



DRAFT MASTER PLAN & SERVICING STRATEGY REPORT
FOR WINGECARRIBEE SHIRE COUNCIL

BOWRAL SOUTH NLA

Project No: MKR00603

VERSION June 2024

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PROJECT: Bowral South NLA Master Plan & Servicing Strategy
Project NO: MKR00603

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1 INTRODUCTION AND BACKGROUND

1.1 BACKGROUND

Maker ENG Pty Ltd (Maker) in partnership with Design Urban Pty Ltd have been engaged by Wingecarribee Shire Council (Council) to prepare a Master Plan and Servicing Strategy for the development of the Bowral South New Living Area (NLA).

This report will provide commentary around identified development considerations associated with the site which led to the development of Indicative Subdivision Layout & Staging, Public Domain & Open Space Strategy, Road Hierarchy and Landscape Plans. It is not intended to be a completely extensive guide, but rather a tool to highlight the constraints and opportunities identified for future investigation under the planning proposal phase.

1.2 DESCRIPTION OF SITE

The site is approximately 300ha and is located south-east of Bowral township, bounded by Bong Bong Picnic Racecourse to the east, Kangaloon Rd to the north, Eridge Park Rd to the west, and the Wingecarribee River to the south. The site includes 17 properties with fragmented ownership. The site can be accessed off Kangaloon Road, Boardman Road South and Eridge Park Road.

There are several watercourses that traverse the site along with several dams. There are patches of remnant vegetation but most of the site has been cleared for agricultural use.

The site topography generally grades down to the watercourses which dissect the site at the east and west then falls to the Wingecarribee River at the south. There are rural views available to the south across most of the site.

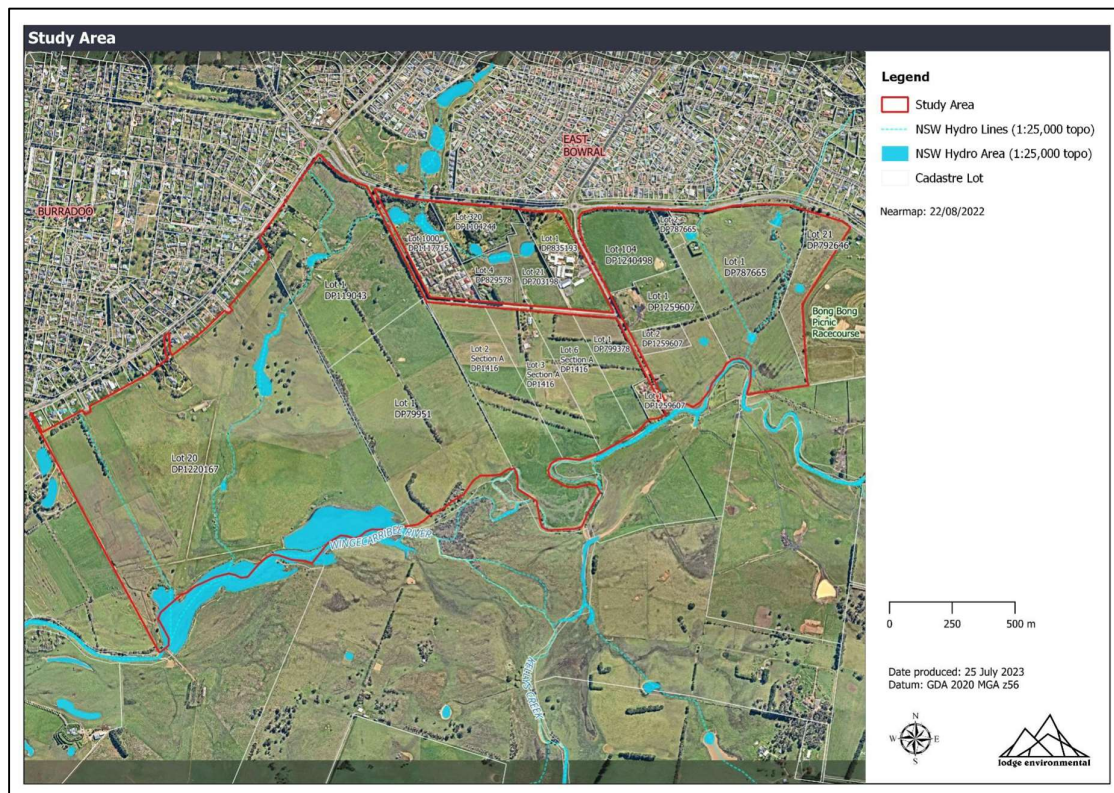


Figure 1: Location of the Site/Study Area (Lodge Environmental 2023)



1.3 SURROUNDING LAND USES

The site adjoins Kangaloon Road which provides vehicle connectivity to nearby town of Bowral. There are connections to the Hume Motorway which provides high-speed vehicle connectivity to Sydney in the northeast and Canberra to the southwest.

The area is abundant in recreational amenity, predominately based around the scenic Wingecarribee River. The Southern Highlands Botanic Garden is within walking distance of the site.

The area has retail amenity with Bowral 3km northwest providing a range of outlets. The supermarkets in Bowral provide all grocery needs within a 10-minute drive from the site.

In terms of Public Transport there are bus stops on Kangaloon Road adjoining the site. Bowral Station is the closest railway 3.5km northwest of the site.

There are private schools in the direct vicinity of the site. The nearest public schools are in Bowral.

There are healthcare facilities available nearby in Bowral including Bowral and District Hospital.

Residential areas immediately to the north are zoned R5 Large Lot Residential and R2 Low Density Residential. The Bong Bong Racecourse to the west is zoned RE2 Private Recreation. The Wingecarribee River and rural lands to the south are zoned C2 Environmental Conservation and C3 Environmental Management respectively.

