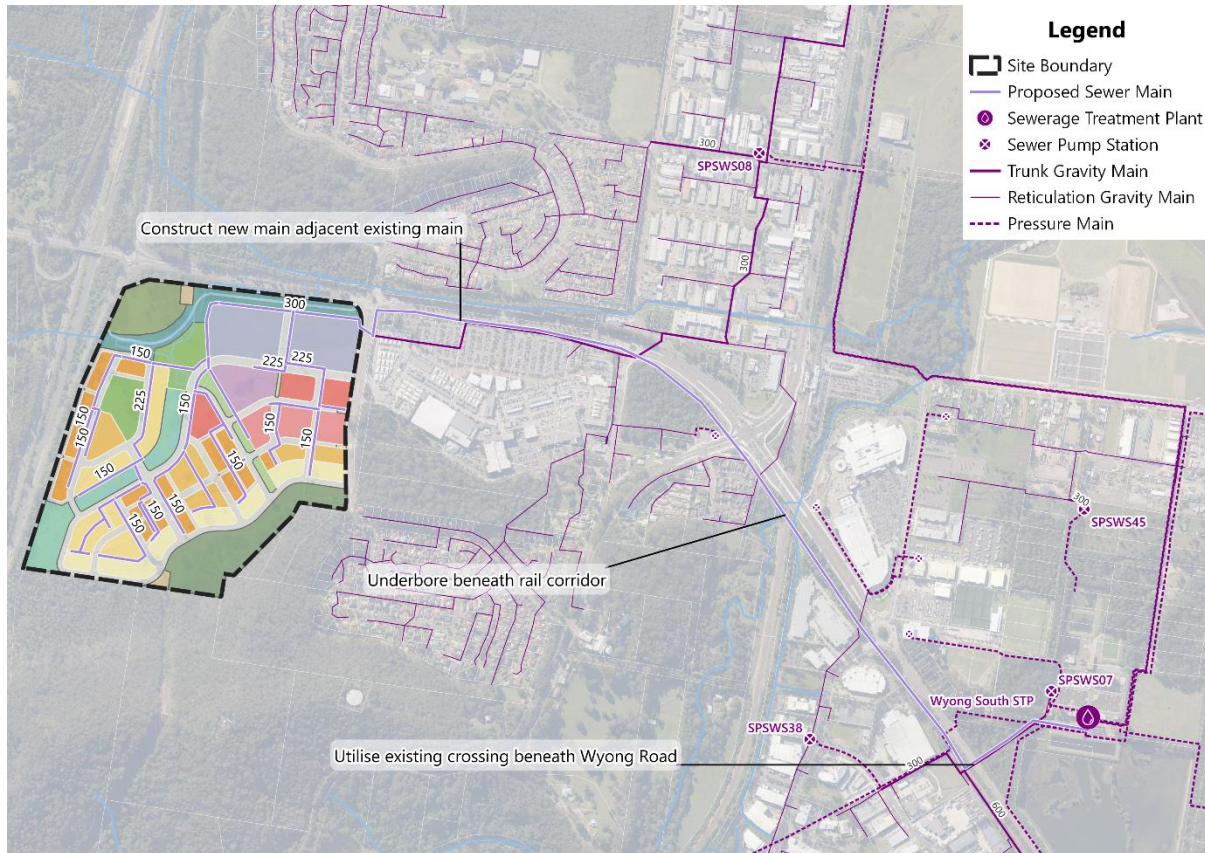


Council have indicated that the existing 300mm gravity sewer main located on the Westfield site does not have capacity to support the total development proposed on the site. Two options for site servicing have been explored which are detailed in the sections below.

Option 1 – Construct New Connection to Wyong South STP

A new gravity main could be constructed from the proposed development site to the Wyong South STP. At an assumed average grade of 0.2%, a 375mm diameter main would have capacity for approximately 82.4L/s and could accommodate the proposed development, the adjacent Westfield site and the existing residential dwellings to the south. A potential alignment for this main is shown in the figure below. Note this alignment is indicative only and subject to further investigation.

