PLANNING PROPOSAL
REZONING TO R5 LARGE LOT RESIDENTIAL
55 WIRE LANE - BERRY

PREPARED FOR
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PROJECT TITLE: 55 Wire Lane Berry – Planning Proposal PROJECT NUMBER: ISC00062		
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1. INTRODUCTION

This Planning Proposal (PP) seeks to amend Shoalhaven Local Environmental Plan (LEP) 2014 to rezone land at 55 Wire Lane, Berry to an R5 Large Lot Residential zone, and to identify a longer-term strategy for rural residential development in the area, that will facilitate the transfer of a large area of Coomonderry Swamp into public ownership. Specifically, in relation to 55 Wire Lane, Berry, the PP seeks to:

- Rezone the subject land to R5 Large Lot Residential and Part E2 Environmental Conservation
- Reduce the minimum lot size of the subject land to 1 hectare (ha).

The purpose of this PP is to explain the intent of, and justification for, amending the land use zoning and minimum lot size controls in Shoalhaven LEP 2014.

This PP has been prepared in accordance with Section 3.33 of the Environmental Planning and Assessment Act 1979 and the NSW Department of Planning and Environment's (DPE) A Guide to Preparing Planning Proposals (August 2016).

This PP should be read in conjunction with the supporting information and technical reports submitted with the proposal as detailed below:

- Assessment against State Environmental Planning Policies (**Appendix A**)
- Assessment against the Section 9.1 Ministerial Directions (**Appendix B**)
- Land Supply and Demand Analysis Report (**Appendix C**)
- Agricultural Assessment (**Appendix D**)
- Ecological Constraints Assessment (**Appendix E**)
- Water Cycle Management Report (**Appendix F**)
- Preliminary Site Investigation (**Appendix G**)
- Bushfire Assessment (**Appendix H**)

1.1 SUBJECT LAND

This PP applies to land within the Shoalhaven Local Government Area (LGA), as shown in **Figure 1** and **Figure 2** below. The subject land is located at 55 Wire Lane, Berry and is legally described as Lot 1 DP 1246435. The subject land is an irregular shaped parcel situated on the southern side of Beach Road, approximately four kilometres east from the township of Berry. The site is approximately 40 hectares in size and is currently used as a cattle grazing farm.

The majority of the property is in a cleared state consisting of grazing paddocks, with a remnant corridor of bushland of approximately 4.5 ha which runs along a second order stream east-west through the centre of the site. The remnant vegetation occurs on the central-western portion of the site and is consistent with the areas mapped on the Terrestrial Biodiversity map under Shoalhaven LEP 2014.

The site contains an existing homestead and associated outbuildings which are located in the south-western corner of the subject land accessed by Wire Lane. The site is surrounded by rural residential development to the east, small lot rural lifestyle lots to the west, Beach Road to the north, rural lands and Coomonderry Swamp to the south, and essentially presents as an infill of rural lands located between two (2) existing rural residential subdivisions.

The area is currently zoned part RU1 Primary Production and Part RU4 Primary Production Small Lots under Shoalhaven LEP 2014 (**Figure 3**), with a mapped minimum lot size of part 40 ha (for land zoned RU1) and part 10 ha (for land zoned RU4) (**Figure 4**).

Figure 1 - Location Plan

Figure 2 - Subject Land

Figure 3 - Current Land Use Zone

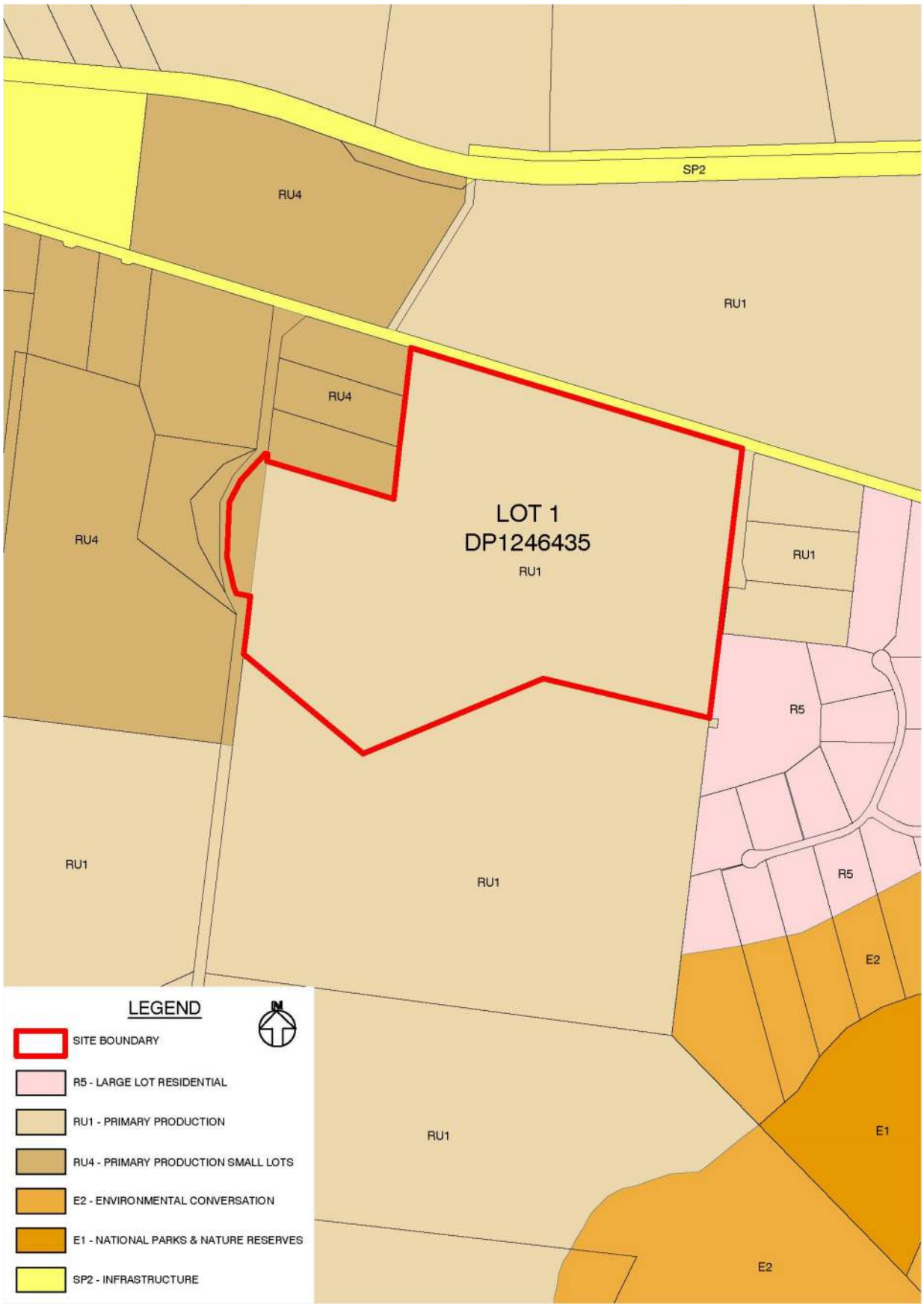
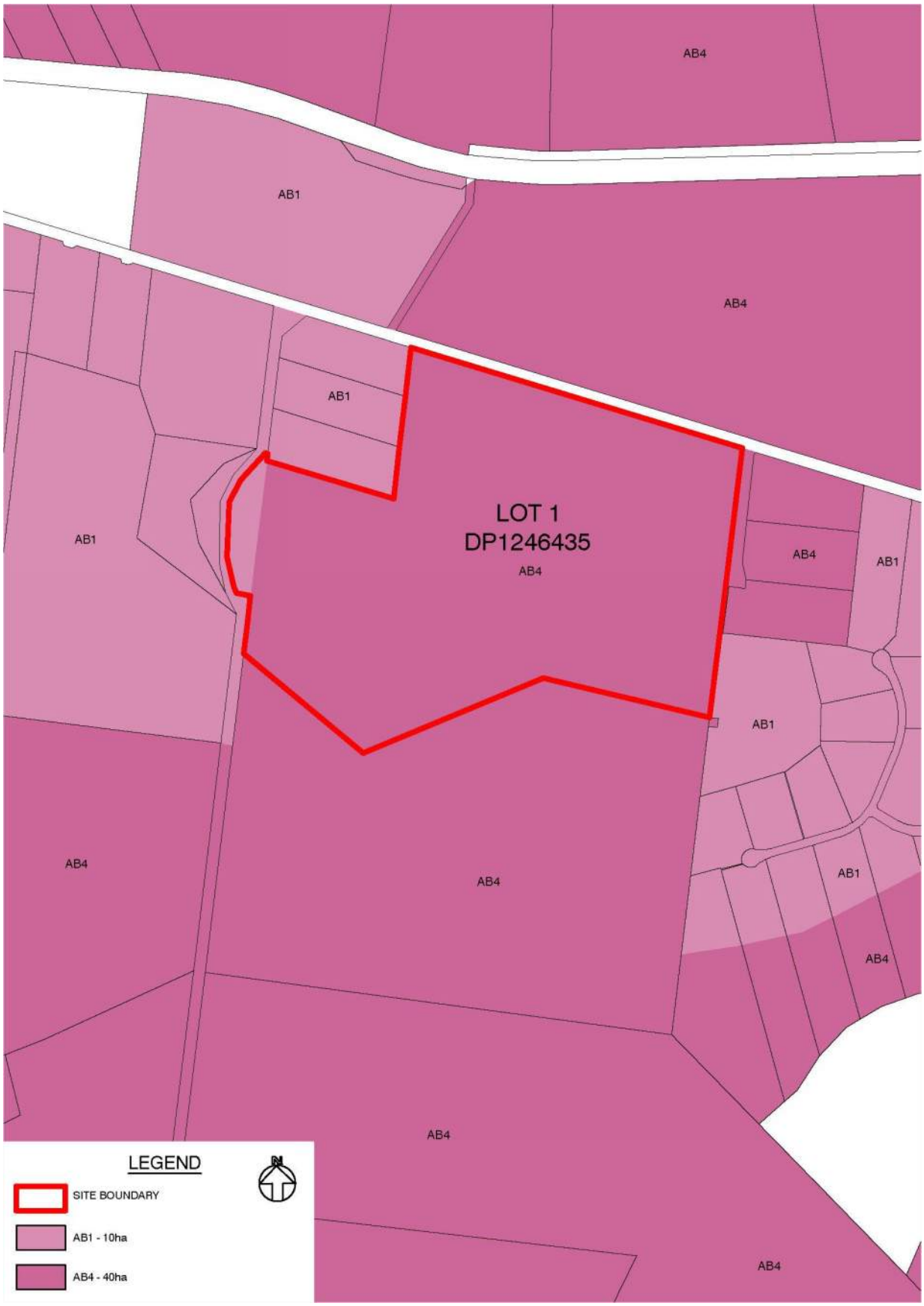


Figure 4 - Current Minimum Lot Size



1.2 BACKGROUND

The last comprehensive review of rural lands in the Shoalhaven was completed in the 1990s, and resulted in major amendments to the Shoalhaven LEP known as the Rural Plan. Among other things, the Rural Plan rezoned a number of rural areas to allow for rural residential development to occur.

In July 2000, the land immediately east of the subject land was rezoned to facilitate a rural residential development. The rezoning of the adjoining site ultimately resulted in the subject land being located between a rural residential development to the east and a small lot rural lifestyle subdivision to the west. Therefore, the subject land now presents as an infill rural area between two existing rural lifestyle developments.

Since the completion of the Rural Plan, there has been a number of significant shifts in State Government policy in relation to rural residential development. For a large period of time, the NSW Government discouraged rural residential development throughout the state, however, more recently the State have been supportive or rural residential development as an important housing product to meet specific market demands and provide adequate choice in the housing market. This has resulted in a significant increase in rural residential development in lifestyle areas such as Wollondilly and Wingecarribee in response to a latent demand in the market.

In the Illawarra-Shoalhaven there was an effective moratorium placed on rural residential rezonings up until the introduction of the Illawarra Shoalhaven Regional Plan (Regional Plan) in November 2015 and the repeal of the Illawarra Regional Plan No. 1. The new Regional Plan has specific goals and directions that encourage Council's to provide a variety of housing choices to meet the needs and lifestyles of their communities. Specifically, the Regional Plan states that 'Councils are to plan for the mix of housing that suits the projected growth, changing demographics (such as an ageing population) and market demand particular to their area'.

Indesco have now been engaged to prepare a PP to rezone the subject land to an R5 Large Lot Residential Zone, to address a specific market demand for rural lifestyle lots in the northern Shoalhaven.

1.3 MARKET ANALYSIS

A Land Supply and Demand Analysis Report (Market Analysis) was prepared in support of this PP and is provided as **Appendix C**. The purpose of the report is to gain a better understanding and appreciation of the existing supply and demand of rural residential land in the Shoalhaven.

Shoalhaven City Council are in the process of reviewing their *Growth Management Strategy* (GMS), and have recently exhibited the draft *Shoalhaven Growth Management Strategy 2019-41 Discussion Paper* (Discussion Paper). Section 4.4 of the Discussion Paper provides an overview of the theoretical supply of rural residential zoned land in the Shoalhaven, and states that '*Shoalhaven is well-supplied with rural-residential style lots, with nearly 6,000ha of land being used or available for this type of development. In addition, the above desktop analysis indicates the potential for an additional 1179 lots, which are yet to be realised and could satisfy the demand for additional rural-residential lots for a number of years*'.

It is noted that the analysis contained within the Discussion Paper is based on a theoretical maximum capacity, and, when site constraints and land ownerships are considered, is likely to be a significant overstatement of the maximum capacity. Therefore, in an attempt to provide

greater clarity around the actual supply and demand for rural lifestyle land in the Shoalhaven, the Market Analysis prepared by Walsh and Monaghan provides an analysis in relation to:

- The current availability of vacant large lot residential home sites in the Northern Shoalhaven
- The amount of undeveloped land (englobo sites) capable of subdivision into large lot residential homesites
- The demand for large lot residential home sites in Berry, and
- The sales rates and volumes of vacant large lot residential sites in the Shoalhaven.

The findings of the Market Analysis show that there is very limited supply of rural residential land in the northern part of the Shoalhaven, which is in contrast to the analysis undertaken as part of the GMS Discussion Paper. Further, the Market Analysis demonstrates a high level of demand for rural residential development in an otherwise weak housing market. A copy of the Market Analysis is provided as **Appendix C** to this report, with the key findings summarised below:

- There are very limited large lot residential homesites available in the northern Shoalhaven, with only four properties available north of the Shoalhaven River
- Of the four properties north of the river, only one is located in Berry, and the remaining three lots are significantly smaller then proposed on the subject land (4,000m2)
- Three proposed subdivisions in Bangalee, Tapitalee and Kangaroo Valley will result in seventy-nine new 4,000m2 lots.
- The Wire Lane proposal is considered a different market due to the significant difference in location, lot size, views and standard of surrounding development.
- Site constraints and development controls are likely to significantly limit the subdivision potential of existing zoned and identified rural residential land
- While the market for standard residential lots has slowed considerably since the start of 2018, there remains strong demand for large lot residential home sites.
- The proposed development at 510 Beach Road will provide a similar housing product to the proposal for Wire Lane, however the total number of lots created between the two projects are considered capable of being absorbed in the market over a two to three-year period, as was done previously with the Berry Beach and Campbells Run Estates.

1.4 THE PROPOSAL

This PP seeks to rezone land at 55 Wire Lane, Berry, to part R5 Large Lot Residential and part E2 Environmental Conservation with a minimum lot size of 1ha. The proposal presents essentially as an infill of rural lands located between two (2) existing rural residential subdivisions, and aims to address a specific market demand for rural lifestyle lots in the northern Shoalhaven.

The proposal also seeks to protect the existing mapped wildlife corridor in perpetuity, through an E2 Environmental Conservation zone, and further, to protect, enhance, restore and establish new wildlife corridors associated with the riparian areas running east-west and north-south through the site through a formal Vegetation Management Plan (VMP) over these areas.

In addition to the proposed rezoning of 55 Wire Lane, it was considered appropriate to take a broader strategic approach to the site and surrounding land for the following reasons:

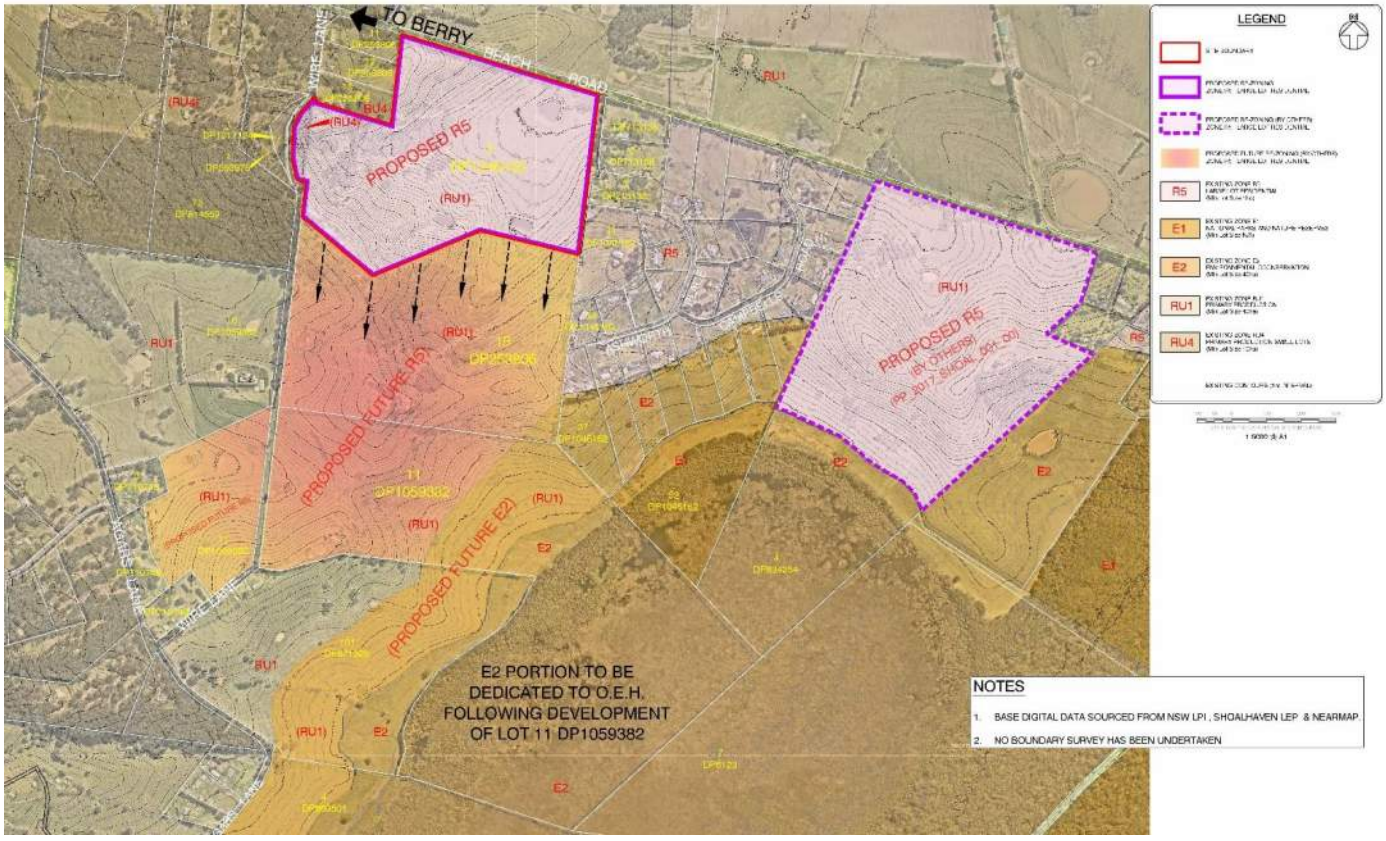
- The site and surrounding lands are located between two existing rural lifestyle subdivisions to the east and west, and present essentially as an infill rural residential area
- The proximity of the adjoining rural residential developments are inconsistent with the principles of the NSW Right to Farm Policy
- While the subject land and surrounding sites are zoned for primary production, the land has insufficient carrying capacity to support a viable broad acre agricultural operation
- More intensive agricultural uses on the site will potentially result in land use conflicts given the close proximity of the existing rural residential development on either side of the subject land

- There is an opportunity to bring a large part of the Coastal Wetlands of Coomonderry Swamp into public ownership (National Parks and Wildlife Service)
- There has been no contemporary review of rural lands in the Shoalhaven, and, in the absence of a strategic framework, it is considered appropriate to look at the area more broadly, and
- There is an opportunity to consider and manage the cumulative impacts of development up front in the process and achieve improved outcomes in relation to biodiversity and water quality.

While this PP is seeking to rezone 55 Wire Lane, **Figure 5** below demonstrates a potential 10 year rural lifestyle land release plan, which will assist in meeting a specific demand in the housing market and facilitate the transfer of Coomonderry Swamp into public ownership. This approach would also allow for the management and protection of the remnant native vegetation located on both 55 and 70 Wire Lane through a vegetation management plan at the development application stage.

Given the sensitive nature of Coomonderry Swamp, a detailed Ground Water and Water Cycle Management Study would be required to support any future rezoning over the identified land, to ensure no negative impacts on Coomonderry Swamp and its catchment.

Figure 5 - Potential Long-Term Strategy for a Rural Lifestyle Land Release



1.5 LAND CAPABILITY

The subject land is zoned part RU1 Primary Production and part RU4 Primary Production Small Lot and is currently used for the breeding and grazing of cattle as a cattle grazing farm operation. This section provides an overview of the agricultural capability of the land, as well as the land capability for rural residential development purposes.

Agricultural Capability

An Agriculture Assessment of the subject land was prepared by Edge Land Planning and is provided as **Appendix D** to this report. The assessment found that the physical characteristics of the site, including the slope, soil fertility and lack of permanent water supply result in significant constraints to the agricultural use of the site. Agricultural use of the land is limited to cattle grazing and the land area is significantly smaller than the area needed to allow for a viable agricultural operation on the site.

The size of the subject land is 40 ha and is too small to make a sustainable profit from cattle grazing, which is the only form of agriculture that can be practised on the property given the physical constraints and limitations of the land.

Biodiversity

An Ecological Constraints Assessment was prepared by Ecoplanning and is provided as **Appendix E** to this report, with the findings of the assessment summarised below.

The majority of the subject land (33.4ha) is in a cleared state dominated by pasture grasses, with non-native plantings located in the south-west of the site surrounding the existing residential buildings. An area of remnant vegetation occurs on the central-western portion of the site and is consistent with the areas mapped on the Terrestrial Biodiversity map under Shoalhaven LEP 2014.

The Ecological Constraints Assessment maps the area of native vegetation as '*Blackbutt - Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin*' (PCT 694). This Plant Community Type (PCT) is not listed as a Threatened Ecological Community (TEC) under the *Biodiversity Conservation Act 2016* (BC Act) or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

No threatened flora or fauna species listed under the BC Act or EPBC Act were recorded during the site inspections undertaken by Ecoplanning. All threatened flora and fauna species were considered to have a 'low' likelihood of occurrence within the study area.

However, due to the presence of Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin (PCT 694), a 2nd order stream and farm dams, there are areas that were considered to have 'moderate' ecological constraint. No area of 'high' constraint was identified.

The proposed development is not anticipated to result in the clearing of native vegetation, however, if at the DA stage the proposed works include the removal of >0.25 ha of native vegetation, a Biodiversity Development Assessment Report (BDAR) will be required to accompany the DA.

The current agricultural land use over the site proposes a significant threat to the native vegetation and the proposed development provides an opportunity to protect and enhance the riparian vegetation via a Vegetation Management Plan (VMP) associated with a future Development Application over the site. A VMP will ensure appropriate protection of the riparian vegetation and maintain an appropriate biodiversity corridor running east west through the site, and lead to an improved biodiversity outcome.

Water Cycle

A Water Cycle Management Report prepared by Indesco is provided as **Appendix F** to this report, with the findings of the assessment summarised below:

- The proposed rezoning would result in an increase in impervious area from 2% to 9% of the site.
- The development is within the Crooked River Catchment outside the high hazard area for flooding.
- All proposed lots will have building areas above the flood planning level.
- The MUSIC modelling shows that the rezoning would lead to an improvement in water quality, with the proposed treatment train contributing to reduction in the annual loads of phosphorus, nitrogen and suspended solids leading to an improved water quality outcome and a neutral or beneficial effect (NorBe) result
- The proposed lots would be able to manage their wastewater on site with aerated wastewater systems with an effluent application area of 1096 m^2 per lot.

The existing RU1 Primary Production zone allows for a range of intensive agricultural uses that are considered high risk land uses for water quality. The proposed development and water cycle treatment plan will provide a significant improvement to water quality discharged from the site.

Contamination

A Stage 1 Preliminary Site Investigation (PSI) prepared by ENRS is provided as **Appendix G** to this report, with the findings of the assessment summarised below:

- The site history records document the Site has been used for rural purposes for an extended period with the addition of a residential dwelling
- The EPA contaminated land records did not identify any areas of environmental concern in proximity to the site
- A single Area of Environmental Concern (AEC) was identified at the site. The AEC included stockpiled material alongside Wire Lane.
- This PSI did not include any intrusive investigations of the AEC, and it is recommended that further ground testing and environmental assessment is conducted within the AEC in order to assess the materials suitability for re-use onsite
- Based on the historical information and observations made during the site inspection, the site may be considered suitable for the proposed sub-division and residential land use

Bushfire

A Bushfire Assessment Report prepared by Peterson Bushfire is provided as **Appendix H** to this report, with the findings of the assessment summarised below.

Only a very small portion of the subject site is mapped as bushfire prone on the bushfire prone lands mapping, with the majority of the site free of any bushfire hazard. The proposal to rezone the subject land for a future rural residential subdivision can satisfy the requirements of Planning for Bush Fire Protection (PBP) 2006.

Compliance with PBP can be achieved by providing compliant bushfire protection measures such as hazard separation and adequate access. The proposal is not considered incompatible with the surrounding environment and bushfire risk, and with identified bushfire management, the proposal can coexist within the rural setting which is assessed to present a low risk to future development that will be compliant with contemporary bushfire protection measures.

The following bushfire protection measures are recommended to ensure compliance with PBP:

- Provision of compliant APZs between future building envelopes and bushfire hazards (see **Appendix H**). The areas for building envelopes can be improved with additional vegetation management around the edges of the remnant vegetation on site
- Adequate access for emergency response and evacuation. In this instance, cul-de-sac roads are considered acceptable as they will traverse cleared land that is not mapped bushfire prone, and lead evacuees away from the bushfire threat.
- Compliant road widths and design.

2. PART 1 – INTENDED OUTCOME

This PP seeks to amend Shoalhaven Local Environmental Plan (LEP) 2014 to facilitate a rural residential development of land at 55 Wire Lane, Berry, to address a specific market demand for rural lifestyle lots in the northern Shoalhaven. Specifically, the PP seeks to:

- Rezone the subject land to part R5 Large Lot Residential and part E2 Environmental Conservation; and
- Reduce the minimum lot size of the subject land to 1 hectare (ha).

The proposal also seeks to protect the existing mapped wildlife corridor in perpetuity, through an E2 Environmental Conservation zone, and further, to protect, enhance, restore and establish new wildlife corridors associated with the riparian areas running east-west and north-south through the site, consistent with the Illawarra Shoalhaven Regional Plan and South Coast Regional Conservation Strategy.

Further, the PP aims to identify a longer-term strategy for rural residential development in the area, that will allow for a more efficient use of non-viable farmland and facilitate the transfer of a large area Coomonderry Swamp into public ownership.

3. PART 2 – EXPLANATION OF PROVISIONS

The intended outcome of the PP will be achieved by:

- Amending the Land Zoning Map Sheet LZN_019E to modify the land use zone of 55 Wire Lane from part RU1 Primary Production and part RU4 Primary Production Small Lot to part R5 Large Lot Residential and part E2 Environmental Conservation; and
- Amending Lot Size Map Sheet LSZ_019E to modify the minimum lot size of 55 Wire Lane from part 40ha and part 10ha to a minimum lot size of 1ha.

4. PART 3 – JUSTIFICATION

4.1 NEED FOR THE PLANNING PROPOSAL (SECTION A)

4.1.1 Is the Planning Proposal a result of any strategic study or report?

No. The PP is not the result of a Government initiated strategic study or report, rather, it aims to address a specific market demand for rural lifestyle lots in the northern Shoalhaven, consistent with Direction 2.1 of the Illawarra Shoalhaven Regional Plan.

The PP is however supported by a strategic Market Assessment that considers the supply and demand of rural lifestyle lots in the northern Shoalhaven. The Market Assessment found that while the housing market for standard residential has slowed considerably since the start of 2018, there remains strong demand for large lot residential home sites in the northern Shoalhaven. Further, the assessment states that there is currently insufficient supply to meet the demand for this housing product, and there is sufficient demand to warrant the rezoning of the subject land.

The PP is also supported by an Agricultural Assessment that considers the agricultural capability of the subject land. Ultimately, the physical characteristics of the site, including the slope, soil fertility and lack of permanent water supply result in significant constraints to the agricultural use of the site. Agricultural use of the land is limited to cattle grazing and the land area is significantly smaller than the area needed to allow for a viable agricultural operation on the site.

4.1.2 Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The PP is considered the most appropriate means of achieving the objectives and intended outcomes of the proposal. A number of different options were considered to address the demand for rural lifestyle lots, including a potential RU4 Primary Production Small Lot zone and / or a mix of zones across the site.

However, given the agricultural limitations of the land, the potential to create land use conflicts through intensive agriculture, and the need to protect the existing biodiversity corridor, the proposed R5 Large Lot Residential and E2 Environmental Conservation zones are considered the most appropriate outcome for the site.

4.2 RELATIONSHIP TO STRATEGIC PLANNING FRAMEWORK (SECTION B)

4.2.1 Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies)?

Illawarra Shoalhaven Regional Plan

The Illawarra Shoalhaven Regional Plan provides a regional planning framework to guide the sustainable growth of the region over the next 20 years. The Regional Plan provides high level objectives and directions for land use in the region, specifically relating to the economy, housing, connectivity, agriculture and the natural environment.

The relevant Directions from the Regional Plan are discussed below.

Direction 2.1 – Provide sufficient housing supply to suit the changing demands of the region

Direction 2.1 aims to provide a variety of housing choices to meet the needs and lifestyles of local communities. Specifically, the Direction states that '…*Councils are to plan for the mix of housing that suits the projected growth, changing demographics (such as an ageing population) and market demand particular to their area'*.

This PP aims to address a specific market demand for rural lifestyle lots in the northern Shoalhaven, consistent with the requirements of this direction. The PP is supported by a strategic Market Assessment that considers the supply and demand of rural lifestyle lots in the northern Shoalhaven. The Market Assessment found that while the housing market for standard residential has slowed considerably since the start of 2018, there remains strong demand for large lot residential home sites in the northern Shoalhaven. Further, the assessment states that there is currently insufficient supply to meet the demand for this housing product, and there is sufficient demand to warrant the rezoning of the subject land.

Direction 4.1 - Protect regionally important agricultural lands as an asset to food and fibre production

The subject land is zoned RU1 Primary Production, however, does not appear to be mapped as 'Biophysical Strategic Agricultural Land (BSAL)' under the Regional Plan.

An Agriculture Assessment of the subject land was prepared by Edge Land Planning and is provided as **Appendix D** to this report. The assessment found that the physical characteristics of the site, including the slope, soil fertility and lack of permanent water supply result in significant constraints to the agricultural use of the site. Agricultural use of the land is limited to cattle grazing and the land area is significantly smaller than the area needed to allow for a viable agricultural operation on the site.

The size of the subject land is 40 ha and is too small to make a sustainable profit from cattle grazing, which is the only form of agriculture that can be practised on the property given the physical constraints and limitations of the land. Given the above, the land is not considered to be regionally important agricultural lands, and the RU1 Primary Production zone is not considered appropriate in this instance.

Direction 5.1 – protect the region's environmental values by focusing development in locations with the capacity absorb development, and

Direction 5.1 aims to ensure that development is located to avoid significant environmental impacts, to protect high environmental value lands and to protect the regions biodiversity corridors.

The PP proposes development on land with the capacity to absorb development, as outlined in the land capability assessment and supporting environmental studies. Further, the PP specifically achieves this Direction by not only protecting the significant Berry wildlife corridor, but also restoring, enhancing and creating new vegetated corridors between significant patches of vegetation within and adjoining the site.

The PP is not inconsistent with the Illawarra Shoalhaven Regional Plan.

South Coast Regional Conservation Plan

The Berry Wildlife Corridor is mapped as a regionally significant corridor in the South Coast Regional Conservation Plan (SCRCP). The SCRCP outlines a number of priority actions, namely to protect, enhance and restore regionally significant wildlife corridors, to create vegetated linkages between significant patches of vegetation.

The PP protects the existing mapped wildlife corridor in the western portion of the site in perpetuity, consistent with the aims of the SCRCP, through an E2 Environmental Conservation zone and the use of a VMP. The PP also seeks to restore and enhance this corridor to provide a vegetated corridor associated with the riparian area running east-west through the site. Further, the PP seeks to enhance the corridor value of the Beach Road road reserve, by providing a 15m deep vegetated corridor along the Beach Road frontage of the subject land.

The PP also seeks to establish a new north-south corridor associated with the riparian area running north-south through the site, providing a new, vegetated link between significant patches of vegetation to the south of the site, and a significantly improved environmental outcome in this area. The PP specifically addresses the priority actions in the SCRCP to protect, enhance and restore important wildlife corridors.

4.2.2 Is the Planning Proposal consistent with the local council's Community Strategic Plan, or other local strategic plan?

Community Strategic Plan - Shoalhaven Integrated Strategic Plan

The Shoalhaven Community Strategic Plan provides a long-term, community driven strategy for the future of the Shoalhaven and identifies priorities for resilient, safe and inclusive communities; sustainable, liveable environments; prosperous communities; and responsible governance in Shoalhaven.

The relevant priority in relation to this proposal is:

2.2 Plan and manage appropriate and sustainable development

The PP seeks to provide a well planned and appropriate rural residential development, located between two existing rural residential areas, and is consistent with the priorities outlined in the CSP.

Shoalhaven Growth Management Strategy (GMS)

The Shoalhaven GMS provides a strategic framework for how the Shoalhaven LGA will grow over the next 20 years, with a particular focus on the growth of existing urban areas. The GMS does not consider rural residential development, and the PP is not inconsistent with the GMS.

It is noted that Council are in the processes of reviewing their *Growth Management Strategy* (GMS), and have recently exhibited the draft *Shoalhaven Growth Management Strategy 2019-41 Discussion Paper* (Discussion Paper). Section 4.4 of the Discussion Paper provides an overview of the theoretical supply of rural residential zoned land in the Shoalhaven, and states that '…*Shoalhaven is well-supplied with rural-residential style lots, with nearly 6,000ha of land being used or available for this type of development. In addition, the above desktop analysis indicates the potential for an additional 1179 lots, which are yet to be realised and could satisfy the demand for additional rural-residential lots for a number of years*'.

It is noted that the analysis contained within the Discussion Paper is based on a theoretical maximum capacity, and, when site constraints and land ownerships are considered, is likely to be a significant overstatement of the supply of rural residential land in the Shoalhaven. Therefore, in an attempt to provide greater clarity around the actual supply and demand for rural lifestyle land in the Shoalhaven, the Market Analysis prepared by Walsh and Monaghan provides an analysis in relation to:

- The current availability of vacant large lot residential home sites in the Northern Shoalhaven
- The amount of undeveloped land (englobo sites) capable of subdivision into large lot residential homesites
- The demand for large lot residential home sites in Berry, and
- The sales rates and volumes of vacant large lot residential sites in the Shoalhaven.

The findings of the Market Analysis show that there is very limited supply of rural residential land in the northern part of the Shoalhaven, which is in contrast to the analysis undertaken as part of the GMS Discussion Paper. Further, the Market Analysis demonstrates a high level of demand for rural residential development in an otherwise weak housing market. A copy of the Market Analysis is provided as **Appendix C** to this report, with the key findings summarised below:

- There are very limited large lot residential homesites available in the northern Shoalhaven, with only four properties available north of the Shoalhaven River
- Of the four properties north of the river, only one is located in Berry, and the remaining three lots are significantly smaller then proposed on the subject land (4,000m2)
- Three proposed subdivisions in Bangalee, Tapitalee and Kangaroo Valley will result in seventy-nine new 4,000m2 lots.
- The Wire Lane proposal is considered a different market due to the significant difference in location, lot size, views and standard of surrounding development.
- Site constraints and development controls are likely to significantly limit the subdivision potential of existing zoned and identified rural residential land
- While the market for standard residential lots has slowed considerably since the start of 2018, there remains strong demand for large lot residential home sites.
- The proposed development at 510 Beach Road will provide a similar housing product to proposal for Wire Lane, however the total number of lots created between the two projects are considered capable of being absorbed in the market over a two to three-year period, as was done previously with the Berry Beach and Campbells Run Estates.

Following the exhibition of the GMS Discussion Paper, Council published a 'Community Engagement Report' on the outcomes of the public exhibition. The Engagement Report stated, among other things, that there was a strong preference for '… *maintaining rural land, with no further rezoning of land for rural-residential development*'. As outlined above, the information that was exhibited in the Discussion Paper was based on a theoretical maximum capacity and is a significant overstatement of the supply of rural residential land in the Shoalhaven.

The Market Assessment undertaken by Walsh and Monaghan demonstrated that there is very limited supply of rural residential land in the northern part of the Shoalhaven, and a high level of demand for rural residential development in an otherwise weak housing market.

The implied community opposition to '*rezoning land for rural residential development'* is based on somewhat misleading information in relation to the existing supply of rural residential land in the Shoalhaven. The strong demand for this form of development indicates that there is broader support for rural residential development than what is represented in the GMS Engagement Report.

4.2.3 Is the Planning Proposal consistent with applicable state environmental planning policies?

The State Environmental Planning Policies (SEPPs) are considered in Appendix A of this report and the SEPPs relevant to the proposal are discussed below.

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55)

SEPP 55 aims to provide a Statewide planning approach to the remediation of contamination land and is a consideration when preparing a PP for land identified in the SEPP.

A Stage 1 Preliminary Site Investigation (PSI) prepared by ENRS is provided as **Appendix G** to this report, with the findings of the assessment summarised below:

- The site history records document the Site has been used for rural purposes for an extended period with the addition of a residential dwelling
- The EPA contaminated land records did not identify any areas of environmental concern in proximity to the site
- A single Area of Environmental Concern (AEC) was identified at the site. The AEC included stockpiled material alongside Wire Lane.
- This PSI did not include any intrusive investigations of the AEC, and it is recommended that further ground testing and environmental assessment is conducted within the AEC in order to assess the materials suitability for re-use onsite
- Based on the historical information and observations made during the site inspection, the site may be considered suitable for the proposed sub-division and residential land use.

The PP is not inconsistent with the SEPP.

4.2.4 Is the Planning Proposal consistent with applicable Ministerial Directions (s.9.1 directions)?

The Section 9.1 Directions are considered in Appendix B and those that are relevant to the subject PP are discussed below.

1.2 Rural Zones

This Direction applies as the PP proposes to rezone the subject land from part RU1 Primary Production and Part RU4 Primary Production Small Lot to part R5 Large Lot Residential and part E2 Environmental Conservation.

The PP is potentially inconsistent with the Direction in that the PP will result in a loss in rural zoned land. However, any inconsistency is considered to be minor in nature, as the proposal represents an infill type development and is reflective of the zoning of the adjoining land. In addition, the proposal is justified by a study prepared in support of the proposal, consistent with the requirements of this Direction (see section 1.5 above).

The PP also seeks to alter the minimum lot size applicable to the subject land from 40 hectares to 1 hectare. However this is considered to be of minor significance given this is consistent with the existing lot sizes of the adjoining rural residential development immediately to the east and only slightly smaller than the lots to the west.

Further information on this Direction is provided in the Agricultural Assessment provided as **Appendix D**.

1.5 Rural Lands

This Direction applies as the PP proposes to rezone the subject land from part RU1 Primary Production and Part RU4 Primary Production Small Lot to part R5 Large Lot Residential and part E2 Environmental Conservation.

The PP is potentially inconsistent with the Direction in that the PP will result in a loss in rural zoned land through a rezoning, and reduction in the minimum lot size. However, the PP is consistent with the Rural Planning Principles and Rural Subdivision Principles outlined in the Direction (previously contained within SEPP (Rural Lands) 2008). Further information on this Direction is provided in the Agricultural Assessment provided as **Appendix D**.

2.1 Environmental Protection Zones

The PP will not impact on any critical habitat or threatened species, populations or ecological communities, or their habitats. The majority of the subject land is in a cleared state dominated by pasture grasses, with non-native plantings located in the south-west of the site surrounding the existing residential buildings.

An area of remnant native vegetation occurs on the central-western portion of the site, however, the PCT is not listed as a TEC under the BC Act or EPBC Act. The remnant vegetation on site is consistent with the areas mapped on the Terrestrial Biodiversity map under Shoalhaven LEP 2014. The PP is not seeking to remove the Terrestrial Biodiversity mapping from the subject land.

The PP is not inconsistent with the terms of this Direction.

3.1 Residential Zones

This Direction specifically seeks to encourage a variety of housing types to provide for existing and future housing needs. As outlined above, the PP seeks to address a specific demand for rural lifestyle lots in the northern Shoalhaven.

Further, the subject land is located between two existing rural residential areas, and will utilise existing infrastructure networks and services.

The PP is not inconsistent with the terms of this direction.

3.4 Integrating Land Use and Transport

This Direction applies as the PP seeks to create a residential zoning. This Direction seeks to improve access to housing, employment and services, walking, cycling and public transport.

The Shoalhaven has very limited public transport options, so new development areas will generally increase the reliance on private vehicles. Nevertheless, the subject land is located on Beach Road in Berry, and is accessible by bus. The future development of the site will also provide adequate road widths and turning circles to facilitate bus movements within the site.

The PP is not inconsistent with the terms of the Direction.

4.1 Acid Sulfate Soils

This Direction applies as the subject land is mapped as low probability of occurrence of acid sulfate soil risk by the NSW Office of Environment and Heritage mapping. Further assessment of acid sulfate soils will be undertaken at the development application stage, if determined necessary.

The PP is not inconsistent with the terms of the Direction.

4.4 Planning for Bushfire Protection

This Direction applies as a small portion of the subject land is mapped as being within a designated bush fire prone area under the NSW Rural Fire Service (RFS) mapping.

The PP seeks to rezone the subject land from part RU1 Rural Landscape and part RU4 Primary Production Small Lot to an R5 Large Lot Residential zone, and reduce the minimum lot size to a minimum of 1ha across the site. Only a very small portion of the subject site is mapped as bushfire prone on the bushfire prone lands mapping, with the majority of the site free of any bushfire hazard.

The PP is supported by a Bushfire Assessment Report which demonstrates that the proposal to rezone the subject land for a future rural residential subdivision can satisfy this Direction and the requirements of Planning for Bush Fire Protection (PBP) 2006.

As outlined in the Bushfire Assessment Report, compliance with this Direction and PBP can be achieved by providing compliant bushfire protection measures such as hazard separation and adequate access. The proposal is not considered incompatible with the surrounding environment and bushfire risk, and with identified bushfire management, the proposal can coexist within the rural setting which is assessed to present a low risk to future development that will be compliant with contemporary bushfire protection measures.

The Bushfire Assessment Report recommends the following bushfire protection measures to ensure compliance with PBP and this Direction:

- Provision of compliant APZs between future building envelopes and bushfire hazards (see **Appendix H**). The areas for building envelopes can be improved with additional vegetation management around the edges of the remnant vegetation on site
- Adequate access for emergency response and evacuation. In this instance, cul-de-sac roads are considered acceptable as they will traverse cleared land that is not mapped bushfire prone, and lead evacuees away from the bushfire threat.
- Compliant road widths and design.

As part of the Gateway process, the NSW RFS will be consulted prior to the PP being publicly exhibited, and will have the opportunity to provide feedback on the PP and the supporting Bushfire Assessment Report. The PP is not inconsistent with the terms of the Direction.

5.10 Implementation of Regional Plans

This Direction applies as the subject land is located within the Shoalhaven LGA and is subject to the Illawarra Shoalhaven Regional Plan.