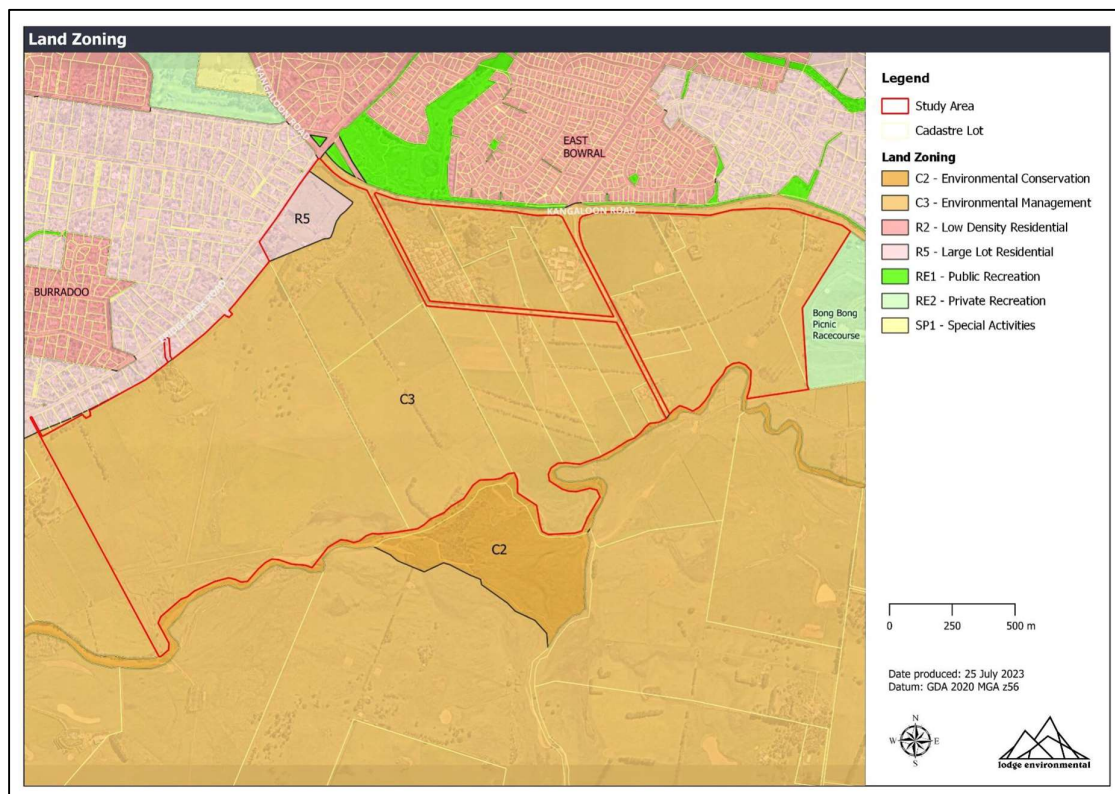


Figure 2: Land Use Zones in the Study Area (Wingecarribee LEP 2010, reproduced by Lodge Environmental 2023)



2 SUMMARY OF INVESTIGATIONS

2.1 PLANNING

The site was identified for future development as one of the six new living areas recommended under the Wingecarribee Local Housing Strategy as amended in July 2021. The Strategy anticipated that the site could yield 1,100+ dwellings over 180ha of developable area and determined design principles for the future development.

The Strategy acknowledged that the timing of the land release at the site may be subject to planned upgrade of the Bowral sewerage treatment plant. The Master Plan and Servicing Strategy project was undertaken to address the design principles prior to the planning proposal. Council will utilise the outputs from the Master Plan and Servicing Strategy to lead a planning proposal to rezone the site once the planning for the upgrade of the Bowral sewerage treatment plant has progressed to a suitable point.

It is understood that Council will undertake further studies and prepare Area Specific Development Control plan as well as Local Contributions Plan to supplement the planning proposal.

2.2 ECOLOGY

An Ecological Constraints and Opportunities (ECO) Report was undertaken by Lodge Environmental Pty Ltd in 2023 to identify areas of ecological constraint and inform the assessment of developable area on the site.

The ECO which is included in **Annexure A** entailed a field survey and desktop study to assess ecological constraints within the site resulting in the Ecological Constraints Assessment map below.

