Planning Proposal
Nebraska Estate,
St Georges Basin

Prepared by
Planning Development Services
Shoalhaven City Council

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2 Introduction

This planning proposal seeks to resolve the planning status and development potential of Nebraska Estate, a 'paper' subdivision'[1] located at St Georges Basin within the Shoalhaven LGA.

2.1 Location

The subject land is located approximately 23 km south of Nowra at the north western fringe of the St Georges Basin area. See Figure 1 - Location of the subject land.

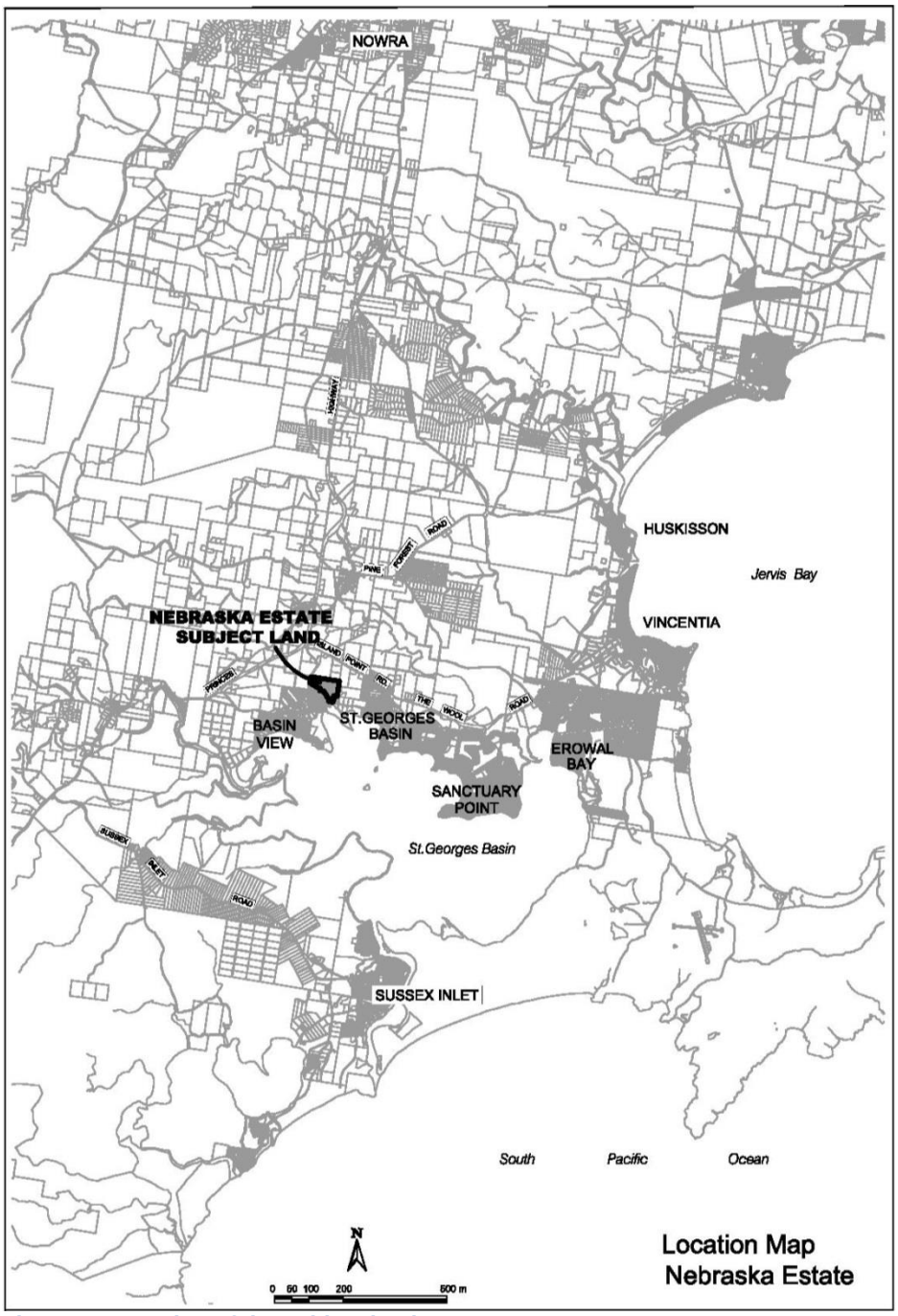


Figure 1 - Location of the subject land

[1] A 'paper subdivision' is an old subdivision where essential infrastructure is not provided and the zoning often prevents the individual lots from being developed.

2.2 Subject land

The subject land comprises 97 lots described as follows:

- Lots 6-9 and 11-20, Section A, DP 9699
- Lots 1-20, Section B, DP 9699
- Lots 1-20, Section C, DP 9699
- Lots 1-13 and 18-20, Section D, DP 9699
- Lots 1-8, Section F, DP 9699
- Lots 15-16 and 19, Section H, DP 9699
- Lots 2-10, Section J, DP 9699
- Lots 1-3, DP 722549
- Lots 2-3, DP 1090657
- Lot 1, DP 777950
- Lot 100, DP 1104506
- Lot 1 DP 1120892

Most of land is privately owned and is held in approximately 50 separate ownerships. The subject land boundary is overlaid onto a 2011 aerial photograph in Figure 2. A photo montage is also provided in the Appendices.

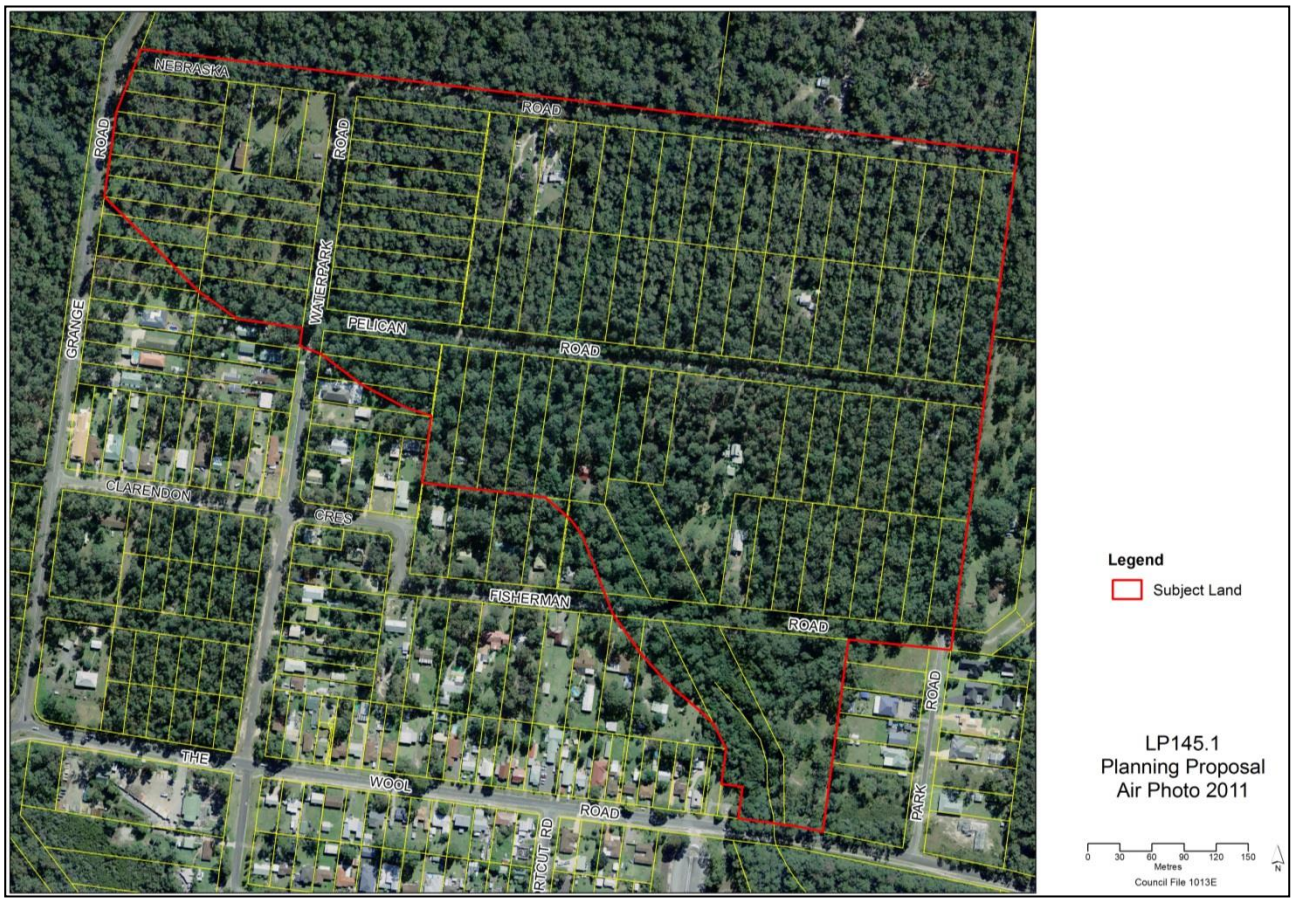


Figure 2 - Subject land boundary overlaid onto a 2011 aerial photograph

2.3 Current zoning

The subject land is currently zoned Rural Landscape (RU2) under Shoalhaven Local Environmental Plan 2014 (SLEP 2014) as shown in Figure 3. The minimum lot size is 40 hectares which generally prevents Council from approving dwelling houses on the individual lots within the Estate (refer to clause 4.2D of SLEP 2014).