The implementation of the Regional Plan is discussed in Section 4.2.1 above. The PP is not inconsistent with the terms of the Direction.

6.1 Approval and Referral Requirements

This Direction applies to the PP. The PP does not propose any provisions that will require additional concurrence or referral requirements of the future development of the subject site.

The PP is not inconsistent with the terms of the Direction.

6.3 Site Specific Provisions

This Direction applies to the PP. The PP proposes to rezone the site to part R5 Large Lot Residential and part E2 Environmental Conservation and reduce the minimum lot size across the site to 1ha. The PP does not propose any site specific provisions to be adopted for the subject site.

The PP is not inconsistent with the terms of the Direction.

4.3 ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACT (SECTION C)

4.3.1 Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The proposed amendment will not impact on any critical habitat or threatened species, populations or ecological communities, or their habitats. The majority of the subject land (33.4ha) is in a cleared state dominated by pasture grasses, with non-native plantings located in the south-west of the site surrounding the existing residential buildings.

An area of remnant vegetation occurs on the central-western portion of the site and is consistent with the areas mapped on the Terrestrial Biodiversity map under Shoalhaven LEP 2014. The Ecological Constraints Assessment prepared by Ecoplanning (**Appendix E**) maps the area of native vegetation as '*Blackbutt - Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin*' (PCT 694). This Plant Community Type is not listed as a Threatened Ecological Community under the *Biodiversity Conservation Act 2016* (BC Act) or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

No threatened flora or fauna species listed under the BC Act or EPBC Act were recorded during the site inspections undertaken by Ecoplanning. All threatened flora and fauna species were considered to have a 'low' likelihood of occurrence within the study area.

The proposed development is not anticipated to result in the clearing of native vegetation, rather, the proposal seeks to not only protect the existing wildlife corridor, but to restore, enhance and provide new vegetated corridors between significant patches of vegetation. This will provide for a significantly improved environmental outcome across the site.

The current agricultural land use over the site proposes a significant threat to the native vegetation and the proposed development provides an opportunity to protect and enhance the riparian vegetation via a VMP associated with a future Development Application over the site. A VMP will ensure appropriate protection of the riparian vegetation and maintain an appropriate biodiversity corridor running both east-west and north-south through the site, and lead to an improved biodiversity outcome.

4.3.2 Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?

There are no environmental effects envisaged as a direct result of the PP. As outlined above, an Ecological Constraints Assessment has been completed and is submitted with this PP (**Appendix E**). Based on a desktop analysis, field survey and literature review, the assessment determined:

- The study area consists predominantly of land that is of low ecological value (i.e. cleared land and weeds/exotics)
- There were areas of 'moderate' ecological constraint, being areas of Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin (PCT 694), a 2nd order stream and farm dams
- No area of 'high' constraint was identified
- If at the DA stage the proposed works include the removal of >0.25 ha of native vegetation, a Biodiversity Development Assessment Report (BDAR) prepared by a suitably qualified ecologist will be required to accompany the DA.

Further, a Water Cycle Management Report was prepared in support of the PP (**Appendix F**), which determined that the proposed lot sizes would allow for the on-site management of wastewater, with no negative environmental effects. Ultimately, the proposed development will

result in a beneficial impact on water quality in line with the Sydney Metropolitan Catchment Management Authority NorBe measure.

4.3.3 How has the Planning Proposal adequately addressed any social and economic effects?

The PP seeks to address a specific market demand for rural lifestyle lots in the northern part of the Shoalhaven. As outlined in the Market Analysis (**Appendix C**), despite a downturn in the housing market, there remains strong demand for rural lifestyle lots in the northern Shoalhaven, with very limited supply.

It is important that housing supply meets the needs and demands of the community, and this PP will assist in providing a housing product that meets the needs of the Shoalhaven community. Further, the PP will provide some economic benefit through the supply of additional rural residential land and housing opportunities.

4.4 STATE AND COMMONWEALTH INTERESTS (SECTION D)

4.4.1 Is there adequate public infrastructure for the Planning Proposal?

There is adequate public infrastructure to support the proposed low-scale rural residential development of the site as outlined below.

Water Supply

Existing development on Wire Lane is connected to Shoalhaven water mains and it is anticipated that the future development of the site will also be connected to the reticulated water supply subject to further studies.

Sewer

The nearest sewer main to the subject land is on Tannery Rd near Pulman St, some 3.4km away by road and not downhill. As such, it is not considered feasible to connect the subject land to the sewer and it is intended for each dwelling to manage their wastewater on-site consistent with the surrounding rural residential development in the area.

The PP is supported by a Water Cycle Management Report (**Appendix F**) which recommends the use of an aerated wastewater treatment system with effluent managed by subsurface irrigation. However, the actual type of system to be installed for each dwelling will be subject to confirmation at the DA stage.

Stormwater

The PP is supported by a Water Cycle Management Report (**Appendix F**) and stormwater quality modelling that shows that the proposed rezoning and subsequent development would have a beneficial impact on water quality in line with the Sydney Metropolitan Catchment Management Authority NorBe measure. A plausible, non-intrusive impact treatment train has been proposed to manage the water quality post-development without leaving onerous maintenance costs.

Electricity

There is sufficient capacity in the existing Endeavor Energy high voltage feeder line to support the proposed development. It is anticipated that a padmount substation may be required on the site, consistent with the proposed rezoning of Lot 4 DP 834254, Beach Road, Berry.

Traffic

The subject land has direct access from both Wire Lane and Beach Road. A Traffic Impact Assessment will be required to support a future development application over the site, and minor upgrades may be required around the proposed access point to the subdivision. It is anticipated

that any upgrades will be addressed as a condition of development consent as part of a future development application over the site.

Council has identified the need for upgrades to Beach and Tannery Roads through its Section 7.11 Contributions Plan, and the proposed development will directly contribute to these upgrades. The proposed upgrades are identified to be completed between 2020-25.

4.4.2 What are the views of state and Commonwealth public authorities consulted in accordance with the Gateway determination?

As per the PP process stipulated under the NSW *Guide to Preparing Planning Proposals*, it is expected that Council will consult with relevant public authorities in accordance with the conditions of the Gateway determination.

The PP will be updated prior to public exhibition, if required, to incorporate the view of any public authority.

5. PART 4 – MAPPING

As described in the explanation of provisions, the PP will require amendments to the Land Zoning Map and Lot Size Map in Shoalhaven LEP 2014, specific map sheets LZN_019E and LSZ_019E. The proposed land use zone and minimum lot size amendments are shown in **Figure 6** and **Figure 7** below.

Figure 6 - Proposed Land Use Zone

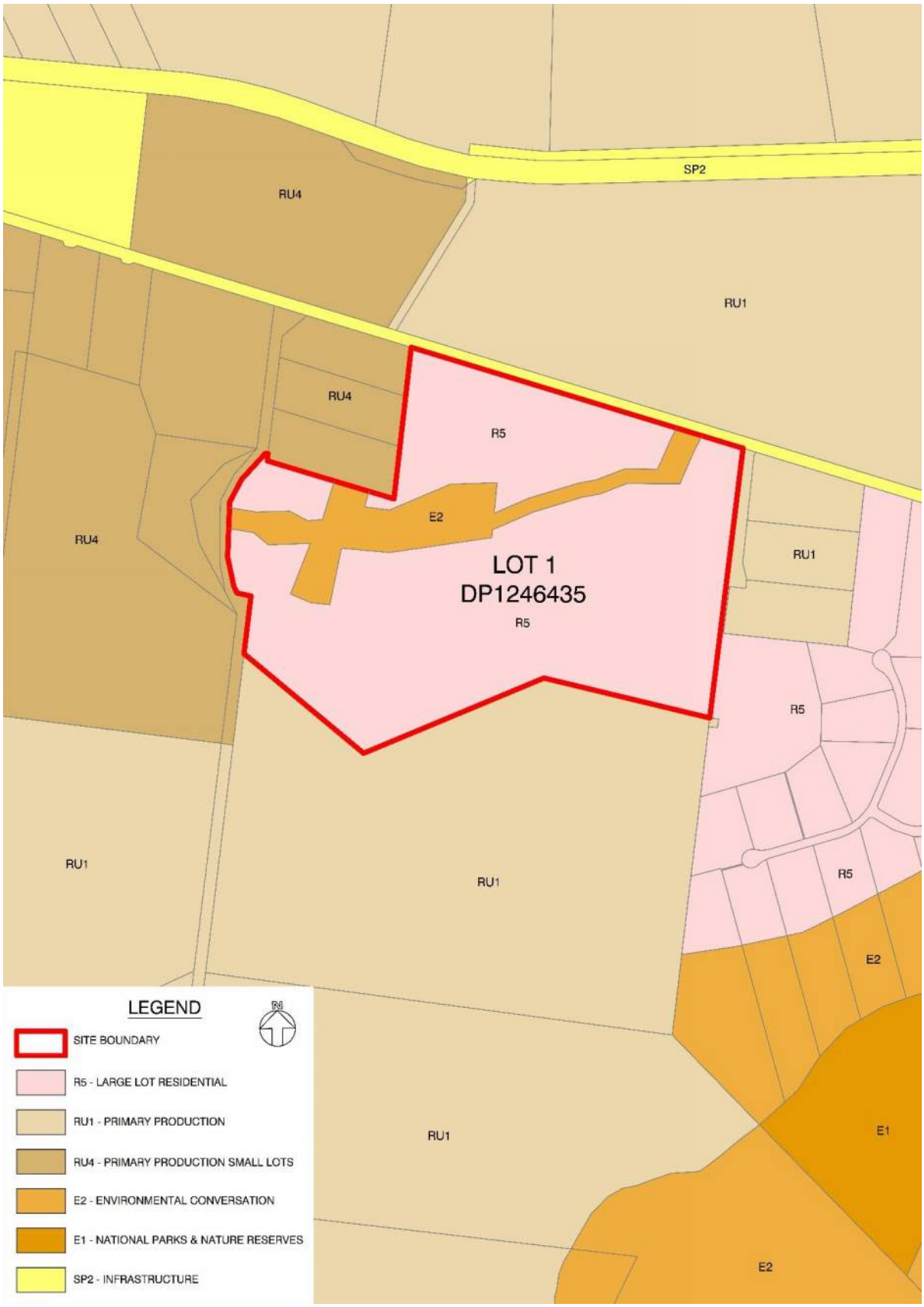
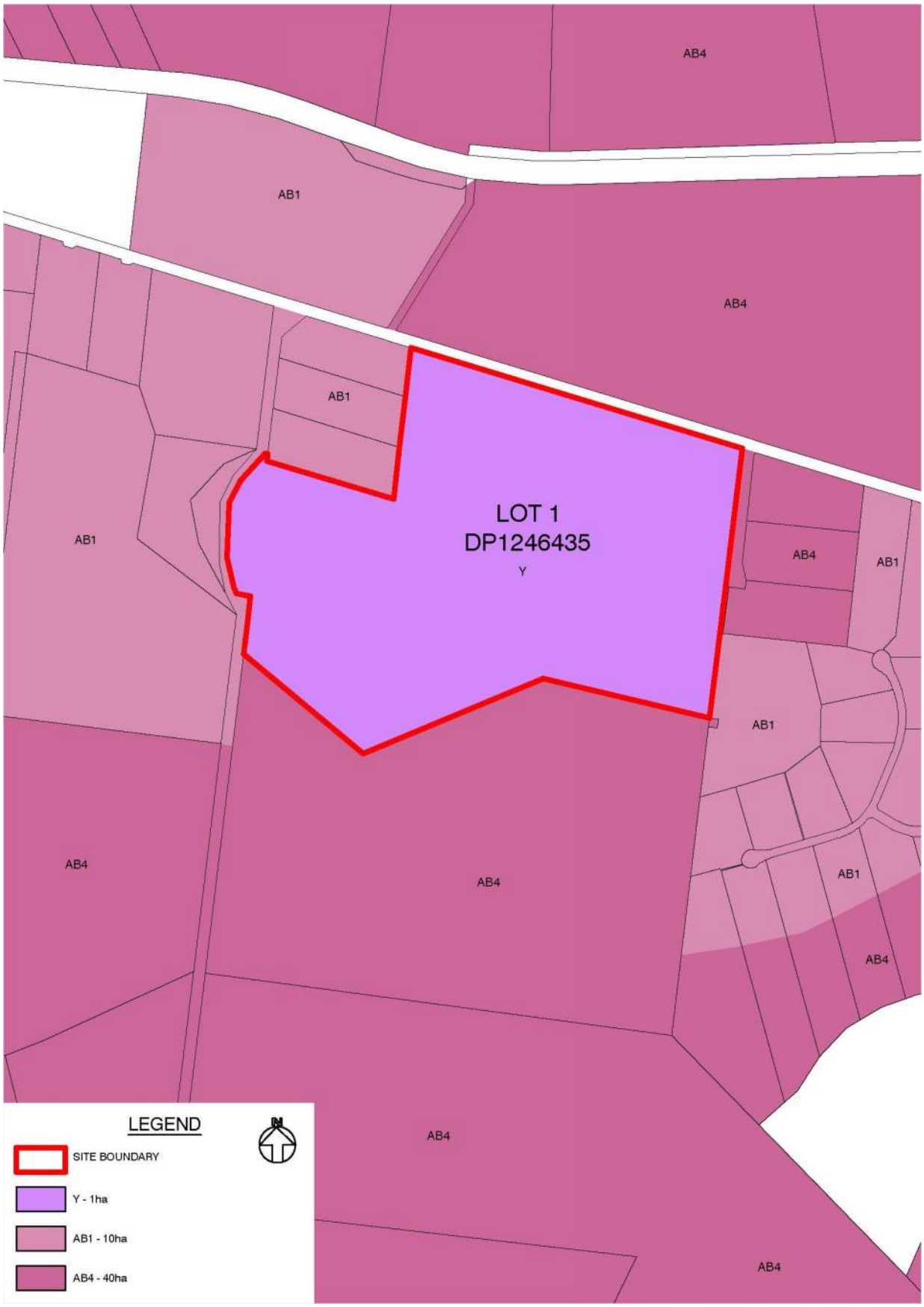


Figure 7 - Proposed Minimum Lot Size



6. PART 5 – COMMUNITY CONSULTATION

Informal consultation has already occurred with local real estate agents in preparing the PP and market assessment, to better understand the demand for rural lifestyle lots in the northern Shoalhaven. It is expected that the PP will be exhibited following Gateway determination and consultation with the RFS. As per the NSW *Guidelines for Preparing Planning Proposals*, the PP would be subject to an exhibition period of a minimum of 28 days.

7. PART 6 – PROJECT TIMELINE

The anticipated timeline for the PP is outline in **Table 1** below.

Table 1 - Project Timeline

TASK	ASSESSMENT
Lodgement of PP to Shoalhaven City Council	September 2019
Pre-Gateway Assessment and Report to Council	January 2020
Submit PP to DPE for Gateway determination	March 2020
Commencement date (date of Gateway determination)	April 2020
Completion of Gateway determination requirements	May 2020
Public Exhibition	June 2020
Consideration of Submissions	July 2020
Post exhibition consideration of PP	August 2020
Finalisation and notification of Plan	September 2020

8. CONCLUSION

The proposal to amend Shoalhaven LEP 2014 in relation to 55 Wire Lane, Berry for the purpose of enabling a rural residential development, is provided with the attached supporting information and in accordance with the NSW Government's Illawarra Shoalhaven Regional Plan.

The PP seeks to address a specific market demand for rural residential land in the northern Shoalhaven, and effectively presents as an infill rural residential proposal. As outlined in the report, the subject land has significant limitations in relation to its agricultural capability, and is not considered viable agricultural land. The proposal is supported by a number of specialist reports that demonstrates the suitability of the land for rural residential purposes.

Whilst some minor potential inconsistencies exist with Section 9.1 Directions, they are considered to be minor in nature and justified as detailed in this report. The outcome of the PP will provide a greater housing choice in the Shoalhaven and address a specific housing need / demand in the area.

APPENDIX A – STATE ENVIRONMENTAL PLANNING POLICIES

SEPP	RELEVANCE	NOT INCONSISTENT
No. 1 – Development Standards	X	
No 19 – Bushland in Urban Areas	X	
No 21 – Caravan Parks	X	
No 33 – Hazardous and Offensive Development	X	
No 36 – Manufactured Home Estates	X	
No 44 – Koala Habitat Protection	X	
No 47 – Moore Park Showground	X	
No 50 – Canal Estate Development	X	
No 55 – Remediation of Land	✓	✓
No 64 – Advertising Signage	X	
No 65 – Design Quality of Residential Apartment Development	X	
No 70 – Affordable Housing (Revised Schemes)	X	
Aboriginal Land (2019)	X	
Affordable Rental Housing (2009)	X	
BASIX (2004)	X	
Coastal Management (2017)	X	
Concurrences (2018)	X	
Educational Establishments and Child Care Facilities (2017)	X	
Exempt and Complying Development (2008)	X	
Gosford City Centre (2018)	X	
Housing for Seniors or People with a Disability (2004)	X	
Infrastructure (2007)	X	
Kosciuszko National Park—Alpine Resorts (2007)	X	
Kurnell Peninsula 1989	X	
Mining, Petroleum Production and Extractive Industries (2007)	X	
Miscellaneous Consent Provisions (2007)	X	
Penrith Lakes Scheme 1989	X	
Primary Production and Rural Development (2019)	X	
State and Regional Development (2011)	X	
State Significant Precincts (2005)	X	
Sydney Drinking Water Catchment (2011)	X	
Sydney Region Growth Centres (2006)	X	
Three Ports (2013)	X	
Urban Renewal (2010)	X	

SEPP	RELEVANCE	NOT INCONSISTENT
Vegetation in Non-Rural Areas (2017)	X	
Western Sydney Employment Area (2009)	X	
Western Sydney Parklands (2009)	X	

APPENDIX B – SECTION 9.1 DIRECTIONS

DIRECTION	APPLICABLE	RELEVANT	NOT INCONSISTENT
1 EMPLOYMENT AND RESOURCES			
1.1 Business and Industrial Zones	X		
1.2 Rural Zones	✓	✓	Potential minor inconsistency - justified
1.3 Mining, Petroleum Production and Extractive Industries	X		
1.4 Oyster Aquaculture	X		
1.5 Rural Lands	✓	✓	Potential minor inconsistency - justified
2 ENVIRONMENT AND HERITAGE			
2.1 Environment Protection Zones	✓	✓	✓
2.2 Coastal Management	X		
2.3 Heritage Conservation	✓	X	
2.4 Recreation Vehicle Areas	✓	X	
2.5 Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEPs	X		
3 HOUSING, INFRASTRUCTURE AND URBAN DEVELOPMENT			
3.1 Residential Zones	✓	✓	✓
3.2 Caravan Parks and Manufactured Home Estates	X		
3.3 Home Occupations	X		
3.4 Integrating Land Use and Transport	✓	✓	✓
3.5 Development Near Regulated Airports and Defence Airfields	X		
3.6 Shooting Ranges	X		
4 HAZARD AND RISK			
4.1 Acid Sulfate Soils	✓	X	
4.2 Mine Subsidence and Unstable Land	X		
4.3 Flood Prone Land	✓	X	
4.4 Planning for Bushfire Protection	✓	✓	✓

DIRECTION	APPLICABLE	RELEVANT	NOT INCONSISTENT
5 REGIONAL PLANNING			
5.1 Implementation of Regional Strategies	X		
5.2 Sydney Drinking Water Catchments	X		
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	X		
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	X		
5.9 North West Rail Link Corridor Strategy	X		
5.10 Implementation of Regional Plans	✓	✓	✓
6 LOCAL PLAN MAKING			
6.1 Approval and Referral Requirements	✓	✓	✓
6.2 Reserving Land for Public Purposes	X		
6.3 Site Specific Provisions	✓	✓	✓
7 METROPOLITAN PLANNING			
7.1 Implementation of A Plan for Growing Sydney	X		
7.2 Implementation of Greater Macarthur Land Release Investigation	X		
7.3 Parramatta Road Corridor Urban Transformation Strategy	X		
7.4 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	X		
7.5 Implementation of Greater Parramatta Priority Growth Area Land Use and Infrastructure Implementation Plan	X		
7.6 Implementation of Wilton Interim Land Use and Infrastructure Implementation Plan	X		
7.7 Implementation of Glenfield to Macarthur Urban Renewal Corridor	X		
7.8 Implementation of Western Sydney Aerotropolis Interim Land Use and Infrastructure Implementation Plan	X		
7.9 Implementation of Bayside West Precincts 2036	X		
7.10 Implementation of Planning Principles for the Cooks Cover Precinct	X		

Appendix C – Land Supply and Demand Analysis Report

Land supply and demand analysis report

South Coast Office: 02 4421 7155
Illawarra Office: 02 4229 7867

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PO Box 16
Nowra NSW 2541
valuations@wmval.com.au

www.wmval.com.au

On behalf of Indesco

Rural residential land
Northern Shoalhaven

Our reference: 20195011

VALUERS SINCE 1923
walsh & monaghan

Executive summary

Study background

Walsh & Monaghan has been commissioned to undertake a land supply and demand analysis for rural residential land in the Shoalhaven. The report is required to support a planning proposal to rezone land from RU1 Primary Production and RU4 Primary Production Small Lots to R5 Large Lot Residential, with a minimum lot size of 1 hectare.

The property which is the subject of the planning proposal is No 55, Wire Lane, Berry (Lot 1 in Deposited Plan 1246435).

Conclusions

Our searches indicate there are few large lot residential homesites available in the northern Shoalhaven, and we have identified only four sites currently for sale north of the Shoalhaven River and east of the Cambewarra Mountain range. Of these, only one is at Berry, and the other three are 4,000 square metre sites at Bangalee.

There are 79 sites currently proposed in three proposed subdivisions at Bangalee, Tapitallee and Kangaroo Valley, however 77 of these are basically 4,000 square metre sites. The prospective purchaser of the sites proposed to be developed within the subject property are highly unlikely to consider the 4,000 square metre sites, due to the significant difference in location, size, views and standard of surrounding development.

While there is land identified in two localities which, in theory, are capable of subdivision when area controls are considered, significant constraints on these sites will in all likelihood limit further subdivision.

While the market for standard residential lots has slowed considerably since the start of 2018, local real estate agents have advised there remains strong demand for large lot residential home sites. The market for rural residential property, generally remains strong with supply limited to improved property. Sale prices are reflecting amounts similar to the equivalent cost of purchasing vacant land and constructing a new dwelling. This can be considered more desirable than purchasing an existing dwelling, in that the buyer has the ability to design and construct a dwelling of their choice.

There has not been enough transactions of large lot residential homesites to determine accurately the sales rates that could be expected for sites of this nature. Given the current demand and historic sales rates for Campbells Run and Berry Beach Estate, it could be expected sales volume of between 15 and 20 lots per annum could be achieved.

The proposed development at 510 Beach Road will obviously be for a similar product to that which is proposed for the subject site, however the total number of lots created between the two projects are considered capable of being absorbed in the market over a two to three year period, as was done previously with the Berry Beach and Campbells Run Estates.

This executive summary must be read in conjunction with the entire report and the details contained therein.

Assumptions, disclaimers, limitations and qualifications summary

This valuation report is provided subject to the assumptions, disclaimers, limitations and qualifications detailed throughout this report. Reliance on this report and extension of Walsh & Monaghan's liability is conditional upon the reader's acknowledgement and understanding of these statements. This valuation is for the use only of the party to whom it is addressed and for no other purpose. No responsibility is accepted to any third party who may use or rely on the whole or any part of the content of this valuation.

Prepared by
Walsh and Monaghan Pty Limited

Peter Adlington AAPI
Certified Practising Valuer
API Member 68369

VALUERS SINCE 1923
walsh & monaghan

Contents

1.0 Introduction and instructions

1.1 Study background

Walsh & Monaghan has been commissioned to undertake a land supply and demand analysis for rural residential land in the Shoalhaven. The report is required to support a planning proposal to rezone land from RU1 Primary Production and RU4 Primary Production Small Lots to R5 Large Lot Residential.

The property which is the subject of the planning proposal is No 55, Wire Lane, Berry (Lot 1 in Deposited Plan 1246435).

1.2 Instructing party and client details

Our instructions have been received from:

Mr Mark Rigoni
Principal Civil Engineer
Indesco Pty Ltd
Ground floor, 25 Atchison Street
Wollongong NSW 2500

On behalf of:

Merveilleux Pty Ltd

1.3 Instructions

My instructions are to provide:

1. An analysis of the current availability of vacant large lot residential home sites in the Northern Shoalhaven;
2. An analysis of the amount of undeveloped land (englobo sites) capable of subdivision into large lot residential home-sites;
3. Comment on the demand for large lot residential home sites in Berry; and
4. An analysis of the sales rates and volumes of vacant large lot residential sites in the Shoalhaven.

Neither the valuer nor any member of our firm has any conflict of interest or direct or indirect financial interest in relation to the property nor any parties to the transaction including agent, purchaser, seller, developer or associated entities.

2.0 Site description

2.1 Location

The subject land is an irregular shaped parcel situated on the southern side of Beach Road, approximately four kilometres east from the township of Berry. It is within an area of rural and rural-residential development, ranging from one hectare homesites to larger grazing holdings.

At the 2016 census, Berry and its surrounding localities had a population of 4,599. It is at the northern end of the City of Shoalhaven, which had a population of 101,942.

2.2 Topography

The subject land is an irregular shaped site, which has a main frontage to Beach Road, and smaller frontages to Wire Lane (western boundary) and Sunnymede Lane (Eastern Boundary). It is mainly cleared and pastured, rising generally from its north eastern corner to the west. The land rises either side of a gully which traverses the western part of the land in a west to east direction. The land is currently improved with a dwelling and associated shedding.

Figure 1 - Location map
(Source: EAC online mapping)

The land is currently zoned RU1 Primary Production with a minimum lot size of 40 hectares and RU4 Primary Production Small Lots with a minimum lot size of 10 hectares. It is proposed to rezone the land to R5 Large Lot Residential with a minimum of 1 hectare.

Figure 2 – Site Plan
(Source: Indesco Ref: ISC00016 C01)

Photographs of the subject land taken from Sunnymede Lane

3.0 Current availability of vacant large lot residential home sites in the Northern Shoalhaven

3.1 Land currently for sale

The subject land is fairly typical of properties in the areas surrounding Berry, popular in the market for their proximity to the town and beaches, accessibility to the Princes Highway, and attractive rural outlook.

For the purposes of this report, it is considered relevant to investigate land availability in localities no further south than Nowra. While there are rural residential areas further south in the Shoalhaven, they are very different to Berry, and the prospective purchasers of rural-residential land in the Berry area are highly unlikely to consider areas further south than the Shoalhaven River. Areas further south lack the rural character, proximity to Sydney and perceived prestige associated with Berry. Nevertheless, we have investigated areas extending south to Worrigee and Nowra Hill, and west to Kangaroo Valley.

To establish the availability of vacant large lot residential homesites in these areas we have:

- Searched web sites including Realestate.com, Domain and Allhomes;
- Searched the websites of the real estate agents active in Berry and the wider northern Shoalhaven;
- Conducted a general Google search for land for sale in these areas;
- Made enquiries with local agents; and
- Driven through existing large lot residential subdivisions searching for 'for sale signs'.

There is very little land currently for sale in these areas, with only one property for sale in close proximity to Berry. Other than three 4,000 square metre sites at Bangalee, approximately 21 kilometres south-west of Berry, the other lots for sale are at Worrigee and Nowra Hill, both approximately 25 kilometres south of Berry. The available lots summarised as follows:

Property	Area	Agent	Description
Lot 4 Kangaroo Valley Road, Berry	1.98 hectares	Ray White Berry	A vacant homesite situated on Berry Mountain. Electricity services only.
Lot 302 Swanwood Rise, Worrigee	1.3 hectares	Raine and Horne Nowra	A vacant site approximately eight kilometres south-east from Nowra. Serviced with water and electricity.
Lot 303 Swanwood Rise, Worrigee	2.8 hectares	Raine and Horne Nowra	A vacant site approximately eight kilometres south-east from Nowra. Serviced with water and electricity.
Lot 305 Swanwood Rise, Worrigee	1.2 hectares	Raine and Horne Nowra	A vacant site approximately eight kilometres south-east from Nowra. Serviced with water and electricity.
Lot 2 Grey Gum Close, Nowra Hill	3.26 hectares	Ray White Nowra	A vacant site approximately nine kilometres south west from Nowra. Serviced with water and electricity.
4 Hickory Crescent, Bangalee	4,027 square metres	Ray White Nowra	A vacant R2 Low Density zoned site, situated within the Woodridge Estate.
10 Sandstone Place, Bangalee	4,039 square metres	Elders Nowra	A vacant R2 Low Density zoned site, situated within the Woodridge Estate.
22 Tallimba Road, Bangalee	4,070 square metres	Elders Nowra	A vacant R2 Low Density zoned site, situated within the Woodridge Estate.

3.2 Land subject to existing subdivision consent or current subdivision applications

We are aware of three proposed subdivisions north of the Shoalhaven River, intending to create minimum 4,000 square metre sites. While these subdivisions will create a total of seventy nine (79) lots, the market for lots of this nature is considered quite different to the lots that would be created by the subject planning proposal.

Woodridge Estate, Bangalee

There are currently two applications to vary the original consent to create ten (10) lots off Sitella Circuit and another ten (10) lots off Counsell Road, varying in size between 4,038 square metres and 4,790 square metres. This land is zoned R2 Low Density Residential.

Tangala Estate, Tapitallee

Forty-nine (49) lots currently being developed off the southern side of Illaroo Road and western side of Bangalee Road at Tapitallee. Sites range in size between 4,001.6 square metres and 4,569 square metres. The land is zoned R2 Low Density Residential.

Lot 14 DP773481 Moss Vale Road Kangaroo Valley

An approved ten (10) lot subdivision off the eastern side of Moss Vale Road, just north of Hampton Bridge. The subdivision will consist of eight (8) lots ranging in size from 4,267 square metres and 6,023 square metres and two larger lots of 3.69 hectares and 6.2 hectares. The land is zoned R5 Large Lot Residential and E3 Environmental Management, with residential development limited to the R5 zoned part.

3.3 Sales of rural-residential homesites

Of the existing large lot residential areas around Berry, the most recently undertaken subdivisions were Campbells Run, which adjoins the subject property to the east and Berry Beach Estate, further east off the southern side of Beach Road. Both of the estates were developed around 2002, with the most lots selling within twelve months of completion. The last remaining vacant lot in those subdivisions sold in 2017.

Opposite to the west of the subject land on Wire Lane, a disused quarry was sold by Shoalhaven Council, and approximately one kilometre north west a one hectare site adjoining the south coast rail line was sold. Both of these transactions were in 2017.

In 2018, contracts were exchanged for the sale of two sites in Kangaroo Valley Road. These two adjoining lots had areas just over 4,000 square metres and were the most recent large lot residential homesites in Berry. Details of the sales are as follows:

Property	Area	Sale date	Sale price	Description
Lot 32, 79 Kangaroo Valley Road	4,026m2	June 2018	$1,000,000	A slightly sloping site which has been subdivided off the rear of a battleaxe lot on the southern side of Kangaroo Valley Road
Lot 31, 79 Kangaroo Valley Road	4,217m2	June 2018	Reported $1,000,000	A slightly sloping site which has been subdivided off the rear of a battleaxe lot on the southern side of Kangaroo Valley Road
35 Harley Hill Road	1.09ha	September 2017	$600,000	A battleaxe site adjoining the south coast rail line approximately three kilometres east of Berry
37 Ashworth Place	4.458ha	July 2017	$1,400,000	A larger elevated site in the Campbells Run estate approximately six kilometres east of Berry
6 Coomenderry Ridge	2.348ha	July 2017	$1,800,000	An elevated site in the Campbells Run estate approximately seven kilometres east of Berry. The land had shedding and significant landscaping, however no dwelling
Lot 1 and 1 Wire Lane, Berry	3.185ha	June 2017	$760,000	Two adjoining lots forming an irregular shaped parcel on the western side of Wire lane, approximately four kilometres east of Berry. The land was formerly a quarry and has also been used for stockpiling.

4.0 Analysis of the amount of undeveloped land (englobo sites) capable of subdivision into large lot residential home-sites

4.1 Land with existing zones allowing large lot residential subdivision

For the purposes of this report we have limited our analysis to lots larger than five (5) hectares where there are minimum lot size restrictions of one hectare. While in some instances a five hectare lot could, in theory, be subdivided to create five lots, a development of this size is not considered to significantly impact on the market in terms of supply and demand.

In other areas we have identified sites with minimum lot sizes of ten hectares, due to the lot averaging provisions in the Shoalhaven Local Environmental Plan 2014, which in certain areas limit development to one lot per ten hectares or four lots per ten hectares.

In the Shoalhaven, land capable of rural-residential subdivision is generally zoned R5 Large Lot Residential or RU4 Primary Production Small Lots, and to a lesser extent E4 Environmental Living and R2 Low Density.

While the Lot Size Map may show a minimum lots size of one hectare, Clause 4.2B of Shoalhaven LEP 2014 includes further controls on the number of lots that can be created in certain areas. Of relevance are the subclauses relating to Bundewallah Road, Berry and the vicinity of Illaroo Road, Tapitallee:

> ***4.2B Subdivision of certain land in Zone RU1, Zone RU2, Zone RU4, Zone R5 and Zone E4***
>
> *(1) This clause applies to land in the following zones:*
>
> *(a) Zone RU1 Primary Production,*
>
> *(b) Zone RU2 Rural Landscape,*
>
> *(c) Zone RU4 Primary Production Small Lots,*
>
> *(d) Zone R5 Large Lot Residential,*
>
> *(e) Zone E4 Environmental Living.*
>
> *(2) Despite clause 4.1, land identified as prime crop and pasture land in a zone to which this clause applies may only be subdivided if the consent authority is satisfied that each lot created by the subdivision will contain at least 10 hectares of prime crop and pasture land.*
>
> *(3) Despite clause 4.1:*
>
> *(a) land identified as "Locality 1" on the Lot Size Map (in the vicinity of Bundewallah Road, Berry) may be subdivided into lots with a minimum lot size of 1 hectare and a maximum of 4 lots per 10 hectares, and*
>
> *(b) ……*
>
> *(c) ……. and*
>
> *(d) land identified as "Locality 4" on the Lot Size Map (in the vicinity of Illaroo Road, Tapitallee) may be subdivided into:*
>
> *(i) north of Illaroo Road—lots with a minimum lot size of 1 hectare and a maximum of one lot per 10 hectares, or*
>
> *(ii) south of Illaroo Road—lots with a minimum lot size of 1 hectare and a maximum of 4 lots per 10 hectares, or*
>
> *(iii) in the case of a lot located south of Illaroo Road with an area of between 3 and 5 hectares—into no more than 2 lots, …*

In addition to the controls in Shoalhaven LEP 2014, Shoalhaven Development Control Plan 2014 includes a specific chapter for rural lifestyle areas. *Chapter V1: Lot Averaging Subdivision* relates to several areas identified for rural residential subdivision. Its purpose, application, context and objectives are:

1. Purpose

The purpose of this Chapter is to outline controls and guidelines for 'rural lifestyle areas' in Shoalhaven.

2. Application

This Chapter applies to all land within localities 1-8 identified in Clause 4.2B of Shoalhaven LEP 2014.

3. Context

This Chapter outlines the lot averaging controls that must be addressed in a subdivision application for 'rural lifestyle areas' as identified in Clause 4.2B in Shoalhaven LEP 2014.

Lot averaging provides a more flexible method of subdivision in certain areas and can:

- *Establish a pattern of future residential use of the land;*
- *Allow the creation of a variety of lot sizes of a specified average area; and*
- *Allow the creation of a residue area of environmentally sensitive land or agricultural land to be set aside for protection or future use.*

This is different to the standard form of subdivision controls that rely on a minimum lot size (for example 1 or 2 hectare lots) across the whole of an appropriately zoned property.

Lot averaging is generally better able to match the pattern of subdivision to landscape features or characteristics, such as environmentally sensitive lands, valuable crop and pasture land or topographic features. This means that a development can have a reduced likelihood of fragmenting rural land, significantly diminishing bio-diversity, degrading air and water quality and resulting in significant cost being borne by future generations in the long term. There is also a greater potential for vegetation retention when designing bushfire asset protection zones and effluent disposal envelopes and more cost effective provision of infrastructure.

4. Objectives

The objectives are to:

i. Ensure allotments created for small holdings are of an area and an arrangement that:

- *Enables the provision of an adequate water supply for domestic and bushfire protection purposes;*
- *Enables effective disposal of domestic waste;*
- *Minimises the creation of traffic hazards;*
- *Provides adequate control of pollution of water supply catchments; and*
- *Minimises the impact on native vegetation and habitat.*

ii. Ensure development is carried out in a way that is sensitive to the topographic and environmental characteristics of the land.

iii. Minimise the cost to the community of providing, extending and maintaining public amenities and services.

iv. Ensure small holding development does not prejudice the interests of agricultural producers in the vicinity and minimise the impact on the natural attractions and amenity enjoyed by permanent residents and visitors;

v. *Safeguard indigenous vegetation and habitats and to rehabilitate appropriate parts of the landscape that has been disturbed or degraded.*

vi. *Ensure development is consistent with and promotes the principles of ecologically sustainable development.*

Additional objectives for each locality (were relevant) are set out in Section 5 below.

Chapter V1 includes locality specific controls:

> ***"5.9 Locality Specific Controls***
>
> *This section shows the land to which the locality specific provisions apply (based on Shoalhaven LEP 2014 Clauses Map and Clause 4.2B) and includes locality specific, key objectives and performance criteria where relevant."*

In the areas north of Nowra, there are two localities identified in clause 4.2B of Shoalhaven LEP 2014.

4.2 Locality 1 – Bundewallah Road, Berry

Bundewallah Road, Berry extends north west off Kangaroo Valley Road, approximately two kilometres west from the Berry town centre. It extends approximately three kilometres through a valley roughly north east of Berry Mountain. The land in the locality is zoned partly R5 Large Lot Residential and partly RU4 Primary Production Small Lots, with a minimum lot size of one hectare and a maximum of four lots per hectare.