Figure 10 - Sewer Option 2



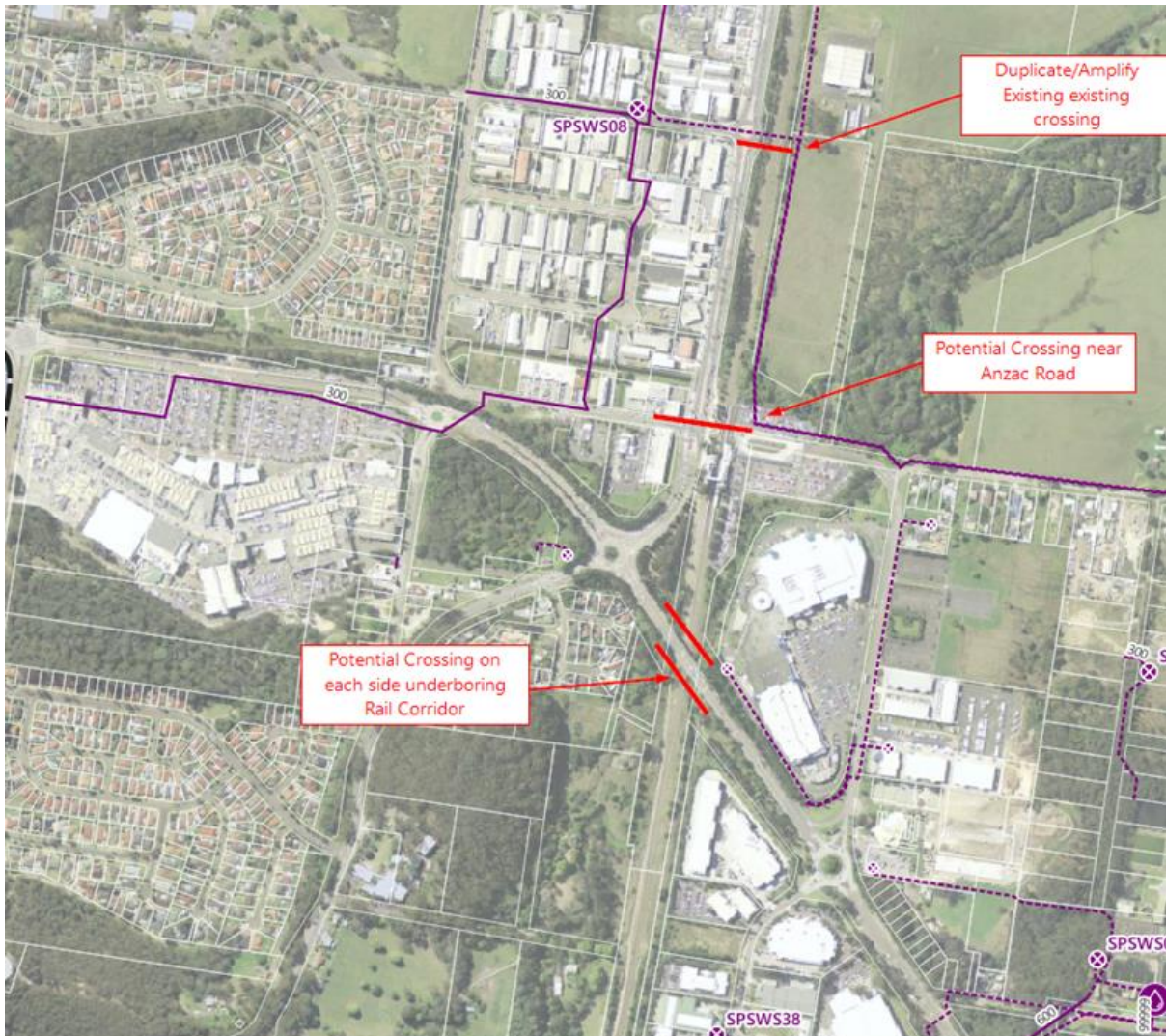
Crossings of key infrastructure corridors such as Wyong Road and the rail line would likely be constructed via under bore to minimise disruptions and associated costs.

TfNSW have indicated that a solution is likely achievable and supportable, and any crossing of the rail corridor would need to meet the requirements of the relevant ASA Standard (*THR CI 12190 ST - Service Installations within the Rail Corridor*) which covers TfNSW requirements for non-rail infrastructure service installations within the rail corridor.

Figure 11 below shows a range of potential locations where sewer infrastructure could be constructed under the rail corridor. The preferred crossing location will be subject to further investigation and analysis and will be determined in collaboration with TfNSW and Council.