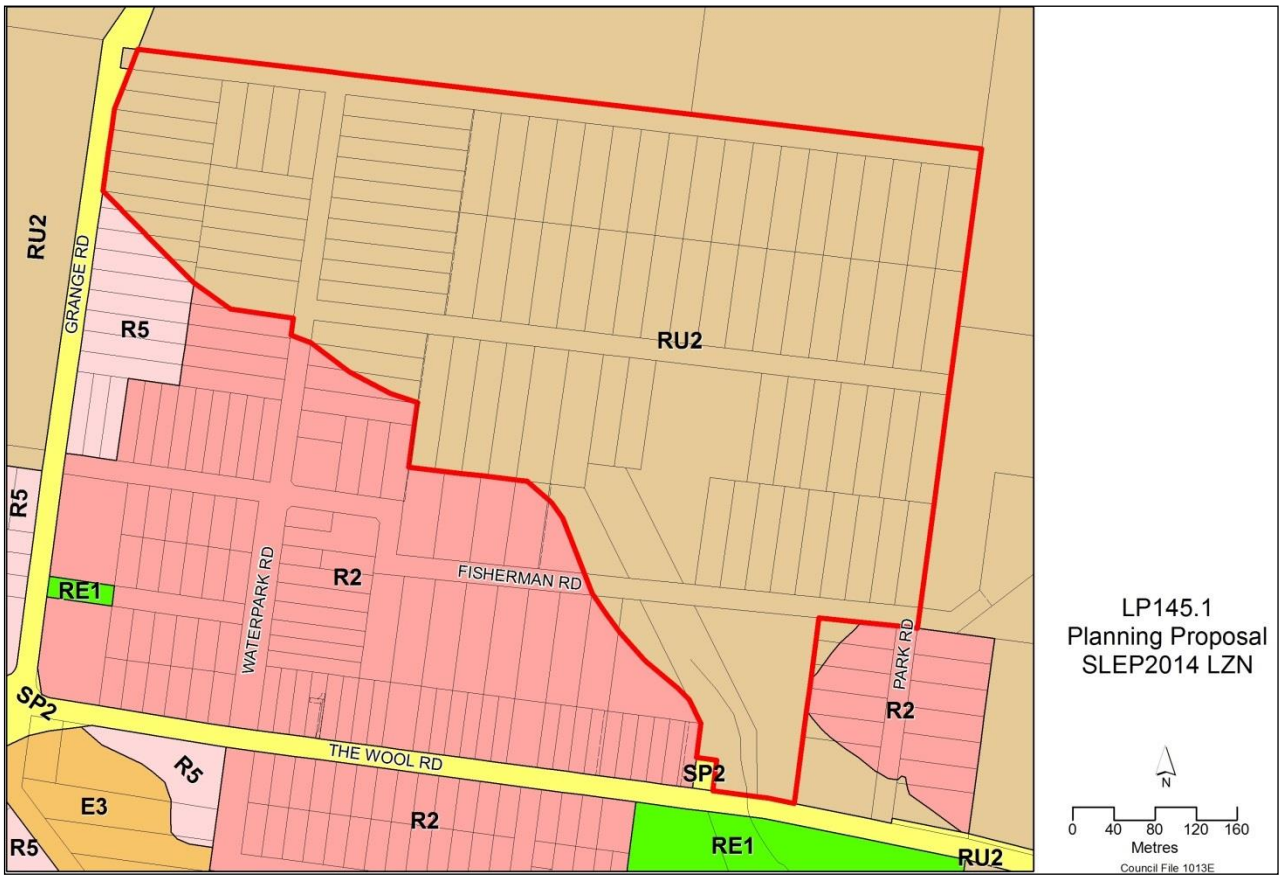


Figure 3 - Current zoning under Shoalhaven Local Environmental Plan (SLEP) 2014

The land is also mapped under SLEP 2014:

- entirely as “natural resource sensitivity - biodiversity” to which clause 7.5 of SLEP 2014 applies;
- partly as “riparian lands and watercourses” on the “natural resource sensitivity – water” to which clauses 7.5 and 7.6 of SLEP 2014 apply;
- partly as “scenic protection area” to which clause 7.7 of SLEP 2014 applies;
- partly as “flood planning area” to which clause 7.8 of SLEP 2014 applies;
- partly as “acid sulfate soils – class 2” to which clause 7.10 of SLEP 2014 applies; and
- on the “local clauses” map in relation to clause 5.9 (“preservation of trees and vegetation”) and clause 7.20 (“development in the Jervis Bay region”).

The above map layers can be viewed online at:

http://www.slep2014.shoalhaven.nsw.gov.au/content/maps

As shown in Figure 3, the land to the south of the subject land is generally zoned R2 – Low Density Residential apart from the lots fronting Grange Road which are zoned R5 – Large Lot Residential and a small area of land adjoining The Wool Road which is zoned SP2 – Infrastructure.

2.4 Background

2.4.1 History of 'paper subdivisions' in the Jervis Bay area

The selection of Canberra as the nation's capital and Jervis Bay as its future port in 1908 and the suggestion that a direct rail link would be provided between the two, triggered speculation that the Jervis Bay area would be extensively developed. At that time, the planning system was still in its infancy; there was no landuse zoning and subdivision plans could be registered without provision of essential infrastructure. These factors contributed to a proliferation of speculative subdivision activity in the Jervis Bay area in the 1910s and 1920s.

By the early 1920s many 'paper subdivisions' had been registered in the Jervis Bay area. The individual lots, of which there were thousands, could be bought and sold despite the lack of essential infrastructure. Any intentions that the developers may have had to develop these 'paper subdivisions' were put on hold indefinitely with the onset of the Great Depression in 1929.

2.4.2 Nebraska Estate planning history

The Nebraska Estate subdivision was registered in 1919. Apart from the southern fringe of the Estate where some development had occurred, the land remained undeveloped when landuse zoning was introduced in 1964. Under Shoalhaven Interim Development Order No.1 (IDO No. 1) most of the Estate was zoned "non-urban", generally precluding development of the individual lots due to their size. The land that was partially developed was zoned 'Village'. An excerpt from the original IDO map and an aerial photograph taken in 1964 are provided in Figure 4 below.

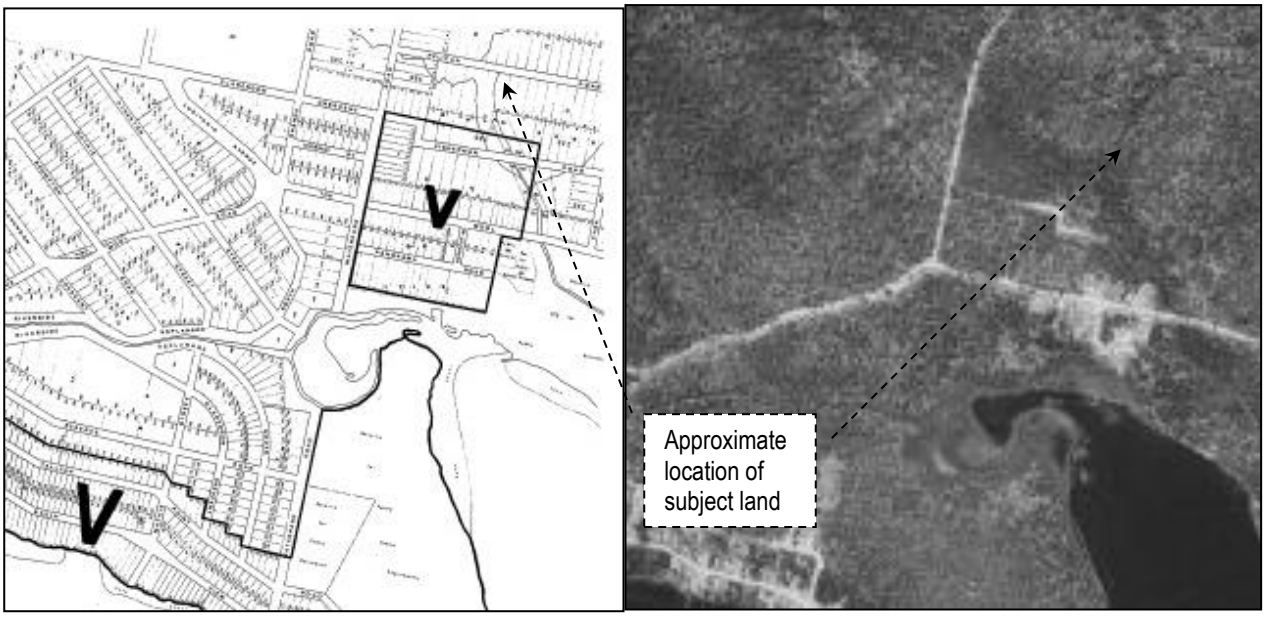


Figure 4 - Excerpt from Shoalhaven IDO No. 1 as gazetted in 1964 and aerial photograph over the area in 1964.

IDO No. 1 was superseded when the Shoalhaven Local Environmental Plan (SLEP 1985) was gazetted in 1985.

Prior to SLEP 1985 being superseded by SLEP 2014 on 22 April 2014, the subject land was zoned part Rural 1(g) (Flood Liable) and part Rural 1(d) (General Rural).

2.4.3 Initial rezoning investigations (1992-2003)

On 20 October 1992, Council resolved to prepare a draft local environmental plan over that part of Nebraska Estate that was zoned rural, for the purpose of allowing low density residential development.

On 20 September 1994, Council resolved to deal separately with lots located along Park Road because it was less constrained than the remainder of the Estate.

A letter from the Department of Urban Affairs and Planning dated 12 July 1995 expressed a number of environmental concerns in relation to the remainder of Nebraska Estate. Rezoning investigations for this area were ultimately interrupted in 1999 by NSW State Government moratorium on rezoning land in the Jervis Bay area pending gazettal of the Jervis Bay Regional Environmental Plan, 1996 (JBREP) and subsequently, completion of the Jervis Bay Settlement Strategy. The moratorium was introduced in 1995 but the Nebraska Estate investigations were initially allowed to continue. In 1999 the Department of Planning informed Council that there was little point in pursuing the matter further until a settlement strategy for the Jervis Bay area was completed.

Park Road area was rezoned in 2001 (Amendment No. 155 to SLEP 1985) enabling 13 dwellings to potentially be approved over 20 lots (*i.e*. in some cases, lots were required to be amalgamated before they could be developed).

The Jervis Bay Settlement Strategy (JBSS) prepared by Council and endorsed by the State Government, was finalised in 2003. The JBSS states that the remainder of the Nebraska Estate will be investigated for rural residential opportunities through a review of lot sizes and configuration to accommodate onsite effluent disposal; and a review of the performance of environmental measures at Park Road.

2.5 Delineation of potential development areas for the Planning Proposal

Council recommenced a thorough investigation of the constraints and land capability in 2006. This work has shown that substantial areas of the subject land are affected by one or more significant constraints including flooding, acid sulfate soils, threatened biodiversity, bushfire and Aboriginal archaeology.