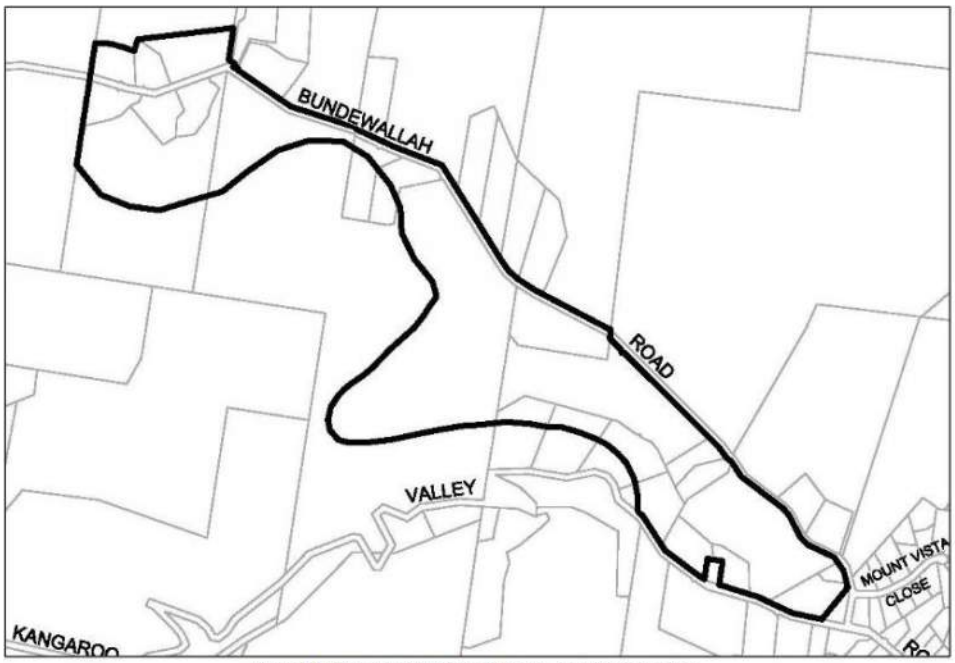


Figure 1: Bundewallah Road, Berry - application map

The specific objective is to:

i. *Provide for a lifestyle and rural character which is primarily non-agricultural.*

Figure 3 – Bundewallah Road, Berry Application Map and Objectives
(Source: Shoalhaven DCP 2014)

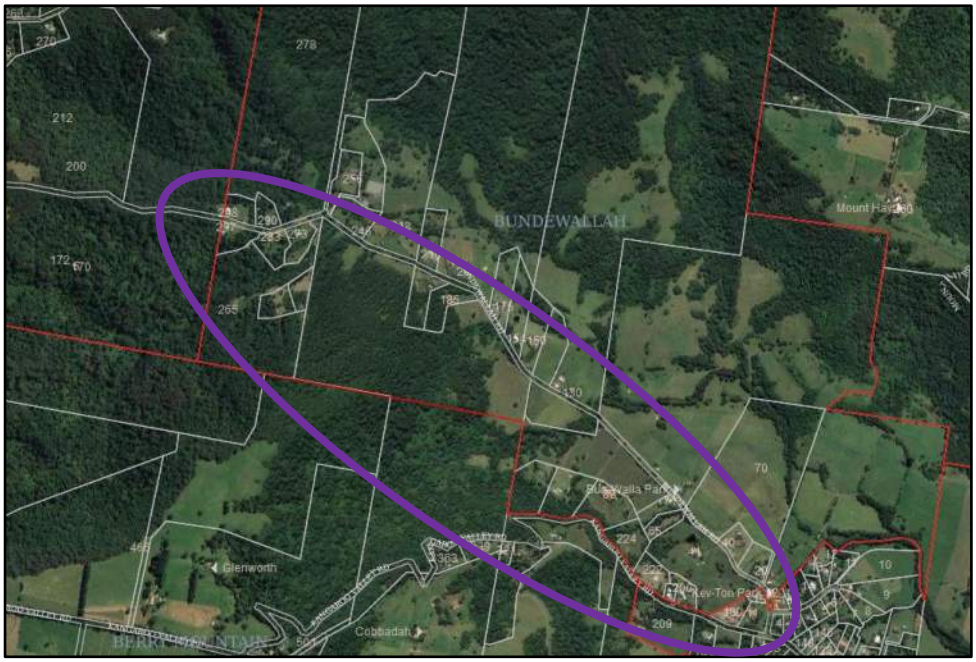
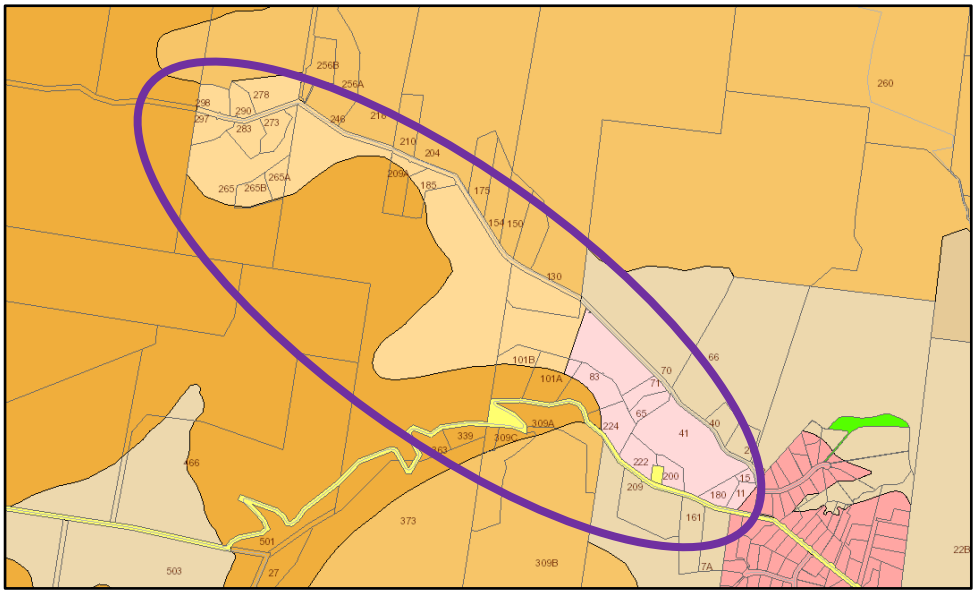


Figure 4 – Aerial Photograph showing approximate location of Locality 1
(Source: EAC online mapping)



B1	Neighbourhood Centre	B2	Local Centre	B3	Commercial Core
B4	Mixed Use	B5	Business Development	B6	Enterprise Corridor
B7	Business Park	E1	National Parks and Nature Reserves	E2	Environmental Conservation
E3	Environmental Management	E4	Environmental Living	IN1	General Industrial
IN2	Light Industrial	IN3	Heavy Industrial	IN4	Working Waterfront
R1	General Residential	R2	Low Density Residential	R3	Medium Density Residential
R4	High Density Residential	R5	Large Lot Residential	RE1	Public Recreation
RE2	Private Recreation	RU1	Primary Production	RU2	Rural Landscape
RU3	Forestry	RU4	Primary Production Small Lots	RU5	Village
RU6	Transition	SP1	Special Activities	SP2	Infrastructure
SP3	Tourist	W1	Natural Waterways	W2	Recreational Waterways
W3	Working Waterways	DM	Deferred Matter	JE	Shoalhaven LEP (Jerberra Estate) 2014
MD	SEPP (Major Development) 2005	UL	Unzoned Land		

Figure 5 – Zoning Map showing R5 and RU4 zoned areas in Locality 1
(Source: Shoalhaven Online Mapping)

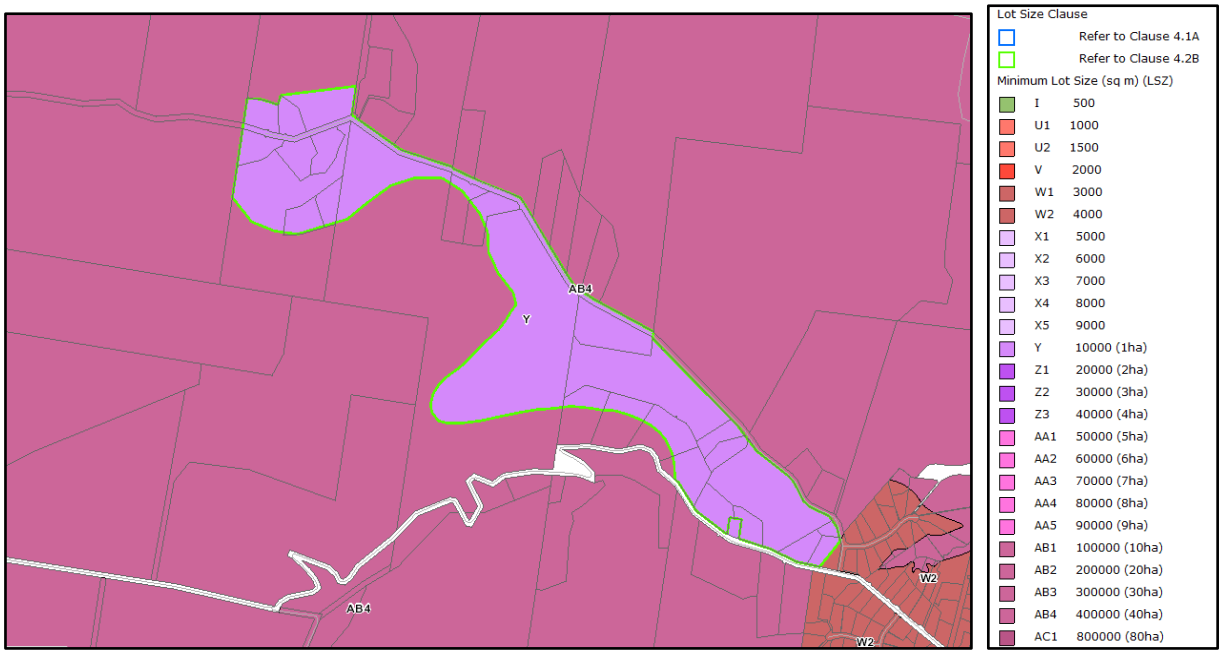


Figure 6 – Lot Size Map showing minimum lot size in Locality 1 as one hectare
(Source: Shoalhaven Online Mapping)

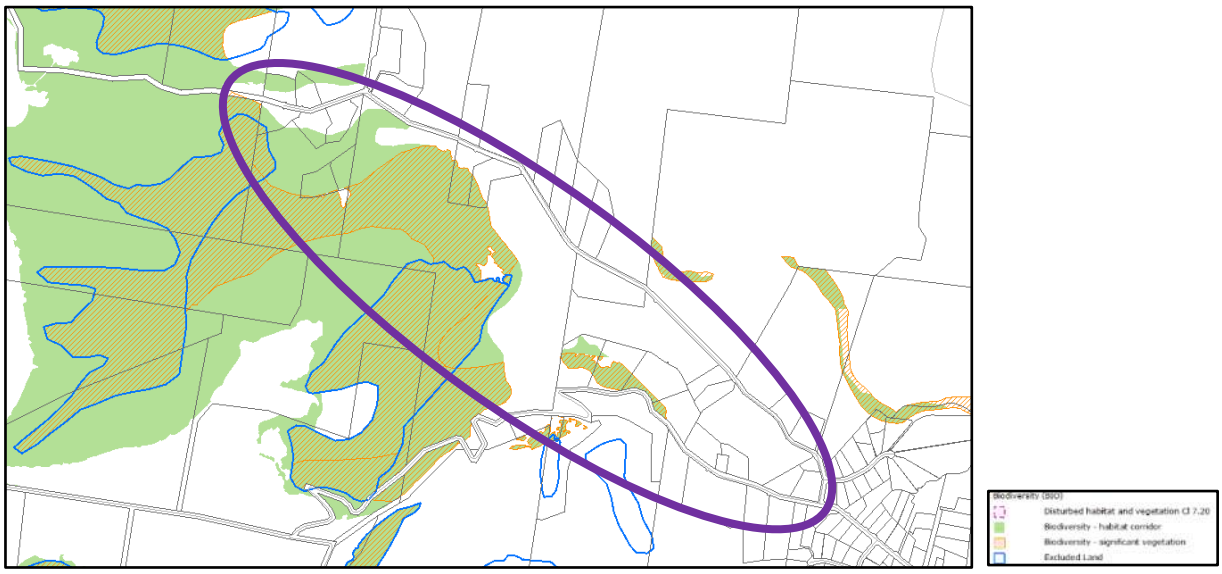


Figure 7 – Biodiversity Map showing lots in Locality 1
(Source: Shoalhaven Online Mapping)

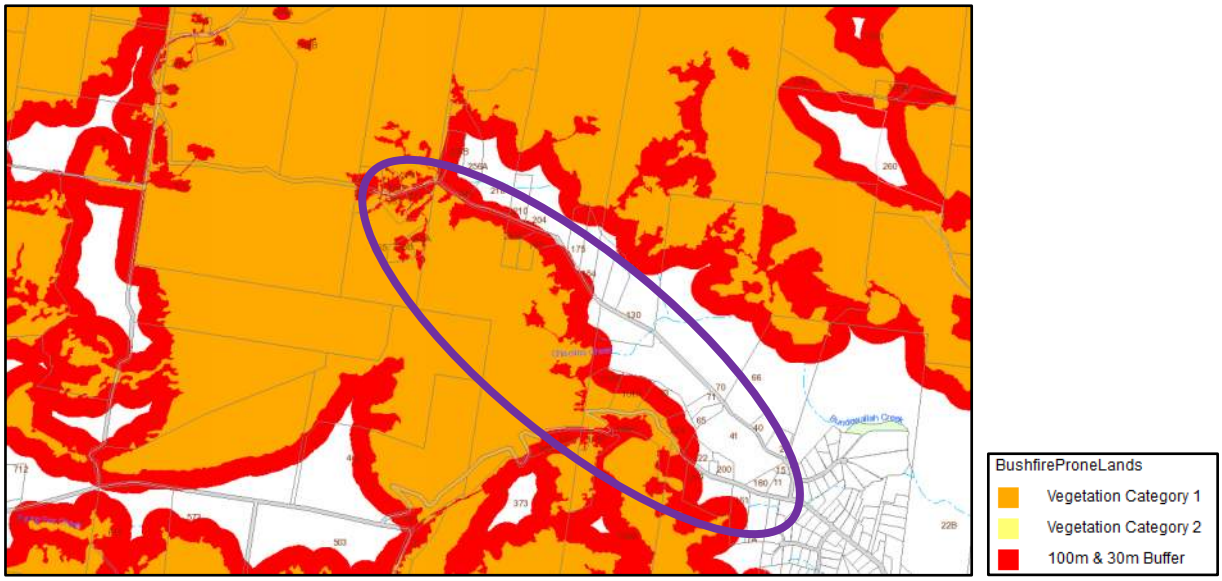


Figure 8 – Bush Fire Map showing lots in Locality 1
(Source: Shoalhaven online mapping)

Within the Bundewallah Road locality, we can identify only three lots with the necessary site area to enable subdivision.

Lot 2 Deposited Plan 1116194 has an area of 74.75 hectares. It has two separate frontages, with a primary frontage to Bundewallah Road and a secondary southern frontage to Kangaroo Valley Road. The part of the land within Locality 1 is zoned RU4 Primary Production Small Lots with the balance of the land zoned E2 Environmental Conservation. The Environmental Conservation zoned part of the land has a minimum lot size of 40 hectares. In addition, much of the land is identified on the biodiversity map as being within a habitat corridor with significant vegetation, with the riparian lands and watercourses map identifying Category 2 and 3 watercourses. Nearly all of the land is bushfire prone and much of the land is steep and heavily timbered. The areas outside of the constrained part of the site include timbered and cleared land.

Number 83 Bundewallah Road is a 10.04 hectare site which is zoned part R5 Large Lot Residential and part RU4 Primary Production Small Lots. The western part of this lot is traversed by a Category 2 and 3 Watercourses, however the balance of the land has enough area to enable its subdivision.

Number 41 Bundewallah Road is an 8.4 hectare site zoned R5 Large Lot Residential. The Riparian Lands Map indicates it is traversed by two Category 3 Watercourses.

Without further investigation it is not possible to ascertain the likely number of lots capable of being created in this location, however the significant constraints suggest the maximum number based on site area controls is considered unlikely to be achieved.

4.3 Locality 4 – Illaroo Road, Tapitallee

This is an area on either side of Illaroo Road, approximately ten kilometres north west from the Nowra town centre and 20 kilometres south west from Berry. It is in the foothills of Browns Mountain and ranges from moderately to steeply sloping land, much of which was former grazing holdings, but with a large proportion of timbered areas. Over the years there has been significant subdivision of concessional allotments which may prevent further subdivision, despite the larger residue lots in those subdivision having the necessary minimum lot size for a subdivision. Additionally, there are significant areas identified on the Biodiversity map as habitat corridor and significant vegetation as well as many watercourses identified on the Riparian Lands Map. The greater proportion of the land is identified as bushfire prone.

Most of this locality is zoned RU4 Primary Production Small Lots, however there is a small part zoned E2 Environmental Conservation.

The Lot Size Map indicates a minimum lot size of 1 hectare with Clause 4.2B (3)(D) further restricting subdivision as follows:

> *(3)*
>
> *(d) land identified as "Locality 4" on the Lot Size Map (in the vicinity of Illaroo Road, Tapitallee) may be subdivided into:*
>
> *(i) north of Illaroo Road—lots with a minimum lot size of 1 hectare and a maximum of one lot per 10 hectares, or*
>
> *(ii) south of Illaroo Road—lots with a minimum lot size of 1 hectare and a maximum of 4 lots per 10 hectares, or*
>
> *(iii) in the case of a lot located south of Illaroo Road with an area of between 3 and 5 hectares—into no more than 2 lots, …*

Chapter V1 of the DCP identifies the locality and its specific objectives as follows:

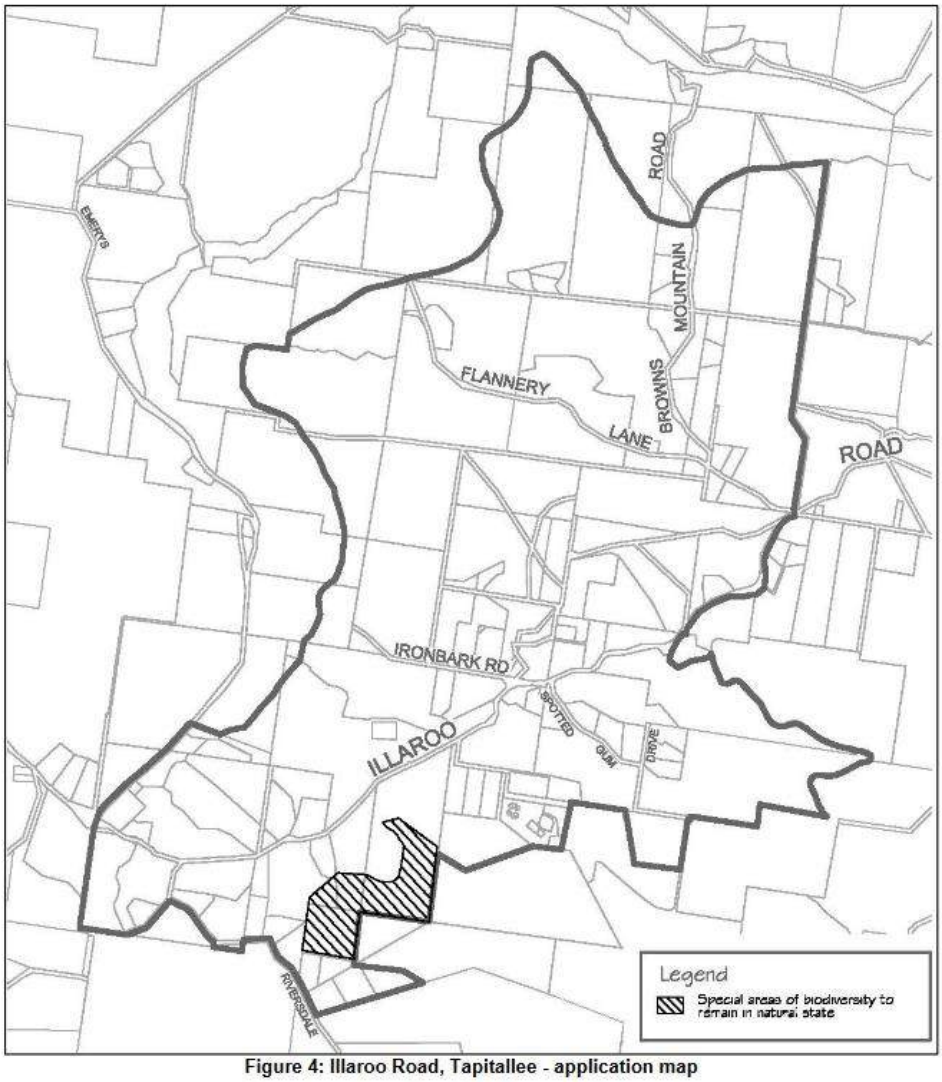


Figure 4: Illaroo Road, Tapitallee - application map

The specific objectives are to:

i. *Recognise the potential for periodic bush fire in the locality and to ensure that adequate bush fire protection measures are provided, particularly for the area south of Illaroo Road and for each individual development in that area.*
ii. *Recognise the presence of prime crop and pasture land and to provide opportunities for small scale part time farming.*
iii. *Provide for a non-agricultural lifestyle primarily south of Illaroo Road.*
iv. *Ensure that ribbon development does not occur along Illaroo Road.*
v. *Retain as much as possible of the native vegetation in the area.*
vi. *Maintain the agricultural landscape north of IllarooRoad.*
vii. *Ensure that development does not take place on prominent ridges.*
viii. *Recognise the need to conserve strategic vegetation communities and the presence of biodiversity habitat south of Illaroo Road.*
ix. *Provide only a basic level of services to the area in keeping with its low development potential and the potential impact of reticulated water supply on waste water volumes.*

Additional development controls:

i. Development does occur on land with a slope in excess of 20% (1:5) so as to minimise erosion potential.

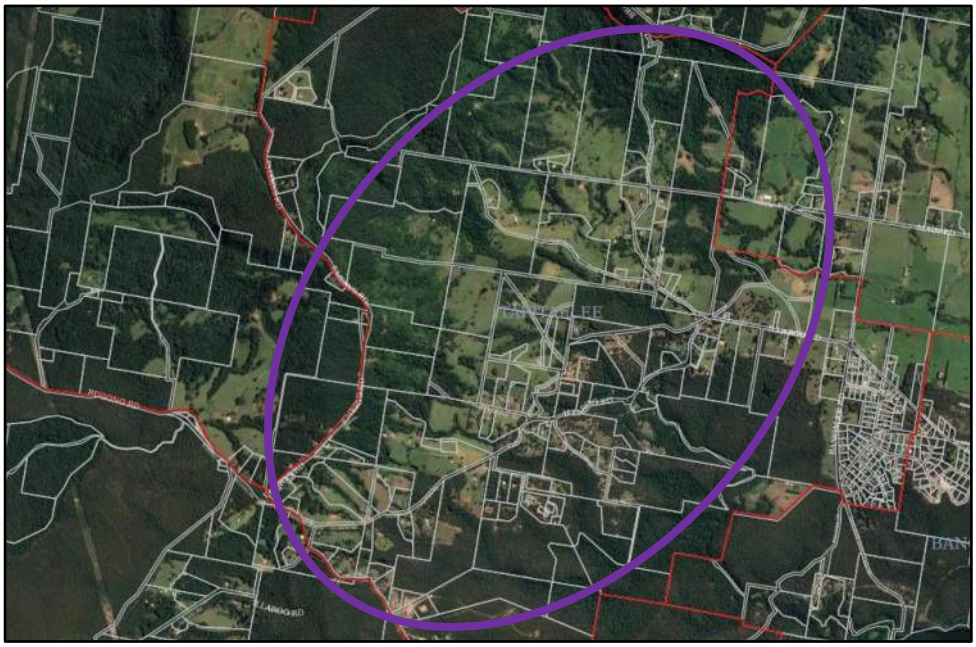
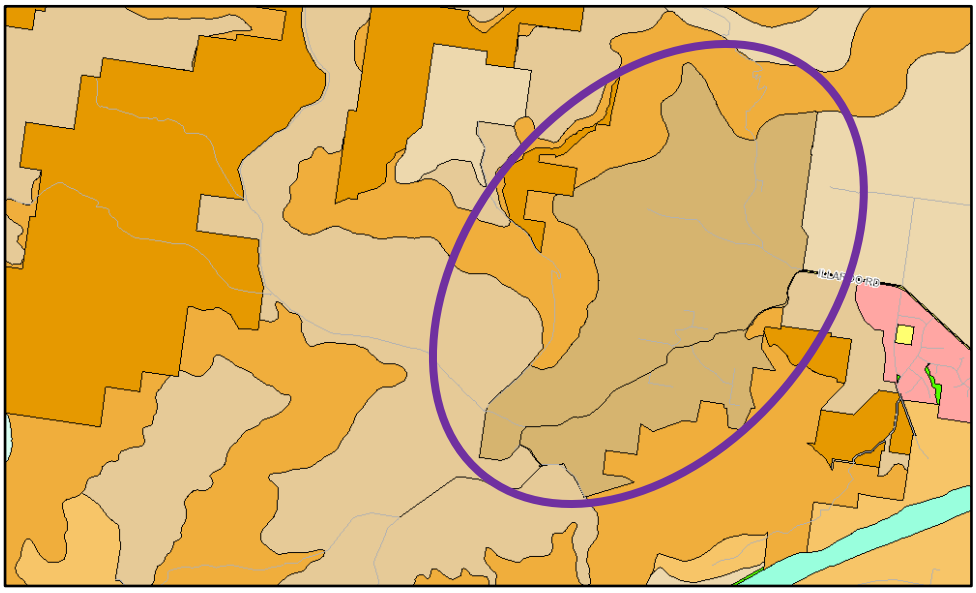


Figure 9 – Aerial Photograph showing approximate location of Locality 4
(Source: EAC online mapping)



RU4 Primary Production Small Lots

Figure 10 – Zoning Map showing Locality 4
(Source: Shoalhaven Online Mapping)

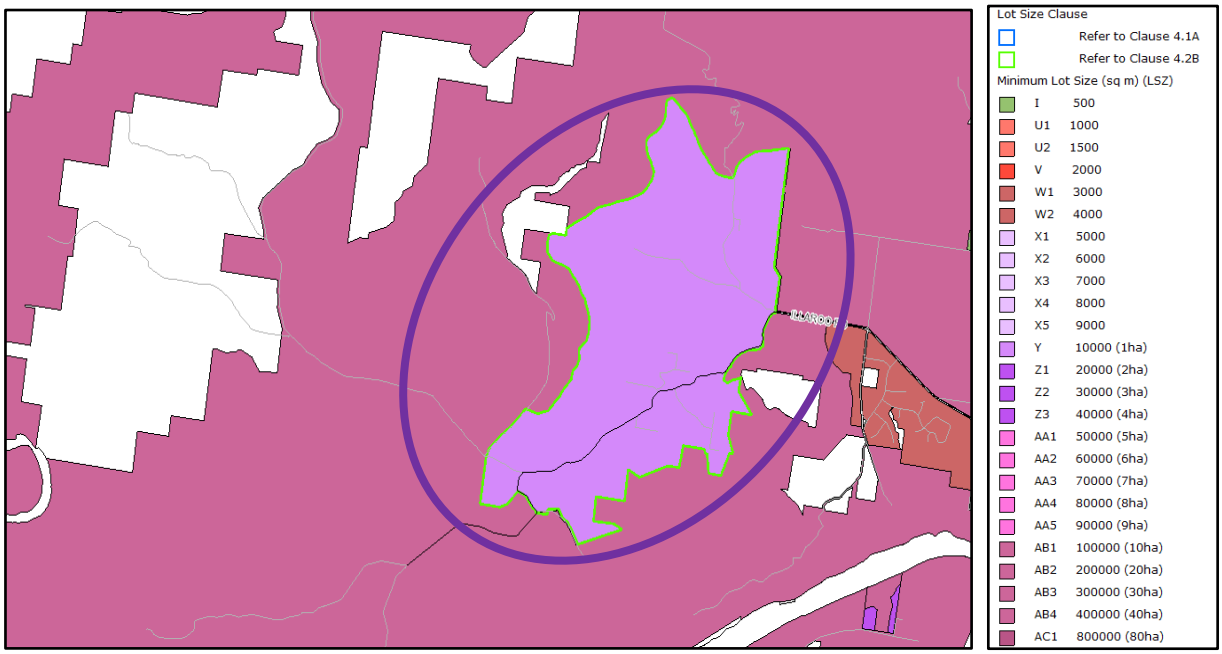


Figure 11 – Minimum Lot Size Map showing Locality 4
(Source: Shoalhaven Online Mapping)

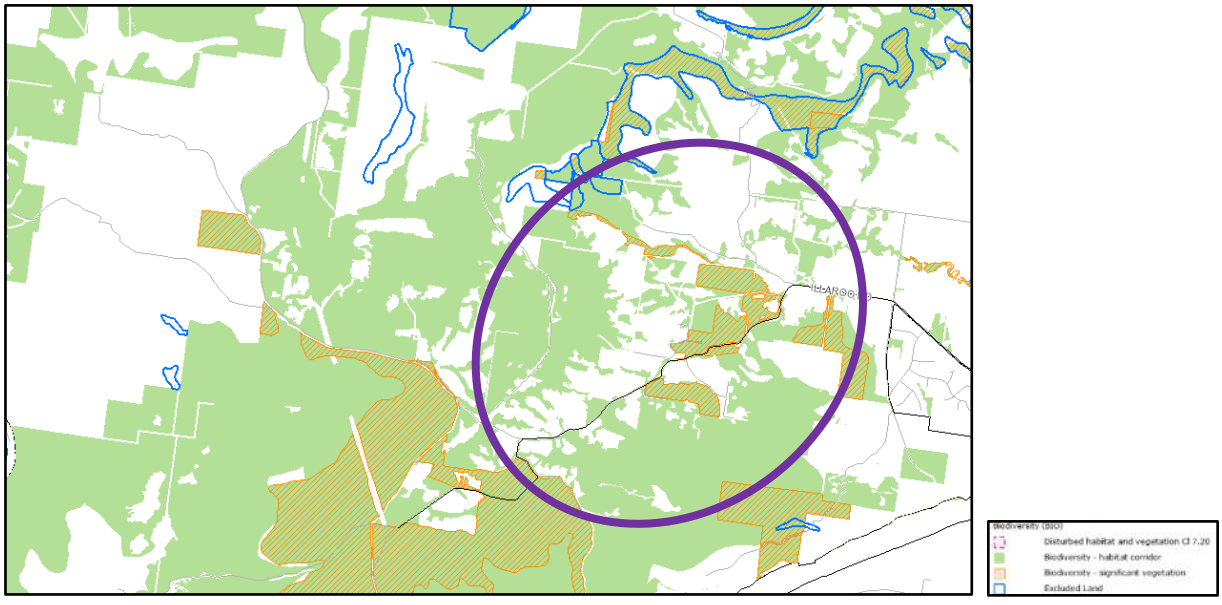


Figure 12 – Biodiversity Map showing approximate location of Locality 4
(Source: Shoalhaven Online Mapping)

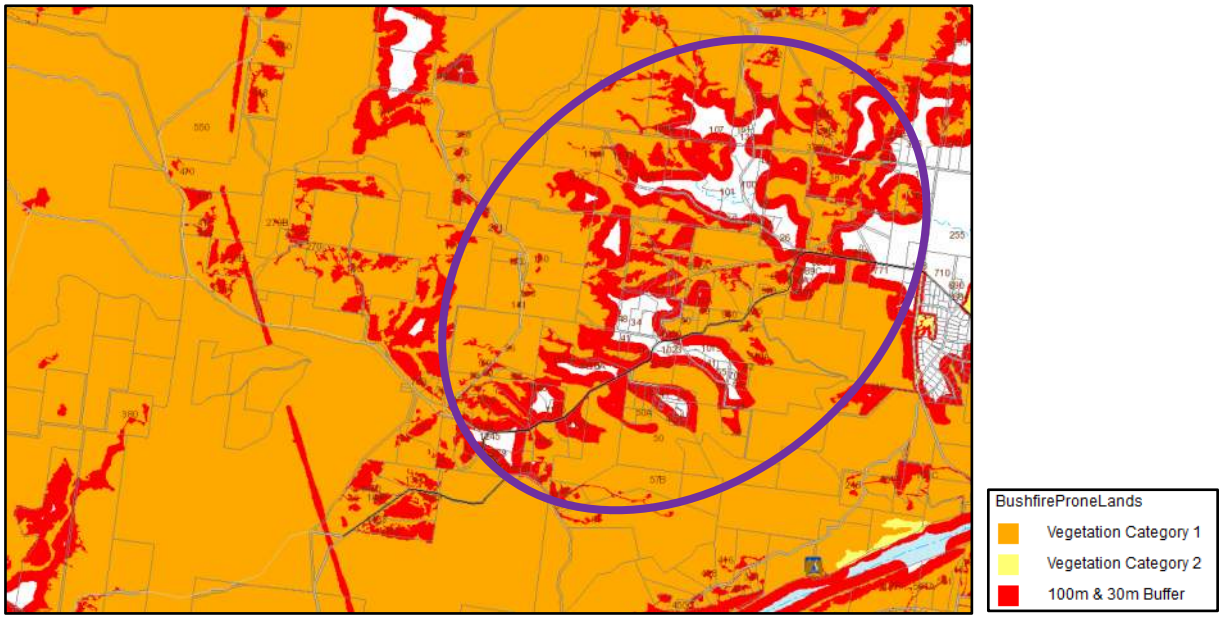


Figure 13 – Bush Fire Map showing approximate location of Locality 4
(Source: Shoalhaven online mapping)

The Bush Fire Prone Lands map indicates a significant proportion of the land identified in Locality 4 is bushfire prone.

We have searched the properties in this locality and have identified thirty (30) properties with an area above 10 hectares. Again, while they in theory have the necessary area to enable subdivision, the constraints mapping indicates much of this land is heavily affected by bushfire, biodiversity issues including habitat corridors and significant vegetation, and watercourses. Given the constraints identified and the objectives of the DCP, it is unlikely all of these will be capable of further subdivision.

The properties in Locality 4 that have areas greater than 10 hectares are as follows:

H/N	Street	Lot description	Area (ha)	Max lots per 10 hectares
1020	Illaroo Rd	45, 184, 194-195/751273; 51/862458; 4/1129204; 1/1168039	225.23	1
Part 109C	Browns Mountain Rd	147-148, 165, 220/751273; 66/851127; 11/852289	153.80	1
110C	Flannery Lane	2/706564	70.82	1
53	Flannery Lane	127/64100; 125-126/751273	58.11	1
Part 388E	Main Rd	21/1056833	45.04	1
15	Flannery Lane	1/153308; 1/256592; 3/600677; 3/711286; 297/751264	44.04	1
110A	Flannery Lane	101/1140138	43.99	1
Part 252	Browns Mountain Rd	105, 230/751273	41.03	1
Part	Browns Mountain Rd	104/751273	40.47	1
Part 110B	Flannery Lane	1/706564	37.94	1
1109	Illaroo Rd	6/1104003	37.34	4
64	Spotted Gum Dr	184/861191	32.31	4
26	Browns Mountain Rd	3/812277	32.02	1
101	Browns Mountain Rd	41-42/1114845	31.96	1
Part 50	Lilly Pilly Lane	11/1198735	29.45	4
1110	Illaroo Rd	202/1220574	29.16	1
945A	Illaroo Rd	3/791835	23.38	4
Part 57B	Riversdale Rd	23/1168007	22.61	4
850	Illaroo Rd	257/751273	21.14	1
Part 45	Ironbark Rd	101/1126125	20.97	1
28	Loganberry Lane	5/1129204; 2/1168039	17.90	1
Part 158	Emerys Rd	201/751273	16.19	1
Part 160	Emerys Rd	202/751273	16.19	1
852A	Illaroo Rd	1/1005903	15.69	1
Part 96	Emerys Rd	2/702754	14.65	1
60	Spotted Gum Dr	5/1046655	13.19	4
1240	Illaroo Rd	31/1049754	10.22	1
180	Browns Mountain Rd	1/587913	10.21	1
1202	Illaroo Rd	2/1012957	10.07	1
1186A	Illaroo Rd	1/1012957	10.04	1

4.4 Other sites with current zones enabling subdivision

We have searched areas zoned for large lot residential development, with minimum lot sizes of 4,000 to 2 hectares, and have identified three further sites.

While there is an area of RU4 Primary Production Small Lots zoned land east of Berry at the western end of Beach Road and north of Agars Lane, this has a minimum lot size of 10 hectares and none of that area is identified for 1 hectare subdivision.

We are aware of one site at 334 Worrigee Road, Worrigee with an area of 17.66 hectares. This is the residue of an earlier subdivision. The original approval indicates only three further one hectare lots are yet to be created, however there is no further subdivision identified on the plan for the balance of the land, which will have an area of 14.03 hectares. It is traversed by a Category One watercourse which may limit further subdivision of this land.

Part of a Lot 601 DP1223625, Abernethys Lane, Meroo Meadow is zoned R5 Large Lot residential, with a minimum lot size of 4,000 square metres. Lot 601 has on overall area of 33.39 hectares, with the area zoned R5 being an irregular shape with an area of approximately 5.87 hectares. The balance of the land is zoned partly RU1 Primary Production and partly E2 Environmental Conservation, with a minimum lot size of 40 hectares. The part of the land zoned R5 adjoins the Regional Services Corridor to the north, and has no direct road frontage, so there may be difficulties in accessing a future subdivision of the land. While fourteen (14) 4,000 square metre lots may in theory be possible to be created in the R5 zoned part of the land, this is unlikely because of the shape of the zoned area and the land that will be required for internal roads.

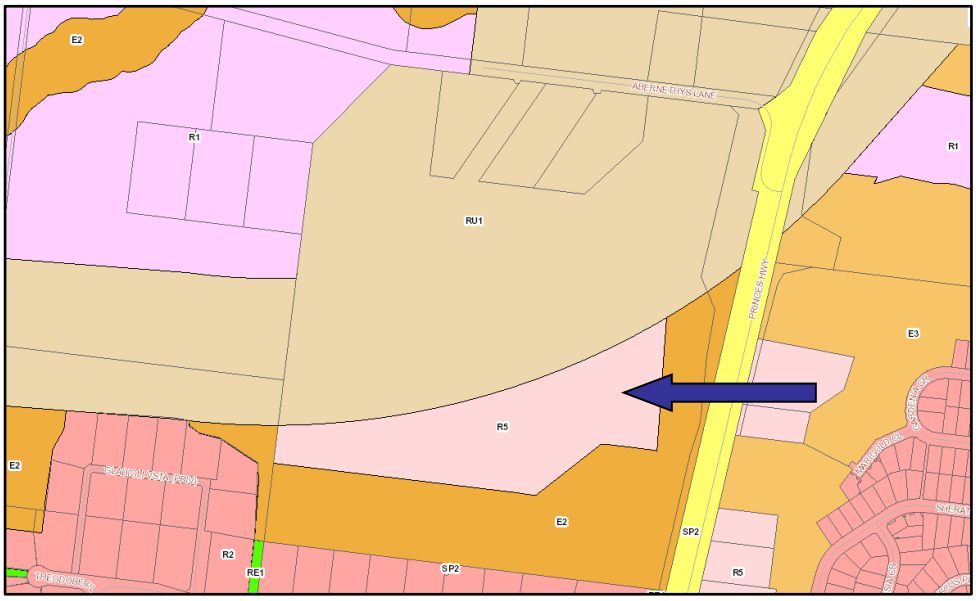


Figure 14 – Lot 501 DP1223625 Abernethys Lane

4.5 Land subject to current planning proposals

Our search of Current LEP proposals on the NSW Government's LEPs Online System reveals one other planning proposal to rezone land in Berry for rural-residential development. PP_2017_Shoal_001_01 is a proposal to rezone No 510 Beach Road, Berry (Lot 4 DP834254) to R5 Large Lot Residential and E2 Environmental Conservation, providing for 20 dwellings and the transfer of Coomonderry Swamp Lands to the Seven Mile Beach National Park.

This land is situated between the Campbells Run Estate and the Berry Beach Estate.

The gateway decision is to proceed subject to conditions.

This development will obviously be for a similar product to that which is proposed for the subject, however the total number of lots created between the two projects are considered capable of being absorbed in the market over a two to three year period, as was done previously with the Berry Beach and Campbells Run Estates.

Figure 15 – Aerial Photograph
(Source: Shoalhaven online mapping)

4.6 Demand for large lot homesites in Berry

There is obviously no official record of enquiry from prospective purchasers, however our discussions with local agents confirm there is ongoing demand for sites of this nature. In recent years the only available land has been either resales from Campbells Run and Berry Beach Estate, or the occasional one off concessional lot with most sites of this nature having had dwellings constructed many years ago. When released, Campbells Run (29 lots) and Berry Beach Estate (14 lots) sold concurrently over an 18 month period through 2001-2003. Since then there have been no other release of rural residential sites of a similar size, but it could be expected a similar sales rate could be achieved given the lack of such a product.

Berry real estate agents interviewed are reporting that while the market has slowed for standard residential property, good demand remains for improved rural residential properties. Prices being achieved for improved properties are generally similar to the cost of vacant land and construction. The ability to construct a dwelling of their own design is considered a selling point for vacant land, particularly at this price level.

5.0 Conclusion

Our searches indicate there are few large lot residential homesites available in the northern Shoalhaven, and we have identified only four sites currently for sale north of the Shoalhaven River and east of the Cambewarra Mountain range. Of these, only one is at Berry, and the other three are 4,000 square metre sites at Bangalee.

There are seventy nine sites currently proposed in three proposed subdivisions at Bangalee, Tapitallee and Kangaroo Valley, however seventy seven (77) of these are basically 4,000 square metre sites. The prospective purchaser of the sites proposed to be developed within the subject property are highly unlikely to consider the 4,000 square metre sites, due to the significant difference in location, size, views and standard of surrounding development.

While there is land identified in two localities which, in theory, are capable of subdivision when area controls are considered, significant constraints on these sites will in all likelihood limit further subdivision.

While the market for standard residential lots has slowed considerably since the start of 2018, local real estate agents have advised there remains strong demand for large lot residential home sites. The market for rural residential property, generally remains strong with supply limited to improved property. Sale prices are reflecting amounts similar to the equivalent cost of purchasing vacant land and constructing a new dwelling. This can be considered more desirable than purchasing an existing dwelling, in that the buyer has the ability to design and construct a dwelling of their choice.

There has not been enough transactions of large lot residential homesites to determine accurately the sales rates that could be expected for sites of this nature. Given the current demand and historic sales rates for Campbells Run and Berry Beach Estate, it could be expected sales volume of between 15 and 20 lots per annum could be achieved.

The proposed development at 510 Beach Road will obviously be for a similar product to that which is proposed for the subject, however the total number of lots created between the two projects are considered capable of being absorbed in the market over a two to three year period, as was done previously with the Berry Beach and Campbells Run Estates.

Walsh and Monaghan Pty Limited

Authorised for issue by:

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Certified Practising Valuer
API Member 68369

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Certified Practising Valuer
API Member 68926

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VALUERS SINCE 1923 walsh & monaghan

6.0 Report qualifications

The valuation is made subject to the following:

The co-signatory of this valuation has done so for risk management purposes. The co-signatory has not inspected the subject property(s) nor have they performed, or arrived at the valuation figures noted herein.

The valuation is for the use only of the party to whom it is addressed, the intending mortgagee and the mortgage insurer and for no other purpose other than the purpose specified. No responsibility is accepted to any third party who may use or rely on the whole or any part of the content of this valuation. This report is a valuation report only and is not a structural survey.

The valuation is for the use only of the party to whom it is addressed, and for no other purpose other than the purpose specified. No responsibility is accepted to any third party who may use or rely on the whole or any part of the content of this valuation. This report is a valuation report only and is not a structural survey.

This valuation is current as at the date of valuation only. The value assessed herein may change significantly and unexpectedly over a relatively short period (including as a result of general market movements or factors specific to the particular property). We do not accept liability for losses arising from such subsequent changes in value. Without limiting the generality of the above comment, we do not assume any responsibility or accept any liability where this valuation is relied upon after the expiration of 3 months from the date of the valuation, or such earlier date if you become aware of any factors that have any effect on the valuation.

This valuation cannot be relied upon for solicitor, private or second mortgage lending purposes, as this lending is not covered under Walsh & Monaghan Pty Limited's Professional Indemnity Insurance policy. **"Solicitor Lender"** means any solicitor involved in arranging, controlling, managing, broking or otherwise inducing the lending of money on mortgage security (including but not limited to any solicitor controlled or managed mortgage fund) BUT shall not include any mortgage fund registered as a Managed Investment Scheme.

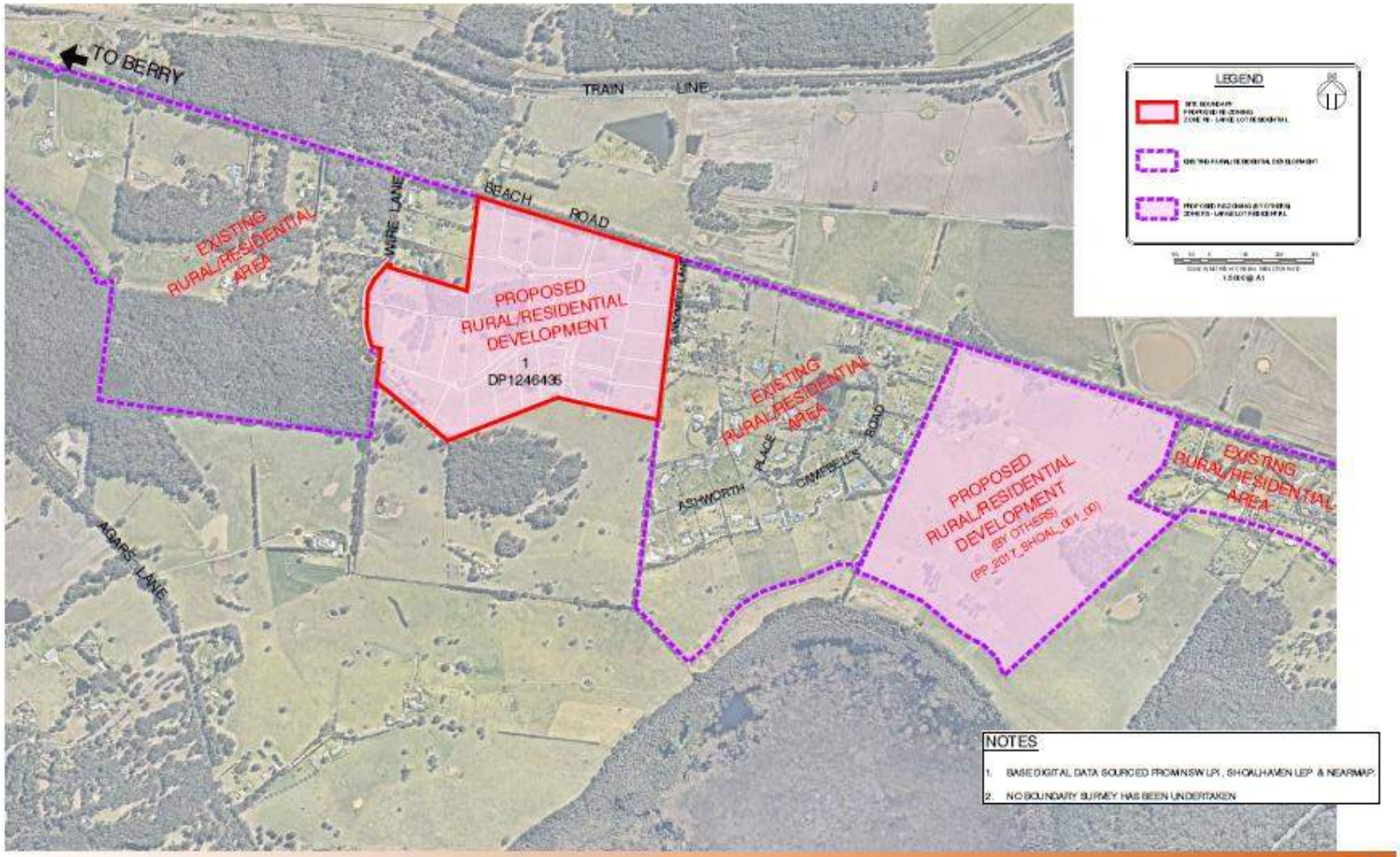
The Professional Indemnity Insurance Policy will not indemnify Walsh & Monaghan Pty Limited in respect of any claim relating to a valuation of real property in connection with any Managed Investment Scheme (within the meaning of the Corporation Law) which:

1. has as its prime or substantial purpose, the provision of tax benefits to investors; or
2. is involved in any form of direct or indirect investment in primary production (including property used for primary production).

7.0 Annexures

Site Plan

Shoalhaven DCP 2014 Chapter V1: Lot Averaging Subdivision



PLAN SHOWING PROPOSED AND ADJOINING DEVELOPMENT
PROPOSED SUBDIVISION OF LOT 1 DP1246435
BEACH ROAD, BERRY

REF: ISC000 16 C04
DATE: 21.03.19

FOR DISCUSSION

walsh & monaghan VALUERS SINCE 1923

INDESCO

Appendix D – Agricultural Assessment

EDGE
LAND PLANNING

Agricultural Assessment
55 Wire Lane, Berry

July 2019

Agricultural Assessment
55 Wire Lane, Berry

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Prepared for Indesco
by

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July 2019

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Executive Summary

The property at 55 Wire Lane, Berry is currently used for the grazing of cattle and has an area of 40 ha.

This study has been prepared to accompany a planning proposal to be submitted to Shoalhaven City Council and the NSW Department of Planning and Environment to enable it to be rezoned for large lot residential development.

The study will specifically address the Local Planning Directions 1.2 and 1.5 dealing with rural lands.

The site can be described as a combination of some hilly land and mostly undulating land that slopes to the north east.

There are a number of intermittent drainage lines joining at a dam on the northern boundary which are spring fed and only run after a prolonged period of rain. There are four dams along the drainage lines. Three of them are used for watering the cattle, however, the drainage is intermittent and therefore is not a permanent source of water. The cattle troughs on the property are fed by a low pressure water main that runs along Wire Lane.

The site is mostly cleared (84%) and has been used for grazing of cattle and as such has a mixture of pastures. The small area of native vegetation has been assessed as being of low ecological value.