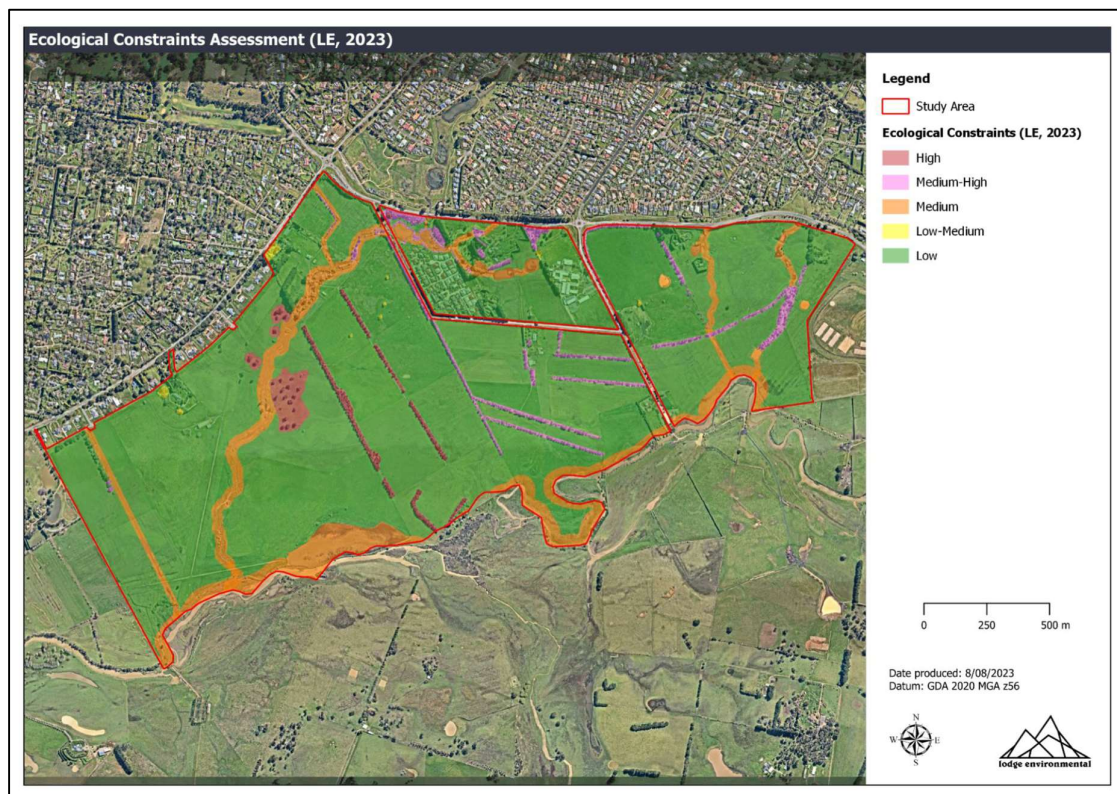


Figure 3: Ecological Constraints as assessed by Lodge Environmental (2023) (Lodge Environmental 2023)



The report suggests that vegetation in areas indicated to have high ecological constraint be retained in park land. This has been implemented where practicable by assigning areas of open space to accommodate remnant native vegetation and habitat.

Native vegetation clearance above 0.25ha, clearing of vegetation identified in the Biodiversity Values Map and/or significant impacts to matters listed under the Biodiversity Conservation Act will trigger entry into Biodiversity Offset Scheme (BOS). The Development Application (DA) stage is the most suitable time to enter a development into the BOS as the extent of impact caused by the development on flora and fauna can be determined. Entry into the BOS is facilitated through completion of a Biodiversity Development Assessment Report (BDAR).

There is the opportunity to prepare a Biodiversity Offset Estimation (BOE) during the planning proposal to offer a preliminary estimate of the credits required to offset the biodiversity impacts of the development. This will be an important tool to prove the viability of the development as it will quantify the likely ecological costs of the development. The BOE can also give insight into whether areas of natural open space are suitable to be rehabilitated and dedicated to Council under a Biodiversity Stewardship Agreement.

2.3 HERITAGE

A Strategic Heritage Assessment (**Annexure B**) was undertaken by Apex Archaeology Pty Ltd in 2023. The report summarises the findings of previous assessments, identifies legislative requirements regarding heritage and recommends site wide Statement of Heritage Impact (SoHI), Aboriginal Cultural Heritage Assessment (ACHA) and Archaeological Report (AR) be undertaken to inform the planning proposal.

Areas of Historical and Aboriginal heritage potential within the site are generally near watercourses and remnant vegetation where disturbance cause by agricultural practices has been limited. Given these areas are generally in the vicinity of open space identified to accommodate remnant vegetation and habitat, it is recommended that these open space areas be refined based on the findings of the planning proposal reporting to avoid impacting heritage sites.

2.4 BUSHFIRE

The site includes areas of bushfire prone land Vegetation Category 1 and vegetation buffer mapping at the northwest. The mapping is likely to address the dense vegetation along Eridge Park Road. The level of hazard that this vegetation presents is likely to diminish as the development progresses and grassland no longer adjoins the properties fronting Eridge Park Road.

Area of natural open space identified surrounding watercourses and remnant vegetation may present bushfire hazard to the proposed dwellings within the development. Perimeter roads between the natural open space and residential areas housing bushfire asset protection zones will help to reduce the bushfire affectation on the proposed lots.

The width of bushfire asset protection zones that will be required will be influenced by the level of vegetation management within the natural open spaces. A Bushfire Study will be undertaken according to the Draft Landscape Master Plan to provide bushfire asset protection zone overlay, offer justification for APZ widths and indicate density/type of planting which could be used to minimise APZ widths and describe the next steps for the development regarding bushfire legislation