Further site specific servicing strategy development will be required prior to undertaking Pre-DA investigations and stakeholder engagement. The development would be subject to the provisions within the relevant Water Supply and Sewerage Development Servicing Plan.

Figure 11 - Potential Rail Crossing Locations



Option 2 – Upgrade Existing Infrastructure

Alternatively, assuming the existing 300mm gravity main is currently operating at capacity, this main could be upgraded to a 450-525mm main to accommodate the development, and allow for any additional development on the R1 General Residential land to the east of the site in future (assuming a similar intensity of development to this proposal, an ET of 230 would be expected). The extent and location of the exact upgrades will be confirmed through detailed hydraulic modelling in conjunction with Council.

Crossings of key infrastructure corridors such as Wyong Road and the rail line would likely be constructed via under bore to minimise disruptions and associated costs. These requirements will be determined in future, more detailed analyses.

SPSWS08 would need capacity for an additional 45-50 L/s to support the additional sewer loading from the development.

Preferred Option

Council have advised that the likely scale of development will result in loads that exceed available capacity in the existing SPS WS08 catchment area and will required a connection to Wyong South STP inlet works at one of the existing spare inlets. The rising main would be in the range of DN200mm to DN300mm and TfNSW have indicated this would be acceptable to install via an underbore in line with relevant standards. Option 1 is therefore considered to be preferred.

Further site specific servicing strategy development will be required prior to undertaking Pre-DA investigations and stakeholder engagement. The development would be subject to the provisions within the relevant Water Supply and Sewerage Development Servicing Plan.

STP Capacity

Council's *Water Supply and Sewerage Development Servicing Plan 2019* includes an assessment undertaken which evaluates the capacity of the existing sewerage treatment plants. At the time of the assessment, the Wyong South STP had capacity for a total 20,000 ET with a planned future capacity of 25,000 ET. The assumed spare capacity in 2031 is sufficient to support the development, and should the STP be upgraded to provide the planned capacity of 25,000 ET, there will be ample available capacity for additional development. The capacity at the Wyong South STP is therefore not expected to pose a constraint to development.

Table 4 - DSP Sewerage Treatment Plant Capacity Assessment

■ **Table 2. STP Capacity Assessment in ET**

STP	STP Current Capacity (ET)	Planned STP Future Capacity (ET)	STP Load 2013 (ET)	Spare Capacity 2013 (ET)	STP Load 2031 (ET)	Spare Capacity 2031 (ET)	STP Load 2043 (ET)	Spare Capacity 2043 (ET)
Bateau Bay	32,000	32,000	17,613	14,387	21,072	10928	23,207	8793
Charmhaven	16,667	25,000	14,907	1,760	28,498	-11832	32,989	-16322
Gwandalan	5,000	5,000	2,799	2,201	3,895	1105	5,092	-92
Manning Park	5,000	5,000	4,745	255	5,997	-997	7,839	-2839
Toukley	17,250	17,250	13,992	3,258	15,609	1641	16,605	645
Wyong South	20,000	25,000	15,285	4,715	17,848	2152	19,088	912
Total	95,917	109,250	69,341		92,920		104,821	

Source: Northern Region Water Supply and Sewerage Development Servicing Plan Appendix F – Central Coast Council 2019

3.2.2 Development Staging

Reticulation mains within the site will be delivered in stages to align with the development rollout. Stages 1 and 2 of the proposed sewer servicing strategy are shown in Figure 12 and Figure 13 respectively. Stage 1 will yield 612 dwellings (including 225 apartment dwellings), while stage 2 will yield 401 dwellings (including 393 apartment dwellings). Stages 1 and 2 account for approximately 50% of the residential development of the site. Future stages will be supplied by further extending the reticulation network shown in the Figures below.

The required upgrades to existing infrastructure would be delivered to the final permanent size rather than being staged or progressively upgraded over time.

Figure 12 - Proposed Indicative Sewer Servicing Strategy – Stage 1



Figure 13 - Proposed Indicative Sewer Servicing Strategy - Stage 2



4 Electricity

4.1 Existing Infrastructure

The site is located within the Ausgrid electrical supply zone and is situated between the Upper and Lower Central Coast Load Areas. The Tuggerah Bulk Supply Point (BSP) is located approximately 2km east of the site, on Lake Road. The Tuggerah BSP is operated by TransGrid and supplies electricity to zone substations (ZS) via overhead transmission lines.