The land use is currently for grazing of cattle and has a dwelling house constructed on it. The size of the land and the poor soil quality combined with the slope suggest that although it has been used for grazing cattle, this would not be of sufficient size to sustain an income and the owner would have to work off farm to supplement the small amount of income that would be generated by the grazing operation. The land use would therefore be characterised as rural residential.

The constraints of the site for agriculture have been outlined in chapters 2 and 4. The suitability of the land for agriculture is constrained by the slope of the land, soil quality, the size of land as well as its proximity to rural residential development. This limits the ability to make an adequate return from farming to provide sufficient income to support a family and needs for an off-farm income.

The LGA is not known as a significant agricultural producing LGA and has a value of production that is 0.6% of the NSW total value of production. Milk produces 67.2% of the agricultural output with cattle grazing producing 22.2%. The average size of farms in Shoalhaven is 158 ha and in the Berry – Kangaroo Valley region the average farm size if 137 ha. The number of cattle per farm in the LGA is 299 and in the Berry – Kangaroo Valley region it is 193 head of cattle. Agriculture is number five for industry of employment in the Berry – Kangaroo Valley Region with 9.4% of the workforce working in agriculture, forestry and fishing. The average age of farmers is older in the Berry – Kangaroo Valley region (60) than NSW (57) and Australia (56). There are also much fewer farmers less than 55 in the Berry – Kangaroo Valley region than the LGA (62.6) and Australia (63%). The sources of income generated on the farm is 60.6% for the Berry Kangaroo Valley SA2 region which is lower than the NSW figure (82.3%) and Australia (83.6%). Similarly, the sources of off-farm income (25.6%) are considerably higher than NSW with 13.1% and Australia 12.1% of off farm income. This suggests

that the farmers in the region could be retired and are carrying out farming on a part-time basis.

The site has been assessed for it use for a range of intensive agricultural uses and the constraints of the site preclude these. The current use of the land is for the grazing of cattle and the owners have carried out two types of grazing operations. One was purely fattening of cattle that were bought and sold and the other was a breeding operation. Neither of these were able to be profitable because of the limited number of cattle that could be housed on the property. This is due to the size of the land.

Therefore it has been concluded that the land is too small to make a sustainable profit from cattle grazing which is the only form of agriculture that can be practised on the property.

Chapter 1: Introduction

1.1. Introduction

The property at 55 Wire Lane, Berry is currently used for the grazing of cattle and has an area of 40 ha.

Edge Land Planning has been engaged by Indesco to provide an assessment of the agricultural use of the land and its suitability for agriculture.

The study will specifically address the Local Planning Directions 1.2 and 1.5 dealing with rural lands.

This study has been prepared to accompany a planning proposal to be submitted to Shoalhaven City Council and the NSW Department of Planning and Environment to enable it to be rezoned for large lot residential development.

1.2. Study Area

The study area is shown on Map 1.1 and is in the Shoalhaven City Council LGA to the east of the urban area of Berry.

The site has an area of 40 ha.

The site is bounded by Beach Road to the north, Wire Lane and three 2 ha lots to the east, Sunnymede Lane to the east and farming land to the south.

Map 1.1: Study Area

Chapter 2: Site Description

2.1. Introduction

This chapter provides a detailed description of the site and focuses on the slope, vegetation, soils and the land use of the site.

2.2. Slope

The site can be described as a combination of some hilly land and mostly undulating land that slopes to the north east.

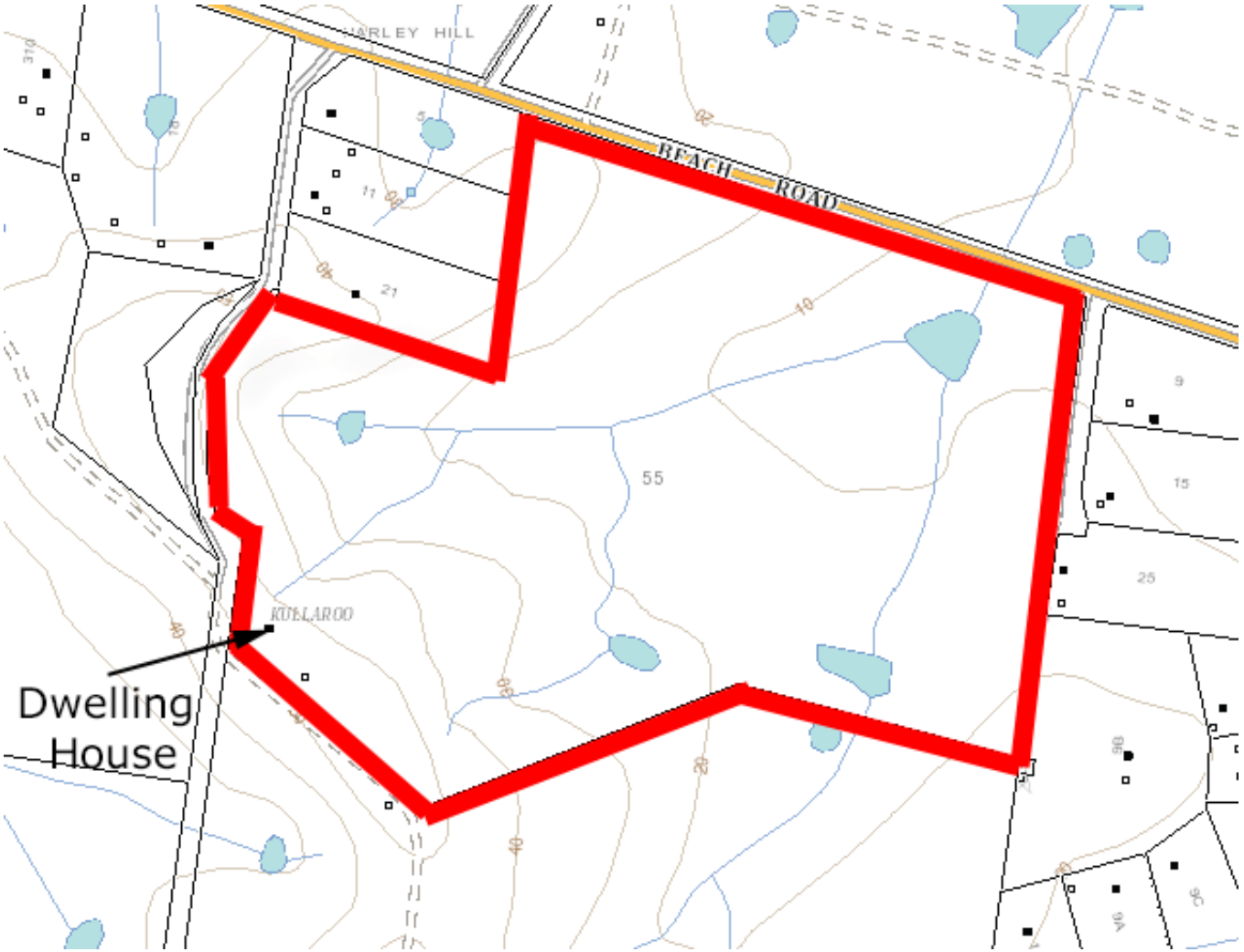
The topography of the site can be seen from map 2.1.

There is a ridge that runs along the south eastern boundary for approximately 25m and then heads to the south.

The property has an amphitheatre type landform which is hilly in the south and east easing to undulating in the north and east.

Photo 2.1 shows the property from the southern boundary looking towards the north east.

Photo 2.1: Undulating Land
Date of Photo: May 2019



Map 2.1: Physical Characteristics of the Site
Source: SIX Maps

2.3. Drainage

There are a number of intermittent drainage lines joining at a dam on the northern boundary which are spring fed and this only runs after a prolonged period of rain.

Map 2.1 and photo 2.1 shows the drainage lines and the dams.

There are four dams along the drainage lines. The three in the north eastern parts of the property are used for watering the cattle whilst the fourth one located in the western part of the property is silted and is not used on a regular basis.

The drainage is intermittent and therefore is not a permanent source of water. The cattle troughs on the property are fed by a low pressure water main that runs along Wire Lane.

2.4. Vegetation

The site is mostly cleared (84%) and has been used for grazing of cattle and as such has a mixture of pastures.

An Ecological Constraints Assessment has been carried out by Ecoplanning has found that there is approximately 7 ha of native vegetation in the central to western part of the property. This was identified as Blackbutt – Turpentine – Bangalay moist open forest. There are also scattered occurrences of this species.

Map 2.2 shows the vegetation communities within the study area. It shows that most of the site is cleared with a small area of Blackbutt – Turpentine – Bangalay in the central part of the property.

The Ecological Constraints Assessment concluded that the land is of low ecological value with some small areas of moderate value.

Map 2.2: Vegetation Communities
Source: (Ecoplanning, 2019)

2.5. Soils

The Soil landscapes of the Kiama 1:100,000 Map (Hazelton, 1993) has been used to derive details about the soils of the site.

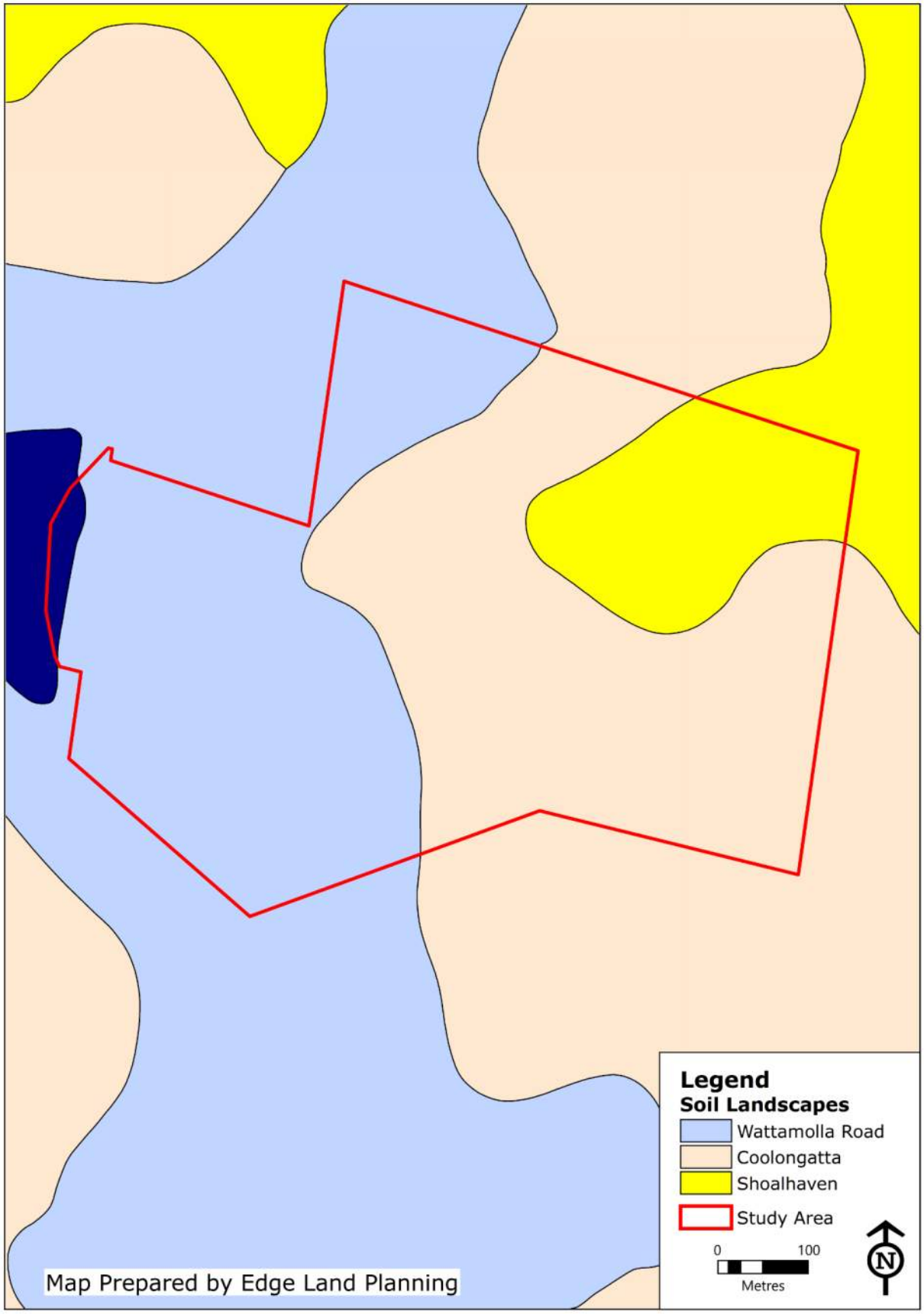
The soils can be summarised as being moderately fertile and only suited to grazing with little suitability for cropping.

There are three different soil landscapes on the site and they can be seen from map 2.3 and area as follows:

- *Wattamolla Road.* This soil landscape covers the hilly land to the west and south of the site. It is described as having long gently to moderately inclined side slopes and undulating to rolling hills with broad benches on slopes of 5-15% and extensively cleared with stands of tall open-forest. The limitations are described as being rock outcrop, run-on, mass movement (localised), hardsetting, high organic matter, low wet bearing strength, strongly acid, sodicity. Its rural capability has generally high to severe limitations for regular cultivation and low to moderate limitations for grazing. It has moderate to high fertility.
- *Coolangatta.* This landscape is in the mid slopes and undulating land in the centre of the property. It is described as having undulating to rolling low hills with slopes of 5 to 20 % gradient, extensively cleared with scattered open-woodland with occasional shrubs. The limitations are described as being water erosion hazard, surface movement potential (localised), mass movement hazard (localised), hardsetting, stoniness, strongly acid, low wet bearing strength (topsoil), shrink-swell (subsoil). Its rural capability has generally high to severe limitations for regular cultivation and low to moderate limitations for grazing. It has moderate to high fertility.
- *Shoalhaven*. This soil landscape applies to flat land in the north of the site. It is described as being level to gently undulating and susceptible to flood inundation on slopes of less than 3% and completely cleared of native vegetation. The limitations are described as being flood hazard, seasonal waterlogging, permanently high water table, hard setting, acid sulphate potential (sub-soil), strongly acid, sodicity. Its rural capability has generally low to moderate limitations for regular cultivation and grazing. High to severe limitations for cultivation and grazing in flood-prone areas. Drainage may result in highly acid soils. It has moderate to low fertility.

The pasture has been extensively improved for many years with the addition of fertiliser on a regular basis.

To summarise, the soils on the site can be described as being moderately fertile, however, the limitations of slope and potential for localised mass movement and erosion hazard as well as the waterlogging on the lower slopes limit its rural land capability to grazing of cattle.



Map 2.4: Soil Landscapes

2.6. Land Use

The land is currently used for the breeding and grazing of cattle and this has been the land use for many years. The current owners have been grazing cattle on the property for four years.

As will be discussed in chapter four in detail, the owners have tried a cattle grazing operation which purchased young cattle and fattened them on pasture for three months and this did not return a sufficient income. They have now embarked on a breeding operation, which could be profitable but the number of cattle that can be sustainably grazed on the property is not enough to make a sufficient profit to enable a sustainable income to support a family without an appropriate source of off farm income. The owners are relying on off farm income to support themselves financially.

The land use would therefore be characterised as rural residential. A definition of this land use can be found in a planning text as follows:

> *"The residential use of rural land is called rural residential development; that is, people live on rural lots, but use the land primarily for residential rather than agricultural purposes. Although some engage in 'hobby farming', most derive the principal source of their income from pursuits not carried out on the land. The main distinction between urban housing and rural residential housing is bigger lot size and larger distances between dwellings. This creates a sense of openness and of living in the landscape rather than in an urban area. Rural residential dwellings are often large (up to 1000 to 2000 square metres in floor area). They can be found in clusters of new houses and are often mixed with intensive plant and animal uses, which invariably leads to rural land-use conflict. (Sinclair, Docking, Jarecki, Parker, & Saville, 2004) They can have varying degrees of native vegetation cover, from totally covered to totally cleared. This has been termed 'rural sprawl' (Daniels, 2014) because of its pervasiveness over the rural landscape, particularly adjoining the metropolitan areas as well as large cities and towns.*
>
> *Rural residential development can be divided into two main categories: rural fringe and rural living. Rural fringe development is characterised by single detached houses and dual occupancies on lot sizes of approximately 4000 square metres to two hectares laid out in an estate. This estate usually joins or is in close proximity to an urban area.*
>
> *Rural living, on the other hand, features single detached houses and dual occupancies on lot sizes between one hectare and 40 to 100 hectares and can adjoin farmland or vegetated areas (it should be noted that there are sometimes lots of less than one hectare). People living on these lots use the land primarily for residential purposes, although they may graze some cattle or have horses. This requires lot sizes of more than two hectares if land degradation is to be avoided. The lots do not adjoin townships or villages and are scattered throughout the rural landscape." (Sinclair & Bunker, 2012)*

The use of the site would fit the rural living category.

Chapter 3: Planning Policy Context

3.1. Introduction

There are a number of planning policies and studies that apply to the future of the land which are as follows:

- State Environmental Planning Policy Primary Production and Rural Development 2019
- Section 117 Local Planning Directions

Each will be addressed separately.

3.2. Shoalhaven LEP

The land is covered by Shoalhaven LEP 2014 which zones the site as RU1 Primary Production with a small part to the as RU4 Primary Production Small Lots.

It has a minimum subdivision size of part 40 ha and part 10 ha. The majority of the property is in the 40 ha area with a small part adjoining Wire Lane being 10 ha minimum subdivision.

Permissible agriculture uses include extensive agriculture, intensive animal livestock and intensive plant agriculture.

3.3. State Environmental Planning Policy (Primary Production and Rural Development) 2019

This State Environmental Planning Policy (SEPP) came into force in February 2019.

The aims of this Policy are as follows:

a) to facilitate the orderly economic use and development of lands for primary production,
b) to reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources,
c) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
d) to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts,
e) to encourage sustainable agriculture, including sustainable aquaculture,
f) to require consideration of the effects of all proposed development in the State on oyster aquaculture,
g) to identify aquaculture that is to be treated as designated development using a well-defined and concise development assessment regime based on environment risks associated with site and operational factors.

3.4. Planning Directions

The Department of Planning and Environment have issued a set of Planning Directions pursuant to section 9.1 of the Environmental Planning and Assessment Act which have to be followed when a Council is preparing any amendment to its LEP.

The ones that are relevant area as follows:

- Direction 1.2 Rural Zones
- Direction 1.5 Rural Lands

Each direction will be separately addressed.

3.4.1. Rural Zones.

The objectives of this direction is to protect the agricultural production value of rural land.

This direction states that a Council must not rezone land from a rural zone to a residential, business, industrial, village or tourist zone or increase the density of the land.

The direction goes on to say that a planning proposal may be inconsistent with the direction if it, amongst others, is justified by a study prepared in support of the planning proposal which gives consideration to the objectives of the direction

3.4.2. Rural Lands

The objectives of this direction are as follows:

(a) protect the agricultural production value of rural land,
(b) facilitate the orderly and economic use and development of rural lands for rural and related purposes,
(c) assist in the proper management, development and protection of rural lands to promote the social, economic and environmental welfare of the State,
(d) minimise the potential for land fragmentation and land use conflict in rural areas, particularly between residential and other rural land uses,
(e) encourage sustainable land use practices and ensure the ongoing viability of agriculture on rural land
(f) support the delivery of the actions outlined in the New South Wales Right to Farm Policy.

This direction applies when a Council prepares a planning proposal that affects an existing or proposed rural or environmental protection zone or changes the existing minimum lot size of land in a rural or environmental protection zone.

(a) be consistent with any applicable strategic plan, including regional and district plans endorsed by the Secretary of the Department of Planning and Environment, and any applicable local strategic planning statement
(b) consider the significance of agriculture and primary production to the State and rural communities
(c) identify and protect environmental values, including but not limited to, maintaining biodiversity, the protection of native vegetation, cultural heritage, and the importance of water resources
(d) consider the natural and physical constraints of the land, including but not limited to, topography, size, location, water availability and ground and soil conditions
(e) promote opportunities for investment in productive, diversified, innovative and sustainable rural economic activities
(f) support farmers in exercising their right to farm
(g) prioritise efforts and consider measures to minimise the fragmentation of rural land and reduce the risk of land use conflict, particularly between residential land uses and other rural land uses
(h) consider State significant agricultural land identified in State Environmental Planning Policy (Primary Production and Rural Development) 2019 for the purpose of ensuring the ongoing viability of this land
(i) consider the social, economic and environmental interests of the community.

A planning proposal to which proposes to change the minimum lot size must demonstrate that it:

(a) is consistent with the priority of minimising rural land fragmentation and land use conflict, particularly between residential and other rural land uses
(b) will not adversely affect the operation and viability of existing and future rural land uses and related enterprises, including supporting infrastructure and facilities that are essential to rural industries or supply chains
(c) where it is for rural residential purposes:
    i. is appropriately located taking account of the availability of human services, utility infrastructure, transport and proximity to existing centres
    ii. is necessary taking account of existing and future demand and supply of rural residential land.

They will also be discussed in chapter 4.

Chapter 4: Agricultural Suitability

4.1. Introduction

This chapter summarises the constraints of the site to assess its suitability for agriculture and assesses the current agricultural practices on the site. Information has also been provided on the types of agriculture practiced in the area to gain an impression of farming and the characteristics of the farming community.

The information contained in this section has been obtained from a number of sources including the ABS Agricultural Census.

4.2. Agriculture in Shoalhaven LGA

The ABS Agriculture Census provides a good source of information about agriculture in the Shoalhaven LGA. This will be used to show the characteristics of farming in the LGA to provide some context to the agriculture suitability of the subject land.

The data will show that the LGA is not known as a high producing agricultural area and that the major commodities are dairy farming and grazing of cattle. It will then provide data to show that agriculture is not the main source of employment for the rural areas as well as the age of the farmers being mostly older than the average age of farmers. It then shows data on the sources of farm income.

It should be noted that the cut off for filling the Agricultural Census is $40,000 farm gate value and so this data only shows an accurate picture of farmers who earn income from the farm. It is also based on farmers who have an Australian Business Number and therefore have a registered business. However, $40,000 is not a large income and is less than half of the Australian adult average weekly wage which is $1,604.9 (ABS, 2019) which equates to $83,454.80.

The data has been provided at the LGA level as well as the Berry – Kangaroo Valley part of the LGA, which is a Statistical Area Level 2.

The value of Agriculture in the LGA is $73.9m and the Berry – Kangaroo Valley area has a value of $12.9m which is 17.5% of the total value of agriculture in Shoalhaven. This is not very high and represents 0.6% of NSW value of agriculture.

Table 2.1 shows the individual commodities which are grown in the Berry – Kangaroo Valley SA2 part as well as the LGA. This shows that for the LGA 89.8%% of the value comes from livestock (67.2% is milk and 22.2% cattle and calves). Cropping makes up 10.2% of the value which is comprised of hay production (3.0%), followed by turf farming (2.6%), flowers (1.1%), vegetables and nurseries (0.8%).). This shows that the main form of agriculture is milk production followed by grazing of cattle and then hay, turf, flowers, vegetables and nurseries.

For the Berry – Kangaroo Valley SA2 region, dairy farming is the number one commodity making up just over half of the total value, followed by cattle grazing and turf farming.

Table 2.1: Value of Agriculture

Commodity	Berry - Kangaroo Valley	% of LGA Total	Shoalhaven LGA	% of LGA Total	% of NSW
Total Crops	$2,770,955	3.8%	$7,529,145	10.2%	0.1%
Broadacre Crops	$195,252	0.3%	$1,306,339	1.8%	0.0%
Total Livestock	$10,177,746	13.8%	$66,338,262	89.8%	1.1%
Hay	$322,530	0.4%	$2,181,303	3.0%	0.7%
Nurseries	$56,157	0.1%	$611,035	0.8%	0.4%
Flowers	$283,017	0.4%	$829,630	1.1%	1.2%
Turf	$1,914,000	2.6%	$1,943,517	2.6%	2.4%
Total Nurseries, Flowers & Turf	$2,253,174	3.1%	$3,384,182	4.6%	1.1%
Fruit & Nuts		0.0%	$31,489	0.0%	0.0%
Perishable Vegetables		0.0%		0.0%	0.0%
Total Vegetables		0.0%	$625,832	0.8%	0.1%
Wool	$10,423	0.0%	$31,200	0.0%	0.0%
Milk	$6,696,569	9.1%	$49,655,040	67.2%	8.4%
Eggs		0.0%	$91,819	0.1%	0.0%
Total Livestock Products	$6,707,178	9.1%	$49,778,059	67.4%	2.8%
Sheep	$9,639	0.0%	$29,836	0.0%	0.0%
Cattle	$3,460,584	4.7%	$16,434,989	22.2%	0.6%
Goats		0.0%	$1,700	0.0%	0.0%
Pigs		0.0%	$48,898	0.1%	0.0%
Poultry Meat		0.0%	$44,779	0.1%	0.0%
Other		0.0%		0.0%	0.0%
Total Livestock Meat	$3,470,568	4.7%	$16,560,203	22.4%	0.4%
Total Agriculture	**$12,948,702**	**17.5%**	**$73,867,407**	**100%**	**0.6%**

Source: (ABS, 2017d)

So it can be seen that the Shoalhaven is not a significant agricultural producing LGA and that 89.8% comes from livestock (67.2% milk and 22.2% cattle grazing). It is significant to note that the total value of cropping is 10.2%.

The Agricultural Census counted 149 farms in the Shoalhaven LGA having a total area of 23,542 ha making the average farm size in the Shoalhaven 158 ha. In the Berry – Kangaroo Valley SA2 region there are 49 farms having a total area of 6,732 ha which has an average farm size of 137 ha.

The Agricultural Census provides counts of the farms as well as the total number of livestock on each farm. This can be used to provide an indication of the average number of cattle on each farm in the LGA as well as the Berry – Kangaroo Valley SA2 region. Table 2.2 shows the total number of cattle, total number of farms and the number of cattle per farm which has been calculated from these figures. It can be seen that the number of cattle per farm in the Berry – Kangaroo Valley area is 193 and for the LGA it is 299. This suggests that for a farm to be sustainable and make more than $40,000 per annum, it would need to have 193 head in Berry – Kangaroo Valley and 299 in the Shoalhaven LGA.

Table 2.2: Number of Cattle per Farm

Commodity	Berry – Kangaroo Valley SA2	Shoalhaven LGA
Total number of Cattle	6768	32,182
Number of Farms	35	108
Number of Cattle per farm	193	299

Source: (ABS, 2017b)

Table 2.3 shows the industry of employment data which has been drawn from the ABS Census of Housing and Population data for the Shoalhaven LGA and the Berry Kangaroo Valley SA2 region. The urban areas of Berry Kangaroo Valley and Shoalhaven Heads have been taken out of the database to provide data on the rural areas only. It can be seen that in the Berry Kangaroo Valley SA2 rural area there are 9.4% of the people who work in agriculture, forestry and fishing. This is the fifth highest industry sector. The top five are as follows:

1. Health Care and Social Assistance
2. Education and Training
3. Construction
4. Accommodation and Food Services
5. Agriculture, Forestry and Fishing.

Table 2.3: Industry of Employment

Industry Sector	Berry Kangaroo Valley SA2 Rural	Shoalhaven LGA
Agriculture, Forestry and Fishing	9.4%	2.1%
Mining	0.5%	0.5%
Manufacturing	4.4%	5.2%
Electricity, Gas, Water and Waste Services	0.7%	1.1%
Construction	10.6%	10.9%
Wholesale Trade	1.7%	1.4%
Retail Trade	8.8%	11.8%
Accommodation and Food Services	9.6%	9.6%
Transport, Postal and Warehousing	2.8%	3.4%
Information Media and Telecommunications	1.2%	0.8%
Financial and Insurance Services	3.2%	1.4%
Rental, Hiring and Real Estate Services	1.7%	1.6%
Professional, Scientific and Technical Services	6.7%	4.4%
Administrative and Support Services	3.1%	4.2%
Public Administration and Safety	3.5%	10.1%
Education and Training	11.5%	7.8%
Health Care and Social Assistance	11.6%	14.7%
Arts and Recreation Services	1.7%	1.4%
Other Services	3.0%	3.8%
Inadequately described/Not stated	4.2%	3.9%
Total	**100.0%**	**100.0%**

Source: (ABS, 2017a)

These are similar to the figures for the Shoalhaven LGA, except for the number of people in agriculture, forestry and fishing.

Table 2.4 shows the average age of the farmer and also some data on the sources of income. It can be seen that the farmers in the Berry Kangaroo Valley SA2 region is 60 years old, which is older than the NSW (57) and Australian farmer (56). The sources of income generated on the farm is 60.6%% for the Berry Kangaroo Valley SA2 region which is lower than the NSW figure (82.3%) and Australia (83.6%). Similarly, the sources of off-farm income (25.6%) are considerably higher than NSW with 13.1% and Australia 12.1% of off farm income.

Table 2.3: Demographics of Farming

Demographic Characteristic	Berry - Kangaroo Valley	NSW	Australia
Age of Farmer All persons	60	57	56
Income generated on farm	60.6	82.3	83.6
income generated off farm	25.6	13.1	12.1

Source: (ABS, 2017c)

Figure 2.1 shows the age of the farmers in the Berry Kangaroo Valley SA2 region and it be seen that only 47.9% of them are younger than 55 which is much less than for the LGA (62.6%), NSW and Australia.

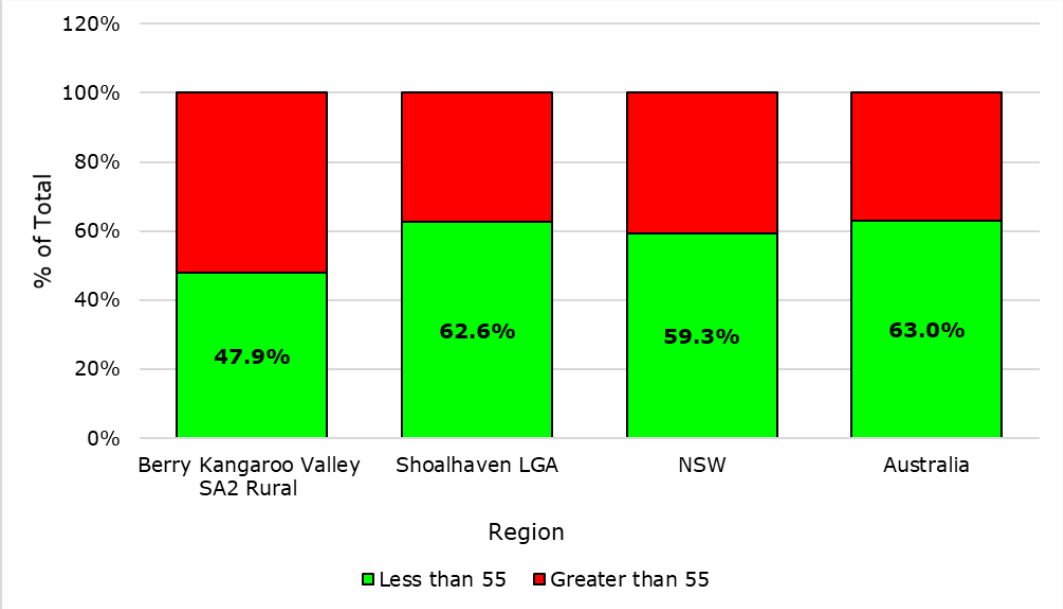


Figure 2.1: Age of Farmers
Source: (ABS, 2017a)

The data presented above indicates that the in the Berry – Kangaroo Valley SA2, just over half of the agriculture is dairy farming with cattle making up another 26.7% of the value. Cropping makes up 21.4% and most of that is turf farming with some hay

making and flower growing. The region does not have many people who work in farming – only 9.4% are farmers, which is number five. To provide a comparison, in rural area of Moree Plains Shire(which is the number one Agriculture LGA in NSW) there are 49.5 % of the workforce who are farmers. The age of the farmers is higher than NSW and Australia and there are significantly more farmers less than 55 years of age in Berry Shoalhaven than in the LGA, NSW and Australia. This suggests that there are a number of farmers who are semi-retired from another industry sector and are living on large properties with some cattle grazing. The average herd size for cattle in the Berry Shoalhaven SA2 region is 193 and for the LGA it is 299.

4.3. Constraints for Agriculture

The constraints for the site for agriculture are based on the slope, soils and water availability.

The landform has been discussed in section 2.2 and this has shown that the land has a hilly to undulating topography which makes it suitable for grazing rather than continual cropping.

The combination of drainage lines and the lack of good soils create significant constraints to using the land for the growing of plants – both intensive and extensive cropping. However, some of the site could be used for protected cropping of horticulture or ornamental plants all which would require a significant amount of investment and would require structures of 2,000 m^2 to 2 ha and larger to be profitable depending on the type of technology (NSW Department of Primary Industries, 2018). The use of the land for poultry farming, is restricted by the slope of the land. Modern poultry sheds are 150m long and there are normally 4 sheds per farm. The constraints of the site would inhibit poultry sheds.

The current owners do not have the expertise nor capital to invest in such an operation as protected cropping or poultry farming.

Therefore, the constraints of the site only allow for cattle grazing, which for reasons outlined above is not a viable use of the site. This is the current operation on the site.

4.4. Current Agricultural Practices

The carrying capacity of the land is estimated to be 1 to 1.2 cattle per hectare. This is based on four years of grazing.

The owners have had two types of grazing operations on the property. Firstly they undertook a purely grazing enterprise where they bought cattle and fattened them on pasture for 3 months. This returned a modest profit of $2,700 which would amount to approximately $11,000 per year which was not considered sufficient. It should be noted that this operation did not require any input of pasture or fertiliser because the stock were fed on pasture that had not been grazed for some time.

The owners then embarked on a breeding enterprise breeding Speckle Park cattle using artificial insemination. This operation commenced with the purchase of 17 heifers in 2017 which were artificially inseminated. This produced 17 Calves in 2017. An additional 6 cows were purchased in 2017. This was repeated in 2018 with 18 embryos implanted. This has resulted in the current herd of 46 cattle on the property. A total of 8 cattle have also been sold. The cost of this breeding operation has been a total of approximately $100,000 and the sale of the 8 cattle returned approximately $8,700 in

total. It is noted that the cost of the purchase of the original 17 heifers was a one off purchase of approximately $28,000. This breeding operation has the potential to make a good return however, at the present time, the carrying capacity of the land limits the total herd to approximately 45 cattle in total. If all of the progeny were sold each year this would mean approximately 20 head per year and would return between $1,000 to $1,100 per head ($20,000 to $22,000) with a profit of $200 per head. This is a profit of $4,000 and this not a sufficient profit to enable a sustainable income to support a family without an appropriate source of off farm income The carrying capacity of the land (1 – 1.2 cattle per ha) does not allow for a large enough herd of cattle to make it a sustainable operation. Based on the average number of cattle per farm in the local area (199) and the LGA in total (299) and the carrying capacity, the property would need to be in the order of 200 ha to 300 ha, which is much larger than the current operation of 40 ha. This would provide a profit of $40,000 to $60,000 which is more sustainable.

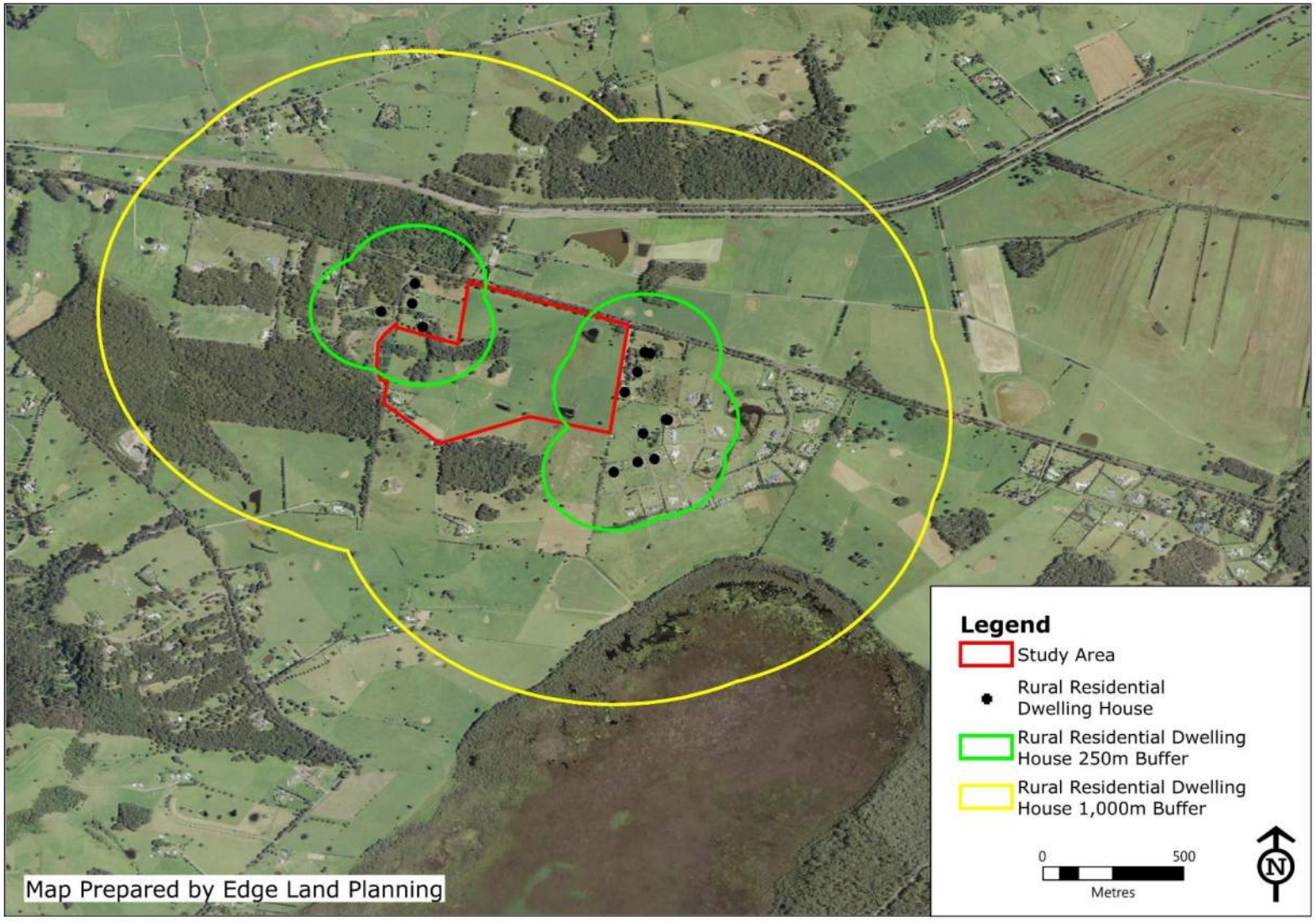
4.5. Suitability of the Site for Agriculture

The site is constrained for its use as an agricultural operation by a number of factors as follows:

- Slope of the land
- Soils quality
- Size of land
- Proximity to rural residential estate development

It is noted that the property sits between two small lot zones. To the east is a Large Lot Residential zone and to the west is a Primary Production Small Lot zone which, from observation, does not have any primary production except for some cattle grazing and its land use can be described as rural residential. A review of Google Maps also reveals that there are a number of bed and breakfast / cabin uses on this land.

The proximity of these residential uses, has the potential to cause land use conflict with any form of intensive agriculture that the owner may wish to conduct on the property. Guidelines for such development have a minimum buffer distance of between 250m for protected cropping and outdoor horticulture to 1,000m for poultry farms (Wells, 2019) from rural residential dwelling houses. This has been done for the rural residential land uses on either side of the study area and the buffers can be seen from map 4.1. It can be seen that the 250m buffer covers the flat land to the east of the site which means that protected cropping and outdoor horticulture such as vegetable growing cannot be located in this area. This area is also the most suitable for these as it is the flattest part of the study area. The 1,000m buffer covers all of the site and so poultry farms are not suitable for the study area.



Map.4.1: Land Use Conflict Buffers

The soils are not suited to continual cropping and so outdoor intensive plant growing such as market gardening would not be suitable. In addition the slope of the land is such that it would not be able to be practiced on a large part of the property. The lack of a permanent water supply is also a constraint to using the land for intensive plant agriculture. Whilst there is a low pressure water supply to the property, this should not be relied upon because of its non-permanence and the potential for it to be cut off by the water supply authority during dry times.

Protected cropping would also be problematical because of the slope as well as the lack of water supply. For a protected cropping use to be profitable, it would need to be a minimum of 2,000 m^2 to 2 ha and the slope of the land would require considerable cut and fill to provide a suitable flat area to on which to construct the protected cropping structure. There would also need to be a packing shed as well as other infrastructure such as water tanks and manoeuvring areas as well as a new access to Beach Road because the existing entrance off Wire Lane is too steep to get to the land that would be suitable to locate the growing area.

Intensive animal livestock would also not be suited because of the proximity to the rural residential development. The buffer distances for this is 500m to 1,000m and this would preclude the part of the site that its suitable for this type of agriculture.

The drainage lines on the site would be designated as waterfront land under the provisions of the Water Act, 2000 and any development would have to be 40m from the banks of these. The location of these two drainage lines would inhibit the placement of structures for either protected cropping or intensive animals as well as restricting the area that could be planted for field cropping of vegetables.

Therefore, the only type of agriculture that the property would be suited to is grazing of cattle and it has been shown that the property is too small to make sufficient profit.

Chapter 5: NSW Local Planning Directions

5.1. Introduction

The Environmental Planning and Assessment Act makes provision for the Minister to issue Local Planning directions pursuant to section 9.1.

Any Planning Proposal prepared for land covered by the relevant direction must be consistent with the direction or justify why it is not consistent.

This chapter will outline the planning directions and will provide justification for the inconsistency.

5.2. Relevant Planning Directions

There are two local planning directions that are relevant to the subject land as follows:

- Direction 1.2 Rural Lands
- Direction 1.5 Rural Lands

Each direction will be separately addressed.

5.2.1. Direction 1.2 Rural Zones

The objective of this direction is as follows:

- to protect the agricultural production value of rural land.

The direction states that the planning proposal must be consistent with the direction unless the inconsistencies are "… justified by a study prepared in support of the planning proposal which gives consideration to the objectives of this direction"

Comment

This study has demonstrated how the site is not suitable for agriculture. The constraints of the site for agriculture have been outlined in chapters 2 and 4. The suitability of the land for agriculture is constrained by the slope of the land, soil quality, the size of land as well as its proximity to rural residential development. This limits the ability to make an adequate return from farming to provide sufficient income to support a family. Therefore, the property is not large enough to protect the agricultural production value of the land for cattle grazing.

5.2.2. Direction 1.5 Rural Lands

The direction applies to planning proposals that affect land in a rural zone or that seeks to change the existing minimum lot size.

It states that the planning proposal must consider the following matters. They will be addressed below:

(a) be consistent with any applicable strategic plan, including regional and district plans endorsed by the Secretary of the Department of Planning and Environment, and any applicable local strategic planning statement

Comment

There are not strategies that cover this part of the LGA specifically. The Shoalhaven Growth Management Strategy was adopted by Council in 2012 and endorsed by the Department of Planning in 2014. This has a strategy E.1 to retain the agricultural production capacity of the city. This Agricultural Assessment has shown that the land is not large enough to be agriculturally productive to provide an ongoing income to support a family.

(b) consider the significance of agriculture and primary production to the State and rural communities

Comment

The Shoalhaven is not a significant agricultural producer in NSW. Table 2.1 has shown that in 2016, the total value of agriculture in Shoalhaven was $73.9m, which is 0.6% of the NSW total value of production. Milk contributes 67.2% of the total value of agriculture in the LGA but this only makes up 8.4% of the NSW value of milk production. Cattle grazing contributed 22.2% of the total Shoalhaven however it was only 0.6% of the NSW total value. Therefore, the loss of any agricultural production from this property will not have an impact on the value of agriculture to NSW nor to the Shoalhaven. The fact that the site can only carry approximately 40-50 head of cattle also will not have an impact on the significance of agriculture because of the low numbers of cattle produced.

(c) identify and protect environmental values, including but not limited to, maintaining biodiversity, the protection of native vegetation, cultural heritage, and the importance of water resources

Comment

The biodiversity value of the land has been assessed and this has found that it is nearly all cleared of native vegetation (84%) and the remaining vegetation is considered to be of low ecological value. There are no other values of significance.