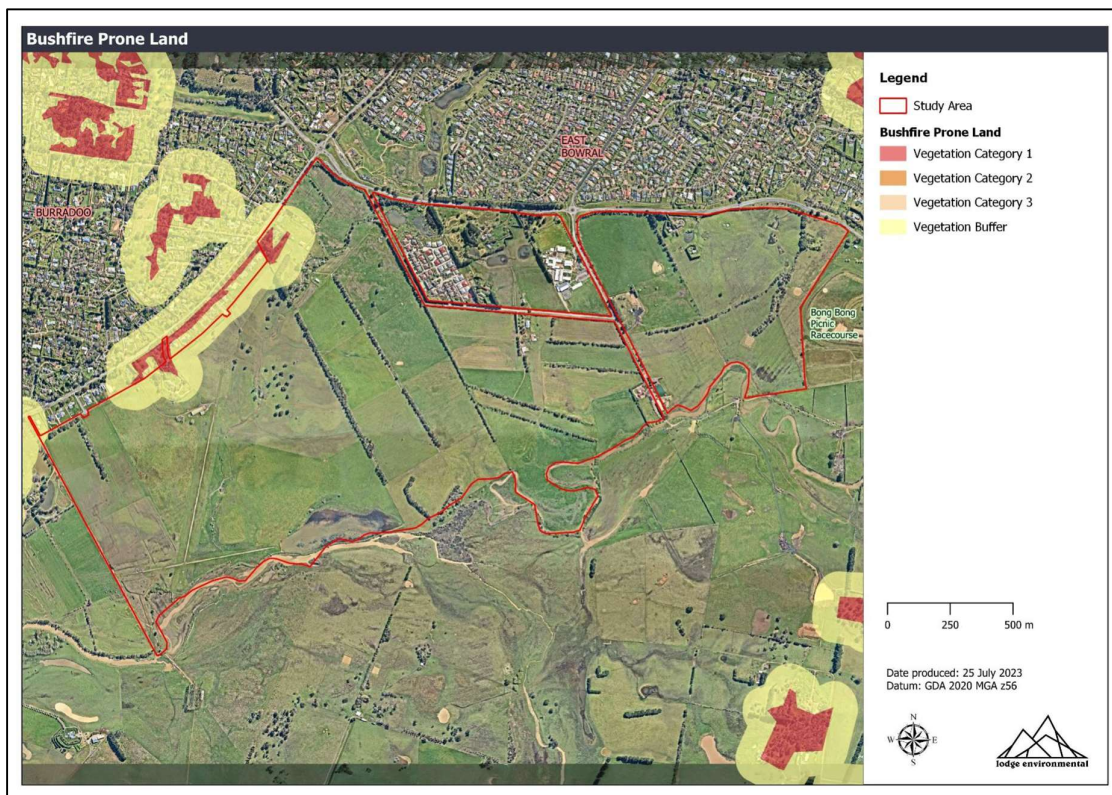


Figure 4: Bushfire Prone Land (RFS 2023, reproduced by Lodge Environmental 2023)

2.5 SUSTAINABILITY

A Sustainability Strategy was prepared by Cundall Pty Ltd to provide recommendations for sustainable initiatives to be incorporated into the development. The report which is included in **Annexure C** describes the development of the Sustainability Strategy responding to the key issues identified. The recommendations of the report were implemented in the design principles for the development.

There is opportunity for Council to address sustainability further by developing a Green Star Communities pathway or Green Star Homes Pathway as the planning progresses.

2.6 URBAN DESIGN

Design Urban Pty Ltd prepared Urban Design Principles (**Annexure D**) to inform the structure of the site. Four structure plans were developed accordingly to support an analysis of the optional locations for an activity centre on the site. Three of these optional structure plans were progressed to Draft Land Use Plans based on the potential for the structure to meet the Urban Design Principles.

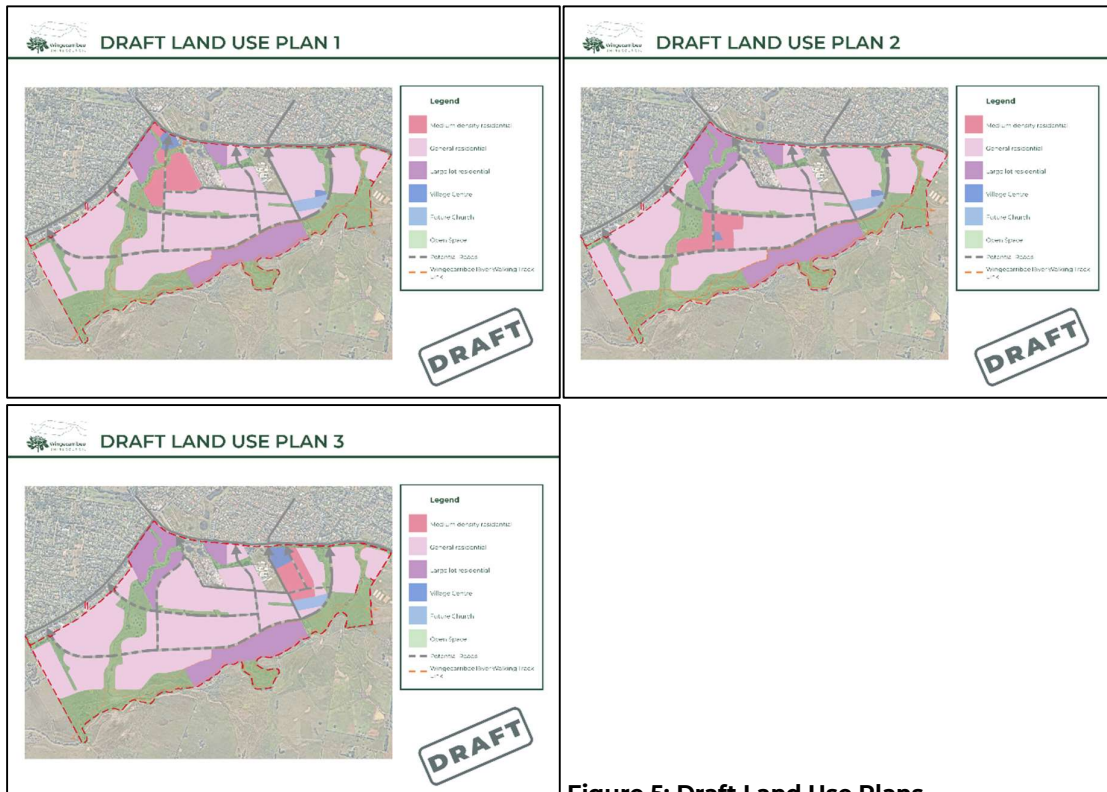


Figure 5: Draft Land Use Plans

Community Consultation was then undertaken to gauge community feedback on the Draft Land Use Plans. The Community Consultation Summary Report (**Annexure E**) documents the consultation process and summarises the feedback received. The Draft Master Plan in **Figure 6** was prepared based on investigations and feedback to date.



Figure 6: Draft Master Plan Version 5 (Design Urban 2023)



The activity centre shown in **Figure 6** is detailed in **Figure 7**. The centre was then refined according to **Figure 8**.