From the Tuggerah BSP, a series of 132kV transmission lines connect to the surrounding substations. The closest ZS to the site is the Berkeley Vale ZS, located approximately 2.5km south east of the site. Other ZS in the vicinity of the site include the Ourimbah ZS, located approximately 5km south of the site, and the Wyong ZS, located approximately 5km north.

Ausgrid operate overhead 132kV transmission lines which bisects the site in a north-south direction. The standard easement for a 132kV transmission line is 45m. Ausgrid have restrictions on the activities and development that can be located within an easement. Farming, grazing and other agricultural activities are permitted within easements. Building houses or other large structures and planting of trees or shrubs which grow taller than 4m are prohibited within easements. Ausgrid have also indicated that roads and open space can be located within easements.

Low voltage underground cables are located within the road reserve of all residential streets in the vicinity of the site. High voltage underground cables traverse the northern side of Wyong Road and the Eastern side of Tonkiss Street, supplying the Westfield site. Existing large lot residential to the west of the Pacific Motorway appears to be serviced by overhead powerlines. The existing electrical infrastructure within the vicinity of the site is shown in Figure 14.

Figure 14 - Existing Electrical Network



4.2 Proposed Electricity 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 5 - Electrical Demand Calculations

Land Use	Dwellings	Load/Unit (VA)	Diversified Load (MVA)
Low Density Residential	86	6,500	0.45
Medium Density Residential	298	5,000	1.19
High Density Residential	1,728	3,500	5.02
Total	2,112		6.21

Based on the assumption that a single 11kV feeder can supply approximately 4-5MVA, the proposed development would require two 11kV feeders over time. It is possible that initial development can be serviced by leveraging any available capacity in the existing 11kV feeders in the vicinity of the site, however this will need to be confirmed by Ausgrid.

Subsequent stages of development would be supplied by constructing new high voltage feeders from the Berkeley Vale ZS. Ausgrid's *Distribution & Transmission Annual Planning Report* data indicates that the Berkeley Vale ZS is forecast to have 18 MVA spare capacity in 2023/24. Electricity supply is therefore not expected to pose a constraint to development.

4.2.1 Impacted Infrastructure

As discussed above, a 132kV overhead transmission line bisects the site in a north-south direction. IDC held a meeting with Ausgrid on 8th July 2021 to determine options for relocating the transmission lines. Ausgrid indicated that overhead transmission lines are preferred, however below ground cables for 132kV lines are accepted. Meeting minutes are provided in Appendix A.

The standard easement for a 132kV transmission line is 45m. If the transmission lines are kept overhead, this can be reduced to as much as 30m with more detailed modelling of blow out (the distance power lines sway in the wind). The blow out is affected by the spacing of poles, prevailing wind directions etc. For overhead transmission lines significant vegetation, including trees, must be cleared from the easement. Any easement for overhead services within the site would therefore need to be cleared. The alignment for overhead lines can include bends, however, stay wires and other structures with additional offsets and easements will be required.