(d) consider the natural and physical constraints of the land, including but not limited to, topography, size, location, water availability and ground and soil conditions

Comment

Chapter 2 of this Agricultural Assessment has outlined the physical characteristics of the site and these have been summarised in section 4.5 and are the slope of the land, quality of the soils, the size of the land as well as the proximity to rural residential estates. All of these combine to make the land not suitable for ongoing agricultural production to derive a suitable income.

(e) promote opportunities for investment in productive, diversified, innovative and sustainable rural economic activities

Comment

The constraints of the site do not allow for any other agriculture than grazing of cattle. Therefore, this part of the direction is not considered to be relevant because the site cannot be used to promote opportunities for investment.

(f) support farmers in exercising their right to farm

Comment

The NSW Right to Farm Policy was published in 2016 and basically aims to reduce land use conflict by ensuring that agriculture does not cause an impact on adjoining land uses and vice versa. One of the key aspects of this is to ensure that new agricultural developments do not locate in close proximity to agricultural land uses. It has been noted in section 4.5 that the proximity of the site to rural residential development on the adjoining land precludes its use for any form of intensive agricultural development. Therefore, any intensive agriculture on the site will not achieve the objectives of the NSW Right to Farm Policy.

(g) prioritise efforts and consider measures to minimise the fragmentation of rural land and reduce the risk of land use conflict, particularly between residential land uses and other rural land uses

Comment

The land use conflict buffers have been applied to the study area and the land that would be suitable for growing intensive plants is within the protected cropping and outdoor horticulture buffer and the entire study area is within the poultry farm buffer. Therefore, the site is not suited to growing intensive agriculture because of the potential for land use conflict.

(h) consider State significant agricultural land identified in State Environmental Planning Policy (Primary Production and Rural Development) 2019 for the purpose of ensuring the ongoing viability of this land

Comment

There is no State Significant Agricultural Land identified in the SEPP Primary Production and Rural Development 2019 so this is not relevant.

(i) consider the social, economic and environmental interests of the community.

Comment

The social interests of the community in relation to rural lands is not to have land use conflict which would cause a loss of amenity to the residents on either side of the study area. This is achieved by not intensifying the land use on the land to a use that would cause land use conflict.

The economic interests are served by not having a detrimental impact on the local economy. The use of the land for grazing is running at a loss and this is not serving the interests of the local economy.

The environmental interests of the economy are served by not having a detrimental impact on the environment.

A planning proposal to which proposes to change the minimum lot size must demonstrate that it:

(a) is consistent with the priority of minimising rural land fragmentation and land use conflict, particularly between residential and other rural land uses

Comment

The land on either side of the study area is currently fragmented and used for mostly rural residential use. The land is not sustainable for agriculture at present being used as extensive agriculture and any intensification of the land use on the subject land is likely to lead to land use conflict.

(b) will not adversely affect the operation and viability of existing and future rural land uses and related enterprises, including supporting infrastructure and facilities that are essential to rural industries or supply chains

Comment

The size of the cattle heard on the property is very low in relation to the size of other farms in the local area as well as the LGA and the loss of its contribution to the cattle operation in the LGA will not have any adverse impact on the rural land uses and related enterprises.

(c) where it is for rural residential purposes:
   iii. is appropriately located taking account of the availability of human services, utility infrastructure, transport and proximity to existing centres
   iv. is necessary taking account of existing and future demand and supply of rural residential land.

Comment

This is not relevant to this agricultural assessment.

Chapter 6: Conclusion

INDESCO are preparing a Planning Proposal to rezone the subject land to large lot residential and part of the studies required is an assessment of the site's value for agriculture production.

The site has constraints for its use as an agricultural holding due to the physical characteristics slope, soil fertility, and lack of a permanent water supply and which limits its use to cattle grazing and the size is not large enough to make a sufficient income to support a family full time and needs an off-farm source of income.

The Berry – Kangaroo Valley Region and the LGA as a whole is not known as a significant agricultural area with the average size of farms in the region being 137 ha which is lower than the LGA. The average size of cattle farms is 137 ha ha which is also lower than the LGA average. Farmers in the region are 60 years old which is older than the NSW and national averages and only 9.4% of the workforce is employed in agriculture and this suggests that they are retired and carry out farming on a part-time basis

The size of the farm is 40 ha and it is too small to make a sustainable profit from cattle grazing which is the only form of agriculture that can be practised on the property.

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Appendix E – Ecological Constraints Assessment

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ecology | planning | offsets

15 March 2019

Re: Ecological Constraints Assessment, Lot 1 // DP 1246435 (55 Wire Lane, Berry)

Dear Mark,

Please find below an outline of the methods and results of an Ecological Constraints Assessment (ECA) for Lot 1 // DP 1246435 (55 Wire Lane, Berry, NSW), hereafter referred to as the 'study area' (**Figure 1**: Location of study area.).

Background and purpose of report

This letter provides an ECA of the study area (Lot 1 // DP1246435), which is wholly located within the Shoalhaven Local Government Area (LGA) and is 40.85 ha in size. The study area is zoned as Primary Production (RU1) and Primary Production Small Lots (RU4) under the Shoalhaven Local Environmental Plan (SLEP) 2014. This assessment will accompany a Planning Proposal to rezone the land.

The ECA identifies the ecological values present within the study area and potential constraints for a proposed subdivision of the study area. Specifically, this ECA considers threatened species, populations and ecological communities listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Biodiversity Conservation Act 2016* (BC Act).

Methods

Literature review and database analysis

A site-specific literature and database review were undertaken prior to the field survey and the preparation of this report. This included desktop analysis of aerial photography and review of regional scale information from the following sources:

- NSW Planning Viewer (NSW Dept. of Planning and Environment 2019)
- BioNet Atlas of NSW Wildlife (NSW Office of Environment and Heritage (OEH) 2019a)
- Protected Matters Search Tool (Commonwealth Department of the Environment and Energy 2019)
- SIX Maps (LPI 2019)

- Native Vegetation of South East NSW (Tozer et al. 2010)
- NSW Vegetation Information System (OEH 2019b)

Threatened species, populations and migratory species recorded within 5 km of the subject site were consolidated in a search of the Atlas of NSW Wildlife (BioNet) (OEH 2019a). Their likelihood of occurrence was assessed by:

- review of location and date of recent (<5 years) and historical (>5-20 years) records
- review of available habitat within the subject site and surrounding areas
- review of the scientific literature pertaining to each species and population
- applying expert knowledge of each species

Following a review of available habitat within the subject site, the potential for each threatened species, population and/or migratory species to occur was considered. The potential for species to use the site and to be affected directly or indirectly by the proposed action were considered as either:

- "Recent record" = species has been recorded in the subject site a within the past 5 years
- "High" = species has previously been recorded in the subject site (>5 years ago) or in proximity to (for mobile species), and/or habitat is present that is likely to be used by a local population
- "Moderate" = suitable habitat for a species is present onsite but no evidence of a species detected and relatively *high* number of recent records (5-20 years) within 5 km of the study area or species is highly mobile
- "Low" = suitable habitat for a species is present onsite but limited or highly degraded, no evidence of a species detected and relatively *low* number of recent records within 5 km of the study area
- "Not present" – suitable habitat for the species is not present onsite or adequate survey has determined species does not occur in the subject site

A site inspection of the study area was undertaken by Lucas McKinnon (Principal Ecologist, Ecoplanning) on 9 February 2019 over approximately 1 hour. The purpose of this site inspection was to validate vegetation community mapping by Tozer et al. (2010), assess the structure and condition of vegetation in the study area and to determine the extent of vegetation impacted by the proposed works. Additionally, fauna habitat features (i.e. tree hollows, stags, decorticating bark, mature / old growth trees, winter-flowering eucalypts) and indirect signs of fauna use (i.e. scats, owl pellets, fur, bones, tracks, bark scratches, foliage chew marks and chewed capsules) were recorded.

Results

Vegetation communities – desktop assessment

Native vegetation within 5 km of the study area was assessed using desktop GIS analysis (**Figure**.**2**). The vegetation mapping by Local Land Services (LLS) (2014) revealed that much of the native vegetation in the study area has been cleared (~84 % or 33.5 ha). The remaining native vegetation occurs within the central-western portion of the study area and

is consistent with areas mapped on the SLEP (2014) 'Terrestrial Biodiversity' map. Portions of largely intact native vegetation also remain adjacent to and west of the study area.

Tozer et al. (2010) regional vegetation mapping identified three vegetation types in the study area. The corresponding Plant Community Types ,following OEH (2019b) nomenclature, have been identified and are presented in **Table 1** and **Figure**.**3**.

Table.1:Past and present native vegetation mapping for the study area and equivalent PCTs.

SCIVI (Tozer et al. 2010)	PCT (OEH 2019b)	Tozer et al. (2010)	Ecoplanning (2019)	BC Act	EPBC Act
Warm Temperate Layered Forest	Sydney Blue Gum x Bangalay -Lilly Pilly moist forest in gullies and on sheltered slopes, southern Sydney Basin Bioregion (PCT 1245)	X		No	No
Illawarra Gully Wet Forest	Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin (PCT 694)	X	X	No	No
South Coast Grassy Woodland	Forest Red Gum – Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion (PCT 838).	X		EEC[1]	CEEC[2]

EEC = endangered ecological community, CEEC = critically endangered ecological community

[1]Component of Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion

[2]Component of Illawarra and South Coast Lowland Forest and Woodland

Vegetation communities – field survey

Vegetation mapping was revised after field assessment to include only one of the three previously mapped native communities (Blackbutt - Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin - PCT 694), and two additional non-native vegetation types (Plantings and Cleared land) (**Figure 4**).

Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin is not listed as a TEC under the BC or EPBC Act.

Field assessment identified two distinct condition classes of Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin (PCT 694): 'Intact/disturbed' (**Photo 1**), and 'Scattered paddock trees' (**Photo 2**).

The Blackbutt – Turpentine – Bangalay community (PCT 694) predominantly occurs in an 'Intact/disturbed' condition in the western section of study area, with herbaceous weeds and exotic grasses occurring in the midstorey and groundcover. Blackbutt- Turpentine –

Bangalay (PCT 694) with the condition class of 'Scattered paddock trees' was mapped to the south of the 'Intact/disturbed' patch.

The majority of the study area consists of 'Cleared land' (33.4 ha) dominated by pasture grasses such *Cenchrus clandestinus** (Kikuyu), *Axonopus fissifolius** (Carpet Grass), *Lolium* spp. (Ryegrass), *Bromus* spp. (Brome) and herbaceous and woody weeds such as *Sida rhombifolia** (Paddy's Lucerne), *Solanum nigrum** (Black-berry Nightshade) and *Bidens pilosa** (Cobblers Pegs) and exotic grasses (**Photo 3**). Vegetation mapped as 'Plantings' was located in the south-west of the study area surrounding the residential buildings (**Photo 4**). Three farms dams (0.5 ha), managed for livestock grazing, are also present within the study area.

Fauna habitat

Field survey did not identify any hollowing bearing trees, stags, habitat trees or man-made structure which may provide roosting or breeding habitat for arboreal mammals and birds. Fauna habitat features in the study area consist of cleared land, farm dams, native vegetation communities and planted vegetation communities. More than half of the study area has been cleared (approximately 82 % or 33.4 ha) and is dominated by exotic pasture, which provides minimal foraging habitat for birds and microbats.

Threatened species

No threatened flora or fauna species listed under the BC Act or EPBC Act were recorded during the site inspection. Further, searches of relevant databases (Atlas of NSW Wildlife, OEH 2019a) did not identify any previous records of threatened flora or fauna species within the study area. Twenty-eight (28) threatened species (25 fauna and three flora species) have previously been recorded within a 5 km radius of the study area (**Figure 5**) (**Appendix A**).

After field assessment all threatened flora and fauna species were considered to have a 'low' likelihood of occurrence within the study area.

Riparian corridors

A number of watercourses have been mapped within the study area (**Figure.**4**6**). In the western half of the study area, two 1st order streams converge into a 2nd order stream. A third 1st order stream, flowing in a northerly direction, also converges with the 2nd order stream in the centre of the study area. However, this 2nd order stream has been marked for reclassification to a 1st order stream due to the absence of a bed or bank on the two northerly flowing tributaries having no bed or bank in accordance with the definition of 'waterfront land' under the NSW *Water Management Act 2000* (WM Act) (Indesco 2019). In the eastern half of the site, one 2nd order watercourse flows in a northerly direction, passing through two farm dams.

NRAR (2018) guidelines require a Vegetated Riparian Zone (VRZ) either side of mapped drainage lines, which are 20 m either side measured from the Top of Bank (ToB) for 2nd order and 10 m for 1st order drainage lines.

Field validation of these streams found no discernible bed and banks on the two northerly-flowing 1st order streams in the south-west of the study area, and where the easterly-flowing 2nd order drainage line exits the woodland, no bed or bank was evident in this area either

(**Photo 5**; **Figure 7**). At the time of survey, the dams had some aquatic and emergent vegetation and it is likely that these dams have habitat value for native species.

Conservation values in the study area

Vegetation communities have been separated based upon their condition and conservation value. The ecological constraints assessment identified areas of 'medium' and 'low' ecological value (**Table 2**). Native vegetation which is not an EEC, farm dams and well vegetated riparian zones of mapped drainage lines are mapped as a 'moderate' ecological constraint. Cleared, exotic land and poorly vegetated riparian buffer zones of mapped drainage lines are mapped as 'low' conservation significance and ecological constraint (**Figure 8**).

Table 2: Ecological constraints criteria.

Ecological Constraint	Criteria
High	• Areas of native vegetation that are listed as threatened ecological community (TEC) under the BC Act or the EPBC Act • Areas of identified threatened species records or significant habitats of species likely to utilise the study area
Medium	• Well vegetated riparian buffer zones of mapped drainage lines • Areas of native vegetation that are not listed as TEC under the BC Act) or EPBC Act • Areas identified on the 'Terrestrial Biodiversity' map SLEP (2014)
Low	• Poorly vegetated riparian buffer zones of mapped drainage lines • Areas of mixed native and exotic vegetation that are likely to have a Vegetation Integrity Score <17/100

Conclusions and recommendations

The study area consists predominantly of land that is of low ecological value (i.e. cleared land and weeds/exotics). However, due to the presence of Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin (PCT 694), a 2nd order stream and farm dams, there are areas that were considered to have 'moderate' ecological constraint. No area of 'high' constraint was identified.

If at the DA stage the proposed works include the removal of >0.25 ha of native vegetation, a Biodiversity Development Assessment Report (BDAR) prepared by a suitably qualified ecologist will be required to accompany the DA. Surveys consistent with the Biodiversity Assessment Method (BAM) will be necessary to determine whether native vegetation proposed for clearing has a Vegetation Integrity Score >17/100 and thereby require offset in accordance with NSW Biodiversity Offset Scheme (Section 7 of the BC Act).

Field assessment of watercourses in the study area found no discernible bed and bank on the two northerly-flowing 1st order streams in the south-west of the study area, nor the

easterly-flowing 2nd order drainage line after exiting the forested area. As such, the proposed reclassification of the easterly flowing 2nd order stream to a 1st order stream and that both northerly-flowing 1st order streams be deleted from mapping is supported.

If any future development proposal includes impacts to 'waterfront land' under the WN Act (i.e. within 40 m of ToB of watercourses), a Controlled Activity Approval will be necessary. Restoration of aquatic and riparian vegetation and habitat will be required through the preparation and implementation of a Vegetation Management Plan (VMP) to meet the requirements of NRAR (2018) guidelines.

If you would like to discuss any of the above comments and recommendations further, please contact me on the below details.

Yours sincerely,

L J McKinnon

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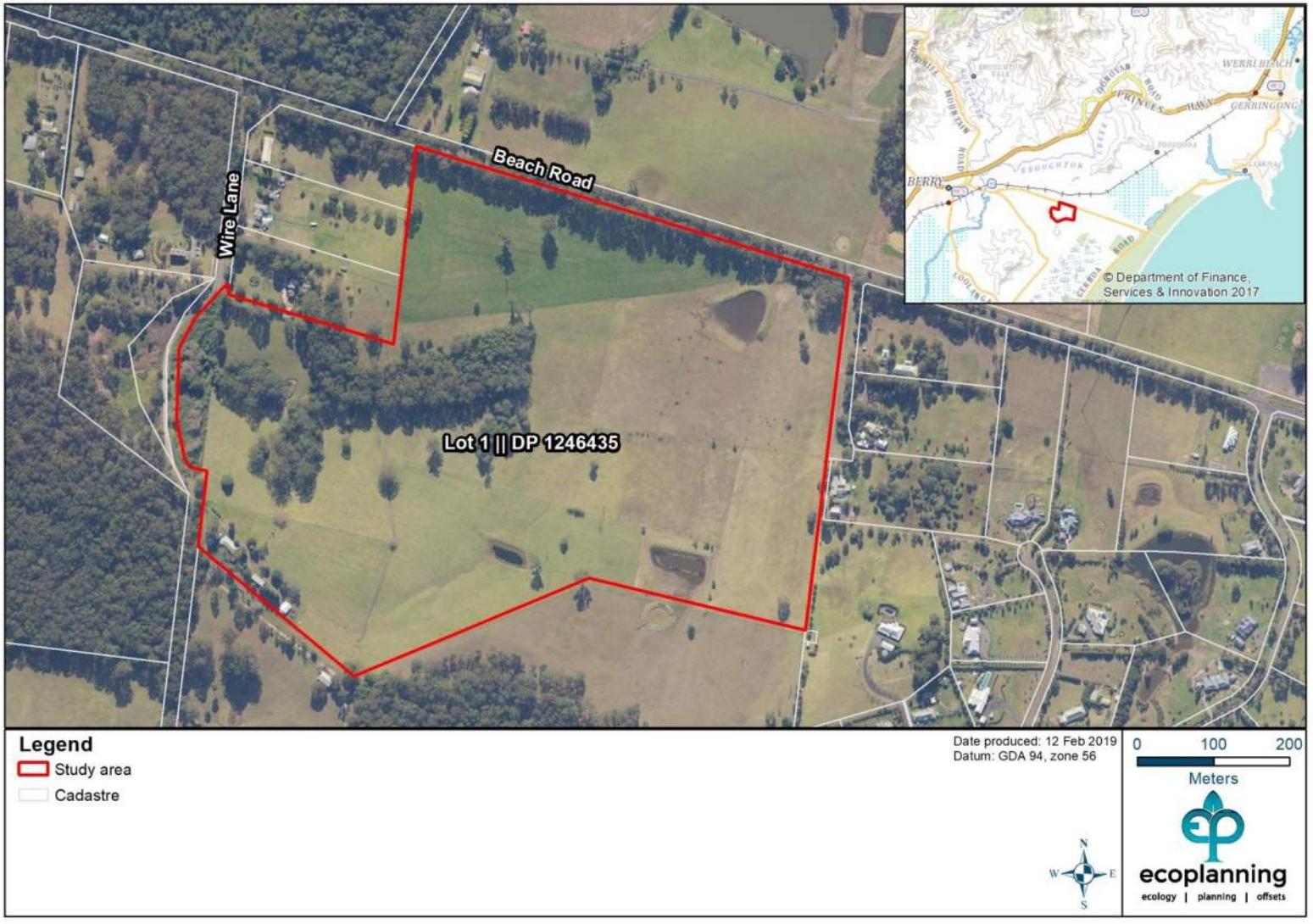

Figure 1: Location of study area.

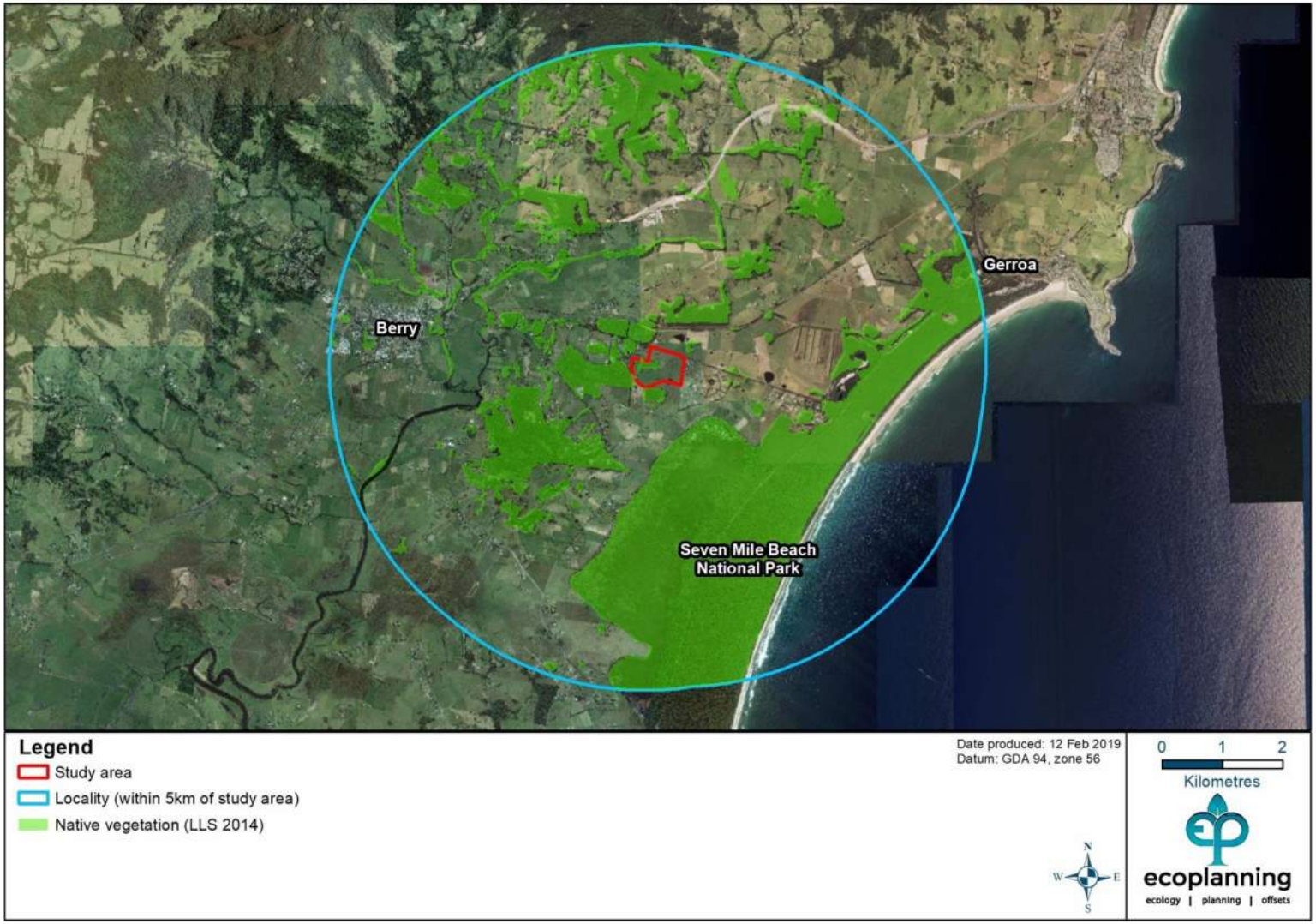

Figure.2: Native vegetation within 5 km of study area (LLS 2014).

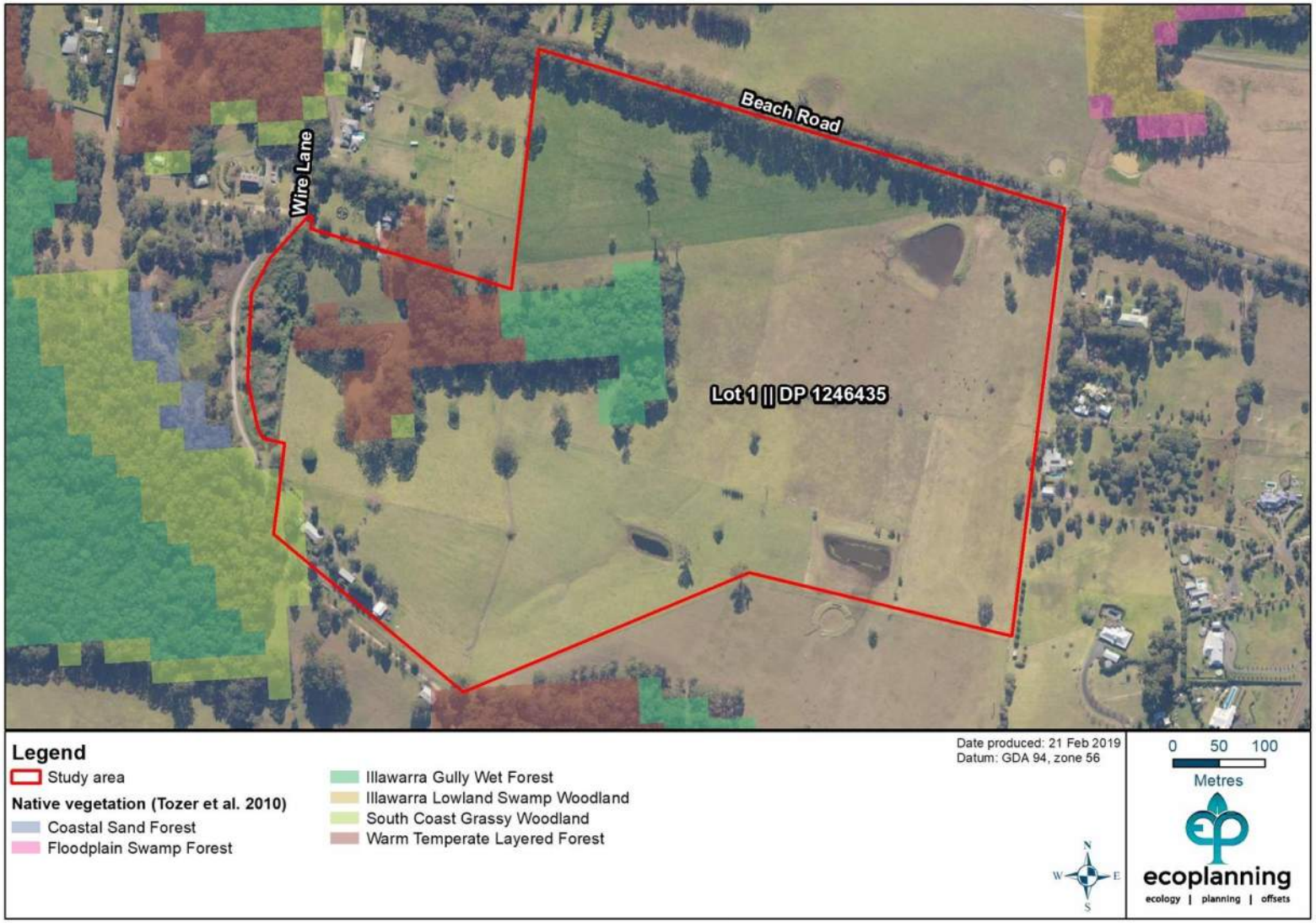

Figure.3: Vegetation within the study area (Tozer et al. 2010).

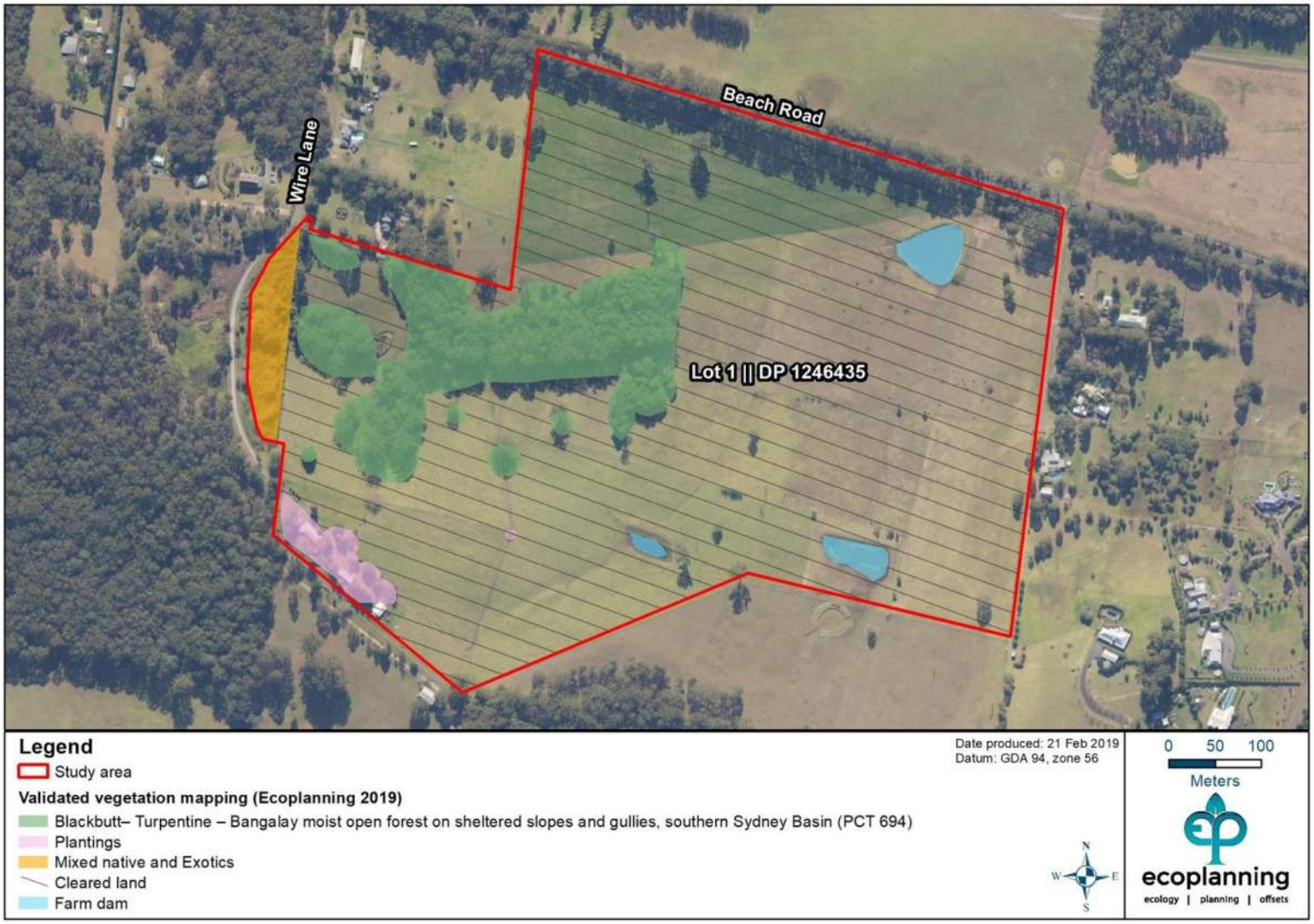

Figure.4: Field validated vegetation communities within study area (Ecoplanning 2019).

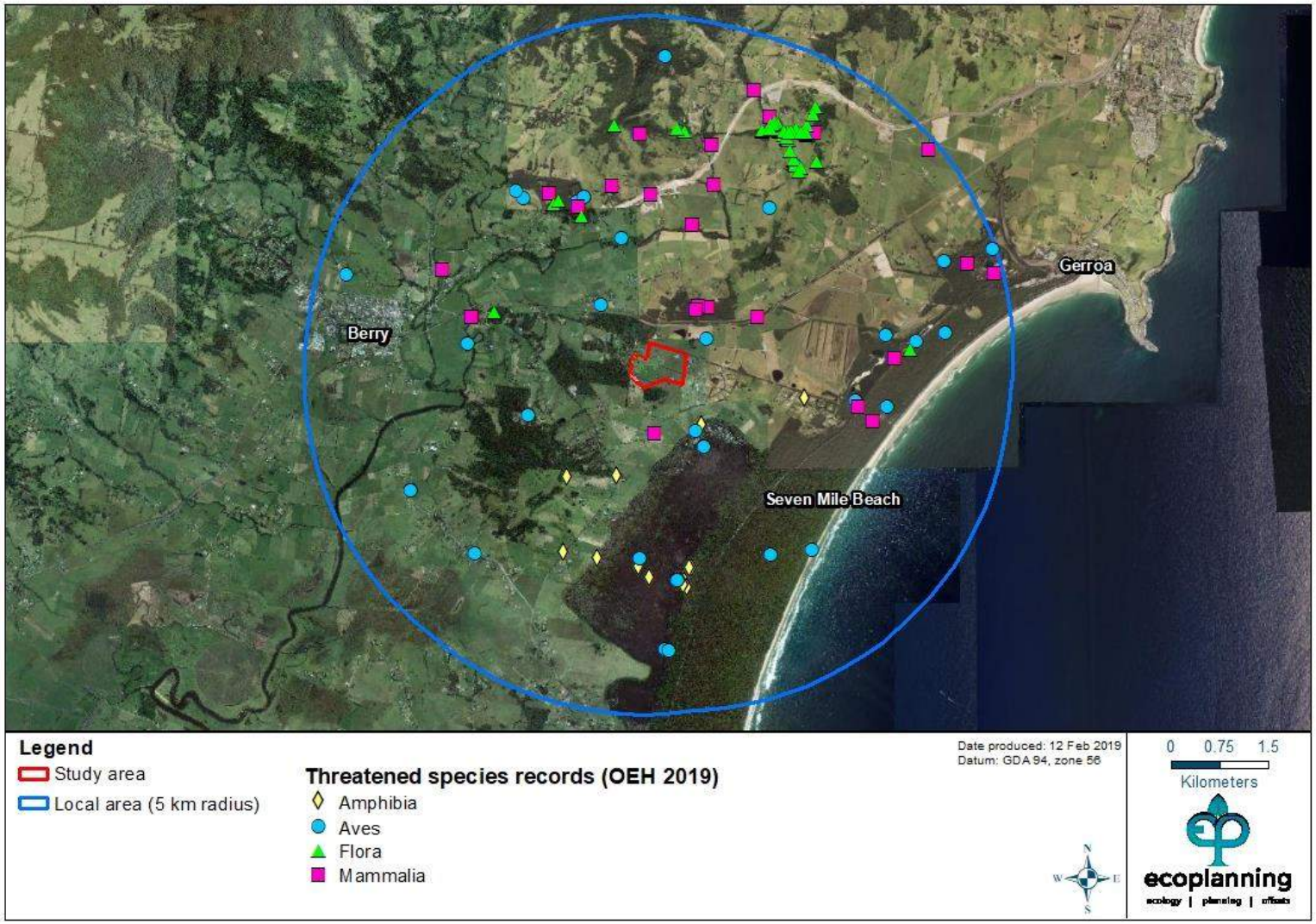

Figure.5: Threatened species records within 5 km of the study area (OEH 2019.

Figure.6: Strahler stream order and buffer zones (NRAR 2018) in study area.

Figure.7: Proposed updated stream order and riparian buffers.

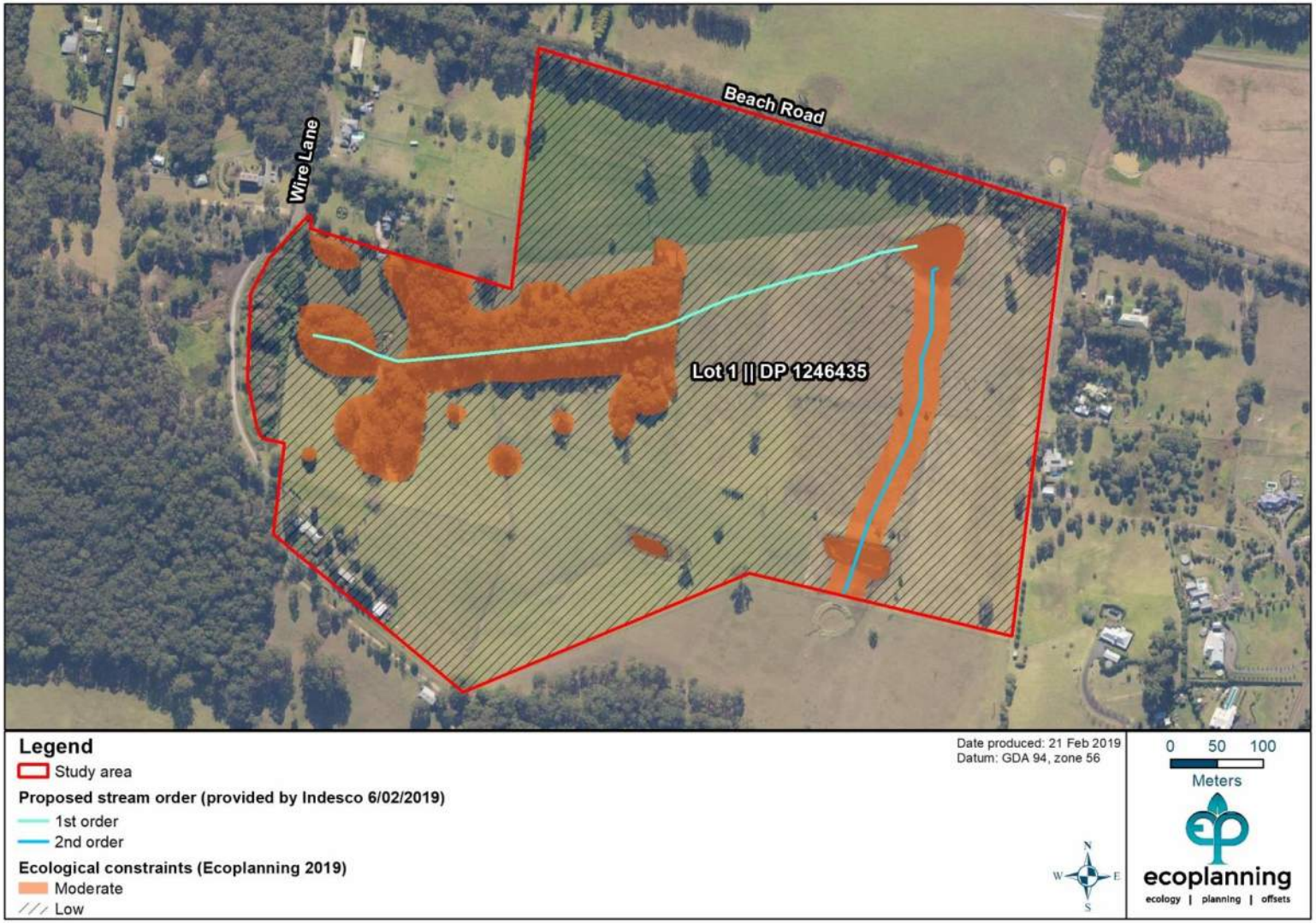

Figure.8: Ecological constraints within the study area.

Photo 2: Patch of Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin (PCT 694) in an 'Intact/disturbed' condition.

Photo 1: Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin (PCT 694) in a 'Scattered paddock tree' condition.

Photo 3: Cleared exotic grassland.

Photo 4: Plantings in the south-west of the study area.

Photo 5: Location of the easterly flowing 2nd order stream (proposed 1st order stream) in study area showing no discernible bed or bank present onsite.

Appendix A: Species likelihood of occurrence

Scientific name (Common name)	Legal Status	No. of records	Closest record (year)	Most recent (distance)	Likelihood of occurrence	
					Pre survey	Post survey
KINGDOM: Animalia; CLASS: Amphibia						
Litoria aurea Green and Golden Bell Frog	BC Act: E1 EPBC Act: V	19	0.7 km (10/12/2014)	16/12/2018 (1.9 km)	Moderate	Low
KINGDOM: Animalia; CLASS: Aves						
Artamus cyanopterus cyanopterus Dusky Woodswallow	BC Act: V	4	1.6 km (15/02/2007)	20/02/2007 (3.3 km)	Low	Low
Botaurus poiciloptilus Australasian Bittern	BC Act: E1 EPBC Act: E	15	0.8 km (27/11/2014)	10/02/2015 (3.0 km)	Moderate	Low
Callocephalon fimbriatum Gang-gang Cockatoo	BC Act: V	4	1.7 km (6/09/2011)	3/02/2012 (4.6 km)	Low	Low
Calyptorhynchus lathami Glossy Black-Cockatoo	BC Act: V	3	3.8 km (17/04/2015)	17/04/2015 (3.8 km)	Low	Low
Dasyornis brachypterus Eastern Bristlebird	BC Act: E1 EPBC Act: E	1	3.8 km (17/04/2015)	8/12/2016 (3.8km)	Low	Low
Haematopus longirostris Pied Oystercatcher	BC Act: E1	1	3.2 km (6/04/2005)	6/04/2005 (3.2km)	Low	Low
Haliaeetus leucogaster White-bellied Sea-Eagle	BC Act: V EPBC Act: C	4	2.6 km (28/04/2000)	15/09/2008 (3.5 km)	Low	Low
Hieraaetus morphnoides Little Eagle	BC Act: V	1	1.9 km (24/01/2008)	24/01/2008 (1.9km)	Low	Low
Lathamus discolor Swift Parrot	BC Act: E1 EPBC Act: CE	1	0.4 km (16/06/2014)	16/06/2014 (0.4km)	Low	Low
Lophoictinia isura Square-tailed Kite	BC Act: V	1	2.9 km (21/10/2014)	21/10/2014 (2.9km)	Low	Low

Scientific name (Common name)	Legal Status	No. of records	Closest record (year)	Most recent (distance)	Likelihood of occurrence	
					Pre survey	Post survey
Ninox strenua Powerful Owl	BC Act: V	5	2.4 km (10/12/2008)	2/01/2009 (3.2 km)	Low	Low
Pandion cristatus Eastern Osprey	BC Act: V	1	2.9 km (28/02/2002)	28/02/2002 (2.9km)	Low	Low
Stagonopleura guttata Diamond Firetail	BC Act: V	1	4.4 km (18/01/2016)	18/01/2016 (4.4km)	Low	Low
KINGDOM: Animalia; CLASS: Mammalia						
Dasyurus maculatus Spotted-tailed Quoll	BC Act: V EPBC Act: V	2	2.5 km (30/06/2006)	30/06/2006 (4.8 km)	Low	Low
Falsistrellus tasmaniensis Eastern False Pipistrelle	BC Act: V	4	1.9 km (24/01/2008)	24/01/2008 (1.9 km)	Low	Low
Miniopterus schreibersii oceanensis Eastern Bentwing-bat	BC Act: V	10	0.7 km (18/02/2007)	27/08/2016 (2.3 km)	Moderate	Low
Mormopterus norfolkensis Eastern Freetail-bat	BC Act: V	6	0.7 km (18/02/2007)	10/11/2008 (3.2 km)	Moderate	Low
Myotis macropus Southern Myotis	BC Act: V	10	0.7 km (18/02/2007)	10/11/2008 (3.2 km)	Moderate	Low
Petauroides volans Greater Glider population in the Seven Mile Beach National Park area	BC Act: E2 EPBC: V	2	3.0 km (9/01/2006)	9/01/2006 (3.0 km)	Low	Low
Petaurus australis Yellow-bellied glider	BC Act: V	1	2.7 km (21/10/2011)	21/10/2011 (2.7km)	Low	Low
Phascolarctos cinereus Koala	BC Act: V EPBC Act: V	1	3.2 km (15/12/2005)	15/12/2005 (3.2km)	Low	Low
Pteropus poliocephalus Grey-headed Flying-fox	BC Act: V EPBC Act: V	5	0.7 km (15/01/2015)	8/02/2017 (3.2 km)	Moderate	Low

Scientific name (Common name)	Legal Status	No. of records	Closest record (year)	Most recent (distance)	Likelihood of occurrence	
					Pre survey	Post survey
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	BC Act: V	4	0.8 km (18/02/2007)	20/02/2007 (0.8 km)	Moderate	Low
Scoteanax rueppellii Greater Broad-nosed Bat	BC Act: V	9	0.7 km (18/02/2007)	13/09/2013 (1.2 km)	Moderate	Low
KINGDOM: Plantae						
Daphnandra johnsonii Illawarra Socketwood	BC Act: E1 EPBC Act: E	30	3.3 km (31/07/2018)	14/08/2018 (3.4 km)	Not present	Not present
Rhodamnia rubescens Scrub Turpentine	BC Act: E4A	8	2.2 km (30/06/2009)	28/07/2016 (2.6 km)	Not present	Not present
Zieria granulata Illawarra Zieria	BC Act: E1 EPBC Act: E	20	3.3 km (16/09/2016)	14/08/2018 (3.7 km)	Not present	Not present

Appendix F – Water Cycle Management Plan

55 WIRE LANE BERRY
WATER CYCLE MANAGEMENT REPORT

PROJECT NO: ISC00016

MARCH 2019

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CONTENTS

FIGURES

1. INTRODUCTION

1.1 OVERVIEW

Indesco Pty Ltd has been engaged by the lot owner of Lot 1 DP1246435 to prepare a Water Cycle Management Study as part of a planning proposal to support an LEP land zoning amendment for 55 Wire Lane, Berry.