Figure 7: Activity Centre Version 5 (Design Urban 2023)



Figure 8: Activity Centre Version 6 (Design Urban 2024)

An overlay was provided to demonstrate how the refined activity centre, **Figure 8**, blends back into the master plan in **Figure 6**.

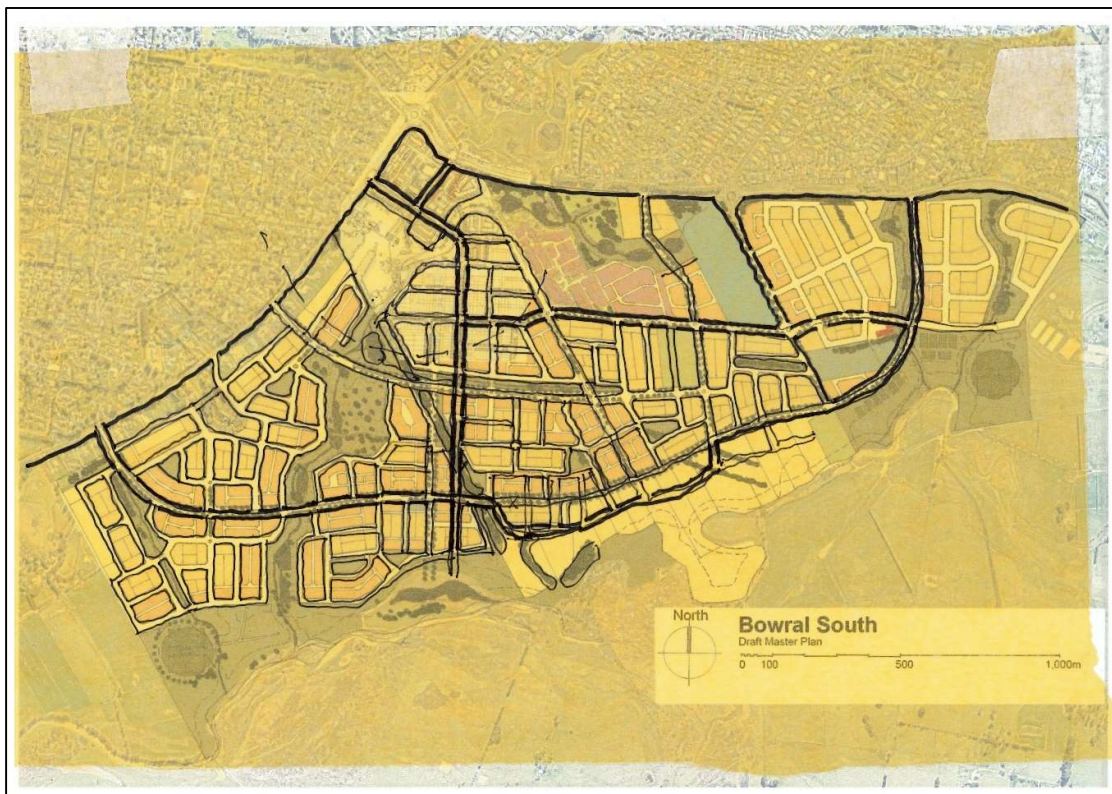


Figure 9: Draft Master Plan Version 5 Overlay (Design Urban 2024)



2.7 RETAIL NEEDS ASSESSMENT

Council commissioned a Retail Needs Assessment to determine the ideal Draft Land Use Plan based on economic viability of the activity centre. Council directed that the project should proceed with an activity centre located near the intersection of Kangaloon Road and Eridge Park Road (Draft Land Use Plan Option 1) and provide for an anchor supermarket with 3,750m² gross floor area within a total 10,000m² total gross floor area for the centre. The Indicative Subdivision Layout Plan was then developed accordingly.

2.8 WATER CYCLE MANAGEMENT STRATEGY

A Water Cycle Management Strategy (**Annexure F**) was prepared to refine the development suggested by the Urban Design. The assessment considered water quality, on-site detention and flooding requirements to ensure that sufficient area was excluded from development to achieve desirable water cycle management outcomes. The Indicative Subdivision Layout Plan was then developed accordingly.

2.9 TRAFFIC

Typical Road Cross Section Plans were developed in collaboration with the Urban Designer to inform the Road Hierarchy Plan. The Road Hierarchy Plan informed a Preliminary Traffic Analysis (**Annexure G**) which was prepared by ARC Traffic + Transport Pty Ltd. The Analysis recommended the design for new intersections to establish access into the development as well as external intersection upgrades to ensure existing intersections operate at an acceptable level of service once the additional movements created by the development are applied.

2.10 LANDSCAPE

Council provided three items from the Community & Recreation Facility Strategy to be accommodated in the landscape of the open spaces in the site detailed in the excerpt below.

Precinct	ID	Action
Burradoo	A2	Plan for the provision of a youth recreation precinct as part of the Bowral South development, including skate facilities, multi-purpose hardcourts and pump track or learn to ride facility.
Burradoo	A3	As part of the Bowral South development, plan for the provision of a new shared path along the Wingecarribee River and explore opportunities for broader linkages in accordance with the aims of Council's Cycling Strategy.
Burradoo	A4	Plan for the provision of addition community tennis courts within the future Bowral South development.

Figure 10: Excerpt from Council's Community & Recreation Facility Strategy (WSC 2023)

In addition to these facilities, the landscaping will accommodate native planting within buffers of riparian corridors to achieve rehabilitation of the watercourses. The streetscape and active public open spaces will maintain the character of the southern highlands according to the feedback received during community consultation.