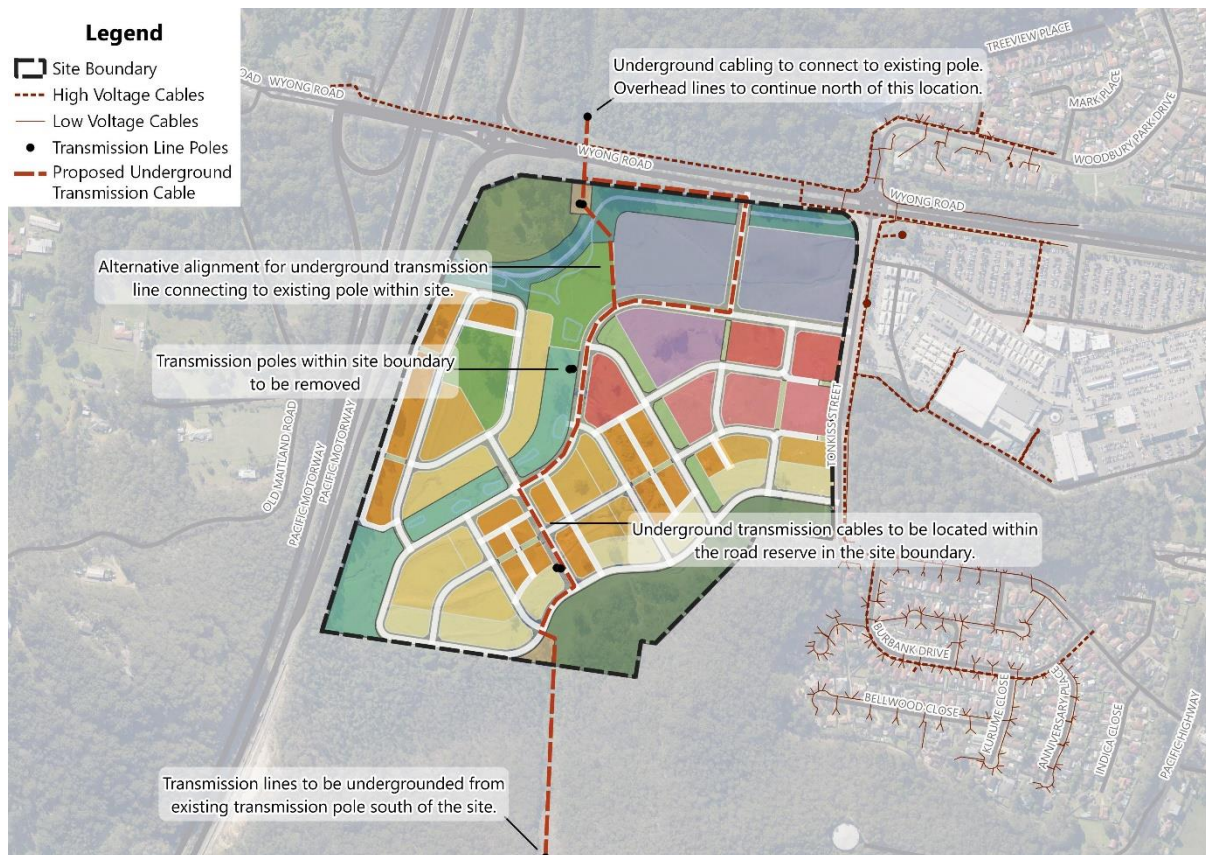
For below ground cables, a minimum distance of 1km is required for a diverted cable run. Based on the existing transmission lines and pole locations, a total run length of approximately 1,200m to 1,600m is achieved by undergrounding the cable length from the pole on the northern side of Wyong Road to the pole south of the site boundary, depending on which route option is selected. Additional trenching would be required to reach the tower south of the site, and an underbore would be required beneath Wyong Road to reach the northern tower. As the

proposed underground main would be located within newly created road reserves, no easements would be required.

Ausgrid have confirmed that any relocation or undergrounding works would need to be funded entirely by the proponent.

Underground cabling would preferably be confined to the road reserve to avoid easements encroaching on development sites. A concept layout of the two options described above has been prepared and is shown in Figure 15 below. A relocation application for the transmission lines will be lodged with Ausgrid, and the final alignment will be subject to further discussions and requirements with Ausgrid.

Figure 15 - Proposed Transmission Line Undergrounding



5 Gas

5.1 Existing Network

The site is not currently serviced by the Jemena natural gas network. Gas infrastructure supplies dwellings to the east and north of the site. A 1,050kPa secondary gas main extends along the northern side of Wyong Road, terminating at a crossing in the north west corner of the Westfield site. Most residential streets within the vicinity of the site boundary are supplied with 210kPa network mains. The large lot residential to the west of the Pacific Motorway is not currently supplied gas. The existing gas network within the vicinity of the site is shown in Figure 16.

Figure 16 - Existing Gas Network



5.2 Future Network

Future development of the site could potentially be supplied by extending the existing 210kPa network mains supplying adjacent residential areas to the site via Tonkiss Street. Should the site require gas infrastructure, Jemena will support the demand generated by residential development as required. Generally, there will be little demand for gas infrastructure generated by non-residential development. Based on the proximity of the site to trunk gas infrastructure, the provision of gas supply is not expected to pose a constraint to development.

6 Telecommunications

6.1 NBN

The site is currently serviced by NBN Co. fixed wireless technology, which transmits data from transmission towers located up to 14km from a dwelling to a rooftop antenna. The surrounding residential areas are serviced by fibre to the node fixed line connections.