This study includes:

- A description of the existing water cycle and any changes to flow patterns due to Rural Residential development;
- A description of the flooding impact on the site;
- An investigation into the stormwater quality impact of the development; and
- A plausible system for disposal of waste water generated by the development.

1.2 SITE DESCRIPTION

The site is located on Lot 1 DP1246435 and extends between Wire Lane on the west and Sunnymede Lane on the east, bounded on the north by Beach Road and three lots fronting Wire Lane (5, 11 and 21 Wire Lane). The site has an area of 41.04ha. Berry township is approximately 4km to the west

The site is currently zoned partly RU4 (small lot primary production) and partly RU1 (Primary Production) and used for cattle grazing. There is one dwelling and two outbuildings at the south-west of the site. There are three dams on the site.

Figure 1 Aerial Image. Source: Nearmap

Figure 2 Locality. Source: Six Maps

1.2.1 Topography

The site grades towards the north east corner of the site, with land in the north-west grading south-east, and the remainder of the site grading north or north-east. It is generally steeper on the western half of the site (typically 15% grade) and flatter on the eastern half (typically 4% grade) Total relief is 47m (RL55 – RL8 based on lidar contours from ELVIS see Figure 3). Some land at the north-west of the site (approx. 1 ha) grades towards Beach Road.

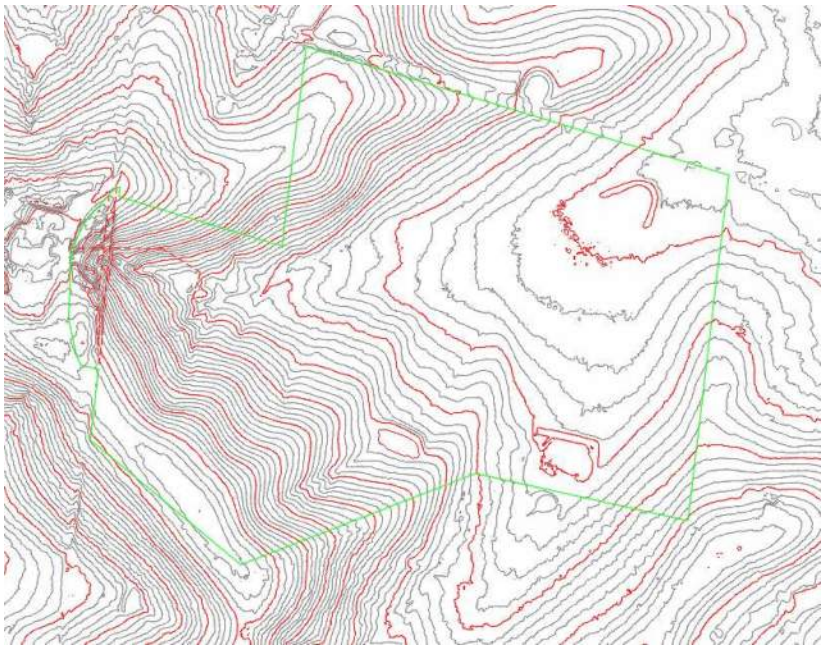

Figure 3: Site showing 1m contours, Lidar data from ELVIS (ELeVation Information System, Geoscience Australia)

1.2.2 Watercourses

Due to the topography almost all of the site drains to the dam in the north-east corner (dam 1, Figure 4).

NSW LPI maps identify four watercourses on the site (see Figure 4). There is an intermittent watercourse running roughly west to north-east across the site (stream A), in a vegetated gully on the western end of the site. The watercourse furthest to the east (stream B) originates in the upstream property (Lot 15 DP 253806) and is intercepted by a dam (dam 2) near the boundary. The overflow from this dam then

flows north toward dam 1. The other two watercourses (stream C and stream D) flow north from inside the property to intercept with stream A.

`Dam 1' overflows through a culvert under Beach Road to the adjoining site to the north (Lot 1 DP 1111012) where the flow is spread and sheets across paddocks, eventually draining to Foys Swamp, a degraded freshwater wetland. The total catchment to the site outlet is approximately 65 ha (see Figure 4). The external catchment contains one dwelling near the southern extent of the catchment and the condition is a mix of isolated heavily vegetated areas (10 ha) with the remainder pasture (14 ha).

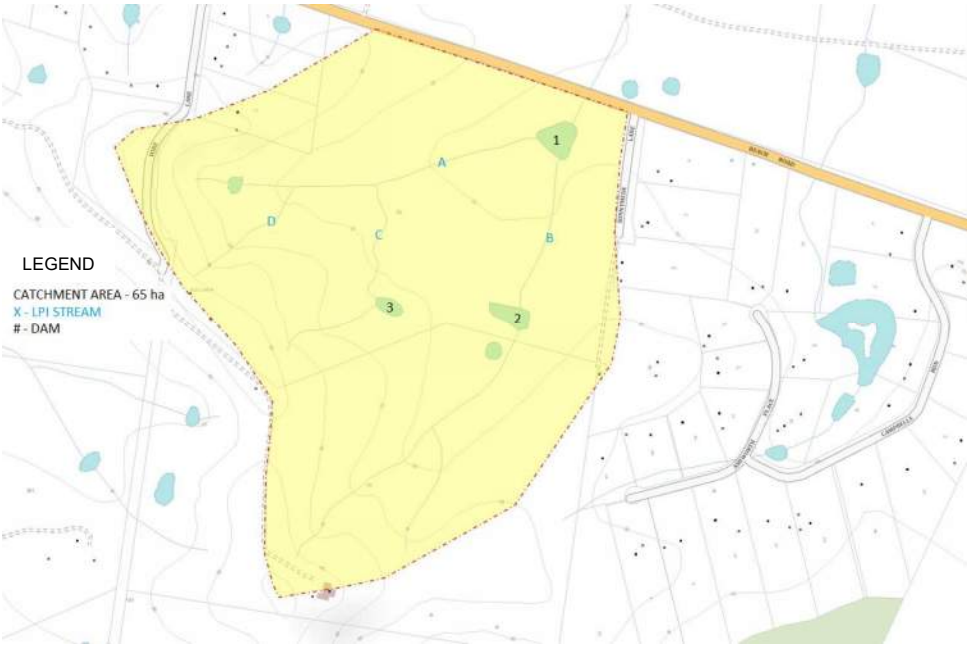

Figure 4 Catchment to site outlet with 10m contours. Watercourses labelled in blue, dams numbered in black. Source: SIX Maps

1.2.3 Climate

Climate data was sourced from the Bureau of Meteorology (BOM).

Table 1 climate data used

Data use	Location	Data type	Summary statistic
Effluent water balance - precipitation	Berry Masonic Village	Monthly average precipitation 1961-1990	Mean annual precipitation: 1521mm
Effluent water balance - evapotranspiration	34.8°S, 150.75°E	Monthly point potential evapotranspiration	Annual evapotranspiration 1474mm
MUSIC modelling - precipitation	Port Kembla	6 min pluviograph 1973-1978	Mean annual rainfall 1522mm
MUSIC modelling – evapotranspiration	Port Kembla	Monthly average areal potential evapotranspiration	Annual evapotranspiration 1188mm

The nearest BOM recorded weather station is at Berry Masonic village, 4km west of the site (mean annual rainfall 1521mmm). For effluent management water balance calculations the average monthly precipitation 1961-1990 was used. This station lacks pluviograph data so 6 min pluviograph data from Port Kembla (37km north of the site) was used. For evapotranspiration the nearest point on the gridded

BOM data is at 34.8°S, 150.75°E, 2km south east of the site. Point potential evapotranspiration data was used for effluent management water balance calculations and areal potential data was used for stormwater quality modelling. Because the annual average areal potential evapotranspiration at Port Kembla (1188mm) was close to that at 34.8°S, 150.75°E (1192mm) the Port Kembla data was used.

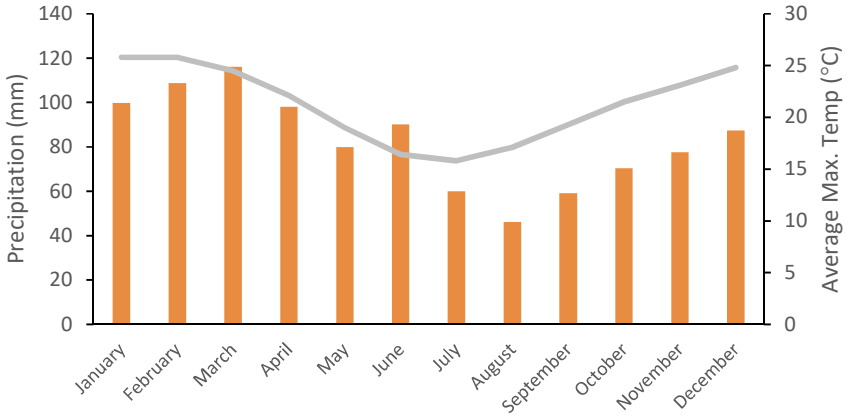

Figure 5 Climate at Berry (BOM data for precipitation and average daily maximum temperature)

1.2.4 Soil

No site geotechnical investigation has been undertaken to inform this report. Geological maps suggest a surface geology of Permian red-brown and grey volcanic sandstones (Budgong Group, Psg) and Quaternary deposits of alluvium, gravel, beach and dune sand (Qa) (see Figure 6). The NSW OEH soil landscapes map shows a progression of soils across the site (see Figure 7).

- The Shoalhaven landscape in the flat northeast corner of the site is characterised by brown sandy clay loam 1-1.5m deep.
- The Wattamolla Road landscape on the steep western portion of the site is characterised by brown silt loam topsoil over brown light clay with soil depth less than 1.2m.
- The Coolangatta landscape over the remainder of the site is characterised by brown to red-brown sandy clay loam 0.6 to 2m deep.

12 soil profiles within 2.5km of the site were accessed via NSW Office of Environment and Heritage eSPADE Soil and Land Information System. The profiles considered are detailed in Appendix 1.

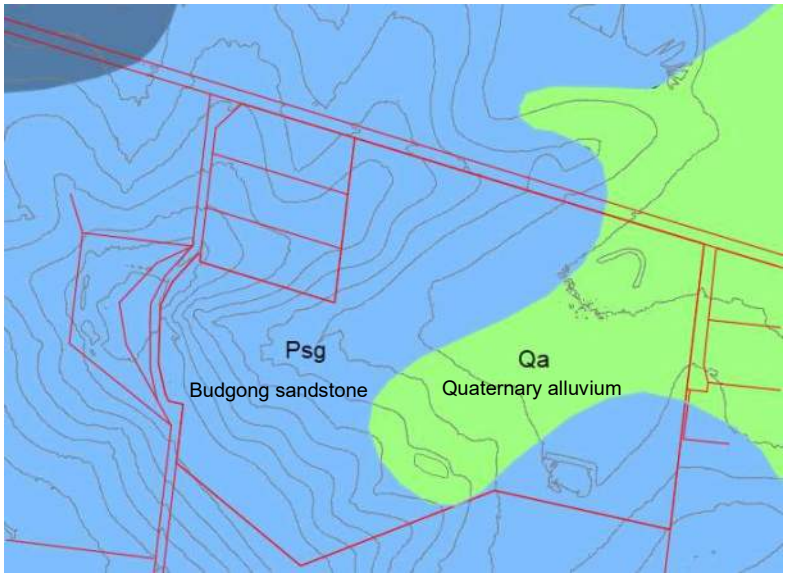

Figure 6 Surface Geology from Nowra-Toolijooa 1:50,000 Geological Series Sheet (Geological Survey of NSW) with 5m contours from ELVIS

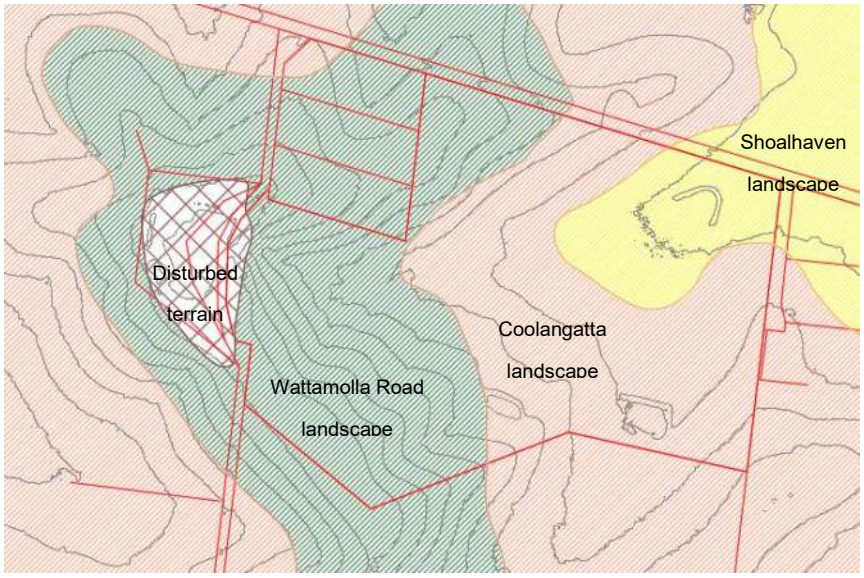

Figure 7 Soil landscapes from Kiama 1:100,000 Soil landscapes Sheet (NSW DECCW) with 5m contours from ELVIS

1.3 PROPOSED DEVELOPMENT

It is proposed to rezone Lot 1 DP1246435 from RU4 and RU1 to R5 (large lot residential) with a minimum lot size of 1 ha. A possible subdivision layout with 29 lots is shown in Figure 8.

The development will result in an increase in impervious area on the site because of the construction of new dwellings and sealed roads. The impervious percentage of the site will rise from approximately 2% to 9%.

The three dams currently on the site will be decommissioned and filled.

Stormwater runoff from lots will be allowed to flow into the watercourses or towards the roads. The large landscaped areas provide opportunities for runoff from lots to be spread before being intercepted by the drainage network. Road drainage will be managed through table drains and culverts for road crossings. The existing catchments will be unchanged, with the roads and watercourses directing runoff to the north-east corner of the site and under Beach Road.

The Ecological Constraints Assessment for Lot 1//DP1246435 by Ecoplanning dated 15 March 2019 identifies that some of the existing vegetation has moderate ecological value and should be preserved by the development. Vegetated management zones 20m wide will be formed around stream A and 40m wide around stream B (as shown on Figure 8).

The future development will need to accommodate the flood impact on the site, which is discussed in Section 2

The change in land use will result in a change in quality of stormwater runoff, which is outlined in Section 3.

The additional dwellings will increase the waste water production of the site. A discussion of how this waste water can be managed is included in Section 4.

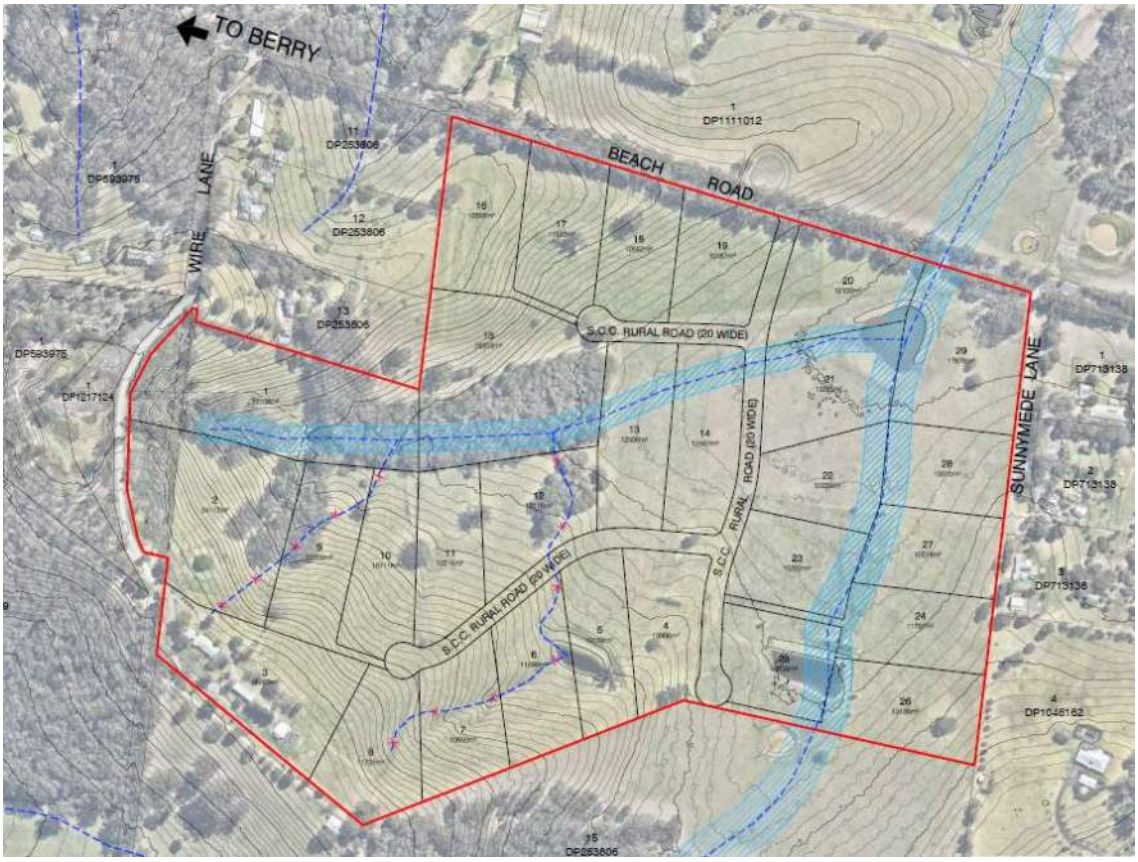

Figure 8 Concept lot layout after rezoning

2. FLOODING

Shoalhaven City Council DCP Chapter G9 gives controls for flood impact on developments. It requires that:

- Subdivision is not permissible in high hazard areas;
- All lots should be accessible to emergency services during the 1% AEP flood event; and
- All lots should have reliable access for pedestrians during a 1% AEP flood event.

It further requires that for dwellings to be constructed:

- Floor levels should have 500mm freeboard above the 1% AEP flood level;
- Any portion of the building below the flood planning level should be built from flood compatible materials; and
- The structure will not become floating debris during a 1% AEP flooding scenario

Elsewhere the Shoalhaven DCP defines the flood planning level to be the level of 1:100 ARI flood event plus 0.5m freeboard.

The subject site is near the south-western edge of the catchment of Crooked River which enters the ocean at the northern end of Seven Mile Beach. Cardno modelled the Crooked River catchment as part of a flood study assessing the impact of an extension to the Cleary Bros sand quarry on the northern side of Beach Road (2018).

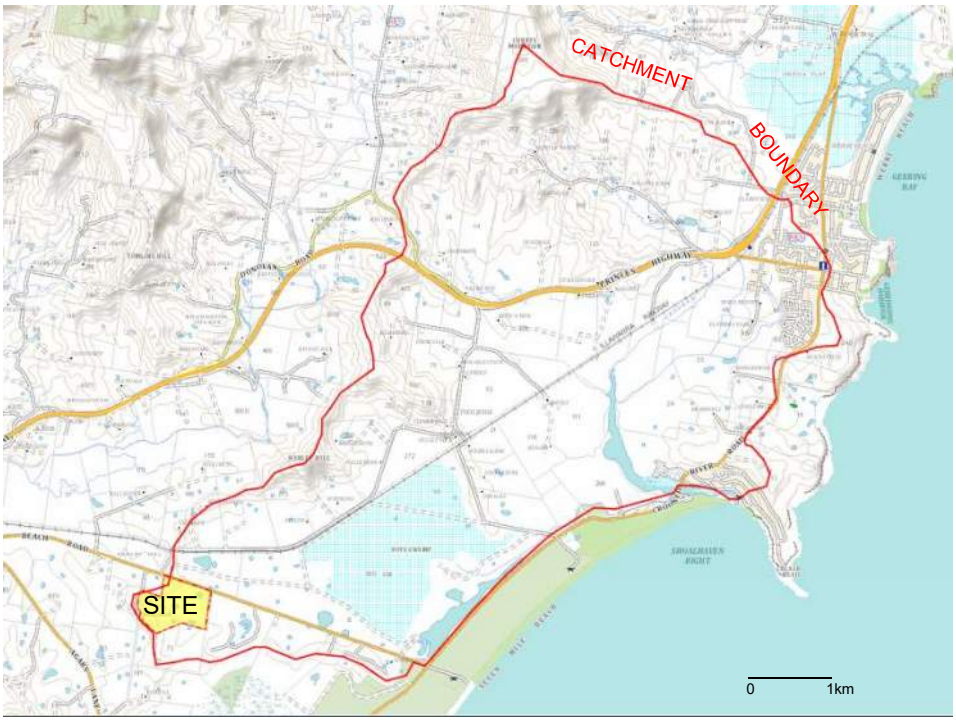

Figure 9 Site location within the Crooked River Catchment

The site is outside the 1%AEP flood extents calculated by Cardno. The report shows 1% AEP flood impacts, with the highest flood height contour showing a flood height at RL 4 AHD just west of Foys swamp (see Figure 10), approximately 900m downstream of the site outlet. The outlet to the site is at around RL8 AHD, so it is expected that tailwater will not have an impact on flooding levels on the site.

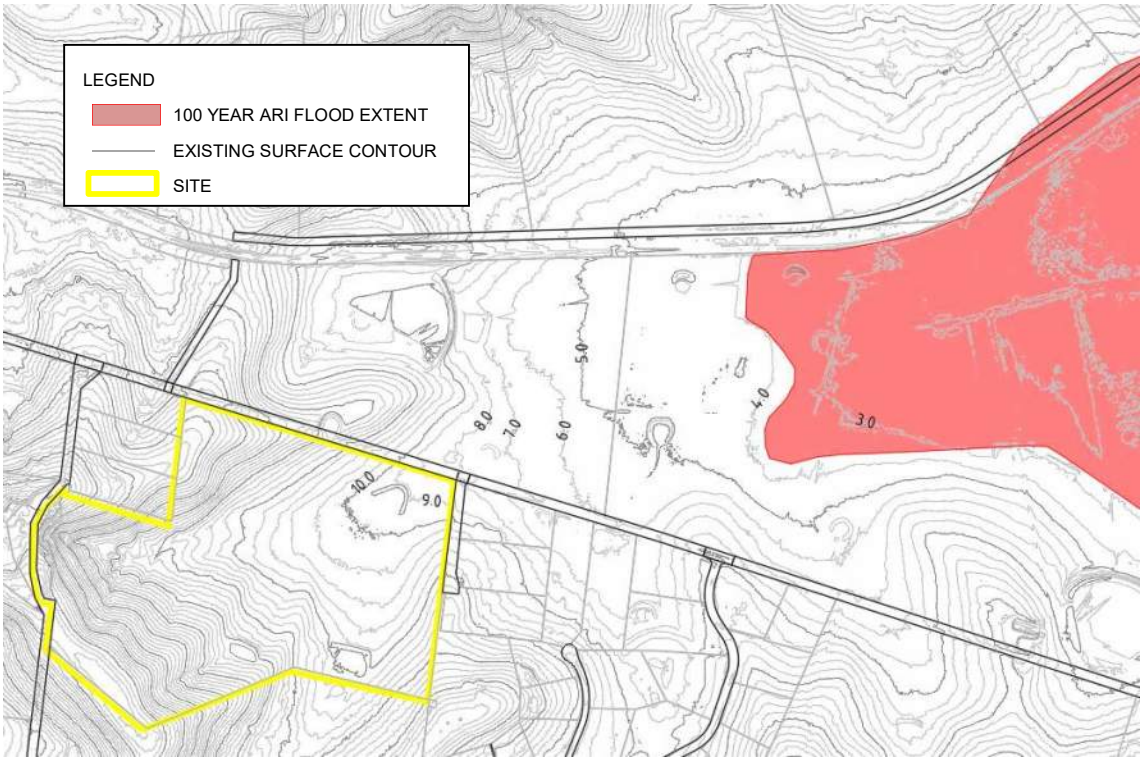

Figure 10 Crooked River 100 year ARI Flood extent near site

To give an idea of the scale of flood impacts across the site we have considered possible flow widths based on estimates of stormwater flows using WBNM and assuming Mannings flow in channels, with the channel profile based on site photos and LIDAR. The drainage lines on the site are generally quite broad, shallow depressions with the exception of stream A at the western side of the site which has steep banks. Near the site outlet we calculate a 1% AEP flow width of approximately 60m. This will not leave any lot without a suitable building area with 500mm freeboard above the 1% AEP flood level. At DA stage the flood planning level across the site should be defined.

To ensure access to lots the crossing of Stream A by the proposed road should be designed to allow for safe passage of vehicles during any 1% AEP flood event.

3. STORMWATER QUALITY MODELLING

The estimated pre and post-development water quality were modelled using MUSIC v6.2 with the intention of developing a treatment train so the development has a neutral or beneficial (NorBe) impact upon water quality.

In preparing this modelling the following documents have been considered:

- Shoalhaven City Council Development Control Plan 2014 Chapter G2 and Supporting Document 2: Sustainable Stormwater Technical Guidelines (Shoalhaven DCP)
- Draft NSW MUSIC Modelling Guidelines (2010) Sydney Metropolitan Catchment Management Authority (SCA 2010)

Shoalhaven DCP would classify the development allowed by this rezoning as large-scale development (subdivision creating more than 10 lots).

3.1 MUSIC MODEL PARAMETERS

The 6 min pluviograph data for Port Kembla (37km north of the site) was used. Mean annual rainfall for Berry Masonic village, the nearest weather station to the site (4km west of the site), is 1521mm. Mean annual rainfall at Port Kembla is 1108mm. To compensate for this disparity a wet sample period of data was used (1973-1978) with mean annual rainfall 1522mm. The evapotranspiration data for Port Kembla was used unaltered (mean annual evapotranspiration 1188mm).

Table 2 Adopted PET data for MUSIC model

	Rainfall (mm/6minutes)	**Evapotranspiration (mm/Day)**
Mean	0.017	3.25
Median	0.000	2.83
9th decile	0.002	5.16
Mean Annual (mm/year)	1522	1188

There are no permanent streams in the site and the catchments are relatively small (post developed all < 10ha) so the baseflow has been based on soil parameters only with all groundwater lost to deep seepage as suggested by SCA 2010.

To set the pervious area parameters the root zone depth and soil type were considered.

In line with the soil information in section 1.2.4 we consider the soil on site to be clay loam and used the parameters for infiltration and groundwater from SCA 2010 for this soil type (see Table 3**).**

Grazing pastures in southern Australia will typically have a root zone between 1.1 and 2m deep (Nie et al., 2008[1]) so the parameters from SCA 2010 for 1m root zone were used. In the post-developed roads, the earthworks and change in vegetation will mean the root zone is unlikely to extend to 1m, so the parameters for 0.5m root zone have been used (see Table 4).

The Roof nodes were given rainfall threshold values of 0.3mm, road nodes 1.5mm and all other source nodes 1.0mm (ref. SCA 2010 Table 3-6).

[1] Nie Z. N., Miller S., Moore G. A., Hackney B. F., Boschma S. P., Reed K. F. M., Mitchell M., Albertsen T. O., Clark S., Craig A. D., Kearney G., Li G. D., Dear B. S. (2008) *Field evaluation of perennial grasses and herbs in southern Australia. 2. Persistence, root characteristics and summer activity*. Australian Journal of Experimental Agriculture 48, 424-435

Table 3 Soil Parameters for clay loam soil type – extract from SCA 2010 table 3-8

Soil Type	Infiltration Capacity Coefficient "a" (mm/d)	Infiltration Capacity exponent "b"	Groundwater		
			Daily Recharge Rate (%)	Daily Baseflow Rate (%)	Daily deep seepage Rate (%)
Clay loam	180	3	25%	25%	0

Table 4 Storage capacities used for different landuses

Landuse	Soil storage Capacity (mm)	Field Capacity (mm)
Agricultural, Forest, Rural Residential	238	189
Roads	119	99

The stormflow pollutant concentration parameters were taken from SCA 2010 and are summarised in Table 5.

Table 5: Stormflow concentration parameters for different landuses

Landuse	Total Suspended Solids (log mg/L) (st. dev.)	Total Phosphorus (log mg/L) (st. dev.)	Total Nitrogen (log mg/L) (st. dev)
Agricultural	2.15 (0.31)	-0.22 (0.3)	0.48 (0.26)
Forest	1.6 (0.2)	-1.1 (0.22)	-0.05 (0.24)
Rural Residential	1.95 (0.32)	-0.66 (0.25)	0.3 (0.19)
Sealed Road	2.43 (0.32)	-0.3 (0.25)	0.34 (0.19)
Roof	1.3 (0.32)	-0.89 (0.25)	0.3 (0.19)

SCA 2010 identifies that MUSIC is robust but designed for urban catchments and there are limitations to applying MUSIC to nutrient export from rural catchments, meaning that care should be taken. Gross pollutant load generation in MUSIC is not subject to user input. The source loads are adapted from field monitoring data in an inner-Melbourne suburb (MUSIC version 6.1 Help[2]), and is based purely on impervious area and runoff independent of landuse. Applying this relationship to agricultural and rural residential catchments is outside of the scope of the data in the study, therefore gross pollutants have not been considered in either pre- or post-development scenarios.

Pre-development source nodes

The existing dwelling, outbuildings and access roads have been modelled as rural residential, the roof of the primary dwelling has been modelled as roof, the heavily vegetated area has been modelled as forest and the remainder of the site (currently being used for beef grazing) has been modelled as agricultural. Impervious percentages and roof area were measured off aerial imagery from Nearmap.

[2] The relevant study is "Allison, R.A., Chiew, F.H.S. and McMahon, T.A. (1997), *Stormwater Gross Pollutants*, Industry Report 97/11, Cooperative Research Centre for Catchment Hydrology"

Post development Source Nodes

The roads were modelled as sealed roads with 40% impervious area (based on a typical profile of a 7m road with 0.5m shoulders in a 20m wide road reserve), the lots as rural residential with 5% impervious and the heavily vegetated area was modelled as forest (0% impervious). We have assumed each block will have one dwelling with a roof area of 400 sq.m based on typical roof size on large lot residential development adjoining the site.

The catchment was broken up based on the conceptual subdivision plan prepared by Indesco (see Figure 12).

Proposed Treatment Train

On each lot at least 50% of the roof will be directed to a 10kL water tank. We have applied a reuse from water tanks of 496kL/year/dwelling assuming each home will have five people and water will be used for toilet, laundry, hot water and external use (SCA 2010 Table 3-12). All roads are directly connected to a buffer strip which connects to a table drain. To model the buffer strip we considered a 1m wide vegetated strip that the runoff from the road shoulder sheets over before entering the table drain. Where the grade is less than 4% the roads will be constructed with roadside vegetated swales.

Model Calibration

The flow output produced by the model was compared to the runoff fraction based on the impervious area using the procedure for large catchments in SCA 2010. The model gave flows up to 5% higher than the runoff fraction from SCA 2010, which is within the preferred range of 0 to +10%.

Node	% impervious	Mean rainfall (mm/year)	Annual Runoff Fraction	Area (ha)	Runoff (ML/year)	Music model flow (ML/year)	Difference (%)
Pre-developed	2	1522	0.37	41.3	233	245	+5%
Post-developed	9	1522	0.41	41.3	258	266	+4%

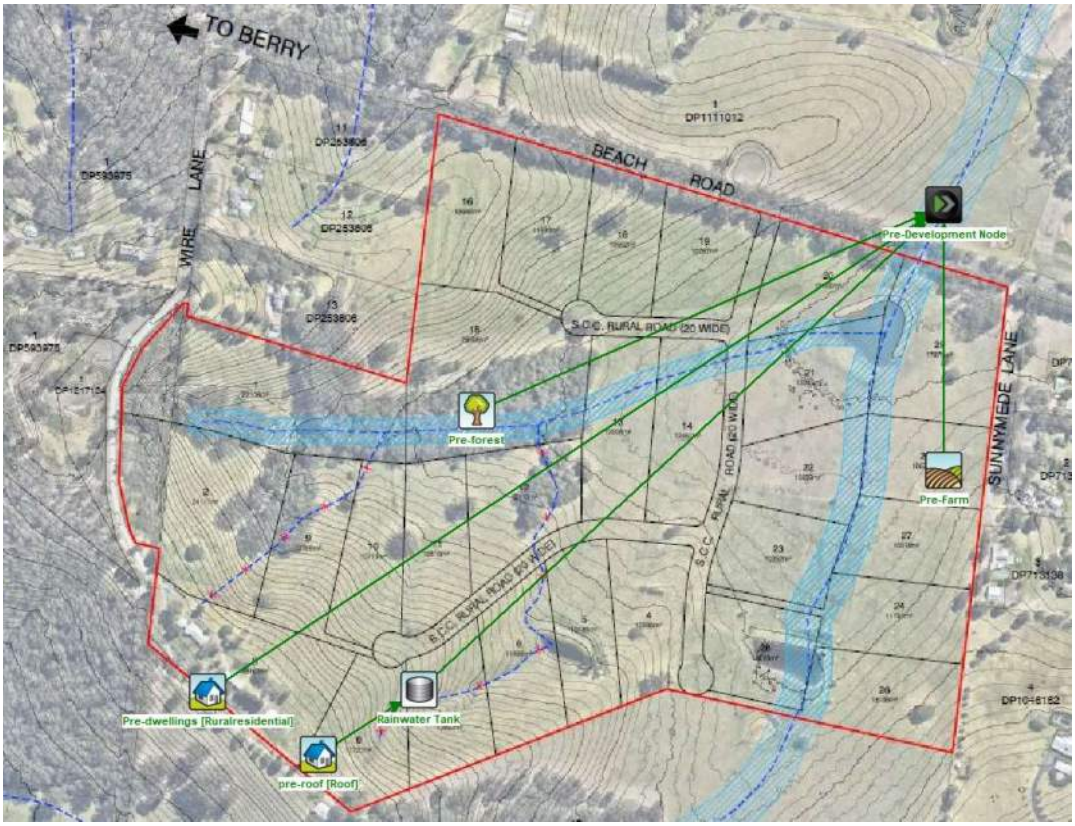

Figure 11 Pre-developed MUSIC model nodes

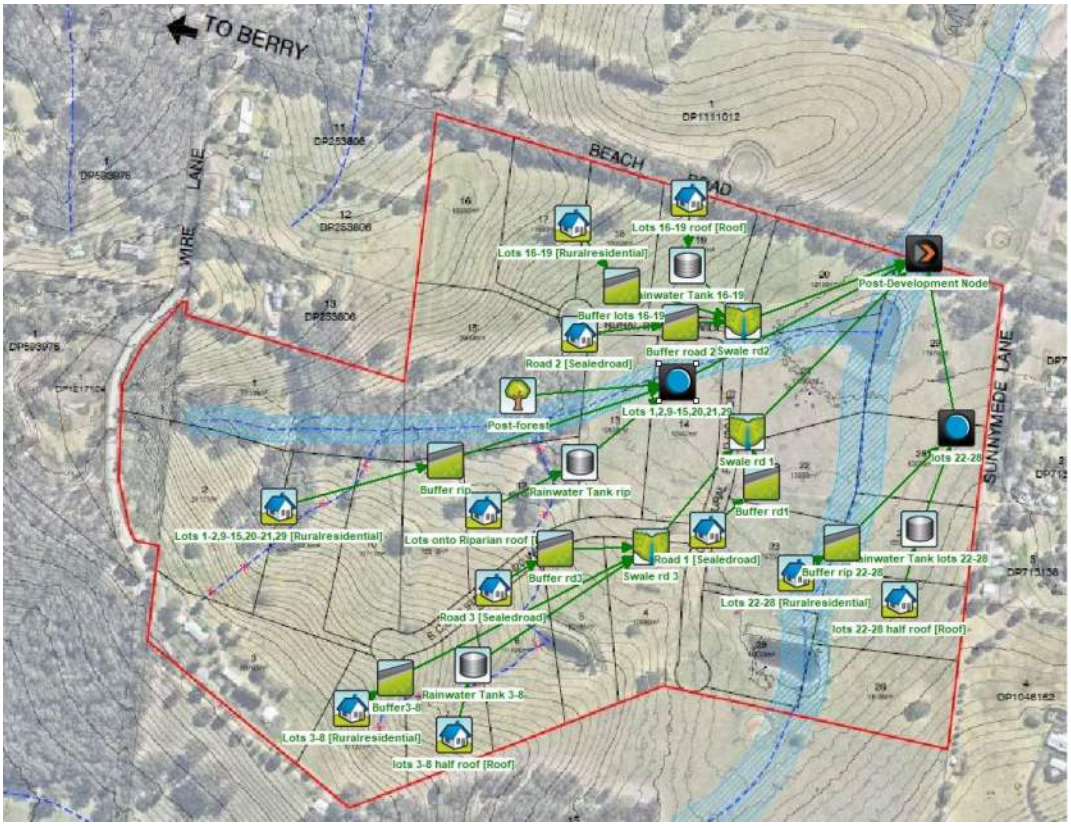

Figure 12 Post-developed MUSIC model nodes

3.2 MUSIC RESULTS

The results from the music model are shown in Table 6 and Table 7. The change in landuse from agricultural land to large lot residential is largely responsible for the reduction in phosphorus and nitrogen loads whilst the proposed treatment train removes most of the suspended solids. For each pollutant the post-developed annual loads are less than the pre-developed annual loads.

Table 6 MUSIC model post-developed treatment train effectiveness

Pollutant	Source Load	Residual Load
Total Suspended Solids (kg/year)	29,800	10,100
Total Phosphorus (kg/year)	64	39
Total Nitrogen (kg/year)	519	422

Table 7 MUSIC model residual loads

Pollutant	Pre-developed	Post-developed
Total Suspended Solids (kg/year)	25,700	10,100
Total Phosphorus (kg/year)	109	39
Total Nitrogen (kg/year)	579	422

3.3 SUMMARY

The MUSIC stormwater quality modelling shows that the rezoning and subsequent development would have a beneficial impact on water quality in line with the SCA NorBe measure. A plausible, non-intrusive impact treatment train has been proposed to manage the water quality post-development without leaving onerous maintenance costs.

4. WASTE WATER MANAGEMENT

Shoalwater's nearest sewer main is on Tannery Rd near Pulman St 3.4km away by road and not downhill. As such it is intended for each dwelling to manage sewage effluent within their lot which is consistent with the surrounding rural residential development in the area.

In reviewing the suitability of the proposed lots for on-site management the following documents and guidelines have been considered:

- Shoalhaven Development Control Plan 2014 "Chapter G8: Onsite Sewage Management" [DCP]
- Environment & Health Protection Guidelines - On-site Sewage Management for Single Households (1998) [The Silver book]
- Designing and installing on-site wastewater systems (2012) Sydney Catchment Authority [SCA2012]
- AS/NZS 1547:2012 On-site domestic wastewater management [AS1547]

For calculation purposes we have assumed a typical subsurface profile of 200mm of topsoil over light clay with underlying rock 900mm below ground level. This is consistent with the soil properties described in Section 1.2.4.

Based on the site conditions and the nature of the proposed development an aerated wastewater treatment system with effluent managed by subsurface irrigation will be a plausible disposal system. The size of the lots, slope and precipitation mean surface irrigation is likely to be unsuitable on most of the lots. The actual type of system to be installed for each dwelling will be subject to confirmation at dwelling DA stage.

4.1 LOADING

To cover the likely scale of the development we have assumed that a typical lot will have a four-bedroom house. Given that the adjoining dwellings on Wire Lane are connected to Shoalhaven water mains it is expected that this development will also be connected to reticulated water supply. As such the design wastewater loading has been taken as 1200L/day (SCA 2012).

4.2 NUTRIENT BALANCE

In calculating the nutrient balance we have assumed nutrient loading of 30mg/L total nitrogen and 12mg/L total phosphorus in wastewater after treatment by an AWTS in line with the guidelines in `The Silver Book'. For nutrient uptake the rates suggested by SCA 2012 for subsurface irrigation under unmanaged lawns have been applied. For phosphorus adsorption the nominal rate for clay loam provided in `The Silver Book' has been applied. A working life of 50 years has been considered. Based on this data the required subsoil irrigation area for each dwelling is 1096 sq.m, nitrogen uptake being limiting. Nutrient balance calculations can be found in Appendix 2.

4.3 WATER BALANCE

A water balance was calculated following the procedure outlined in `The Silver Book'. Precipitation data for Berry Masonic Village (BOM station 68003, average monthly precipitation 1961-1990) was used along with point potential evapotranspiration data from BOM gridded data. For the 1096sq.m irrigation area to balance without a wet storage, a soil percolation of 2.5mm/day is required, which AS 1547 advises is a suitable design percolation for a heavy to medium clay soil.

4.4 SITE CONSTRAINTS

The DCP and other reference documents outline areas that are not suitable for waste water management. To investigate the feasibility of siting an effluent application area of 1096 sq.m on each lot we considered the following constraints:

- Effluent application areas were only considered that had more than 40m flow distance to a

watercourse (DCP).

- The BOM Australian Groundwater Explorer identifies a household water supply bore GW208636.1.1 near to site. This is more than 100m distant (DCP).
- It was considered that heavily vegetated areas within lots would be preserved by development and would not be suitable for waste water management.
- Potential effluent disposal areas were located more than 6 m from property boundaries and leaving a suitable area from a dwelling offset by more than 6m (DCP).
- Land with a grade of 20% or more was considered unsuitable for the location of an effluent application area (SCA 2012).

Considering these constraints each lot was found to have a suitable area for an effluent application area of a sufficient size to manage the design wastewater loading.

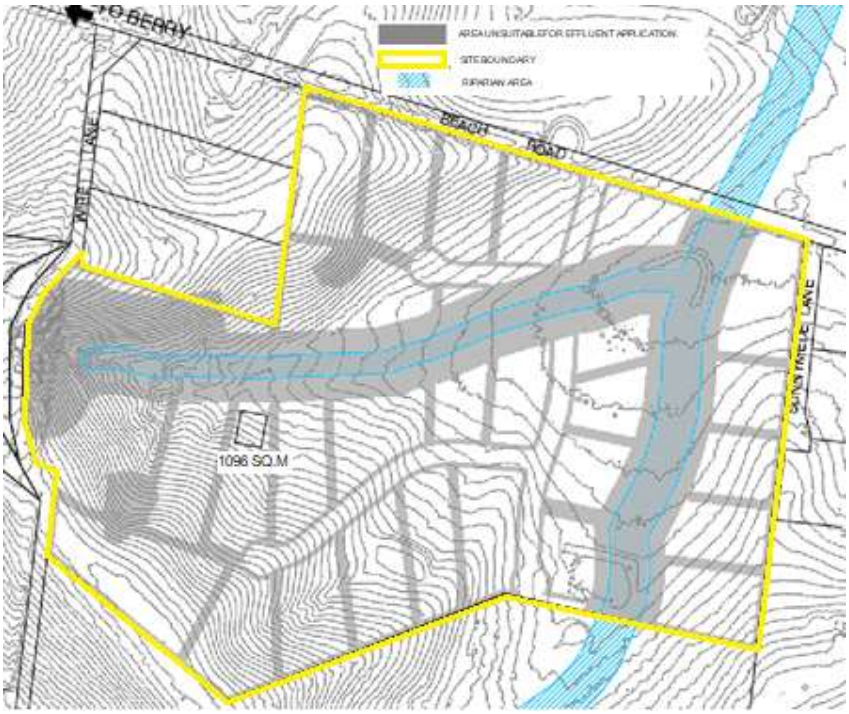

Figure 13 Layout showing area not suitable for wastewater effluent application

5. CONCLUSION

It is proposed to rezone Lot 1 DP1246435 from RU1 primary production and RU4 small lot primary production to R5 large lot residential with a minimum lot size of 1ha.

The rezoning would mean an increase in impervious area from 2% to 9% of the site.

The development is within the Crooked River Catchment outside the high hazard area for flooding. All proposed lots will have building areas above the flood planning level.