A large proportion of the land is below the one in 100 year flood line. This floodprone land broadly corresponds with Swamp Sclerophyll Forest, an Endangered Ecological Community (EEC) under the NSW Threatened Species Conservation Act, and a population of the protected Biconvex Paperbark (*Melaleuca biconvexa*). Parts of the floodprone areas are identified as potential acid sulfate soils. Aboriginal artefacts have also been recorded within the floodprone land.

The north eastern corner of the subject land contains a large number of threatened orchids (+400 individual greenhood orchids *Pterostylis ventricosa*[2] and a single Leafless Tongue Orchid *Cryptostylis hunteriana*).

As reported to Council in April 2010, three separate potential development sectors were identified. These sectors are described below and are shown on Figure 5.

- North Western (NW) Sector: this is the least constrained and largest of the potential development areas. Given its size and proximity to existing residential land on the southern side of the main drainage line, a denser option may be possible, but only if serviced by reticulated sewerage.

- North Eastern (NE) Sector: this is a relatively small area of flood-free land bounded to the north, east and south by large numbers of threatened orchids. This area has potential for very limited rural residential development. Note: in 2010, Council resolved to review the potential of this area when the orchid's threatened status had been determined. The orchid's current status as 'critically endangered' is discussed further below.

- Eastern (E) Sector: this potential development area is located on flood free land, between a developed rural residential lot to the west, the Swamp Sclerophyll Forest EEC and Biconvex Paperbark to the south and southeast, and the orchid *Pterostylis ventricosa* to the north.

From December 2009 to April 2010, Council considered a number of reports on the constraints and land capability assessments.

[2] *Pterostylis ventricosa* was discovered in 2000 (in Nebraska Estate) and was formally recognised as a new species in 2008. The species was originally published as *Speculantha ventricosa* (Jones 2008) but *Pterostylis ventricosa* is now the accepted name.

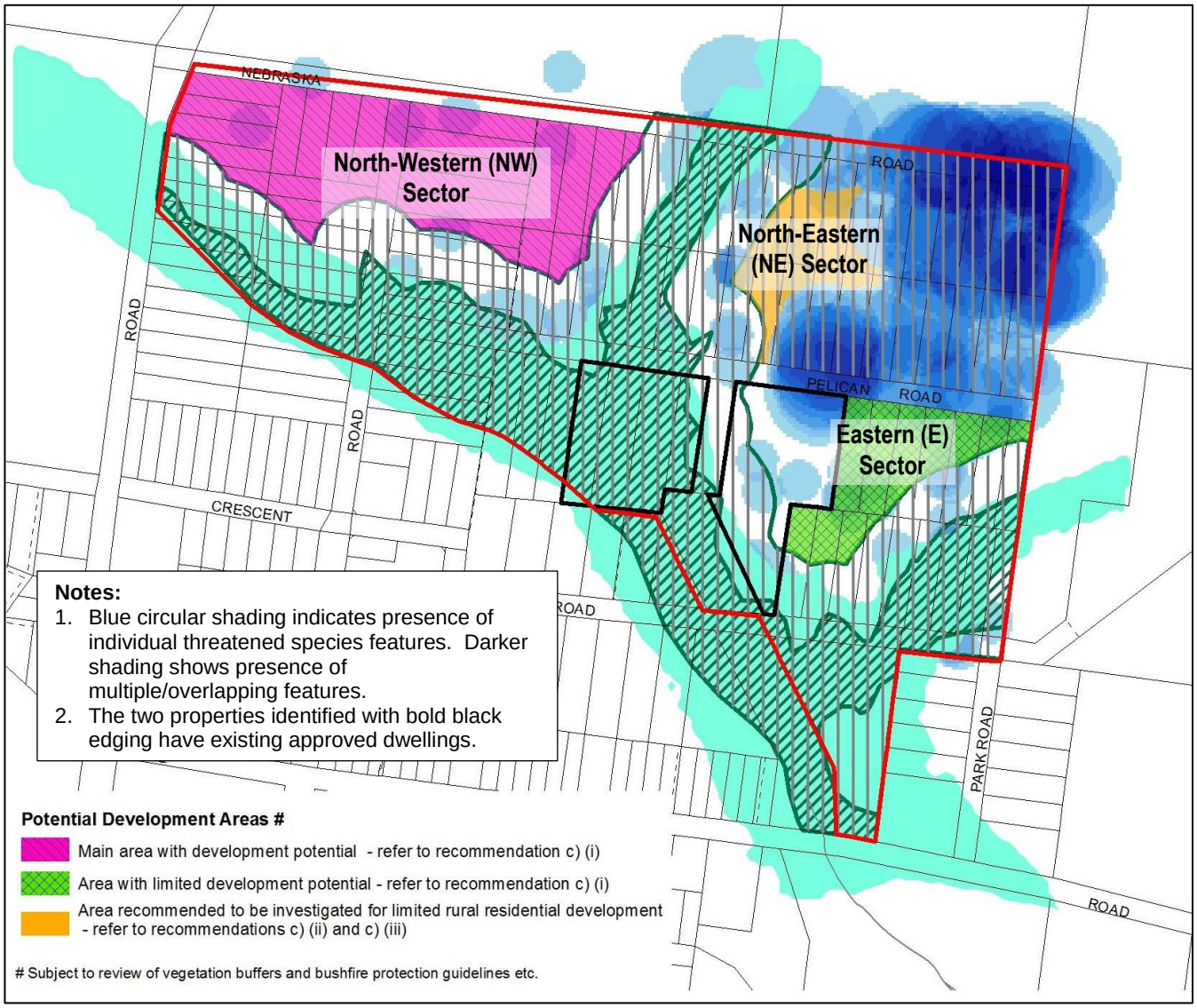


Figure 5 - Synthesis of constraints and potential development areas

On 13 April 2010, Council reached a formal position that the three areas described above have limited development potential and that the remaining areas are unsuitable for development (MIN10.376).

A report on the possible rezoning and development outcomes was considered by Council's Development Committee on 17 July 2012. The report is available online at: http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D12/166751

The report presented zoning and conceptual development options consistent with Council's resolution on 13 April 2010 (MIN10.376). In response, on 31 July 2012, Council resolved to:

- *Prepare and submit a Planning Proposal for Nebraska Estate; and*
- *Seek feedback from the affected landowners and wider community about whether to pursue a higher or lower density option in the north-western sector of the Estate as part of the rezoning process. (MIN12.868)*

This Planning Proposal has been prepared in accordance with the above resolution. Landowners and Government agencies will be consulted on the options for the NW Sector in conjunction with the exhibition process.

2.6 Subdivision layout - considerations for future zoning

When the land is rezoned, the existing lot layout will need to be reconfigured as part of any development. This is essential to enable provision of bushfire asset protection zones and perimeter access for firefighting and emergency vehicles. Depending on whether or not the developable land will be serviced by reticulated sewerage, some reconfiguration may also be necessary to safely manage on-site effluent. There is also an opportunity to improve solar access (by orientating lots to the north-south).

This Planning Proposal includes conceptual subdivision layouts for each of the zoning and minimum lot size options presented. The conceptual subdivision layouts show the type and extent of development that is potentially achievable under each option having regard to environmental and bushfire planning requirements etc. They also enable preliminary cost estimates to be calculated for the provision of infrastructure.

The existing fragmented ownership and in some cases, approved development, must be considered in any proposed re-subdivision. For example, an existing approved dwelling straddles three lots on the western side of Waterpark Road.

Any re-subdivision would be the subject of a separate development application process after the land is rezoned. It is envisaged that the conceptual subdivision layout for the preferred zoning and minimum lot size option would be refined and included in a site-specific development control plan (DCP) chapter for the Estate. This is similar to the approach taken with the Jerberra Estate rezoning that was notified in early 2014.

3 Part 1 - Objectives

- To resolve the land's planning status in recognition of the environmental values and constraints and associated statutory and policy framework.

- To rezone parts of the subject land that are less constrained to allow residential development, whilst providing increased protection for the remaining land by rezoning it to 'E2 – Environmental Conservation', in accordance with the environmental and land capability constraints.

- To manage bushfire risk in accordance with Planning for Bushfire Protection.

- To protect waterways and sensitive downstream ecosystems from the potential impacts arising from residential development.

4 Explanation of provisions (Part 2) and Planning Proposal maps (Part 4)

4.1 Proposed zones, minimum lot sizes and potential development outcomes

A summary of the land capability and proposed planning provisions is provided in Table 1. Three lot size map options and two zoning options are presented for the NW Sector. (The proposed zoning is the same for Options 2.1 and 2.2.)

Table 1 - Summary of land capability and proposed zone and minimum lot size provisions

	Summary of site issues	Proposed zones	Proposed minimum lot sizes (MLS) & dwelling yield	Comments
North-Western Sector	Separated from residential land to south by floodprone land, Biconvex Paperbark and Swamp Sclerophyll Forest EEC Bushfire issues [a]. Existing approved dwelling straddles 3 lots on western side of Waterpark Road. Scenic preservation area within 50 metres of Grange Road. Poor sight distance along Grange Road at its intersection with Nebraska Road (unformed).	*Option 1 (Lower density)* ***R5 – Large Lot Residential***	2,500 – 5,000 m^2 Yield:13 dwellings	Requires localised landowner coordination to achieve land pooling and resubdivision. Reticulated water and sewer preferable for catchment health but onsite disposal could be investigated.
		Option 2 (Higher density) ***R2 – Low Density Residential*** ***R5 – Large Lot Residential*** ***SP2 – Infrastructure*** (for new perimeter road)	*Option 2.1* R2: 1,000 m^2 *Option 2.2* R2: 750 m^2 R5: 3,000–5,000 m^2 *Option 2.1* Yield= 27 dwellings *Option 2.2* Yield= 35 dwellings	Requires more landowner coordination than Option 1 to achieve the land pooling and re-subdivision outcomes. Reticulated sewerage, water, a new perimeter road between Nebraska and Pelican Roads, and additional stormwater treatment measures would be essential. Lot averaging provisions required. Land Reservation Acquisition overlay for the proposed perimeter road
North-Eastern Sector	Isolation: separated from NW Sector by floodprone land and associated threatened vegetation (see above). Surrounded by threatened orchids: *Pterostylis ventricosa* and Leafless Tongue Orchid (*Cryptostylis hunteriana*). Bushfire issues [a].	***E4 – Environmental Living***	8,000 m^2 Yield= 4 dwellings	Subject to resolving environmentally sensitive land and creation of perimeter fire trail (easement needed). Requires landowner coordination to achieve the land pooling and re-subdivision outcomes. Lot averaging provisions required. Reticulated water and sewer preferable but onsite disposal could be investigated.