3 INFRASTRUCTURE AVAILABILITY & SERVICING REQUIREMENTS

3.1 STORMWATER/FLOODING



The Water Cycle Management Strategy (**Annexure F**) suggests infrastructure likely to be required to achieve water quality, onsite detention and flood mitigation requirements. The Strategy defines stormwater catchments with the intent of limiting infrastructure to practicable size as well as considering the potential impact of fragmented ownership of the site. Locations defined to house stormwater quality and detention basins are indicative based on the existing grade of the site. There is potential for these locations to be refined and alternated with residential area in some cases therefore land acquisition for these assets is not recommended until after the basins have been constructed.

Infrastructure required to achieve water quality, onsite detention requirements according to the Water Cycle Management Strategy has been summarised in Figure 11. Basin areas are taken from MKR00603-00-SK020 WSUD Assets Catchment Plan and Drainage Reserve Lots are indicated in MKR00603-00-SK022 Open Space & Public Domain Plan. Rates for treatment infrastructure are based on MUSIC Life Cycle Costing as well as rates for similar infrastructure constructed at the time of this report. The rates should be refined according to construction rates and expected maintenance costs at the time the Local Contributions Plan is to be written.

Water Sensitive Urban Design Element		Rate (/m2)	Cost	Total
Bioretention Treatment Basin A (m2)	1000	\$600.00	\$600,000.00	\$861,430.00
Drainage Reserve Lot 302 (m2)	4022	\$65.00	\$261,430.00	
Total Catchment A				
Bioretention Treatment Basin B (m2)	850	\$600.00	\$510,000.00	\$798,600.00
Drainage Reserve Lot 301 (m2)	4440	\$65.00	\$288,600.00	
Total Catchment B				
Bioretention Treatment Basin C (m2)	1150	\$600.00	\$690,000.00	\$1,113,280.00
Drainage Reserve Lot 303 (m2)	6512	\$65.00	\$423,280.00	
Total Catchment C				
Sediment Pond Basin D (m2)	360	\$600.00	\$216,000.00	\$1,094,150.00
Wetland Treatment Basin D (m2)	3600	\$65.00	\$234,000.00	
Drainage Reserve Lot 304 (m2)	9910	\$65.00	\$644,150.00	
Total Catchment D				
Gross Pollutant Trap E			\$66,000.00	\$66,000.00
Total Catchment E				
Bioretention Treatment Basin F (m2)	1560	\$0.00	\$0.00	\$0.00
Drainage Reserve (m2)	N/A	\$0.00	\$0.00	
Total Catchment F*				
*Development of the Activity Centre within Catchment F is assumed to provide WSUD infrastructure under community title agreement or require each lot to implement treatment/detention according to proposed usage therefor does not create Council infrastructure and costs have been excluded.				
Bioretention Treatment Basin G (m2)	1150	\$600.00	\$690,000.00	\$877,525.00
Drainage Reserve Lot 309 (m2)	2885	\$65.00	\$187,525.00	
Total Catchment G				
Sediment Pond Basin H (m2)	360	\$600.00	\$216,000.00	\$1,596,035.00
Wetland Treatment Basin H (m2)	920	\$80.00	\$73,600.00	
Drainage Reserve Lot 307 (m2)	20099	\$65.00	\$1,306,435.00	
Total Catchment H				



Swale I Length (m)	150	\$300.00	\$45,000.00	
Sediment Pond Basin I (m2)	600	\$600.00	\$360,000.00	
Wetland Treatment Basin I (m2)	6000	\$80.00	\$480,000.00	
Drainage Reserve Lot 306 (m2)	14681	\$65.00	\$954,265.00	
Total Catchment I				\$1,839,265.00
Bioretention Treatment Basin J (m2)	950	\$600.00	\$570,000.00	
Drainage Reserve Lot 305 (m2)	3512	\$65.00	\$228,280.00	
Total Catchment J*				\$798,280.00
*An area of Catchment J bypasses treatment and detention due to the inability to convey flows from this to the basin. Flows from the bypass must be accommodated in the net assessment for Catchment J.				
Bioretention Treatment Basin K (m2)	900	\$600.00	\$540,000.00	
Drainage Reserve Lot 308 (m2)	5135	\$65.00	\$333,775.00	
Total Catchment K				\$873,775.00
Bioretention Treatment Basin L (m2)	450	\$600.00	\$270,000.00	
Drainage Reserve Lot 310 (m2)	5016	\$65.00	\$326,040.00	
Total Catchment L				\$596,040.00
Bioretention Treatment Basin M (m2)	300	\$600.00	\$180,000.00	
Drainage Reserve Lot 311 (m2)	2556	\$65.00	\$166,140.00	
Total Catchment M				\$346,140.00
Bioretention Treatment Basin N (m2)	300	\$600.00	\$180,000.00	
Drainage Reserve Lot 312 (m2)	2005	\$65.00	\$130,325.00	
Total Catchment N				\$310,325.00
Sediment Pond Basin O (m2)	570	\$600.00	\$342,000.00	
Wetland Treatment Basin O (m2)	5700	\$80.00	\$456,000.00	
Drainage Reserve Lot 314 (m2)	16772	\$65.00	\$1,090,180.00	
Total Catchment O				\$1,888,180.00
Bioretention Treatment Basin P (m2)	1950	\$600.00	\$1,170,000.00	
Drainage Reserve Lot 313 (m2)	9538	\$65.00	\$619,970.00	
Total Catchment P				\$1,789,970.00
Bioretention Treatment Basin Q (m2)	1200	\$600.00	\$720,000.00	
Drainage Reserve Lot 315 (m2)	7626	\$65.00	\$495,690.00	
Total Catchment Q				\$1,215,690.00
Bioretention Treatment Basin R (m2)	550	\$600.00	\$330,000.00	
Drainage Reserve Lot 316 (m2)	3642	\$65.00	\$236,730.00	
Total Catchment R				\$566,730.00
Total Residential Catchments				\$16,631,415.00
Total Residential Catchments Per Tenement (2,100 dwellings)				\$7,919.72

Figure 11: Estimated Water Sensitive Urban Design Infrastructure Costs

Areas excluded from development to convey flood flows do not have the same flexibility in location as water quality and detention infrastructure so have been defined separately. Infrastructure requirements to accommodate flooding are addressed in the Roads and Open Space components as the infrastructure will have dual uses.