The MUSIC modelling shows that the rezoning would lead to an improvement in water quality, with the proposed treatment train contributing to reduction in the annual loads of phosphorus, nitrogen and suspended solids leading to a NorBe result

The proposed lots would be able to manage their wastewater on site with aerated wastewater systems with an effluent application area of 1096 sq.m.

APPENDIX 1: SOIL PROFILES

Figure 14 Soil profiles near the site from eSPADE (NSW Soil and Land Information System), with soil landscapes, contours and aerial image underlays.

Soil profiles:

Profile 12757

Layer 1	
0.00 - 0.30 m Horizon	dark greyish brown (dark greyish yellow) (2.5Y 4/2) [moist] silty clay loam with moderate pedality (2 - 5 mm, rough-faced peds), field pH is 5.0. Coarse fragments are very few (< 2%), sedimentary, fine gravel (2-6 mm), pans are not evident, segregations are not evident. Layer notes are: Sand fraction is fine.; wavy abrupt (5-20 mm) boundary to ...
Layer 2	
0.30 - 0.60 m Horizon	red (reddish brown) (2.5YR 4/8) [moist] medium clay with strong pedality (10 - 20 mm, rough-faced peds), field pH is 6.0. Coarse fragments are very few (< 2%), sedimentary, fine gravel (2-6 mm), pans are not evident, segregations are not evident
Layer 3	
0.60 - 1.50 m Horizon	colour not recorded . Layer notes are: Unknown layer(s) - created due to gap in layer depths; adjusted subsequent layer numbers to be sequential.

Profile 12742

Layer 1	
0.00 - 0.20 m Horizon	dark yellowish brown (brown) (10YR 4/6) [moist] silty clay with massive structure, field pH is 6.5. Coarse fragments are not evident, pans are not evident, segregations are not evident; wavy abrupt (5-20 mm) boundary t ...
Layer 2	
0.20 - 0.60 m Horizon	yellowish red (reddish brown) (5YR 4/6) [moist] medium clay with weak pedality (rough-faced peds), field pH is 4.5. Coarse fragments are not evident, pans are not evident, segregations are not evident. Layer notes are: Sand fraction is fine

Profile 12760 shovel hole 0.5m deep

Layer 1	
0.00 - 0.50 m Horizon	(brownish black) (5YR 2/2) [moist] silty clay with massive structure (earthy field pH is 6.0. Coarse fragments are common (10-20%), not identified, fine gravel (2-6 mm), gravel (6-20 mm), pans are not evident, segregations are not evident

Profile 12868

Layer 1	
0.00 - 0.20 m Horizon	dark brown (10YR 3/3) [moist] silty loam with weak pedality (crumb, 2 - 5 mm, rough-faced peds), field pH is 6.0. Coarse fragments are not evident, pans are not evident, segregations are not evident. Layer notes are: Fabric also earthy.; gradual (50-100 mm) boundary to ...
Layer 2	
0.20 - 0.40 m Horizon	brown (7.5YR 4/3) [moist] light clay with moderate pedality (5 - 10 mm, rough-faced peds), field pH is 6.0. Coarse fragments are not evident, pans are not evident, segregations are manganiferous. Layer notes are: Fabric also earthy.
Layer 3	
0.40 - 1.00 m Horizon	brown (7.5YR 4/4) [moist] medium clay with strong pedality (50 - 100 mm, rough-faced peds), field pH is 5.5. Coarse fragments are not evident, pans are not evident, segregations are ferruginous. Layer notes are: Fabric also earthy.

Profile 31382 – stopped at 0.72m auger refused on very heavy clay

Layer 1	
0.00 - 0.25 m Horizon	dark brown (brownish black) (7.5YR 3/2) [moist] clay loam with moderate pedality. Coarse fragments are not evident, pans are not evident, segregations are not evident; gradual (50-100 mm) boundary to ...
Layer 2	
0.25 - 0.40 m Horizon	dark yellowish brown (brown) (10YR 4/4) [moist] medium heavy clay with weak pedality. Coarse fragments are not evident, pans are other, segregations are not evident. Layer notes are: Clay restricts water movement and root growth. Waterlogging may occur.; gradual (50-100 mm) boundary to ...
Layer 3	
0.40 - 0.72 m Horizon	dark yellowish brown (brown) (10YR 4/6) [moist] medium heavy clay with weak pedality. Coarse fragments are not evident, pans are other, segregations are not evident. Layer notes are: As for layer 2.; gradual (50-100 mm) boundary to ...

Profile 31383 stopped at 0.9m with soil continuing

Layer 1	
0.00 - 0.20 m Horizon	very dark greyish brown (brownish black) (10YR 3/2) [moist] light silty cla loam with moderate pedality, field pH is 6.0. Coarse fragments are not evident, pans are not evident, segregations are not evident; gradual (50-1 mm) boundary to ...
Layer 2	
0.20 - 0.50 m Horizon	dark grey (brownish grey) (10YR 4/1) [moist] fine light clay loam sandy with weak pedality, field pH is 6.0. Coarse fragments are few (2-10%), not identified, fine gravel (2-6 mm), gravel (6-20 mm), pans are not evident, segregations are not evident; clear (20-50 mm) boundary to ...
Layer 3	
0.50 - 0.90 m Horizon	dark yellowish brown (brown) (10YR 4/6) [moist] medium heavy clay with weak pedality, field pH is 5.0. Coarse fragments are very few (< 2%), charcoal, fine gravel (2-6 mm), segregations are not evident. Layer notes are: pH did not change after addition of H2O2.; clear (20-50 mm) boundar to ...

Profile 31384 stopped at 0.67m due to auger refusal

Layer 1	
0.00 - 0.15 m Horizon	very dark greyish brown (brownish black) (10YR 3/2) [moist] clay loam w strong pedality, field pH is 6.0. Coarse fragments are not evident, pans a not evident, segregations are not evident; clear (20-50 mm) boundary to
Layer 2	
0.15 - 0.30 m Horizon	brown (dull yellowish brown) (10YR 4/3) [moist] clay loam with moderate pedality, field pH is 6.5. Coarse fragments are few (2-10%), not identified fine gravel (2-6 mm), gravel (6-20 mm), pans are not evident, segregatior are not evident; clear (20-50 mm) boundary to ...
Layer 3	
0.30 - 0.50 m Horizon	strong brown (brown) (7.5YR 4/6) [moist] light medium clay with modera pedality, field pH is 6.0. Coarse fragments are many (20-50%), not identified, fine gravel (2-6 mm), gravel (6-20 mm), pans are not evident, segregations are common (10% - 20%), ferruginous; clear (20-50 mm) boundary to ...
Layer 4	
0.50 - 0.67 m Horizon	dark yellowish brown (brown) (10YR 4/4) [moist] light medium clay with weak pedality, field pH is 5.5. Coarse fragments are many (20-50%), not identified, fine gravel (2-6 mm), pans are not evident, segregations are no evident

Profile 16926

Layer 1	
0.00 - 0.20 m A Horizon	(brownish black) (7.5YR 2/2) [moist] fine loamy sand with single grained (sandy), field pH is 5.5. Coarse fragments are not evident; smooth abrupt -20 mm) boundary to ...
Layer 2	
0.20 - 0.52 m B1 Horizon	dark brown (7.5YR 3/4) [moist] fine loamy sand with single grained (sandy), field pH is 6.0. Coarse fragments are few (2-10%), not identified, coarse gravel (20-60 mm); irregular abrupt (5-20 mm) boundary to ...
Layer 3	
0.52 - 0.71 m B2 Horizon	dark yellowish brown (brown) (10YR 4/4) [moist] coarse clayey sand with single grained (sandy), field pH is 6.0. Coarse fragments are few (2-10%) not identified, cobbles (60-200 mm)

Profile 22231

Layer 1	
0.00 - 0.08 m A11 Horizon	very dark brown (brownish black) (10YR 2/2) [moist] silty loam with weak pedality (polyhedral, < 2 mm, rough-faced peds), common (10-25/10x10cm) roots (<1mm), few (1-10/10x10cm) roots (1-2mm), field pH is 6.0. Coarse fragments are very few (< 2%), as substrate, fine gravel (2-6 mm); sharp (<5 mm) boundary to ...
Layer 2	
0.08 - 0.29 m A12 Horizon	very dark greyish brown (brownish black) (10YR 3/2) [moist] clay loam with massive structure (polyhedral, < 2 mm, earthy), few (1-10/10x10cm) roots (<1mm), none roots (1-2mm), field pH is 6.5. Coarse fragments are few (2-10%), as substrate, fine gravel (2-6 mm); abrupt (5-20 mm) boundary to ...
Layer 3	
0.29 - 0.41 m B Horizon	brown (dull yellowish brown) (10YR 4/3) [moist] light sandy clay with massive structure (polyhedral, 2 - 5 mm, earthy), none roots (<1mm), none roots (1-2mm), field pH is 6.5. Coarse fragments are few (2-10%), as substrate, fine gravel (2-6 mm)

Profile 22232 auger refusal on gravel

Layer 1	
0.00 - 0.10 m A11 Horizon	very dark brown (brownish black) (10YR 2/2) [moist] silty loam with weak pedality (< 2 mm, rough-faced peds), common (10-25/10x10cm) roots (<1mm), few (1-10/10x10cm) roots (1-2mm), field pH is 6.0. Coarse fragments are very few (< 2%), as substrate, fine gravel (2-6 mm); clear (20-50 mm) boundary to ...
Layer 2	
0.10 - 0.26 m A12 Horizon	very dark greyish brown (brownish black) (10YR 3/2) [moist] clay loam with massive structure (polyhedral, < 2 mm, earthy), few (1-10/10x10cm) roots (<1mm), none roots (1-2mm), field pH is 6.5. Coarse fragments are common (10-20%), as substrate, gravel (6-20 mm), coarse gravel (20-60 mm); abrupt (5-20 mm) boundary to ...
Layer 3	
0.26 - 0.32 m B Horizon	brown (dull yellowish brown) (10YR 4/3) [moist] sandy clay with massive structure (polyhedral, 2 - 5 mm, earthy), none roots (<1mm), none roots (1-2mm), field pH is 7.0. Coarse fragments are common (10-20%), as substrate, gravel (6-20 mm), coarse gravel (20-60 mm)

Profile 22233

Layer 1	
0.00 - 0.08 m A1 Horizon	very dark greyish brown (brownish black) (10YR 3/2) [moist] silty loam with weak pedality (polyhedral, 2 - 5 mm, rough-faced peds), common (10-25/10x10cm) roots (<1mm), few (1-10/10x10cm) roots (1-2mm), field pH is 6.5. Coarse fragments are very few (< 2%), as substrate, fine gravel (2-6 mm); clear (20-50 mm) boundary to ...
Layer 2	
0.08 - 0.42 m A2 Horizon	dark greyish brown (greyish yellow brown) (10YR 4/2) [moist] clay loam with weak pedality (polyhedral, 5 - 10 mm, rough-faced peds), few (1-10/10x10cm) roots (<1mm), field pH is 6.5. Coarse fragments are very few (< 2%), as substrate, fine gravel (2-6 mm); gradual (50-100 mm) boundary to ...
Layer 3	
0.42 - 1.24 m B Horizon	dark reddish brown (5YR 3/4) [moist] silty clay with moderate pedality (polyhedral, 5 - 10 mm, rough-faced peds), field pH is 7.0. Coarse fragments are not evident

Profile 22234

Layer 1	
0.00 - 0.07 m A11 Horizon	very dark grey (brownish black) (10YR 3/1) [moist] loam with weak pedality (sub-angular blocky, 2 - 5 mm, smooth-faced peds), common (10-25/10x10cm) roots (<1mm), few (1-10/10x10cm) roots (1-2mm), field pH is 6.5. Coarse fragments are not evident; not evident boundary to ...
Layer 2	
0.07 - 0.26 m A12 Horizon	very dark greyish brown (brownish black) (10YR 3/2) [moist] fine sandy clay loam with weak pedality (sub-angular blocky, 2 - 5 mm, smooth-faced peds), few (1-10/10x10cm) roots (<1mm), field pH is 6.5. Coarse fragments are very few (< 2%), as substrate, fine gravel (2-6 mm); abrupt (5-20 mm) boundary to ...
Layer 3	
0.26 - 0.71 m B Horizon	yellowish brown (dull yellowish brown) (10YR 5/4) [moist] light medium clay with strong pedality (polyhedral, 20 - 50 mm, rough-faced peds), field pH is 7.0. Coarse fragments are few (2-10%), as substrate, fine gravel (2-6 mm), coarse gravel (20-60 mm)

APPENDIX 2: NURIENT BALANCE

NUTRIENT BALANCE

55 WIRE LANE, BERRY

INDESCO REF ISC00016 DATE 6/02/2019

DAILY LOAD	1200	L/day
DESIGN LIFE	50	years

NITROGEN BALANCE

Effluent Concentration	30	mg/L
Vegetation Nitrogen Uptake	120	kg/ha/year
	32.9	mg/sq.m/day
REQUIRED AREA	**1096**	**sq.m**

PHOSPHORUS BALANCE

Effluent Concentration	12	mg/L
Lifetime Phosphorus loading	263	kg

Phosphorus Sorption

Soil Strata	Depth (m)	Density (kg/cu.m)	Lab Sorption (mg/kg)	Psorb (kg/sq.m)
Loam	0.2	1500	290	0.09
Clay	0.7	1500	450	0.47
			sum	0.56

Design factor	0.33	
Design Soil P-Sorption	0.19	kg/sq.m

Phosphorus Uptake

Vegetation Phosphorus Uptake	0.0012	kg/sq.m/year
Lifetime Phosphorus Uptake	0.06	kg/sq.m
REQUIRED AREA	**1067**	**sq.m**

WATER BALANCE

55 WIRE LANE, BERRY

INDESCO REF ISC00016 DATE 24/04/2019

Design Precipitation + ***Wastewater Applied*** = ***Evapotranspiration*** + ***Percolation***

Irrigation Area	1094	sq.m
Wastewater Loading	1200	L/day
Percolation Rate	2.9	mm/day

Month	Berry Precipitation (mm)	Wastewater Applied (mm)	Evapotranspiration (mm)	Percolation (mm)	Inputs - Outputs	Storage (mm)	Cumulative Storage (mm)
January	110.6	34.0	191.0	90	-136.3	0	0
February	111.1	31.0	148.0	82	-87.8	0	0
March	122.9	34.0	144.0	90	-77.0	0	0
April	98.8	32.9	109.0	87	-64.3	0	0
May	84.3	34.0	75.0	90	-46.6	0	0
June	103.3	32.9	49.0	87	0.2	0	0
July	38.3	34.0	54.0	90	-71.6	0	0
August	49.8	34.0	88.0	90	-94.1	0	0
September	64.2	32.9	115.0	87	-104.9	0	0
October	98.2	34.0	153.0	90	-110.7	0	0
November	92.5	32.9	169.0	87	-130.6	0	0
December	103.4	34.0	179.0	90	-131.5	0	0
						max.	0
						STORAGE REQUIRED (cu.m)	0

Appendix G – Preliminary Site Investigation

STAGE 1 PRELIMINARY SITE INVESTIGATION (PSI)

55 WIRE LANE
LOT 1 DP 1246435
BERRY, NSW, 2526

Prepared For:	**INDESCO**
Project Number:	**ENRS1234**
Date:	**10th April 2018**

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Record of Distribution

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1 x PDF	ENRS1234.r1_INDESCO_Wire Lane Berry_Stage 1 PSI	Rev.1	10th April. 2019	INDESCO

EXECUTIVE SUMMARY

Environment & Natural Resource Solutions (ENRS Pty Ltd) were commissioned as independent environmental consultants by *INDESCO* (the client) to conduct a Stage 1 Preliminary Site Investigation (PSI) for a proposed residential sub-division of a rural block located at 55 Wire Lane, Berry, NSW, 2526 *(herein referred to as the Site).*

ENRS understands the proposal includes the sub-division of the current Lot to form twenty-six (26) large Lot residential blocks. Given that the proposal includes a change in land use from rural to residential, this Preliminary Site Investigation (PSI) is required for development application (DA) purposes, to assess the potential for ground contamination and document the Site suitability for the proposed land uses consistent with NSW State Environmental Planning Policy No. 55 (SEPP55).

This report documents the results of a Stage 1 site history review and site inspections in general accordance with the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), and the guidelines made and approved under Section 105 of the Contaminated Land Management Act 1997 (the Act), namely the Guidelines for Consultants Reporting on Contaminated Sites (OEH;2011); and the Guidelines for the Assessment and Management of Groundwater contamination (DEC;2007).

This assessment aims to document the site history and identify the potential for contaminated land with respect to current or proposed land use. The objectives of this Stage 1 PSI were to;

- Document the available Site history;
- Identify potential on and off-site sources of contamination (past and present);
- Identify potential contamination types;
- Document the Site condition;
- Provide a preliminary assessment of potential Site contamination;
- Assess the need for further investigations, if any; and
- Provide a statement regarding the suitability of the Site for the proposed ongoing residual land use.

The scope of work for the project comprised the following tasks:

- Review available Site history records incorporating previous investigation reports (where available), proposed development plans, and publicly available data (including aerial photographs, geological maps, topographical maps, and registered groundwater bore database) to identify any past or present potentially contaminating activities and or any potential Areas of Environmental Concern (AECs);
- Site inspection to investigate for potential sources of contamination or uncontrolled Fill (19/03/2019); and
- Document investigation results and prepare a PSI report with a statement of Site condition, suitability and recommendations for additional investigation works or ongoing environmental management, if required.

Based on the results of the historical data and a site inspection, the following conclusions and recommendations have been provided:

- This Stage 1 PSI report documents a review of historical land use records and a Site inspection for 55 Wire Lane Berry, NSW, 2526. ENRS understand the Site proposal is for residential land use;
- The Site history records document the Site has been used for rural purposes for an extended period with the addition of a residential dwelling;
- Review of EPA contaminated land records did not identify any areas of environmental concern in proximity to the Site;
- Review of Potential Acid Sulfate soil maps identified the Site as 'Not Assessed'. If the Site proposal is to include earth works, it is recommended that Potential Acid Sulate Soil field testing is conducted in accordance with; the NSW Acid Sulphate Soils Management Advisory Committee (ASSMAC;1998) guidelines; Australian Standard – Piling Design & Installation (AS2159-2009); and with consideration of the NSW RTA (2005) Guidelines for the Management of Acid Sulphate Materials;
- The Site walkover and inspections were conducted on the 19th March 2019 confirmed the Site condition is consistent with the documented history of rural land use. A single Area of Environmental Concern (AEC) was identified at the Site. The AEC included stockpiled material alongside Wire Lane. This Preliminary Site investigation did not include any intrusive investigations of the AEC. It is therefore recommended that further ground testing and environmental assessment is conducted within the AEC in order to assess the materials suitability for re-use onsite;
- Based on the historical information provided in this report and observations made during the Site inspection, the Site ***may be considered suitable for the proposed residential land use***;
- Should any change in Site conditions or incident occur which causes a potential environmental impact, a suitable environmental professional should be notified to further assess the Site and consider requirements for any additional assessment; and
- This report must be read in conjunction with the attached Statement of Limitations.

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LIST OF TABLES, FIGURES & APPENDICES

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INTRODUCTION

Environment & Natural Resource Solutions (ENRS Pty Ltd) were commissioned as independent environmental consultants by *INDESCO* (the client) to conduct a Stage 1 Preliminary Site Investigation (PSI) for a proposed residential sub-division of a rural block located at 55 Wire Lane, Berry, NSW, 2526 *(herein referred to as the Site).*

ENRS understands the proposal includes the sub-division of the current Lot to form twenty-six (26) large Lot residential blocks. Given that the proposal includes a change in land use from rural to residential, this Preliminary Site Investigation (PSI) is required for development application (DA) purposes, to assess the potential for ground contamination and document the Site suitability for the proposed land uses consistent with NSW State Environmental Planning Policy No. 55 (SEPP55).

This report documents the results of a Stage 1 site history review and site inspections in general accordance with the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), and the guidelines made and approved under Section 105 of the Contaminated Land Management Act 1997 (the Act), namely the Guidelines for Consultants Reporting on Contaminated Sites (OEH;2011); and the Guidelines for the Assessment and Management of Groundwater contamination (DEC;2007).

1.1 OBJECTIVES

This assessment aims to document the site history and identify the potential for contaminated land with respect to current or proposed land use. The objectives of this Stage 1 PSI were to;

- Document the available Site history;
- Identify potential on and off-site sources of contamination (past and present);
- Identify potential contamination types;
- Document the Site condition;
- Provide a preliminary assessment of potential Site contamination;
- Assess the need for further investigations, if any; and
- Provide a statement regarding the suitability of the Site for the proposed ongoing residual land use.

1.2 SCOPE OF WORK

The scope of work for the project comprised the following tasks:

- Review available Site history records incorporating previous investigation reports (where available), proposed development plans, and publicly available data (including aerial photographs, geological maps, topographical maps, and registered groundwater bore database) to identify any past or present potentially contaminating activities and or any potential Areas of Environmental Concern (AECs);
- Site inspection to investigate for potential sources of contamination or uncontrolled Fill (19/03/2019); and

- Document investigation results and prepare a PSI report with a statement of Site condition, suitability and recommendations for additional investigation works or ongoing environmental management, if required.

SITE DESCRIPTION

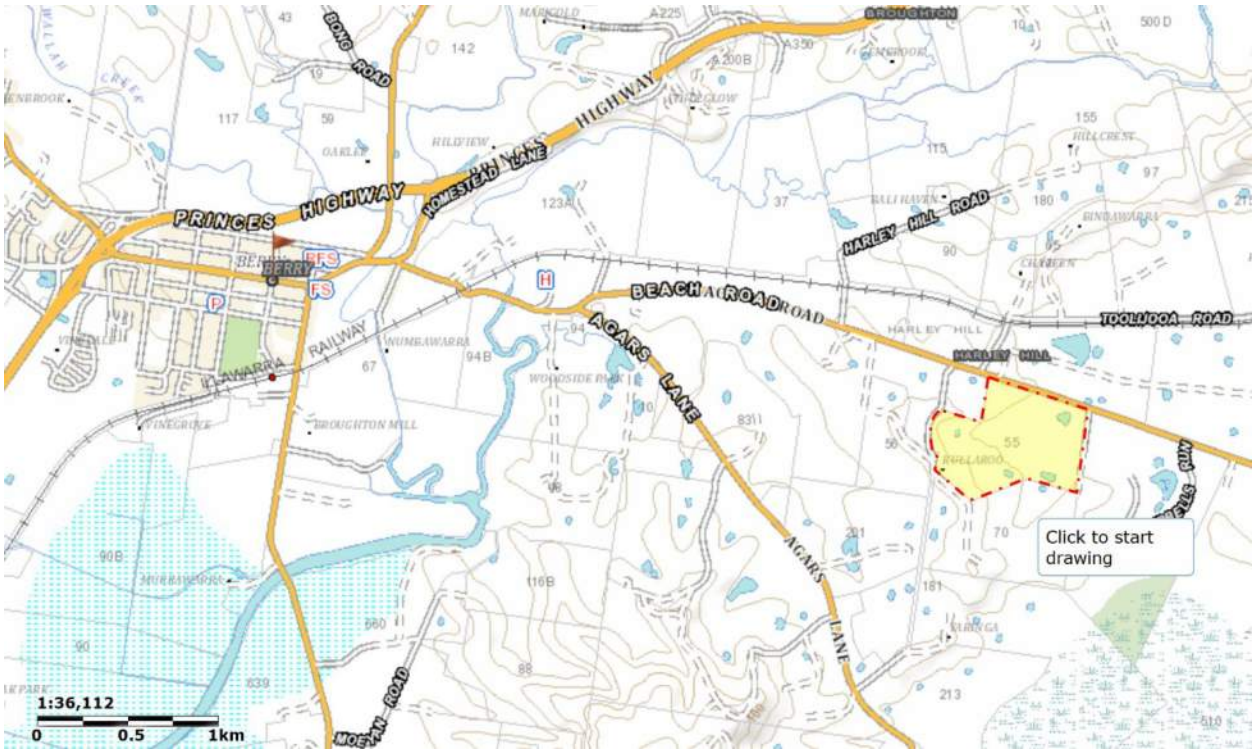
1.3 SITE IDENTIFICATION

The Site is located along Cooby Road, Tullimbar as shown in **Figure 1**. The key features required to identify the Site are summarised in **Table 1**.

Table 1: Site Identification

SITE	DESCRIPTION
Street Address	55 Wire Lane, Berry, NSW, 2526
Lot / Deposited Plan	1 / 1246435
Area	Approx. 40.65 ha or 406,400m^2
Local Government Area	Shoalhaven City Council
Current Zoning	(RU1) Primary Production & (RU4) Primary Production Small Lot
Future Zoning	(R5) Large Lot Residential

Figure 1 Site Location Map

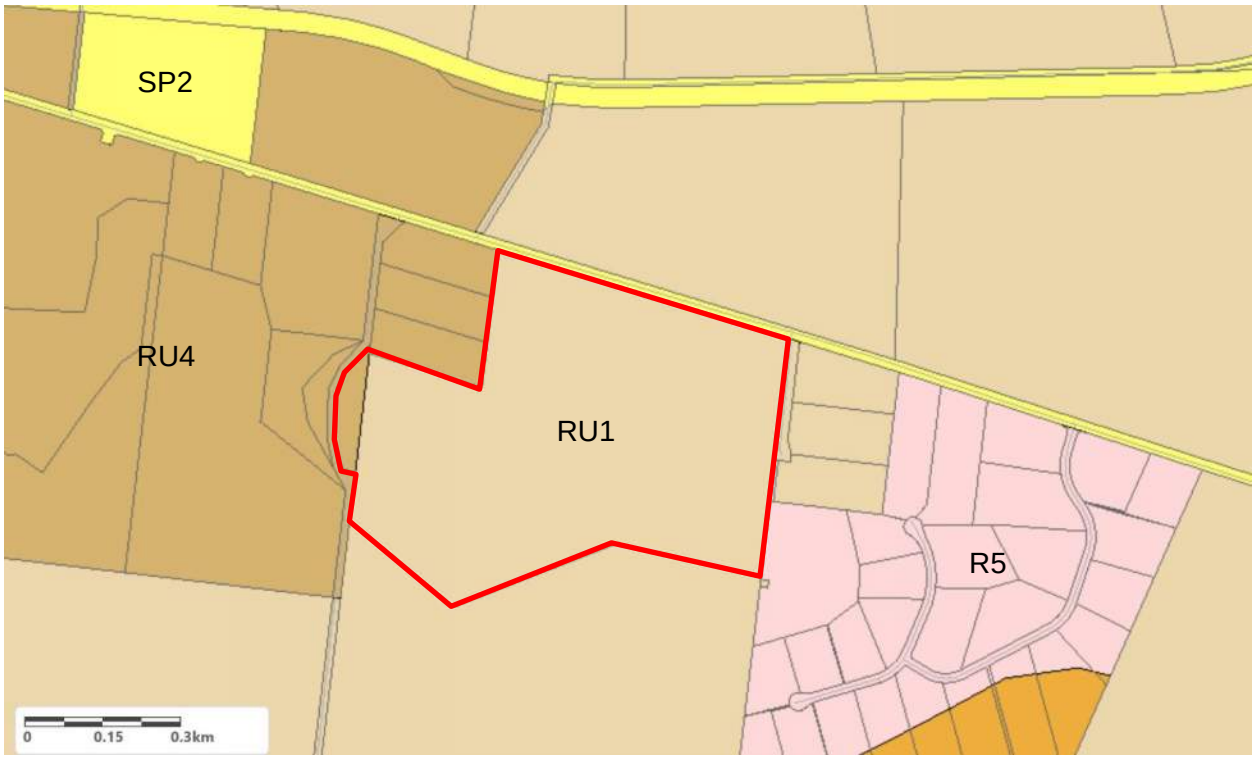


Source: www.maps.six.nsw.gov.au (cited 01/04/2019)

1.4 ZONING AND LAND USE

The majority Site is currently zoned as ***(RU1) Primary Production*** with a small area along the western boundary zoned as ***(RU4) Primary Production Small Lot*** under the Shoalhaven City Council Environmental Plan (SLEP) 2019, as shown in **Figure 2**. The surrounding area is currently zoned as; Primary Production Small Lot (RU4); and Large Lot Residential (R5). At the time of this investigation the Site was used for light rural purposes.

Figure 2: Registered Bore Locations



Source: *Shoalhaven City Council* SLEP 2019 (cited 2/04/2019)

1.5 SURROUNDING ENVIRONMENT

The Site is situated within a mixed area of rural (RU1) Primary Production and (R5) Large Lot Residential properties, refer to **Table 2** for the following adjacent land uses:

Table 2: Surrounding land uses

North:	Beach Road further to rural properties and a railway corridor (~340m)
East:	Adjoining large Lot residential dwellings
South:	Adjoining rural properties
West:	Wire Lane further to vegetated areas, residential blocks and rural properties.

1.5.1 Nearest Sensitive Receptors

The nearest sensitive receptors include:

- Vegetated areas west of the Site;
- Drainage lines and dams within the Site and downgradient (north) rural properties; and
- Shallow groundwater aquifers, if any.

1.6 TOPOGRAPHY

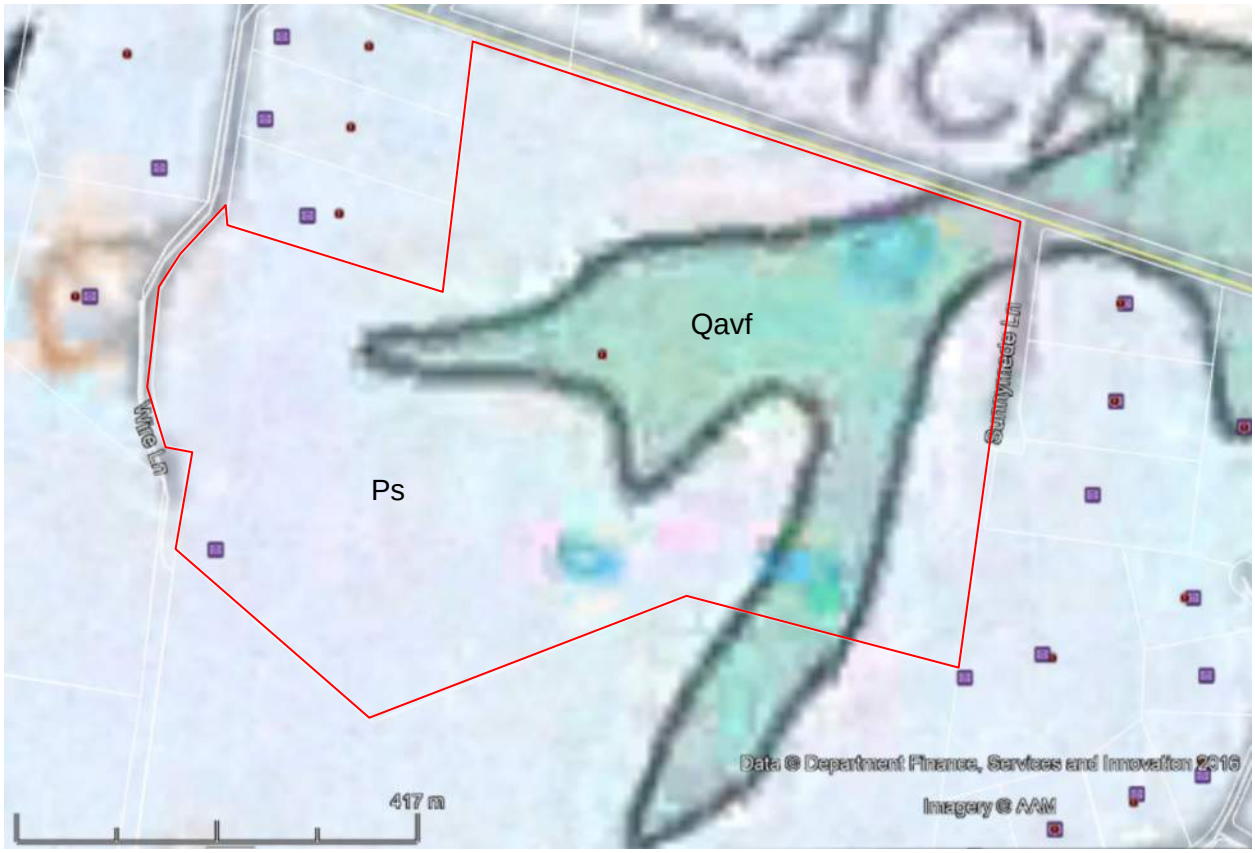
A review of the Site topography was conducted with reference to the current series topographic map sheet. The following points summarise the key observations:

- In general, the Site is characterised by an undulating environment.
- The north-east corner of the Site is considered the lowest point of the Site. Surface water is expected to flow into this area from both the south and west portions of the Site;
- Multiple drainage lines and dams were observed at the Site. The drainage lines follow a north-east trend towards a dam and eventually flow off-site via a stormwater drain under Beach Road. The drainage lines are expected to capture the majority of surface runoff at the Site; and
- The regional gradient is expected to gently dip to the north-east towards *Foys Swamp* ~1.5km from the Site.

1.7 GEOLOGY

Review of the Site's geological setting was conducted with reference to the Shoalhaven Coastal Quaternary 1:100,000 geological series sheet. The Site is generally underlain by Permian aged (Ps) characterised by sedimentary rocks and minor volcanic rocks, including sandstone, conglomerate, shale and coal measures (Sydney Basin). An inclusion of Quaternary aged sediments (Qvaf) is mapped within the north-east area of the Site. The location of the deposit corresponds to the drainage lines mapped at the Site. The Qvaf sediments are characterised as an alluvial and colluvial fan comprising fluvial sand, silt, gravel and clay.

Figure 3: Geology Map



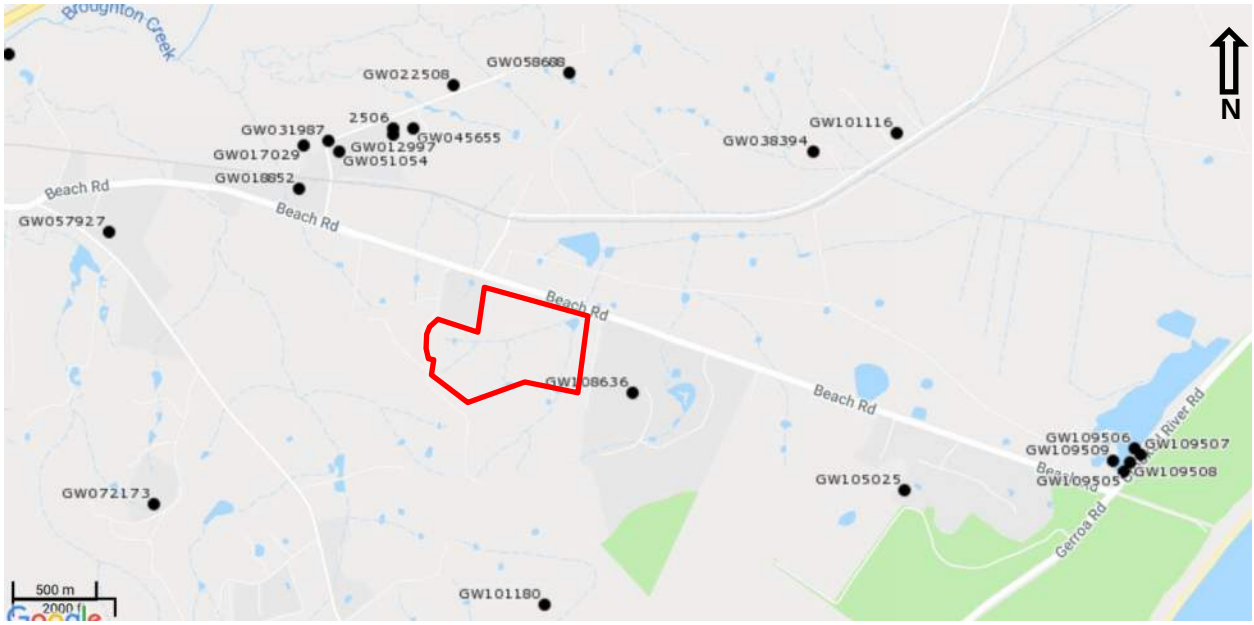
1.8 HYDROGEOLOGY

Based on the Site geology, groundwater in the area is expected to be associated with the following aquifer systems;

- *hallow unconfined* systems hosted in the unconsolidated soil and clay, often ephemeral associated with rainfall recharge, with elevated salinity, and a shallow groundwater table generally less than 10 metres; and
- *Deep dual porosity aquifer (fractured and porous rock)* systems hosted in the underlying rock sequences with low to moderate yields, elevated salinity and standing water levels generally deeper than 10 metres

Review of the *WaterNSW* online registered bore database identified multiple groundwater wells within 1 km radius of the Site. The closet groundwater well (GW108636) is located east of the Site and registered as Private / Domestic. However, as the proposal is residential land use, the Site is considered unlikely to impact the surrounding groundwater users in the area. The registered bore searches results are provided in **Figure 4** below.

Figure 4: Registered Bore Locations



Source: https://realtimedata.waternsw.com.au/water.stm (cited 4/03/2019)

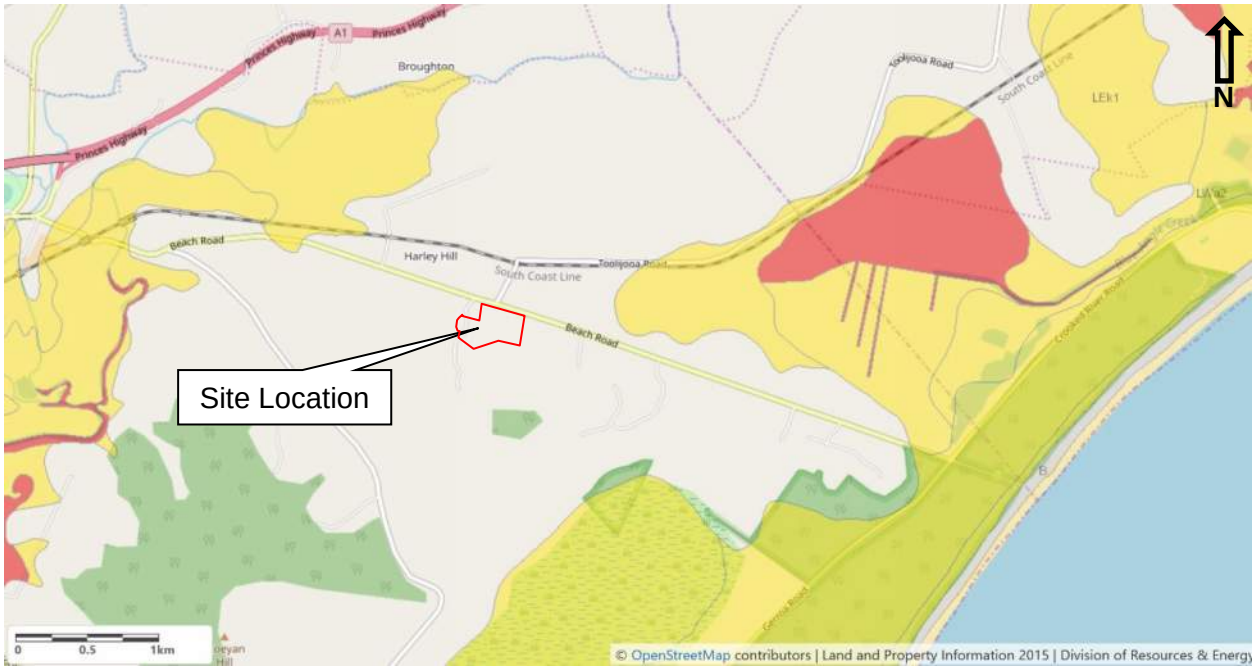
1.9 POTENTIAL ACID SULPHATE SOIL ASSESSMENT (PASSA)

A desktop assessment was conducted for Potential Acid Sulphate in Soil (PASS) with reference to; the eSPADE online Acid Sulphate Soil Risk maps; NSW Gov. SEED datasets; and the *Shoalhaven City Council* PASSA resources.

1.9.1 eSPADE online Acid Sulphate & SEED Soil Risk Maps

The Site is mapped in an area classed as *'Not Assessed'*. The surrounding areas are generally mapped as 'Low Risk' (yellow). The nearest mapped PASS as 'High Risk' (red) is located within *Foys Swamp* approximately ~1.5km north-east from the Site. The reader is referred to **Figure 5** below.

Figure 5: eSPADE / SEED Potential Acid Sulphate Soil Map

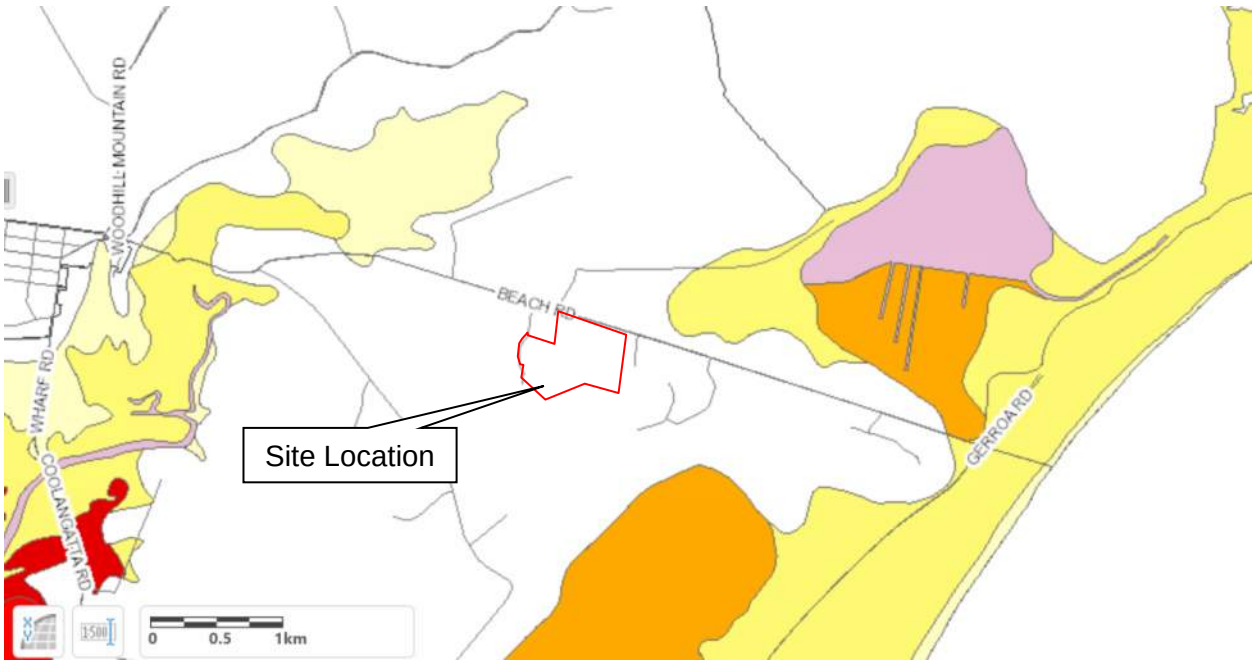


Source: https://www.environment.nsw.gov.au/eSpade2Webapp (cited 2/04/2019)

1.9.2 Shoalhaven City Council PASSA Resources

Review of the Shoalhaven City Council online resources presented similar results to the eSPADE and SEED maps. The Site is classed as 'Not assessed' as depicted in **Figure 6** below.

Figure 6: Shoalhavcen City Council



1.9.3 POTENTIAL ACID SULPHATE SOIL RISK ASSESSMENT

Based on the review of the available online records the Site hasw not been investigated for potential acid sulahte soils (PASS). Based of the mapped surrouding areas the Site is considered to present a Low risk for PASS. It is therefore recomended that field testing is conducted during the construction phase of the Site. Future investihgations should be conducted in accordance

with; the NSW Acid Sulfate Soils Management Advisory Committee (ASSMAC;1998) guidelines; the NSW RTA (2005) Guidelines for the Management of Acid Sulfate Materials; and where appropriate the WA Department of Environment and Conservation (DEC; 2013) guidelines for Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes.

SITE HISTORY

1.10 PREVIOUS REPORTS

ENRS understands that the Site has not been the subject of any previous environmental assessments. Hence, no reports were available for review at the time of this assessment.