	Summary of site issues	Proposed zones	Proposed minimum lot sizes (MLS) & dwelling yield	Comments
Eastern Sector	Isolation: separated from residential land by floodprone land, acid sulfate soils and threatened vegetation to south east. Bushfire issues [a]. Threatened orchids (*Pterostylis ventricosa*) directly to the north. Two approved dwellings to the west.	***E4 – Environmental Living***	4,000 – 10,000 m^2 Yield= 4 dwellings	Subject to resolving environmentally sensitive land. Requires landowner coordination to achieve the land pooling and re-subdivision outcomes. Reticulated water and sewer preferable but onsite disposal could be investigated.
Other areas	Flooding, acid sulfate soils, Aboriginal sites and threatened species.	***E2 – Environmental Conservation***	Status quo (40 hectares)	Investigate options to amalgamate and protect these areas either as separate matter or in conjunction with development of the NW, NE and E Sectors.

a. Rezoning must comply with Planning for Bushfire Protection requirements including in relation to public road network, asset protection zones (APZ) and building construction standards.

Council will seek feedback on the preferred option for the NW Sector when the Planning Proposal has received gateway approval.

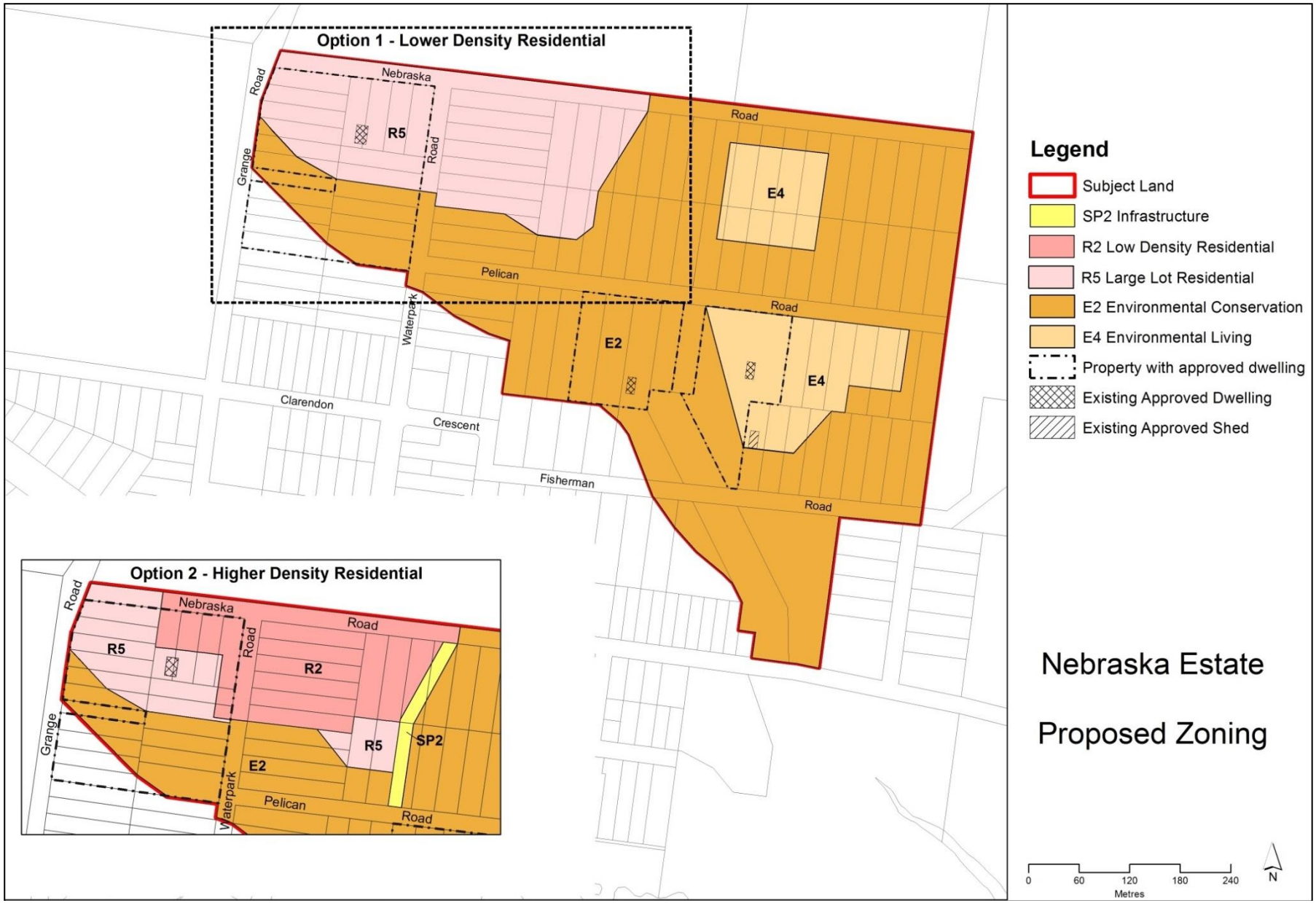
Landuse tables for the proposed zones can be viewed in SLEP2014, which is available online at: http://slep2014.shoalhaven.nsw.gov.au/

4.2 Planning Proposal maps

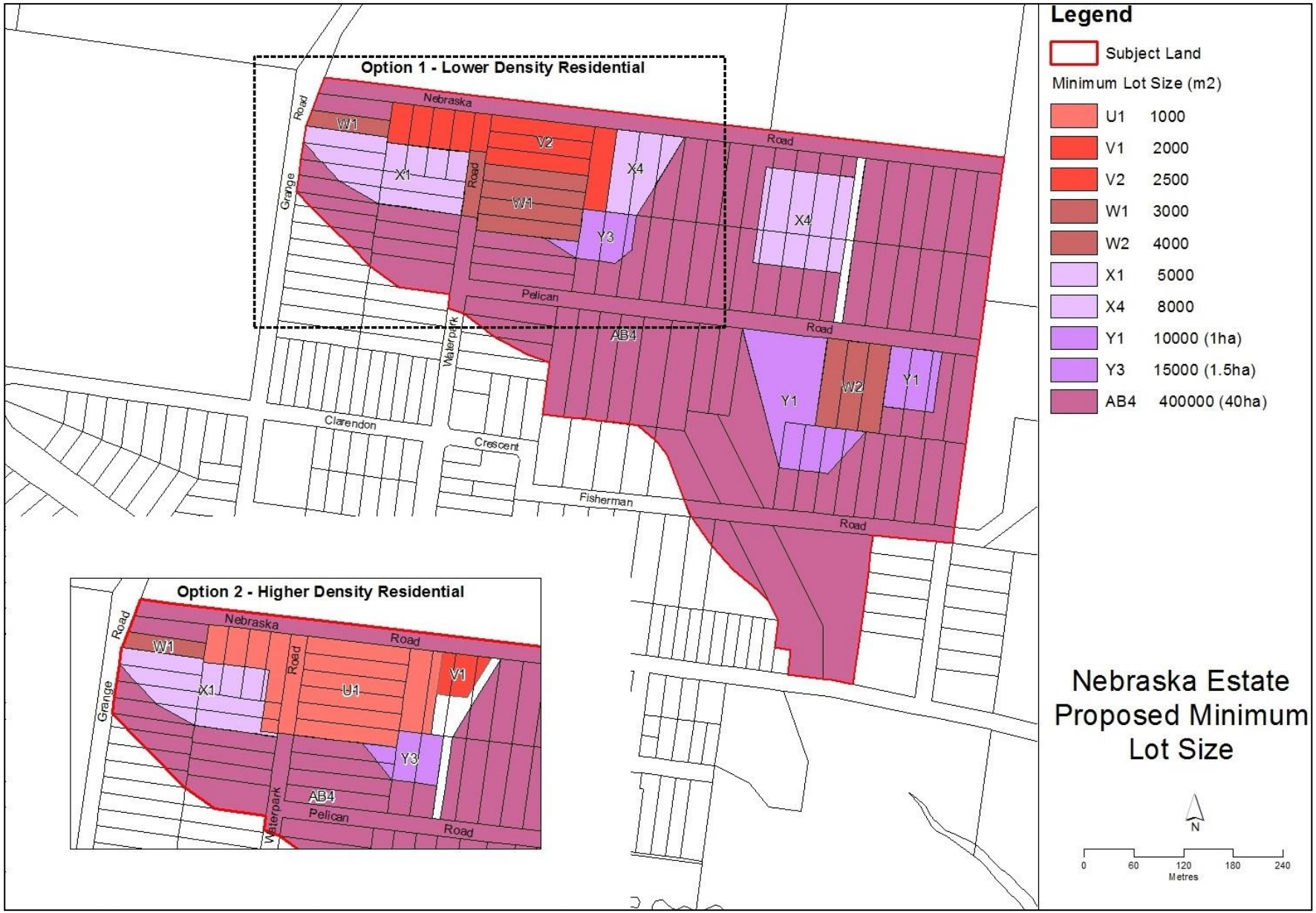
This Planning Proposal includes proposed changes to the following map layers that form part of SLEP 2014:

- proposed landuse zoning;
- proposed lot size;
- land reservation acquisition (Option 2 only); and
- terrestrial biodiversity.