3.2 ROADS

3.2.1 External Road Upgrades

The Preliminary Traffic Analysis (**Annexure G**) indicates external road upgrades will be required as summarised below. Depending on the timing of the development in relation to other projects within the Local Government Area, there may be opportunity to share the cost of the upgrades with other projects.

1. Staged Upgrade of the Moss Vale Rd, Kangaloon Rd & Funston St roundabout.
2. Upgrade of the Kangaloon Rd, Eridge Park Rd & Old South Rd roundabout.
3. Restriction of the right turn movement from Eridge Park Rd to Moss Vale Rd at the unsignalised T-intersection.

Given the external upgrades impact roads governed by TfNSW, the design and construction will be subject to consultation with TfNSW. It may be possible for Council to fund and undertake the upgrades through means other than developer contributions to remove some burden from the development. This should be explored during preparation of the planning proposal.

Cost estimate for these items are subject to feedback from TfNSW and will be added subsequent to consultation.

External Road Upgrade Element		Rate (/m ²)	Cost	Total
Stage 1 Upgrade of Moss Vale Rd, Kangaloon Rd & Funston St Roundabout (m2)	0	\$0.00	\$0.00	
Land Acquisition to facilitate Stage 2 Upgrade (m2)	0	\$0.00	\$0.00	
Stage 2 Upgrade of Moss Vale Rd, Kangaloon Rd & Funston St Roundabout (m2)	0	\$0.00	\$0.00	
Total Moss Vale Rd, Kangaloon Rd & Funston St Roundabout				\$0.00
Upgrade of Kangaloon Rd, Eridge Park Rd & Old South Rd Roundabout (m2)	0	\$0.00	\$0.00	
Total Kangaloon Rd, Eridge Park Rd & Old South Rd Roundabout				\$0.00
Restriction of the right turn movement from Eridge Park Rd to Moss Vale Rd (m2)	0	\$0.00	\$0.00	
Total Eridge Park Rd & Moss Vale Rd unsignalised T-intersection				\$0.00
Total External Road Upgrades				\$0.00
Total External Road Upgrades Per Tenement (2,100 dwellings)				\$0.00

Figure 12: Estimated External Road Upgrade Costs

3.2.2 New Intersections along Existing Roads

New intersections are proposed on Eridge Park Road and Kangaloon Road to establish vehicular access to the site. The design for these intersections is detailed in the Preliminary Traffic Analysis in **Annexure G**.

1. Proposed intersection design on Kangaloon Rd.
 - a. New signalised intersection at Road 01.
 - b. New unsignalised intersection at Road 03.
 - c. Maintain roundabout at Boardman Rd South.
 - d. New unsignalised intersection at Road 4.
2. Proposed intersection design on Eridge Park Rd.
 - a. New signalised intersection at Road 02.



- b. New signalised intersection at Road 05/Tirikee Lane.
- c. New signalised intersection at Road 06/Sutherland Park Drive.

Given the new intersection impact roads governed by TfNSW or require implementation of signals, the design and construction will be subject to consultation with TfNSW.

Cost estimate for these items are subject to feedback from TfNSW and will be added subsequent to consultation.

New Intersections along Existing Road Element			Rate (/m ²)	Cost	Total
Kangaloon Rd	Signalised Road 01 (m2)	0	\$0.00	\$0.00	\$0.00
	Unsignalised Road 03 (m2)	0	\$0.00	\$0.00	
	Roundabout Boardman (m2)	0	\$0.00	\$0.00	
	Unsignalised Road 04 (m2)	0	\$0.00	\$0.00	
Total Kangaloon Rd Intersections					\$0.00
Eridge Park Rd	Signalised Road 02 (m2)	0	\$0.00	\$0.00	\$0.00
	Signalised Road 05/Tirikee Lane (m2)				
	Signalised Road 06/Sutherland Park Dr (m2)	0	\$0.00	\$0.00	
Total Eridge Park Rd Intersections					\$0.00
Total New Intersection					\$0.00
Total New Intersection Per Tenement (2,100 dwellings)					\$0.00

Figure 13: Estimated New Intersections along Existing Road Costs

3.3 OPEN SPACE & PUBLIC DOMAIN

Areas of passive open space have been allocated along riparian corridors, where remnant vegetation is to be retained and in areas that are not suitable for residential development because of flood impacts. There is 74.7ha of land assigned to Passive Open Space – Riparian Corridors & Flood Controls as demonstrated in MKR00603-00-SK022 Open Space & Public Domain Plan.

Typically, areas of passive open space are rehabilitated/revegetated during construction of the development then dedicated to Council for management. It would be beneficial for Council to include controls to govern the rehabilitated/revegetation of passive open space in the Development Control Plan.

A pedestrian link is to be established along the bank of the Wingecarribee River within the area dedicated as passive open space according to the outcomes in Council's Community & Recreation Facility Strategy.

The youth recreation precinct and tennis court identified in Council's Community & Recreation Facility Strategy have been integrated into areas of Active Open Space which are identified in MKR00603-00-SK022 Open Space & Public Domain Plan as Lot 104 and 112 respectively.

Cost estimates for the items included in Council's Community & Recreation Facility Strategy are subject to further landscape master plan design and will be added to **Figure 14**. Details of the landscape embellishment are included in the Landscape Master Plan. Typically, embellishment of smaller open spaces is undertaken by developers then dedicated to Council. It would be beneficial for Council to include controls to govern development of other open spaces in the Development Control Plan.