1.11 REVIEW OF COUNCIL RECORDS

A review of council records was not undertaken during this PSI. The review of historical information supported by Site inspections was considered adequate to identify any potential Areas of Environmental Concern (AECs).

1.12 HISTORICAL TITLES

A search of prior and cancelled land titles was undertaken to document the timeline of previous landowners and their occupation which provides an indication of potential contaminating activities associated with previous land use. A summary of historical titles is provided in **Table 3** with a record of titles attached in **Appendix A.**

Available prior & cancelled land titles were limited for the Site. The records indicated that the electronic folio was created in October 2018 and did not include any historical titles. However, review of the historical imagery and site inspections was considered adequate to determine any partially contaminated land. A summary of historical titles is provided in **Table 3** below.

Table 3: Summary of Historical Titles

15/10/2018	Folio Created - Edition 1

1.13 HISTORICAL AERIAL IMAGERY

Historical aerial photographs of the Site area were reviewed to identify potential contaminating land use and relevant changes in site conditions. Copies of imagery are provided in **Appendix B.** The key observations made from aerial reconnaissance are summarised in the **Table 4**.

Table 4: Summary of Historical Aerial Photography

Year	Description of site condition and surrounding land use
1948	No dwellings were present at the Site. The ground cover included light vegetation and open paddocks. The Site was characteristic of rural land use and consistent with the surrounding area.
1963	No significant change since 1948.

Year	Description of site condition and surrounding land use
1993	A single dwelling and shed were located within the south west corner of the Site off Wire lane. Vegetation within the northern portion of the Site had been cleared. Two (2) dams were also installed at the Site. Residential development was present to along the adjacent west and east boundaries. Stockpiled material was present along side Wire Lane.
2005	The single dwelling has been replaced. The remainder of the Site remained consistent with the 1993 imagery. There was an increase in residential development within the surrounding areas.
2017	No significant change since 2005. An additional 'container' shed had been built adjacent the residential dwelling.

1.14 DANGEROUS GOODS RECORDS

A registered search of SafeWork NSW records for licences to keep dangerous goods was not required for the report, as the Site has not been subject to historical commercial/industrial use.

1.15 EPA RECORDS

A search of the NSW EPA Contaminated Land register was conducted to assess the potential for contaminated land in the area. The search did not identify records within a 5km radius of the Site.

Your search for: LGA: Shoalhaven City Council

Matched 10 notices relating to 3 sites.

Notice Type: Declaration of Significantly Contaminated Land

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
BOMADERRY	320 Princes HIGHWAY	Commercial Land	1 current
NOWRA	Lamonds LANE	Former gasworks	2 current and 1 former
NOWRA EAST	Lot 3 Kalandar STREET	Mobil Service Station	6 former

Page 1 of 1

4 April 2019

1.16 UNDERGROUND SERVICE PLANS

The location of underground services can provide conduits and preferential pathways for contaminant migration into or from a Site. Service excavations and trenches may also comprise historical Fill which may require management as waste.

A Dial Before You Dig (DBYD) search was undertaken to compile underground service plans. Given that a large majority of the Site has never been developed all services were located along the road ways; Wire Lane and Beach Road. Hence, the services are not considered to impact on the Site.

1.17 INTEGRITY ASSESSMENT

Where available this Site history assessment has utilised formal sources of information issued by local government (Council), SafeWork, NSW EPA, and NSW Land & Property Information. Review of the Site history summary demonstrates a consistent timeline of land use activities and layout with no significant data gaps or inconsistencies to trigger further historical investigations. Hence, the sources and content of this assessment maybe considered to provide a reliable and satisfactory level of accuracy to support this Site history assessment and the identification of potential sources of environmental contamination.

SITE INSPECTION

A Site inspection was conducted by ENRS Environmental Consultant, Mr Taite Beeston, on the ***19th March 2019***. Refer to **Appendix C** for a photographic log of Site conditions and field observations.

The inspection consisted of a Site walk over to confirm the Site boundaries, access, layout, surface conditions, land use, buildings, potential for Above ground Storage Tanks (AST) and Underground Storage Tanks (UST), and a preliminary assessment for uncontrolled Fill and waste storage.

1.18 SITE LAYOUT

The following points outline the site activities and layout identified at the time of this investigation. A Site layout plan is provided in **Figure 7**.

The investigation area was generally characterised as a rural property with a single residential dwelling and two (2) storage sheds. The dwelling and sheds were located within the south-west corner of the Site off Wire Lane. The Site inspection did not include intrusive investigations of the infrastructure. However, the sheds were observed to be constructed from corrugated iron and steel shipping containers. Review of historical aerial photography indicated that the shed were installed; container shed circa 2015 and corrugated iron shed pre 2005. The remainder of the Site was made up of large open paddock and lightly vegetated areas. Access through the Site was via unsealed tracks conforming to the paddock fences. Additional infrastructure at the Site included a windmill and groundwater well located within the centre of the Site and five (5) water dams. Dams were generally located within the natural drainage lines across the Site. A stockpile of used bricks and ceramic tiles was identified at the Site. No hazardous materials or visual or olfactory evidence of contamination was observed within the material. Discussions with the landowner identified that the material was generated on Site form a former BBQ.

An area of stockpiled material was observed alongside Wire Lane. The stockpile is considered to be associated with an excavation on the neighbouring properties north of Wire Lane (Lot/DP 1/1217124 & 1/593975). The stockpiled material is estimated to cover an area of approximately ~3,000m^2. The material was observed to be covered in light vegetation. The site inspection did not include any intrusive investigations which was considered to be outside the scope of work for this preliminary assessment. The stockpile location is provided in **Figure 7**.

In summary, the Site was consistent with its historical land use with no visual or olfactory evidence of contamination observed during the Site inspection. The stockpiled material alongside Wire Lane was considered to be the only observed Area of Environmental concern (AEC).

1.19 BUILDINGS

The Site inspection did not include any intrusive investigations of the building at the Site. However, the buildings present at the Site included;

- Residential dwelling. Double story building. Constructed between circa 1993-2005. The building replaced the original house which was constructed prior to 1993. No evidence of the former structure was observed.
- 2x Sheds. Constructed form shipping containers (circa 2005) and corrugated iron (circa 1993).

1.20 SURFACE CONDITIONS

The property generally comprised of lightly vegetated areas and open paddocks. Sealed areas were limited to the main house driveway and building footprints. Access tracks through the property were unsealed. No oil or surface stains were noted around the sheds and surrounding areas to indicate a history of spills or chemical contamination.

1.21 LIQUID & SOLID WASTE

The Site inspection did not identify any stored liquid and solid waste.

1.22 ABOVE GROUND STORAGE TANK

No evidence of fill points, mounting or venting infrastructure was observed during the Site inspection. No evidence of AST's or UST's was noted.

1.23 ASBESTOS

The site inspection included visual investigations for asbestos containing materials (ACM). No ACM was identified over the ground surfaces at the Site. Given the age of the residential dwelling (circa 1993-2005) is considered unlikely to contain any significant quantities of Asbestos Containing Materials (ACM).

1.24 LEAD PAINT & HAZARDOUS MATERIALS

Lead within domestic paints was restricted circa 1969 (AS/NZS 4361.2:2017). Given the age of the residential dwelling and sheds, investigations for lead based paints were not considered necessary.

1.25 POTENTIALLY CONTAMINATED SOILS

Given the documented Site history of rural land use and observed Site conditions there is 'low' potential for the presence of significant ground contamination at the Site. No areas of Fill were observed across the Site. No visual or olfactory evidence of contamination was observed on the surface of this material.

SITE CHARACTERISATION

The Site history records document the Site has largely been used for rural purpose for an extended period of time comprising of paddocks and light bushland and a single residential dwelling. This Preliminary Site Investigation identified a potential Area of Environmental Concern (AEC) comprising of stockpiled material alongside Wire Lane. Further investigations and environmental assessment is required to assess if the material is suitable for re-use onsite.

Based on the results of the historical searches and Site inspections the Site condition is consistent with the documented land use and the majority of Site it is considered unlikely to pose a significant risk to the surrounding environment and health of future users of the Site. The ***Site may be considered suitable for the proposed residential land use***.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the historical data and a site inspection, the following conclusions and recommendations have been provided:

- This Stage 1 PSI report documents a review of historical land use records and a Site inspection for 55 Wire Lane Berry, NSW, 2526. ENRS understand the Site proposal is for residential land use;
- The Site history records document the Site has been used for rural purposes for an extended period with the addition of a residential dwelling;
- Review of EPA contaminated land records did not identify any areas of environmental concern in proximity to the Site;
- Review of Potential Acid Sulfate soil maps identified the Site as 'Not Assessed'. If the Site proposal is to include earth works, it is recommended that Potential Acid Sulate Soil field testing is conducted in accordance with; the NSW Acid Sulphate Soils Management Advisory Committee (ASSMAC;1998) guidelines; Australian Standard – Piling Design & Installation (AS2159-2009); and with consideration of the NSW RTA (2005) Guidelines for the Management of Acid Sulphate Materials;
- The Site walkover and inspections were conducted on the 19th March 2019 confirmed the Site condition is consistent with the documented history of rural land use. A single Area of Environmental Concern (AEC) was identified at the Site. The AEC included stockpiled material alongside Wire Lane. This Preliminary Site investigation did not include any intrusive investigations of the AEC. It is therefore recommended that further ground testing and environmental assessment is conducted within the AEC in order to assess the materials suitability for re-use onsite;
- Based on the historical information provided in this report and observations made during the Site inspection, the Site ***may be considered suitable for the proposed sub-division and residential land use***;
- Should any change in Site conditions or incident occur which causes a potential environmental impact, a suitable environmental professional should be notified to further assess the Site and consider requirements for any additional assessment; and
- This report must be read in conjunction with the attached Statement of Limitations.

REFERENCES

Australian Government National Water Commission (2012). Minimum Construction Requirements for Water Bores in Australia (third Edition).

Australian Government (2011) National Health & Medical Research Council. National Resource Management Ministerial Council. National Water Quality Strategy. Australian Drinking Water Guidelines (v3.3 updated 2016).

Australian Standard (1999) AS4482.2–1999: Guide to the investigation and sampling of sites with potentially contaminated soil – Volatile substances.

Australian Standard (2005) AS4482.1–2005: Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds.

enHEALTH (2005). Management of Asbestos in the Non-Occupational Environment

NEPC (2013). National Environment Protection (Assessment of Site Contamination) Measure.

NSW Department of Environment and Conservation (2007). Guidelines for the Assessment and Management of Groundwater Contamination.

NSW EPA (1995) Sampling Design Guidelines. ISBN 0-7310-3756-1.

NSW EPA (2014). Waste Classification Guidelines. Part 1 Classifying Waste.

NSW EPA (2015). Contaminated Land Management: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997

NSW EPA (2017). Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme, 3rd ed.

NSW Office of Environment and Heritage (OEH) (2011) Guidelines for Consultants Reporting on Contaminated sites. ISBN 0 7310 3892 4.

Safe Work Australia (2016). How to Manage and Control Asbestos in the Workplace Code of Practice (version 3).

Safe Work Australia (2016). How to Safely Remove Asbestos Code of Practice (version 2).

WorkCover NSW (2014). Guidelines for Managing Asbestos in or on Soil.

LIMITATIONS

This report and the associated services performed by ENRS are in accordance with the scope of services set out in the contract between ENRS and the Client. The scope of services was defined by the requests of the Client, by the time and budgetary constraints imposed by the Client, and by the availability of access to Site.

ENRS derived the data in this report primarily from visual inspections, and, limited sample collection and analysis made on the dates indicated. In preparing this report, ENRS has relied upon, and presumed accurate, certain information provided by government authorities, the Client and others identified herein. The report has been prepared on the basis that while ENRS believes all the information in it is deemed reliable and accurate at the time of preparing the report, it does not warrant its accuracy or completeness and to the full extent allowed by law excludes liability in contract, tort or otherwise, for any loss or damage sustained by the Client arising from or in connection with the supply or use of the whole or any part of the information in the report through any cause whatsoever.

Limitations also apply to analytical methods used in the identification of substances (or parameters). These limitations may be due to non-homogenous material being sampled (i.e. the sample to be analysed may not be representative), low concentrations, the presence of 'masking' agents and the restrictions of the approved analytical technique. As such, non-statistically significant sampling results can only be interpreted as 'indicative' and not used for quantitative assessments.

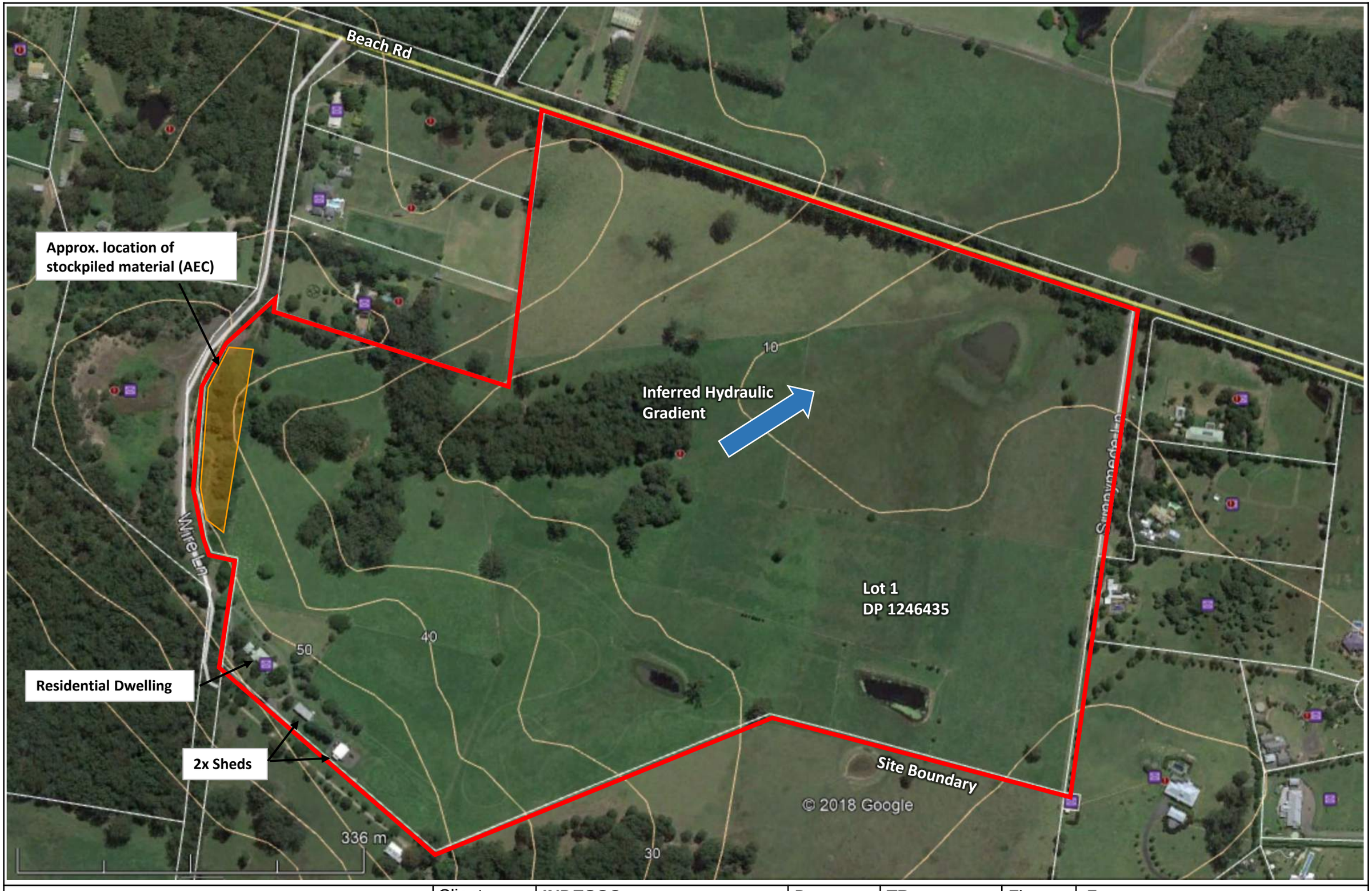
The data, findings, observations, conclusions and recommendations in the report are based solely upon the state of Site at the time of the investigation. The passage of time, manifestation of latent conditions or impacts of future events (e.g. changes in legislation, scientific knowledge, land uses, etc) may render the report inaccurate. In those circumstances, ENRS shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of the report.

This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the provisions of the agreement between ENRS and the Client. ENRS accepts no liability or responsibility whatsoever and expressly disclaims any responsibility for or in respect of any use of or reliance upon this report by any third party or parties.

It is the responsibility of the Client to accept if the Client so chooses any recommendations contained within and implement them in an appropriate, suitable and timely manner.

FIGURES

Figure 7 Site Plan



Client:	**INDESCO**	Drawn:	**TB**	Figure:	**7**
Project:	**ENRS1234**	Source:	**Sixviewer**	Date:	**10/04/2019**
Location:	55 Wire Lane, Berry, NSW, 2526	Scale:	**scale bar**	Title:	**Site Layout**
		Status:	**Rev 1**		

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APPENDICES

Appendix A

Historical Titles

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
4/4/2019 1:19PM

FOLIO: 1/1246435

First Title(s): OLD SYSTEM
Prior Title(s): 14/253806 2/1217124

Recorded	Number	Type of Instrument	C.T. Issue
15/10/2018	DP1246435	DEPOSITED PLAN	FOLIO CREATED EDITION 1 CORD ISSUED

*** END OF SEARCH ***

PRINTED ON 4/4/2019

Prior Title

14/253806
2/1217124

Prior title search for title reference: 1/1246435

Appendix B

Historical Aerial Photography

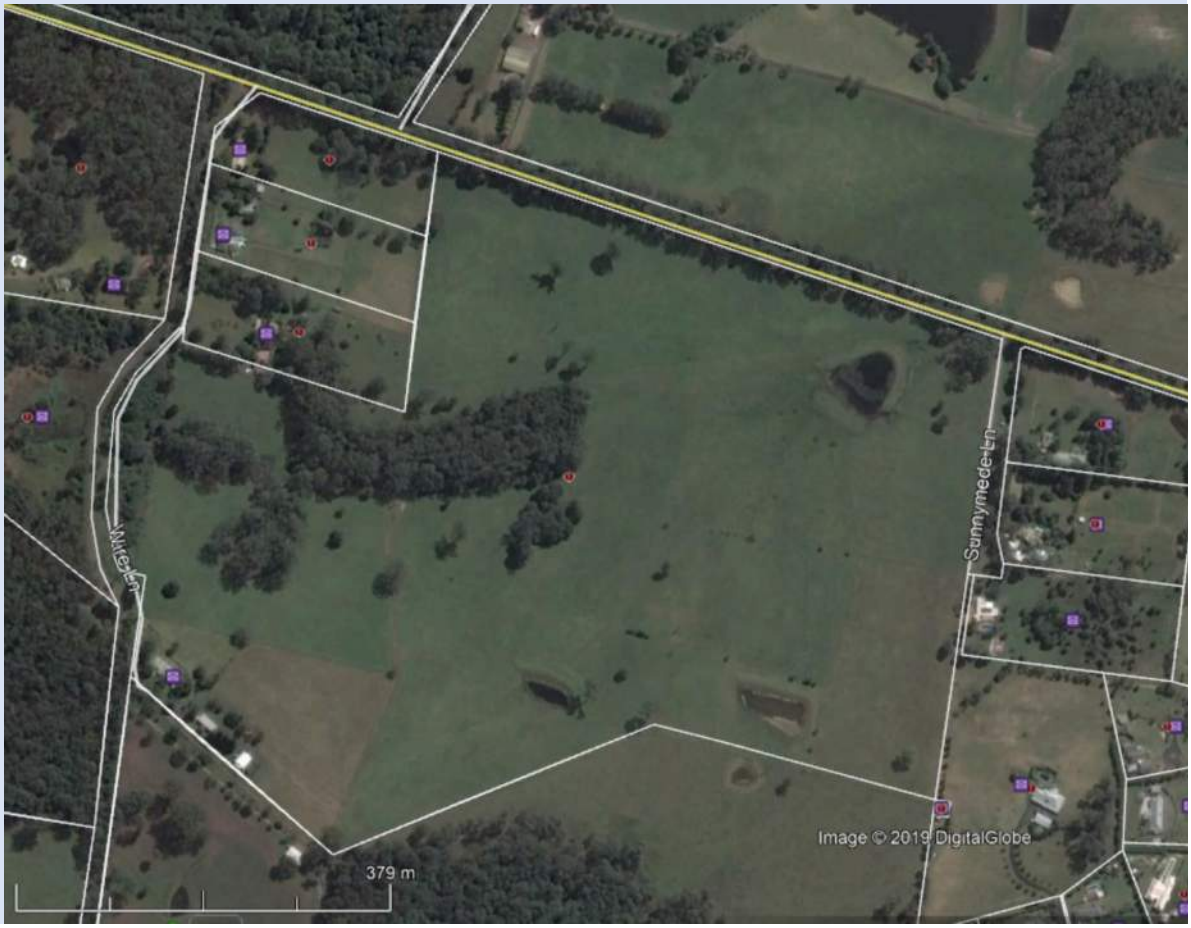
1948

1963

1993

2005

2017



Appendix C

Photographic Record of Site Conditions

Photograph 1: Residential dwelling

Photograph 2: Driveway

Photograph 3: Sheds

Photograph 4: Rural landscape

Photograph 5: Brick Stockpile on Site

Photograph 6: Access track conditions

Photograph 7: Stockpiled Material adj, Wire Lane covered in vegetation

Photograph 8: Stockpiled Material adj, Wire Lane covered in vegetation

Appendix H – Bushfire Assessment

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Bushfire Assessment

Planning Proposal

55 Wire Lane, Berry

Indesco

2 April 2019

(Ref: 19021)

report by
david peterson

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Executive summary

Objective

This Bushfire Assessment Report was commissioned by Indesco to inform a Planning Proposal application seeking approval to rezone bushfire prone land at 55 Wire Lane, Berry to allow future residential subdivision. The objective was to assess the bushfire hazard and risk and recommend bushfire protection measures commensurate with the risk to achieve compliance with the relevant specifications and requirements for protection against bushfires.

Compliance with legislation and policy

A Planning Proposal on bushfire prone land must have regard to the *Environmental Planning and Assessment Act 1979* Section 9.2 Ministerial Direction No. 4.4 – 'Planning for Bush Fire Protection', referring to the document *Planning for Bushfire Protection 2006*.

Bushfire hazard, threat and risk

The primary hazard consists of forest vegetation west of the subject land located beyond Beach Road and Wire Lane. A secondary bushfire hazard consists of a remnant within the subject land and the revegetation of 'low hazard' riparian corridors.

Beyond the subject land, the bushfire threat is assessed to be low to medium due to the primary hazard being located only on one side of the subject land and confined to isolated parcels within a predominately cleared landscape.

The Shoalhaven Bushfire Risk Management Plan (Shoalhaven Bushfire Risk Management Committee 2010) reports the absence of landscape-wide fire within the surrounding area since recorded history. A risk rating of future residential development at the subject land would be low as there will be compliant bushfire protection measures.

Measures to achieve compliance

Bushfire protection measures for future residential development recommended within this report to achieve the requirements are listed below:

- Provision of compliant APZs between future building envelopes and bushfire hazards as mapped on Figure 4. Areas for building envelopes can be improved with additional vegetation management around the edges of the remnant vegetation on site.
- Adequate access for emergency response and evacuation. Cul-de-sac roads are acceptable in this case as they will traverse cleared land that is not mapped bushfire prone, and will lead evacuees away from the bushfire threat.
- Compliant road widths and design.

Conclusion

The report concludes that the Planning Proposal together with the recommended bushfire protection measures satisfies the specifications and requirements of Ministerial Direction No. 4.4 and *Planning for Bushfire Protection 2006*.

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1 Introduction

1.1 Background

Indesco commissioned Peterson Bushfire to prepare a Bushfire Assessment Report to accompany a Planning Proposal to rezone land in Berry to allow future subdivision for residential development. This report addresses the requirements for assessment of rezoning proposals involving bushfire prone land, namely the *Environmental Planning and Assessment Act 1979* Section 9.2 Ministerial Direction 4.4 – 'Planning for Bush Fire Protection'.

1.2 Location of subject land

The subject land (Lot 1 DP 1246435) is an agricultural property located on Wire Lane part way between Berry township to the west and Seven Mile Beach to the east. The location of the subject land is shown in Figure 1. At approximately 40 hectares in size, the majority of the property is in a cleared state consisting of grazing paddocks and a 4.5 hectare remnant corridor of bushland along a drainage line. The homestead and associated outbuildings are located in the south-western corner of the subject land accessed by Wire Lane.

1.3 The proposal

The proposal seeks to rezone the subject land from RU1 and RU4 (Primary Production) to R5 (Large Lot Residential) to allow future subdivision and the construction of dwellings. A concept subdivision layout is included as Figure 2.

Legend

Subject Land

N

DKGIS

Date: 14/03/2019

0 250 500 1,000

Metres

Figure 1: The Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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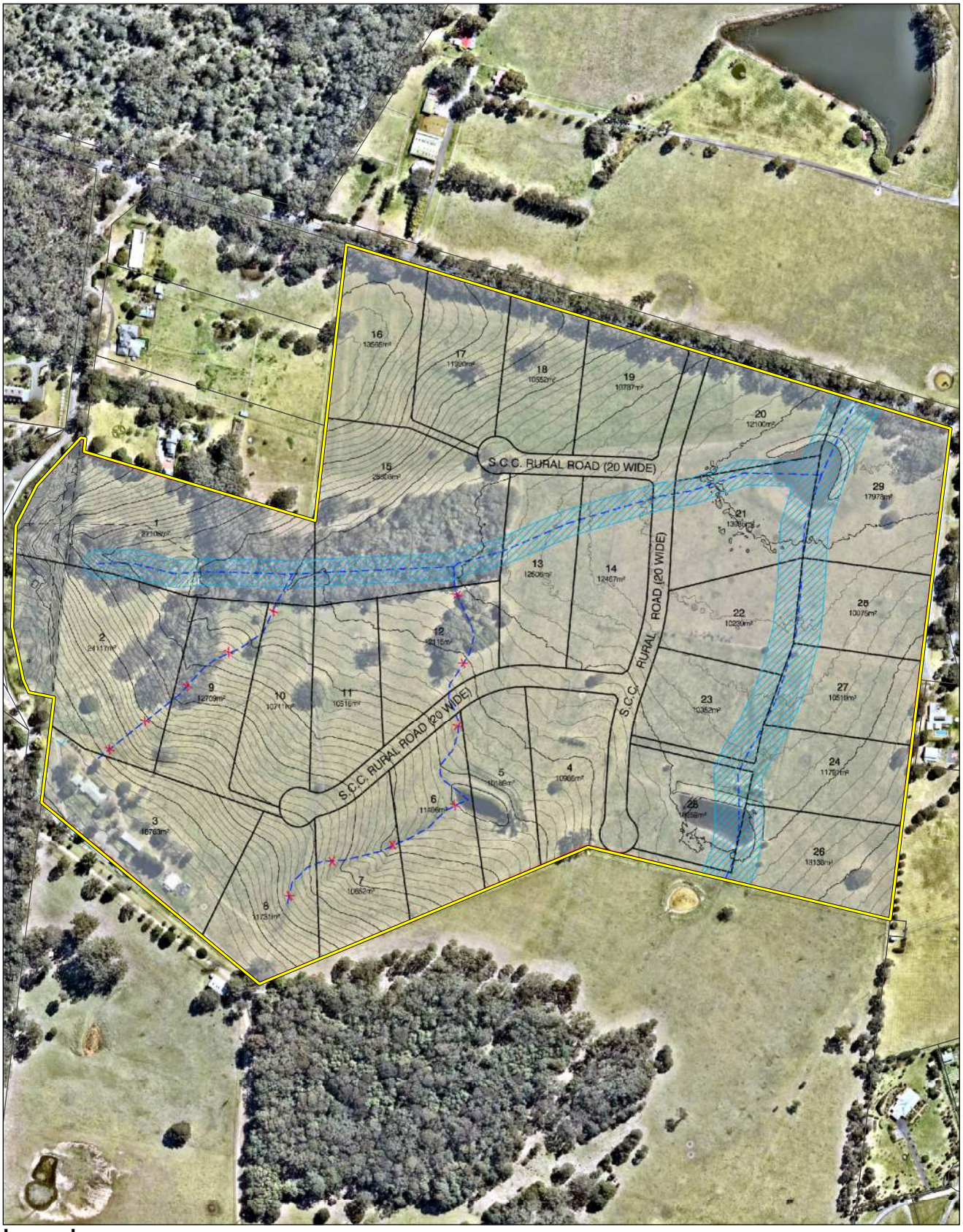

Legend

Subject Land

Lot

N

DKGIS

Date: 14/03/2019

0 75 150 300

Metres

Figure 2: The Proposal

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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2 Assessment requirements

The subject land and adjoining properties are identified as 'bushfire prone land' on the Shoalhaven Bushfire Prone Land Map as shown on Figure 3. When investigating the capability of bushfire prone land to be rezoned, submissions must have regard to Section 9.2 Direction 4.4 – 'Planning for Bush Fire Protection' of the *Environmental Planning and Assessment Act 1979*. The objectives of Direction 4.4 are:

- *To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas; and*
- *To encourage sound management of bushfire prone areas.*

Direction 4.4 instructs councils on the bushfire matters which need to be addressed when drafting and amending Local Environmental Plans (LEP). They are as follows:

- *A draft LEP shall:*
    - *have regard to the document Planning for Bushfire Protection 2006;*
    - *introduce controls that avoid placing inappropriate developments in hazardous areas; and*
    - *ensure that bushfire hazard reduction is not prohibited within the asset protection zone.*
- *A draft LEP shall, where development is proposed, comply with the following provisions, as appropriate:*
    - *provide an asset protection zone incorporating at a minimum:*
        - *an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and,*
        - *an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road.*
    - *for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the draft LEP permit Special Fire Protection Purposes (as defined under Section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,*
    - *contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,*

- *contain provisions for adequate water supply for fire-fighting purposes,*
- *minimise the perimeter of the area of land interfacing the hazard which may be developed,*
- *introduce controls on the placement of combustible materials in the Inner Protection Area.*

The need for Planning Proposals to comply with '*Planning for Bushfire Protection 2006*' (referred to as PBP throughout this report) is called up by Direction 4.4. The Direction 4.4 provisions are specified within PBP as well. The relevant sections of PBP as they apply to the proposal are summarised below:

- PBP Section 2.1 – describes the submission requirements for rezoning proposals. The requirements do not differ from Direction 4.4.
- PBP Section 4.1 – outlines the specific objectives (Section 4.1.2) and assessment requirements (Section 4.1.3) for residential subdivision.

Legend

Subject Land

Bush Fire Prone Land

- Vegetation Category 1
- Vegetation Category 2
- Vegetation Category 3
- Vegetation Buffer

N

DKGIS

Date: 14/03/2019

0 75 150 300

Metres

Figure 3: Bushfire Prone Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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3 Bushfire hazard and risk

3.1 Bushfire hazard

An assessment of the hazard surrounding and within the subject land is necessary to determine the suitability of the proposed future land use as well as the required bushfire protection measures, such as Asset Protection Zones, that may be required between future dwellings and bushfire hazards. The bushfire hazard is a combination of vegetation and slope determined in accordance with methodology specified by PBP.

3.1.1 Predominant vegetation (fuels)

The vegetation within 140 m of the subject land has been assessed in accordance with the methodology specified within PBP. Figure 4 maps the current distribution of the bushfire hazard. The hazard lies off site to the north, west, and south, and within the site along drainage lines as described below. The vegetation community forming the hazard in these locations is 'Blackbutt – Turpentine – Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin Bioregion' (Ecoplanning 2019). In accordance with PBP the hazard is classified as 'forest' for the determination of Asset Protection Zones (APZ) and Bushfire Attack Levels (BAL).

North-east: The vegetation to the north-east is greater than 100 m from the subject land boundary. At approximately 2.2 hectares in size and isolated amongst cleared paddocks, the required APZs and BALs won't impact the subject land.

North-west and west: Approximately 50 m to the north-west across Beach Road and to the west of Wire Lane is a larger parcel of forest which acts as the primary bushfire hazard affecting the subject land simply due to size.

South: Within the adjoining property to the south is a 7.5 hectare remnant of forest which is set back of the southern property boundary.

Internal: Within the subject land is a 4.5 hectare remnant located along the west-east drainage line. The riparian vegetation will be continued by revegetation eastwards along the drainage line to intersect with the south-north drainage line. Outside of the existing forested corridor, which exceeds 100 m in places, the revegetated section of the riparian corridors along both drainage lines will be less than 50 m wide and therefore can be classified 'low hazard vegetation'.

3.1.2 Slopes influencing fire behaviour

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most influence fire behaviour where the hazard occurs. The slope was determined using a 1 m contour layer as shown on Figure 4.

The effective slope is predominantly downslopes both adjoining and within the subject land. The slope classes are predominately in the PBP slope class range of 'downslope 0-5º' and 'downslope 5-10º' as indicated on Figure 4.

3.2 Bushfire threat

Beyond the immediate hazard adjoining the subject land, the bushfire threat is assessed to be low to medium. This is due to the hazard being confined to only the western side of the subject land and forming isolated parcels within a wider landscape of cleared farming land and rural residential properties.

3.3 Bushfire risk

Assessing the impact of bushfire is often better addressed by measuring risk. Bushfire risk is defined (Shoalhaven Bushfire Risk Management Committee 2010) as the chance of a bushfire igniting, spreading and causing damage to assets of value. Therefore, risk is analysed not only in terms of the existence of an adjacent hazard, but also the potential for ignition, fire spread, but also factors contributing to fire control and response. The Shoalhaven Bushfire Risk Management Plan (Shoalhaven Bushfire Risk Management Committee 2017) doesn't place a risk ranking on the subject land or surrounding area due to the current lack of existing assets, as well as the absence of landscape-wide fire within the surrounding area since recorded history. A risk rating of future residential development at the subject land would be low, as although the risk profile may increase with the introduction of life and property into the area, there will be compliant bushfire protection measures in accordance with PBP. Required measures to achieve compliance are discussed in the following Section 4 – 'Addressing Compliance'.

Legend

- Subject Land
- Contour - 1m
- Lot

Vegetation Formation

- Forest
- Riparian Corridor - Proposed

Asset Protection Zone

- Asset Protection Zone - 14m
- Asset Protection Zone - 24m
- Asset Protection Zone - 29m
- Asset Protection Zone - 37m

N

DKGIS

Date: 14/03/2019

0 50 100 200

Metres

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

Figure 4: Bushfire Hazard Analysis and Asset Protection Zone

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4 Addressing compliance

This section details how compliance with the assessment requirements listed in Section 2 is addressed. The response to requirements is set-out following the structure of Direction 4.4, followed by PBP. There is reiteration of requirements between Direction 4.4 and PBP; in these cases, the relevant report subsection is referred to for the appropriate response.

4.1 Direction 4.4

The objectives of Direction 4.4 can only be satisfied once the provisions are achieved. Demonstration of achieving the provisions is provided below. A statement of how the objectives are achieved is listed below also:

> *"To protect life, property and the environment from bushfire hazards, by discouraging the establishment of incompatible land uses in bushfire prone areas"*
>
> The intention of the objective is to avoid a development outcome that is faced by or poses a risk that cannot be managed to an acceptable level. The assessment of 'incompatible', 'inappropriate' and 'acceptable' is a subjective one, and one that is not defined within the legislation or related policy.
>
> To guide an assessment, reference should be made to the measures specified by *Planning for Bushfire Protection 2006* (see Section 4.1), such as the ability to establish and maintain an adequate Asset Protection Zone (APZ), and the assurance of acceptable access and evacuation.
>
> The hazard and risk analysis within this report (Section 3) demonstrates that future residential development at the site will be faced by a risk that can be managed to an acceptable level by implementing the recommendations therefore making it compatible with the surrounding environment.
>
> It is concluded that the proposed land use is not considered incompatible with the surrounding bushfire prone area. Compliant APZs coupled with adequate access designed to address the bushfire risk produces a use not incompatible with the surrounding environment.
>
> *"To encourage sound management of bushfire prone areas"*
>
> The recommended bushfire protection measures demonstrate sound management of the use of the subject land for the intended use.

The provisions and how they are to be addressed are as follows:

> *"have regard to Planning for Bushfire Protection 2006"*
>
> Addressing this provision is detailed in the following Section 4.2.

"*introduce controls that avoid placing inappropriate developments in hazardous areas"*

The proposed land use is not considered inappropriate nor is the area determined to be hazardous to a degree that should preclude development (refer to Section 3). Controls (bushfire protection measures) will be set in place commensurate with the level of risk for any future development. These controls would comply with PBP as set out in Section 4.2.

"ensure that bushfire hazard reduction is not prohibited within the asset protection zone"

It is intended that APZs will be confined to land zoned for residential development and not environmental protection. APZs will be placed within maintained land within residential lots and road reserves so that they can be maintained without conflicting with ecological objectives, such as those associated with riparian zones.

"provide an asset protection zone incorporating at a minimum:

> *an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and,*
>
> *an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road"*

APZs suitable for residential subdivision are shown on Figure 4 and detailed in Section 4.2.

"for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the draft LEP permit Special Fire Protection Purposes (as defined under Section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with"

The proposal is not 'infill development'.

"contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks"

Future development will be serviced by an existing and proposed two-way road network. Addressing this provision is detailed in the following Section 4.2.

"contain provisions for adequate water supply for fire-fighting purposes"

Addressing this provision is detailed in the following Section 4.2.

"minimise the perimeter of the area of land interfacing the hazard which may be developed"

The perimeter of the subject land adjacent the identified hazards will not be altered as part of the proposal. The hazard perimeter is minimal and consists of the western boundary, part of the southern boundary, and the internal riparian corridors which are, for the most part, classified low hazard. The nature of R5 large lot rural subdivisions is that a reduced number of dwellings will be located on the interface.

"introduce controls on the placement of combustible materials in the Inner Protection Area"

Section 4.2 details how the site and any APZs are to be maintained.

4.2 Planning for Bushfire Protection 2006 (PBP)

Compliance with *Planning for Bushfire Protection 2006* (PBP) is achieved by addressing the standards for bushfire protection. The standards consist of 'Acceptable Solutions' and corresponding 'Performance Criteria' for the provision of APZs, access and services (water supply). Discussion on the standards and statements on how each protection measure can be complied with are listed in the subsections below.

4.2.1 Asset Protection Zones (APZ)

Using the hazard parameters of vegetation and slope discussed in Section 3, APZ distances have been estimated and are shown on Figure 4. The APZ dimensions are based on the draft document 'Planning for Bushfire Protection 2018' (PBP 2018) as subdivision of the subject land would occur after May 2019 when the draft document becomes legislated. The APZ distances specified within PBP 2018 exceed those specified within PBP 2006 for the vegetation types present, therefore using PBP 2018 APZ distances will achieve compliance with PBP 2006 and Direction 4.4.

The required APZs range from 24 to 37 m for the forest hazards within and adjoining the subject land. The APZ required for newly created riparian corridors is 14 m and is based on a vegetated corridor width not exceeding 50 m.

The APZ mapping on Figure 4 indicates that some lots at the western end and adjacent the internal forest remnant may have building envelopes constrained unless vegetation management into some edges of the remnant is achieved.

APZs will need to be maintained to achieve the performance requirements of an Inner Protection Area (IPA) as specified by PBP. The following guide can be used:

- Canopy treatment: The tree canopy is to be discontinuous with gaps between crowns of at least 2 to 5 m. Small clumps of trees can remain forming one larger crown providing larger gaps to the next adjacent crown of minimum 5 m is achieved.
- Understorey treatment: Shrubs, saplings and understorey vegetation should not be within the APZ.

- Groundcover treatment: Groundcovers such as grasses are to be regularly mowed or slashed to minimal height (i.e. 100 mm), and ground fuels are to be maintained in a minimal state by removing all dead vegetative material by raking and removing leaf litter and other fine fuels such as sticks and fallen dead-wood.

4.2.2 Access

Alternate access and egress

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response. All bushfire prone areas should have an alternate access or egress option depending on the bushfire risk, the density of the development, and the chances of the road being cut by fire for a prolonged period.

The subdivision concept layout plan (see Figure 4) shows most lots accessed by an internal road system that leads off Beach Road. Lots on the western boundary will gain access via Wire Lane and lots on the eastern boundary will gain access via Sunnymede Lane.

The PBP Acceptable Solution for roads accessing subdivisions is for a through road, or a cul-de-sac no longer than 200 m. The PBP Performance Criteria requires a "design that allow safe access for fire-fighters while residents are evacuating and area". The proposed road design ensures evacuation can occur away from the bushfire threat and all roads are not within a mapped bushfire prone area (refer to Figure 3). Therefore, having a cul-de-sac road exceeding 200 m is acceptable in this instance as the access and egress is considered safe leading away from the threat and amongst cleared lands. The chances of the proposed roads being severed by the impacts of fire is highly unlikely in their chosen location. Having cul-de-sac roads greater than 200 m is commonly accepted where the road design traverses cleared land and leads evacuees away from the fire threat.

Perimeter access

Wire Lane provides perimeter access between the subject land and the primary fire threat to the west. It is acceptable not to require a continuous perimeter road between large rural lots and the hazard, particularly when the hazard consists of smaller internal remnants and low hazard riparian vegetation. Additional perimeter road at the hazard interface is therefore not required.

Design and construction standards

The proposed subdivision roads are to be designed in accordance with the PBP Acceptable Solutions for the design and construction of public roads in bushfire prone areas (see Table 1 on the following page).

Table 1: Design and construction for public roads

Performance Criteria	Acceptable Solutions
• *Firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources)*	• *Public roads are two-wheel drive, all weather roads*
• *Public road widths and design that allows safe access for firefighters while residents are evacuating an area*	• *Urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with PBP Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle), which is a minimum of 6.5 metre carriageway for two-way road with inside edge curve radius >100 and swept path 2.5 metres.* • *The perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas* • *Traffic management devices are constructed to facilitate access by emergency services vehicles* • *Public roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard* • *Curves of roads (other than perimeter roads) are a minimum inner radius of six metres* • *Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient* • *There is a minimum vertical clearance to a height of four metres above the road at all times*
• *The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles*	• *The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicated load rating*
• *Roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered*	• *Public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression* • *Public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression*
• *There is clear access to reticulated water supply*	• *Public roads up to 6.5 metres wide provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression* • *One way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression*
• *Parking does not obstruct the minimum paved width*	• *Parking bays are a minimum of 2.6 metres wide from kerb to kerb edge to road pavement. No services or hydrants are located within the parking bays* • *Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road*

4.2.3 Water supply for fire-fighting

Given that a hydrant system fed by reticulated water supply may not be available for this subdivision or the fact that hydrants along the road reserve may not be within the required distance of building envelopes (in accordance with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning*), each future dwelling may require a static water supply for fire-fighting purposes. The assessment of a static water supply will be undertaken at the development application stage for a dwelling.

The water supply is to be a tank with a minimum volume of 20,000 litres and can have shared use for domestic requirements. The tank, or its outlet, is to be located within 4 m of the standing position of the tanker, which may be the driveway or turning facility. The outlet is to be fitted with 65 mm metal Storz outlet with gate or ball valve. An above ground tank is to be non-combustible.

5 Conclusion and recommendations

The information presented in this Bushfire Assessment Report demonstrates that the proposal to rezone the subject land for future residential subdivision can satisfy the Ministerial Direction No. 4.4 – 'Planning for Bush Fire Protection' and the requirements of *Planning for Bush Fire Protection 2006*. This is achieved by providing compliant bushfire protection measures such as hazard separation and adequate access.

The proposal is not considered incompatible with the surrounding environment and bushfire risk. With sound bushfire management, the proposal can coexist within the rural setting which is assessed to present a low risk to future development that will be compliant with contemporary bushfire protection measures.

Bushfire protection measures for future residential development recommended within this report to achieve the relevant requirements and specifications are listed below:

- Provision of compliant APZs between future building envelopes and bushfire hazards as mapped on Figure 4. Areas for building envelopes can be improved with additional vegetation management around the edges of the remnant vegetation on site.
- Adequate access for emergency response and evacuation. Cul-de-sac roads are acceptable in this case as they will traverse cleared land that is not mapped bushfire prone, and lead evacuees away from the bushfire threat.
- Compliant road widths and design.

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