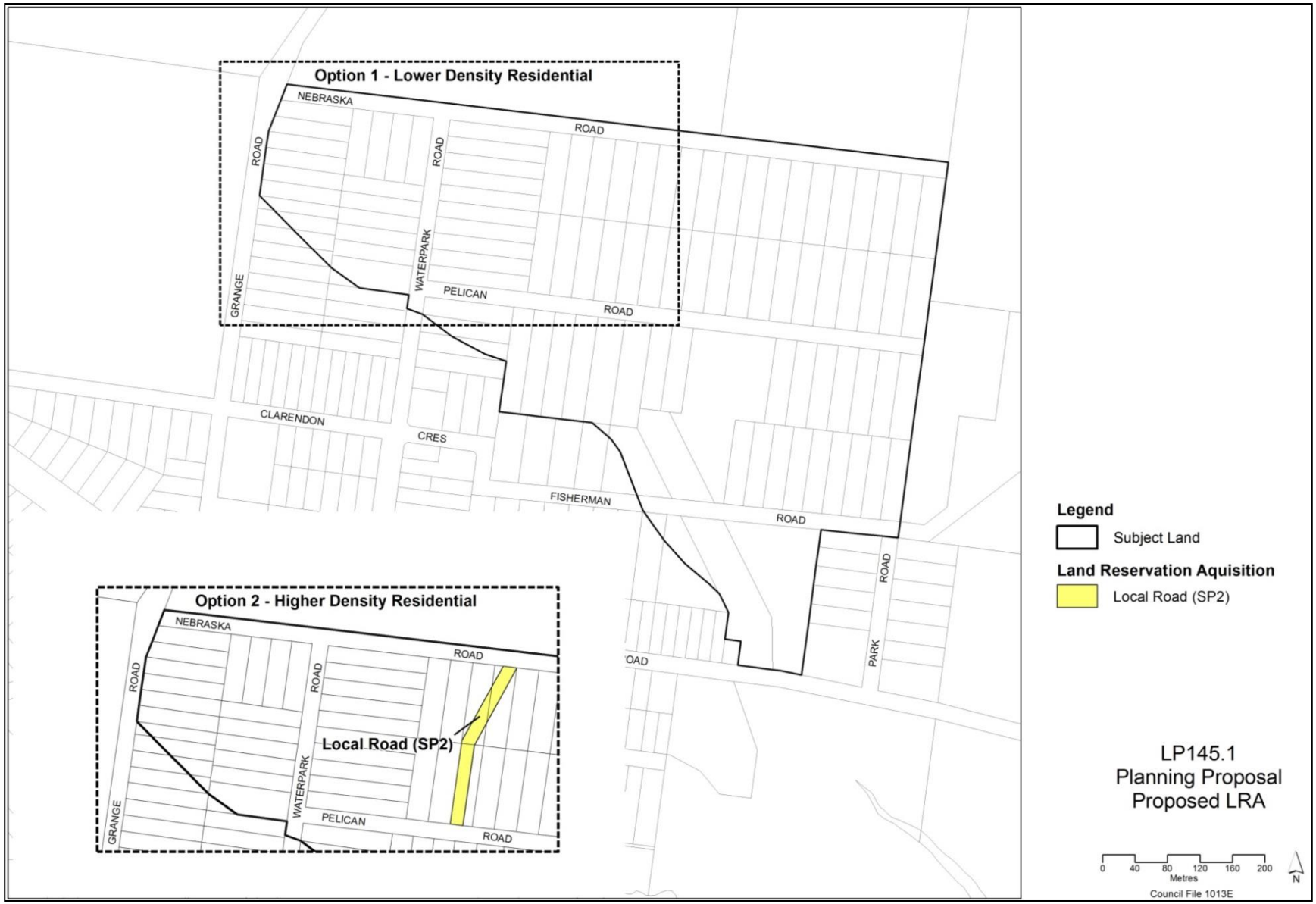
As discussed in section 2.6, a supplementary 'Conceptual Subdivision and Development Layout Map' has also been prepared for each of the zoning/minimum lot size options.



Planning Proposal Map 1 - Landuse zoning



Planning Proposal Map 2 - Minimum lot sizes



Planning Proposal Map 3 – Land acquisition overlay (new road required only for Option 2)

Planning Proposal Map 4 – Terrestrial biodiversity map overlay ('bio' layer removed from subject land due to proposed zones and controls)

Planning Proposal Map 5 - Conceptual subdivision and development layout

4.3 Lot averaging

It is intended to enable lot averaging in each of the development sectors in recognition that some lots will need to be larger than others, for example, to provide bushfire APZs on corner lots. These provisions would be triggered via the Lot Size Map and accompanying clauses under clause 4.2B (subdivision of certain land in Zone RU1, Zone RU2, Zone RU4, Zone R5 and Zone E4). If Council chooses to pursue Option 2 for the NW Sector, the clause would also need to be amended to include "Zone R2".

4.4 Preservation of trees or vegetation (clause 5.9)

Clause 5.9 (preservation of trees or vegetation) of Shoalhaven LEP 2014 applies to the subject land as well as other paper subdivisions in accordance with MIN12.379. This is proposed to be retained.

4.5 Reservation of land for public acquisition

The perimeter road that is proposed to be zoned SP2 on the proposed zoning map for Option 2 is also identified on the Land Reservation Acquisition map. The cost of acquiring the land would be borne by the landowners that benefit from the creation of the perimeter road. (Option 2 would not be able to be implemented without the perimeter road.)

4.6 Flood planning area (clause 7.3)

The current Flood Planning Area map (to which clause 7.3 applies) over the subject land is based on the 2001 St Georges Basin Flood Study. In 2013, the St Georges Basin Floodplain Risk Management Study and Plan – Climate Change Assessment was completed.

In due course, the Flood Planning Area map will be updated across the broader area as part of a 'housekeeping' amendment to SLEP 2014, to reflect the St Georges Basin Floodplain Risk Management Study and Plan – Climate Change Assessment (2013) in accordance with Recommendation 13.13.1.

4.7 Natural resource sensitivity – terrestrial biodiversity

Under SLEP 2014, the land is currently mapped as 'natural resource sensitivity – biodiversity'. Consistent with Council's approach to Jerberra Estate near Tomerong and Verons Estate near Sussex Inlet, it is proposed to remove the biodiversity layer from the subject land to avoid any confusion with the LEP and DCP provisions. An outline of matters proposed to be addressed in a DCP for the Estate is provided later in section 4.9 of this Planning Proposal.

4.8 Other provisions to be retained

The following existing local provisions that currently affect the land will be retained:

Clause 7.1 - Acid sulfate soils;

Clause 7.6 - Riparian land and water courses; and

Clause 7.8 - Scenic protection area

4.9 Development Control Plan (DCP)

A supporting site-specific DCP chapter in the overall Shoalhaven DCP will be needed to resolve complexities associated with development of the subject land (regardless of which

option is pursued for the NW Sector). The site specific chapter would include additional objectives, controls and guidance including a map based on the conceptual residential subdivision and development map provided in this Planning Proposal. It is envisaged that the DCP chapter would address issues such as:

- *Bushfire protection planning*: the location and construction standard of dwellings and associated structures, the provision of asset protection zones (APZ) and access for firefighting vehicles are primary considerations for developing each of the sectors. Dwellings should also be aligned/clustered on adjoining properties so that APZs overlap and are mutually beneficial. Refer to section 8.3.

- *Allotment layout and resubdivision*: in addition to Council's generic subdivision requirements (Chapter G11) some additional guidance would be required to facilitate any necessary consolidated and/or re-subdivision. Stakeholder consultation as part of the DCP preparation process would enable the conceptual subdivision plan provided in Planning Proposal Map 5 to be refined and improved.

- *Conservation management*: some additional controls and guidance may be necessary to ensure development does not adversely affect the adjacent environmentally sensitive land. Refer to section 8.2.

- *Stormwater management*: some additional guidance on stormwater management may be required in addition to Council's generic requirements (Chapter G2). This will depend on the outcome of the stormwater management assessment that is proposed to be undertaken. This assessment will be required to ensure that any recommendations are consistent with water sensitive urban design (WSUD) principles. Refer to section 8.5.

- *Onsite effluent treatment and application*: if reticulated sewerage is not proposed, any site-specific onsite effluent management requirements would be addressed as part of the DCP chapter.

4.10 Contributions Plan

If Option 2 (2.1 and 2.1 inclusive) is pursued, the dedication of the new perimeter road on the eastern edge of the NW Sector will possibly need to be identified in a Contributions Plan prepared under Section 94 of the *Environmental Planning and Assessment Act 1979*.

5 Justification (Part 3)

5.1 Need for the planning proposal (Section A)

5.1.1 Is the planning proposal a result of any strategic study or report?

This Planning Proposal reflects and is the outcome of a specific action in the Jervis Bay Settlement Strategy (JBSS 2003) to investigate rezoning Nebraska Estate – refer to section 5.2.1 of this Planning Proposal. As the JBSS is an endorsed strategy, the Planning Proposal is also consistent with the South Coast Regional Strategy (SCRS 2007) – refer to section 5.2.2 of this Planning Proposal.

The Planning Proposal takes into account constraints and opportunities identified as part of the Nebraska Estate rezoning investigations. These are discussed in section 8 of this Planning Proposal.

5.1.2 Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The current zoning needs to be reconsidered and amended to resolve the subject land's development potential, achieve environmental outcomes and meet contemporary planning requirements. Various environmental and land capability studies have been undertaken and significant progress has been made on reaching agreement with the relevant Government agencies on appropriate development and environmental outcomes.

5.1.3 Is there a net community benefit?

A Net Community Benefit Test has not been undertaken and is not considered appropriate as this Planning Proposal is being prepared to ensure the continuation of an extremely drawn-out and complicated rezoning process that originally commenced in the 1992 and is consistent with an existing endorsed settlement strategy.

Significant progress has been made since the rezoning investigations were recommenced in 2006. There is a clear need and expectation among the community and the landowners that the process be concluded so that the land's planning status can be resolved.

5.2 Relationship to strategic planning framework (Section B)

5.2.1 Jervis Bay Settlement Strategy 2003

The Jervis Bay Settlement Strategy 2003 (JBSS) identifies the remainder of Nebraska Estate (i.e. excluding Park Road) as an area for investigation, stating that:

> *"The development potential of the remainder of the estate will be investigated through: a review of lot sizes and configuration in order to accommodate on site effluent management; having considered the performance and success or otherwise of environment measures at Park Road; and in accordance with the guiding principles and policy actions of this Strategy"*

Comment: On-site effluent management is discussed in section 8.4. A review of the environmental outcomes has not been undertaken at this stage. This will be discussed with the relevant agencies in conjunction with the exhibition process.