Open Space & Public Domain			Rate (/m ²)	Cost	Total
Pedestrian Link Wingecarribee River	Land Acquisition	0	\$0.00	\$0.00	\$0.00
	Track	0	\$0.00	\$0.00	



	Embellishment	0	\$0.00	\$0.00	
	Planting	0	\$0.00	\$0.00	
	Total Pedestrian Link Wingecarribee River				
Youth Precinct	Land Acquisition	0	\$0.00	\$0.00	
	Skate Facility	0	\$0.00	\$0.00	
	Multi-purpose hardcourts	0	\$0.00	\$0.00	
	Pump track/learn to ride	0	\$0.00	\$0.00	
	Embellishment	0	\$0.00	\$0.00	
	Planting	0	\$0.00	\$0.00	
	Total Youth Precinct				\$0.00
Community Tennis Courts	Land Acquisition	0	\$0.00	\$0.00	
	Tennis courts	0	\$0.00	\$0.00	
	Club house	0	\$0.00	\$0.00	
	Car park	0	\$0.00	\$0.00	
	Embellishment	0	\$0.00	\$0.00	
	Planting	0	\$0.00	\$0.00	
	Total Community Tennis Courts				\$0.00
Total Open Space & Public Domain					\$0.00
Total Open Space and Public Domain Per Tenement (2,100 dwellings)					\$0.00

Figure 14: Estimated Open Space & Public Domain Costs

3.4 SEWER

Council commissioned sewer hydraulic modelling to build on the Bowral Sewerage System Performance Report and determine the impact of the development on the sewerage network. The modelling indicated that upgrades in excess of those proposed in the Bowral Sewerage Catchment System Performance Report 2024 would be required and provided options to service the site. The sewerage flows from the site will be split into two catchments so the east area can be analysed separately to the west. The modelling suggests three options to upgrade the network to cater for the east and three options to upgrade the network to cater for the west. Given the uncertainty of which option will proceed, the costs have not been estimated.

It would be beneficial for Council to develop a Development Servicing Plan for the site during the planning proposal to ensure upgrade costs and timeframes providing assurance for development of the site.

3.5 WATER

Council commissioned a water modelling assessment to analyse the capacity of the potable water network to supply the development. The assessment found that the reservoirs nearby and pipe network within roads fronting the site are sufficient to supply the development. It was recommended that Council continue to assess the impacts of the development on the potable water network to ensure the network continues to perform at the relevant standard.

It would be beneficial for Council to develop a Development Servicing Plan for the site during the planning proposal to trunk mains are constructed to achieve orderly development of the site.

3.6 ELECTRICAL



Endeavour Energy has been consulted to provide feedback on the electrical servicing for the development. It is understood that there is limited capacity available in the electrical network and a new zone substation will likely be required to service the development. Additionally, the overhead transmission lines traversing the site will require undergrounding to facilitate the development. Recommendations on electrical infrastructure availability and servicing requirements will be considered in final documentation.

3.7 GAS

Gas is not considered an essential service and servicing residential areas with gas is not considered environmentally sustainable. Servicing the site with gas infrastructure has therefore not been considered.

3.8 TELECOMMUNICATIONS

NBN is available on Eridge Park Road and Kangaloon Road for the entire length of the site. Access and availability are not likely to constrain the development.

3.9 SERVICE RELOCATIONS

3.9.1 Electrical Transmission Lines

The overhead transmission lines traversing the site will require undergrounding to facilitate the development. Whilst such works are not unusual, liaison with service authorities to secure approval for the works can be onerous.

3.9.2 Optic Fibre

There is an optic fibre cable running north to south through the middle of the site. Realignment such assets so the infrastructure is housed within proposed road reserves is typically achievable, so relocation is not likely to constrain the development.

3.10 STATE GOVERNMENT INFRASTRUCTURE

Awaiting feedback from WNSW, HNSW, DPE-Biodiversity, NSW Health, TfNSW, and the Dept. Education. Feedback on state government infrastructure availability and servicing requirements will be considered in final documentation.

3.11 MAJOR INFRASTRUCTURE TIMEFRAMES

Servicing the development with sewer and electrical infrastructure as well as upgrading external intersections are likely to be the items which determine development timeframes.

It is understood that construction of sewer infrastructure and upgrade of the Bowral Sewerage Treatment Plant as recommended in the Bowral Sewerage System Performance Report is underway however construction of the two new sewerage pumping stations and additional network upgrades would preferably be complete before construction commences on the first stage of the development.

Securing a site and planning for a new zone substation can be a lengthy process. Planning and acquisition for the zone substation site should be complete before construction commences on the first stage of the development.

The staged approach to the upgrade of the Moss Vale Road, Kangaloon Road and Funston Street roundabout to facilitate trips from/to the NLA to Bowral Town Centre will constrain the development. The existing intersection reaches capacity at Base 2036 +



20% Bowral South scenario (i.e. 20% of the trips created by the development). Stage 1 of the intersection upgrade reaches capacity at Base 2036 + 80% Bowral South scenario when stage 2 of the upgrade would need to be implemented. Planning and acquisition for the intersection upgrades should be complete before construction commences on the first stage of the development.

A program including indicative timeframes for major infrastructure and recommendations on development sequencing will be included in final documentation.



ANNEXURE A: ECOLOGY



ANNEXURE B: HERITAGE



ANNEXURE C: SUSTAINABILITY



ANNEXURE D: URBAN DESIGN



ANNEXURE E: COMMUNITY CONSULTATION



ANNEXURE F: WATER CYCLE MANAGEMENT STUDY



ANNEXURE G: TRAFFIC