It is likely that fixed line technology can be extended to the site to supply future development. NBN Co. policy requires developers to provide pit and pipe infrastructure within the road reserve for all subdivisions. NBN assess each application request separately to negotiate commercial terms, however connection fees of up to \$600 and \$400 may apply to single dwelling units and multi dwelling units respectively. Please note these charges are subject to change.

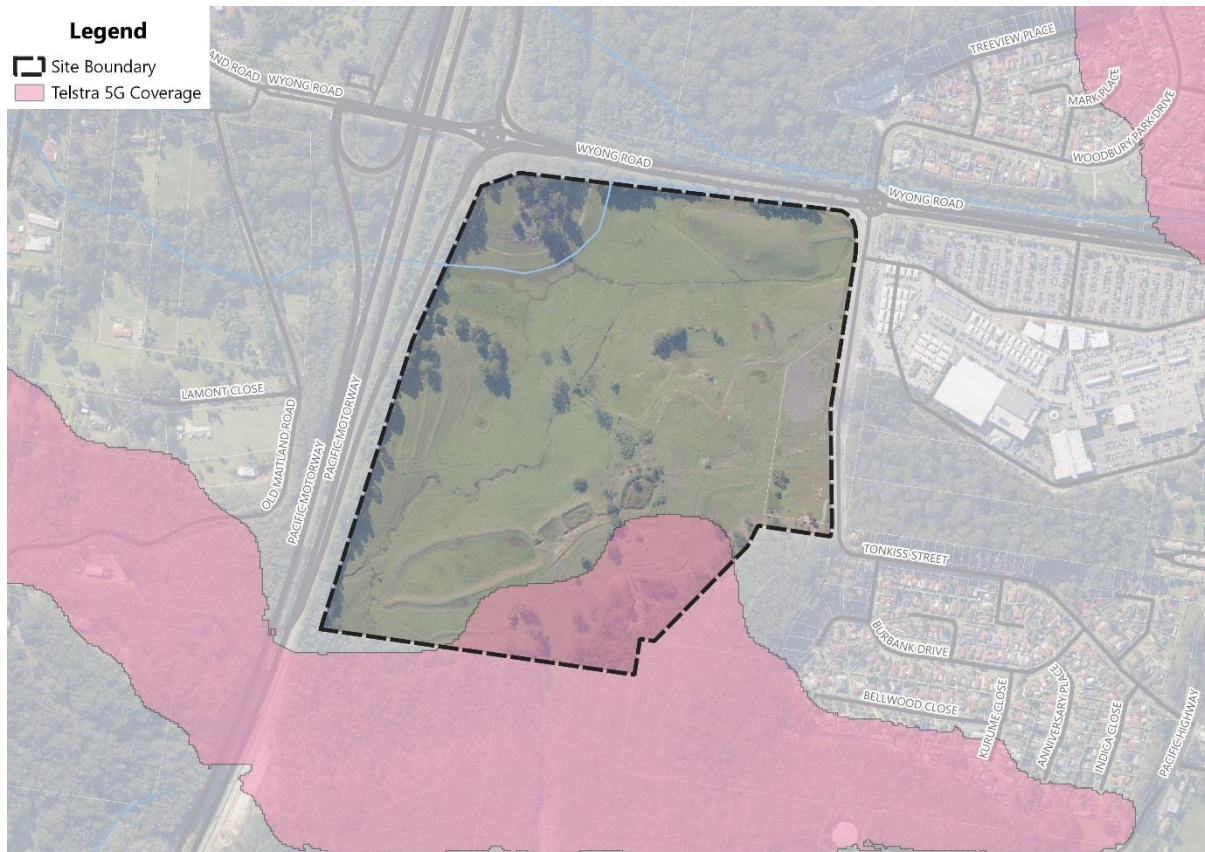
Figure 17 - NBN Coverage



6.2 Telstra 5G Network

Telstra have blanket handheld 4G coverage across the site. Rollout of Telstra’s 5G network has commenced across the Central Coast area. Parts of the site can already access 5G coverage, in the south east corner. It is expected that 5G network coverage will extend across the whole site over the coming years. The existing 5G network coverage is shown in Figure 18.

Figure 18 - Telstra 5G Coverage



Appendix A – Ausgrid Meeting Minutes