5.2.2 South Coast Regional Strategy 2006

Relevant actions in the South Coast Regional Strategy (SCRS) include:

Natural environment:

- New urban development is to be prohibited by local environmental plans on land assessed as being of high conservation value; and appropriate planning controls are to be incorporated into LEPs to protect biodiversity values on land of lower conservation value.

- Strategic assessments of riparian corridors to be applied through appropriate zoning and management through a develop control plan.

Comments:

Council has worked closely with the NSW Office of Environment and Heritage (OEH) to ensure high value conservation land is retained through appropriate zoning and appropriate planning controls. This is discussed further in section 8.

The proposed E2 areas encompass the watercourses, riparian vegetation and buffers. The 40 ha minimum lot size will be retained over the E2 land to ensure that dwellings are unable to be approved in these areas.

Housing and settlement: Only urban areas identified in endorsed settlement strategies will be supported.

Comment: As previously indicated Nebraska Estate is identified in the Jervis Bay Settlement Strategy, which is an endorsed strategy.

5.2.3 Draft Illawarra Regional Growth and Infrastructure Plan

The Shoalhaven LGA is now part of the Illawarra Region in recognition of its important economic and housing connections with Kiama, Shellharbour and Wollongong. The draft Illawarra Regional Growth and Infrastructure Plan (the draft Plan) is open for comment until 7 December 2014. The draft Plan integrates planning for land use and strategic infrastructure. The Plan will provide a broad planning framework for Council's preparing landuse plans and development controls.

Actions in the draft Plan which are relevant to this Planning Proposal include:

Action 3.6 Implement neighbourhood planning principles, such as:

- Providing a range of landuses provides a mix of housing, green space etc.
- Conserving land in/around the development site to help protect biodiversity
- Minimising impacts on the water cycle and protect aquatic life.

Action 6.6 Protect key environmental and heritage values when rezoning land, such as:

- Avoiding and minimising impacts on key assets
- Maintaining existing protections for key assets

Action 6.7 Local Plans should ensure the ongoing protection of vulnerable estuaries and coastal lakes from inappropriate development types. The draft Plan identifies St Georges Basin as one of the vulnerable estuaries/coastal lakes in the Illawarra Region.

This Planning Proposal is consistent with the above actions.

5.2.4 Consistency with Council's Community Strategic Plan

The proposal is consistent with Council's Community Strategic Plan. The relevant objective and strategy in Council's Community Strategic Plan are:

Objective 2.2	Population and urban settlement growth that is ecologically sustainable and carefully planned and managed.
Strategy 2.4.2	Develop land use and related plans for the sustainable growth of the City which use the core principles of the Growth Management Strategy and ESD principles, also carefully considering community concerns and the character of unique historic townships

This Planning Proposal has been prepared in consultation with, and agreement of OEH. The proposal is also consistent with the Jervis Bay Settlement Strategy which was endorsed by the State Government in 2003, and which is also reflected in the State Government's South Coast Regional Strategy – see above.

5.2.5 Consistency with applicable State Environmental Planning Policies

The Planning Proposal is consistent with relevant State Environmental Planning Policies (SEPPs). A checklist is provided in the Appendix A1.

5.2.6 Consistency with applicable Ministerial Directions

The Planning Proposal is generally consistent with the relevant Ministerial Directions. A checklist is provided in the Appendix A1. Any inconsistencies are justifiable as outlined below:

- *1.2 Rural Zones*. The Planning Proposal is consistent with the Jervis Bay Settlement Strategy which is an endorsed strategy, and the results of strategic land capability and environmental assessments. This justifies any inconsistency with Direction 1.2 in respect of rezoning rural-zoned land.

- *1.5 Rural Lands*. The Planning Proposal is consistent with the Rural Planning Principles described in clause 7 of the SEPP, including:

  → *in planning for rural lands, to balance the social, economic and environmental interests of the community,*

  → *the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land,*

  → *the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities*

- *2.2.1 Environmental Protection Zones*. The Planning Proposal aims to recognise and protect environmentally sensitive land.

- *2.2.3 Heritage Conservation*. Refer to section 8.1.

- *3.1 Residential Zones*. The Planning Proposal seeks to expand development in St Georges Basin and will require services and infrastructure from these areas to be

extended. However it will allow the existing subdivision to be reconfigured in accordance with contemporary planning requirements and best practice. Any inconsistency with this Direction is justifiable given that the subject land is identified for investigation in an endorsed planning strategy.

- *5.1 Implementation of Regional Strategies*. Refer to sections 5.2.1 and 5.2.2.

- *6.2 Reserving Land for Public Purposes*. The land identified as SP2 for Option 2 is also identified on the Land Reservation Acquisition map. Should Option 2 be pursued, Council will seek the approval of the Department of Planning and Environment at the appropriate point in time.

- *6.3 Site Specific Provisions.* The conceptual resubdivision/development details will not be included in the amending LEP. However, they are relevant to the proposed zoning. They also help to demonstrate that the Planning Proposal complies with bushfire planning requirements. As stated in section 4.3, lot averaging provisions will need to be added via Clause 4.2B and if Option 2 is pursued, this clause would also need to apply to the R2 Zone. It should also be noted that if Option 2.2 is pursued for the NW Sector, a minimum lot size of 750 m^2 would need to be added to SLEP 2014.

5.3 Environmental, social and economic impact (Section C)

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

Environmental studies into the potential impact of residential development on the existing environment have been undertaken. Proposed zone boundaries have been delineated in consultation with OEH to protect high value conservation land and to minimise any potential impacts on threatened biodiversity. Refer details provided in section 8.2.

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

The subject land has been disturbed to varying degrees. In some cases bushland will need to be cleared to accommodate residential development, infrastructure and provision of bushfire asset protection zones. Conversely, in some cases disturbed land will ultimately be regenerated as a result of the Planning Proposal. Refer to section 8.

5.3.3 How has the planning proposal adequately addressed any social and economic effects?

Resolution of the zoning and development potential of Nebraska Estate would provide some social and economic benefits. It will provide certainty for landowners within and adjacent to the subject land and the broader community. It will also provide an economic stimulus. As stated previously, this Planning Proposal is completing a specific action in an agreed strategy of the State Government and Council.

5.4 State and Commonwealth interests (Section D)

5.4.1 Adequacy of infrastructure

Roads

The subject land is located in close proximity to existing residential infrastructure. The Wool Road provides ready access to east (St Georges Basin, Vincentia etc) and west (Basin View and to the Princes Highway). Grange Road extends north to The Wool Road

Bypass. Roads and Maritime Services (RMS) will be consulted as part of the Planning Proposal process.

Road upgrade requirements are discussed in section 9.1.

Water and sewerage

Nearby residential areas are serviced by reticulated sewerage and advice from Shoalhaven Water has confirmed that it is potentially feasible to service the subject land. This is discussed further in section 8.4.1 and cost estimates are provided in section 0.

Electricity

Preliminary advice provided by AKH Design on electricity reticulation is summarised below.

General advice:

As the subject land is adjacent to existing urban development, Endeavour Energy may require underground electricity reticulation. *Comment:* Endeavour Energy will be consulted in due course.

Urban subdivisions will require a pad mount substation underground reticulation with street lighting and a maximum voltage drop of 10 volts to the last customer on any circuit, as well as having high voltage ring ties through the subdivision and low voltage backup on all underground circuits.

Rural subdivisions can use pole substations and overhead reticulation. Street lighting is generally not required however some lighting at major intersections may be required. A maximum voltage drop of 5 volts to the last customer on any circuit applies.

Option 1: depending on the final zoning, this option may be able to be serviced with overhead electricity. This would require a high voltage overhead extension to a minimum of two pole substations. However, this option may need to be serviced with underground electricity, in which case two pad-mount substations may need to be provided.

Option 2.1: the urban character of the residential area in the NW Sector would need to be serviced by underground electricity reticulation, probably requiring the installation of two pad-mount substations.

Option 2.2: as for Option 2.1.

It is proposed to consult with Endeavour Energy and then prepare a preliminary design. This has not been done at this stage due to the cost involved in preparing multiple conceptual designs.

A rough cost estimate is provided in section 9.1.

5.4.2 State and Commonwealth public authorities consultation

Council has been consulting with government agencies throughout the process of preparing the Planning Proposal. Council intends to seek feedback from the following government agencies in conjunction with exhibition of the Planning Proposal:

- NSW Department of Planning and Environment

- NSW Rural Fire Service
- NSW Office of Environment and Heritage
- NSW Department of Primary Industries – Fisheries
- NSW Department of Primary Industries – Office of Water
- Local Land Services, South East
- NSW Office of Water
- Endeavour Energy
- Roads and Maritime Services

6 Community consultation (Part 5)

6.1 Landowner consultation

Landowners are consulted as part of the rezoning investigation process as a matter of due process. For example, landowners are notified in writing whenever a report is submitted to Council on the rezoning investigations.

A number of landowner meetings have been held over the years. The most recent was a facilitated planning workshop held for landowners on Saturday, 13 March 2010. A summary of the meeting was prepared and is available on Council's website at:

http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D10/71840

A dedicated project web page has also been established on Council's website and this is updated periodically. The web page can be accessed from the following site:

http://shoalhaven.nsw.gov.au/Planningamp;Building/Strategicplanning/Papersubdivisions.aspx

Council officers are available to discuss the proposal with landowners (during business hours) and respond to correspondence.

6.2 Public exhibition

The Planning Proposal is categorised as "Local Area – High Impact" under Council's Community Engagement Policy and a range of engagement methods would be employed as appropriate. In particular, Council will seek input from landowners and other stakeholders on the preferred option for the NW Sector. Landowners will be asked to complete a survey/questionnaire that will be available online as well as hard copy. At least one information drop-in information session will be held for landowners during the exhibition. Ongoing landowner involvement will be essential for the successful implementation of the Planning Proposal.

Given the complexities of this matter and the number of landowners involved, the planning proposal would be publicly exhibited for a minimum of 28 days. Landowners would be notified in writing and Council officers will continue to be available to discuss the matter and assist with enquiries.

The exhibition would be advertised in the South Coast Register and on Council's website. The notification will be in accordance with DPE's community consultation requirements (refer to "A guide to preparing local environmental plans") and Council's Community Engagement Policy.

7 Project timeline (Part 6)

The following milestone timeframes are anticipated.

Table 2 - Project milestones and anticipated timeframes

Task	Anticipated timeframe
Commencement date (date of Gateway determination)	January/February 2015
Completion of studies	December 2015. Most studies required for the LEP have been completed. However some additional work such as the stormwater assessment will need to be completed once a decision has been made on the preferred option for the NW Sector. Consultation with landowners and Government agencies will be required before a decision is made. Previous experience indicates the risk of delay is high. If however a prompt decision is made, a shorter timeframe should be achievable.
Government agency consultation (pre and post exhibition as required by Gateway determination)	March 2016. As for above, this will first require a decision to be made on the preferred option for the NW Sector.
Public exhibition of Planning Proposal Dates for public hearing (if required)	The public exhibition should be completed by March 2015 (unless a decision is required to be made on the NW Sector beforehand). The public exhibition will be used to get feedback on the preferred option for the NW Sector. Public hearing not required
Consideration of submissions	July 2015
Post exhibition consideration of Planning Proposal	July 2016
Date RPA will make the plan (if delegated)	Not applicable
Date RPA will forward to the department for notification (if delegated)	Not applicable

Given previous experience with other paper subdivisions and the complex issues associated with this Planning Proposal, it is likely that the Planning Proposal will take at least two years to finalise.

8 Environmental constraints and land capability

8.1 Aboriginal archaeology and cultural heritage

8.1.1 Previous studies

Archaeological studies were undertaken in Nebraska Estate in 1994, 1995 and 2001. The first of these identified two small scatters of stone artifact and one isolated artifact within the drainage lines. Archaeological excavations in the second study by the same author failed to identify any subsurface evidence of past Aboriginal occupation, leading the author to suggest that artifacts previously identified may have been introduced in imported material.

The findings of these studies are explained in more detail below.

1. **Marshall, B, Webb C, 1994. *An Archaeological survey of Nebraska Estate, St Georges Basin, New South Wales.* Report prepared by South East Archaeology for Shoalhaven City Council**

The report states that most of the study area was densely vegetated and that the survey was restricted to the roads and other areas of high visibility such as partially cleared lots and a walking track in the south east of the Estate. Approximately 10% of the study area was intensively surveyed.

Two small scatters of stone artifact and one isolated artifact were found. These are described below.

Pelican Road site (NPWS Site no. 58-2-305): Lithic scatter extending over 175m along Pelican Road in the vicinity of the watercourse. The extent of this site beyond the road is unknown. 23 artifacts consisting mainly of quartzite and silcrete flakes were recorded at a density of <1 artifact/m^2. Two blade cores, a small circular sandstone grindstone and a broken hammerstone were also recorded.

Nebraska Road site (NPWS Site no. 58-2-307): An isolated chert flake was found on a ridge on Nebraska Road.

Fisherman Road site (NPWS Site no. 58-2-306): A small lithic scatter 5m square on a ridge overlooking the creek. Four artifacts were recorded; one quartzite and two silcrete flakes, and a silcrete backed blade.

All three sites were classified as low density, open artifact scatters typical of those found in the St Georges Basin/Tomerong area and all were within the flood liable land, on either side of the watercourse. The artifacts consisted predominantly of simple flakes with little retouch to indicate subsequent reuse. The backed blade from Fisherman's Road and the two blade cores from the Pelican Road site were estimated to be 1,000 to 5,000 years old.

It was concluded that the artifacts found are probably representative of open camp sites in the region and that their scientific significance is moderate with little educational value. The report states *"Their significance to Aboriginal people was assessed by Rhonda Connelly during the survey, and according to her this is low."*

The report recommended that:

- Disturbance/vegetation removal within the flood liable land should be minimised and that any major development on flood liable land should not proceed without further archaeological investigation including sub-surface testing.

- Written permission should be sought from the Jerrinja Local Aboriginal Land Council (LALC) and the Director of the NSW NPWS prior to the destruction of recorded sites.

2. Marshall, B, 1995. *Archaeological excavations at Nebraska Estate, St Georges Basin, New South Wales.* Report prepared by Austral Heritage Consultants for Shoalhaven City Council

Archaeological excavations in the form of backhoe scrapes were conducted at eight locations. A total of eight scrapes exposed a total of 58 m^2 of ground but revealed no subsurface evidence of past Aboriginal occupation. A foot survey of the major roads also revealed no additional archaeological sites. The report suggests that the surface artefacts at the Pelican Road site (NPWS Site no. 58-2-305) and the Nebraska Road site (NPWS Site no. 58-2-307) may have been introduced via sand/gravel used to surface the roads.

The report concludes that because of their low density, high degree of disturbance and possible association with imported fill, the previously recorded sites are of low significance. In relation to the Fisherman Road site (NPWS Site no. 58-2-306) it was concluded that the artifacts may derive from local deposits and the site is of moderate to low scientific significance.

The cultural significance of all three sites was assessed by a member of the Jerrinja LALC (Rhonda Connolly) who participated in both surveys, as low.

The report recommended that:

- No further archaeological investigations are necessary;

- Written permission should be sought from the Jerrinja Local Aboriginal Land Council prior to any development which is likely to impact on the recorded sites; and

- Written permission be sought from the Director of NSW NPWS prior to any development likely to impact on the recorded sites.

3. Kuskie, P. 2001 *Further archaeological assessment of a proposed subdivision of the Park Road area, at Nebraska Estate, St Georges Basin, New South Wales*. Report prepared by South East Archaeology for Shoalhaven City Council.

A further archaeological study was completed in 2001 by Kuskie (South East Archaeology) as part of the rezoning investigations for Park Road at the southern end of Nebraska Estate. The study aimed to reassess the potential for sub-surface archaeological deposits to occur immediately to the south of the current study area, in the vicinity of Park Road (approx. 2.7 ha). A cursory inspection was also made of the remainder of Nebraska Estate (the current study area), focusing on the flood liable land. Survey coverage was estimated to be 18% in Park Road and 0.9% in the remainder of the Estate. No Aboriginal heritage sites were found in the vicinity of Park Road and the land has since been rezoned and developed.

The report states:

> *"In relation to the remainder of the watercourse bordering flats in the Nebraska Estate, if extensive development is to occur it is recommended that sub-surface testing be undertaken in at least one location of such development, preferably close to the recorded Fisherman's Road or Pelican Road sites, to test for the presence of heritage evidence and permit an adequate assessment of the nature, scope and significance of any evidence. The Jerrinja Local Aboriginal Land Council has requested that a representative be engaged to monitor initial ground disturbance works in this area if future construction occurs."*

The report by Kuskie in 2001 did not refer to the subsurface testing reported by Marshall in 1995 so it is uncertain if Kuskie was aware that substantial sub-surface testing had previously been undertaken.

8.1.2 Aboriginal participation and views

The Jerrinja Local LALC was involved in all three archaeological studies undertaken in Nebraska Estate. Rhonda Connolly participated in the field surveys in 1994 and 1995 and Dallas Carberry participated in the 2001 field survey. Written comments were submitted by Dallas Carberry on the draft report and these were incorporated into the final report (Kuskie, 2001). These comments indicated that the Jerrinja LALC was satisfied with the results and that a member of Jerrinja LALC should be engaged to monitor any excavation of low-lying land near the watercourse.

8.1.3 Advice from the former Department of Environment and Conservation

A letter from the former Department of Environment and Conservation (DEC) dated 12 January 2007, provided the following advice:

- It is impossible to determine whether the Aboriginal objects identified in the assessment completed in 1994 by Marshall and Webb were imported with road base or are an *in situ* Aboriginal site.

- The Department accepts that the findings of the reports is indicative of what is expected of the archaeological record in the region based on previous archaeological research and current models of pre-contact Aboriginal land use strategies.

- The Department considers that Aboriginal consultation has been adequate in the context of the consultation requirements in effect at the time.

- No further archaeological work is required in the areas of low archaeological potential.

- In areas of high potential (i.e. the drainage depressions) further controlled hand excavation will be required, together with input from the Aboriginal community.

- Before making a final determination on the matter, the Department would appreciate Council's written advice on the steps that Council will take to ensure the areas of high potential are not going to be subject to major ground disturbance. If development is to occur within the three recorded sites, a section 90 Consent to Destroy will be required.

8.1.4 Conclusion

All three Aboriginal sites are located within the proposed E2 zone and no further residential development is proposed on the affected land. Some ground disturbance will be necessary for construction of infrastructure.

Any disturbance of the site will be subject to the requirements of the *NSW National Parks and Wildlife Act, 1974* in relation to Aboriginal cultural heritage protection. There are known Aboriginal sites on the subject land and, as a result, Council must follow the "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales" prepared by the NSW Department of Environment, Climate Change and Water (2010) to determine if an Aboriginal Heritage Impact Permit (AHIP) is required for any works that Council undertakes. If an AHIP is required, Council will undertake the necessary consultation and impact assessment requirements in order to comply with the Act and regulations.

8.2 Biodiversity issues

8.2.1 Constraints

A Threatened Biodiversity Survey and Assessment was completed by Bushfire and Environmental Services (BES) in 2009. A copy of the report is available on Council's website at:

http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D13/31495

Figures 4 to 6 have been removed having regard to Section 161 of the NSW *National Parks and Wildlife Act 1974* and Clause 12, Schedule 1 of the *Government Information (Public Access) Act, 2009.*

Three vegetation communities were identified, as summarised below:

- *Currambene Lowlands Forest*: the most widespread vegetation community in the subject land, occurring on most of the more elevated land. The north-eastern area was more intensely logged in the past.

- *Coastal Sand Swamp Forest*: occurs in association with the drainage depressions and watercourses. This community is classed as Swamp Sclerophyll Forest Endangered Ecological Community (EEC).

- *Coastal Sand Forest*: occurs in the south-eastern extremity of the subject land.

A total of eight (8) threatened fauna species, two (2) threatened flora species and one (1) endangered ecological community (EEC) were identified. The status of these is discussed further below. Another flora species that was recorded within the Estate has since been listed as critically endangered on the NSW *Threatened Species Conservation Act* (*TSC Act*) taking the number of threatened flora species to three (3). One (1) migratory species listed on the *Environment Protection and Biodiversity Conservation Act* (*EPBC Act*) was recorded within the subject land.

BES concluded that development of all lots in the Estate is not considered appropriate, but that it is possible to maintain the key biodiversity values whilst accommodating limited residential development. The report states that achieving long term habitat retention in close proximity to dwellings is difficult but achievable provided appropriate development controls are in place, coupled with education and enforcement strategies.

The findings and recommendations of the Threatened Biodiversity Assessment in respect of specific threatened species are summarised below and the ecological constraints map is provided in Figure 6.

Figure 6 - Ecological constraint categories prepared by Ecological Australia (2009)

8.2.1.1 Swamp Sclerophyll Forest

Status: Endangered Ecological Community (EEC) - *TSC Act.*

Distribution and Significance: This EEC occurs in the drainage depressions and riparian land and corresponds closely with occurrence of the Biconvex Paperbark (see below). BES recommended that a 50 metre vegetated buffer be provided to the EEC, except where the buffer is dissected by roads. BES also recommended that the outer edge of the buffer be reduced for bushfire asset protection where this does not substantially compromise the objectives of the buffer and that no other disturbances should be allowed within the buffer.

Comments: No residential development is proposed within the EEC and the Planning Proposal is generally consistent with the report's recommendations. The Planning Proposal incorporates a buffer to the EEC that is generally between 30 and 50 metres wide. Furthermore, any housing would be separated from the edge of the buffer by an APZ that is at least 32 metres wide.

8.2.1.2 Biconvex Paperbark *(Melaleuca biconvexa)*

Status: vulnerable on *EPBC Act* and *TSC Act.*

Distribution and Significance: Around 1,000 Biconvex Paperbark individuals occur within the drainage lines on the subject land. Several individuals or clusters of individuals occur away from the main occurrence. The recommendations for the Swamp Sclerophyll Forest EEC also apply to the Biconvex Paperbark (see above).

Comments: See comments on the Swamp Sclerophyll Forest EEC.

8.2.1.3 Leafless Tongue Orchid *(Cryptostylis hunteriana)*

Status: endangered on *EPBC Act* and *TSC Act.*

Distribution and Significance: A single Leafless Tongue Orchid was found in the north-eastern corner of the subject land. According to BES, the subject land is not expected to contain a large or important population of this species. A 50 metre buffer was recommended to retain habitat for other possible undetected individuals and ensure connectivity with suitable habitat to the northeast of the subject land.

Comments: No development is proposed within 50 metres of the Leafless Tongue Orchid. The northeast corner of the subject land is also affected by numerous other threatened biodiversity constraints, in particular the orchid recently listed as critically endangered, *Pterostylis ventricosa* – see below.

8.2.1.4 *Pterostylis ventricosa* (orchid)

Status: listed as critically endangered on the *TSC Act*.

Distribution and Significance: When the current potential development footprint was adopted by Council in April 2010, it was uncertain whether the orchid *Pterostylis ventricosa* would be listed on the NSW Threatened Species Conservation Act (TSC Act) and if so, whether it would be as *vulnerable*, *endangered* or *critically endangered*. Note: The 2009 Threatened Biodiversity Assessment refers to this species as *Speculantha ventricosa*, by which it was previously known.

95% of the 467 individuals that were found within the subject land were found within 6 hectares of land in the north east corner. Other scattered individuals were found in association with riparian land on the edges of Pelican Road and Fisherman Road. Most of the individuals were found to be associated with vegetative clearing along forest edges or more open areas with denser forest.

The report states that this species is likely to occur more widely, at least in adjoining areas. Reconnaissance surveys subsequently undertaken by Council identified clusters of individuals elsewhere and this information was forwarded to the NSW Scientific Committee prior to its determination. In 2013 Council wrote to the NSW Scientific Committee requesting a review of the orchid's status based on updated information on its distribution. It is understood that the matter is currently under review.

BES recommended that a 50 metre buffer be applied to all known individuals and that appropriate links be provided to adjoining habitat for pollinators and undetected individuals.

Comments: No development is proposed in the areas where this orchid was found but the proposal does seek to allow some limited rural residential development adjacent to the main occurrence in the north eastern corridor. A proposed new perimeter fire trail between

Pelican and Nebraska Roads along the eastern edge of the developable area would help to help to delineate the boundary between the development and conservation area containing the main population of *Pterostylis ventricosa*.

8.2.1.5 Yellow-bellied Glider

Status: vulnerable on *TSC Act*

Distribution and Significance: The subject land forms part of the home range of a group of Yellow-bellied Gliders, with the core habitat on adjoining land to the north. One individual Yellow-bellied Glider and two sap feeding trees were identified within the subject land. Sap feeding trees were also observed to the north and southwest of the subject land.

Comments: The proposal would enable a large proportion of the key Yellow-bellied Glider habitat to be retained by zoning it to E2.

8.2.1.6 Powerful Owl

Status: vulnerable on *TSC Act*

Distribution and Significance: A Powerful Owl was observed roosting by day in the northern gully of the subject land. According to BES, the subject land is likely to form part of a much larger home range and habitat within the subject land is generally marginal or unsuitable.

Comments: The Planning Proposal is generally consistent with the recommendations of the Threatened Biodiversity Assessment. A large proportion of the subject land, including the identified roost site, is proposed to be zoned E2 – Environmental Conservation.

8.2.1.7 Glossy Black-cockatoo

Status: vulnerable on *TSC Act*

Distribution and Significance: A total of 25 feed trees (Black She-oaks) were identified, mostly in the north of the subject land, but were mainly concentrated in the south eastern corner. No nesting activity was recorded, although there are many potentially suitable hollow-bearing trees.

Comments: The proposal has been design to minimise the potential removal of the identified Glossy Black-cockatoo feed trees and hollow-bearing trees. Of the 25 Glossy Black-cockatoo feed trees identified, 13 are within the proposed E2 area. A number of the remainder are located within the proposed bushfire asset protection zones (APZs) and therefore they are likely to be removed in the long term.

8.2.1.8 Other Threatened Fauna

Microchiropteran bats: the Eastern False Pipistrelle, the Greater Broad-nosed Bat and the East Coast Freetail Bat were detected and are expected to forage throughout the subject land as part of much larger home ranges. No evidence of communal roosting was found but several large hollow-bearing trees are potentially suitable. Refer to the comments below in respect of hollow-bearing trees.

Grey-headed Flying-fox: The Grey-headed Flying-fox was recorded foraging within the subject land. Breeding activity was not detected and the species has extensive foraging areas. BES's recommendation for the retention of areas of forest and scattered trees would be achieved by the proposal.

8.2.2 Conservation outcomes

The Planning Proposal attempts to retain as much of the threatened species habitat as possible whilst allow an appropriate level of development on the less constrained land. A breakdown of the number and proportion of threatened species habitat that would be zoned for E2 – Environmental Conservation is shown in Table 3.

Table 3 – Quantitative summary of threatened species habitat outcomes

Type of threatened species habitat	**Total within subject land**	**Total within proposed E2 – Environmental Conservation area**	
	Number of GPS records	Number of GPS records	% of GPS records
Hollow-bearing trees	107	65	60%
Glossy Black Cockatoo feed trees	25	13	52%
Yellow-bellied Glider feed frees	2	1	50%
Leafless Tongue Orchid (*Cryptostylis hunteriana*)	1	1	100%
Pterostylis ventricosa	78 [a]	72[a]	92%
Total number of records	213	152	71%
Area	**32.774 ha**	**22.292ha (Option 1)**	**68 %**
		22.440 ha (Option 2)	**68 %**

a. More than 400 individual orchids were recorded. Where occurrences are dense, each GPS record represents multiple individuals.

The subject land has been disturbed to varying degrees and some lots have been under-scrubbed or totally cleared. According to BES, the vegetation was significantly disturbed in the 1970s and much of the existing understorey vegetation is advanced regrowth. There are several unauthorised structures that need to either be regularised or removed.

By allowing some development to occur in the least constrained areas, subject to consolidation of lots, there is an opportunity to deliver positive environmental outcomes and resolve land tenure via the development approval process.

However, at this point in time there is no clear practical way to resolve the tenure and management of those lots that will not be able to form part of a developable lot. Options which may not be directly related to the Planning Proposal should be collectively considered by landowners and explored in conjunction with the relevant government agencies including the Department of Planning and Environment.

Council will seek the views of the relevant agencies to determine the appropriate form and content of planning controls to deliver the intended development and environmental outcomes. In addition to the proposed local environmental plan (LEP) additional

supporting planning controls will be required to facilitate the intended outcomes, including a development control plan (DCP) chapter that is specific to Nebraska Estate.

8.2.3 '10/50' vegetation clearing provisions

The subject land is designated as a "10/50 Vegetation Clearing Entitlement Area". Hence, the 10/50 bushfire clearing provisions recently introduced by the NSW Government under section 100Q of the Rural Fires Act 1997 will apply to any approved residential development. These provisions create an entitlement to clear understorey and groundcover vegetation within 50 metres, and trees within 10 metres, of an approved dwelling. With exception of matters protected under the EPBC Act, there is no requirement to retain or protect threatened species unless a legally-binding conservation agreement is in place.

In relation to this Planning Proposal, the 10/50 provisions potentially compromise the ability for threatened species such as the orchids and Biconvex Paperbark, to be retained within 50 metres of proposed dwellings. In these situations, development approvals (at subdivision stage) may require a legally-binding conservation agreement to be in place before the development can proceed. Alternatively, a 50 metre setback (between dwellings and sensitive bushland) could be used as the basis for the Planning Proposal. This would result in a lower development yield and/or smaller environmental conservation area.

8.3 Bushfire risk management

The subject land is designated as Bushfire Prone land under the *Rural Fires Act 1997* and *Environmental Planning and Assessment Act 1979*.

Section 117 Direction 4.4 (Planning for Bushfire Protection or PBP) requires Council to consult the NSW Rural Fire Service when preparing an amending LEP over, or in proximity to bushfire prone land. This Ministerial Direction essentially requires the Planning Proposal to be prepared with regard to PBP.

The key bushfire protection measures that need to be addressed at the rezoning stage are:

- Provision of the clear separation of buildings and bushfire hazards in the form of asset protection zones (APZ);
- Construction and design of the structures;
- Appropriate access standards for residents and firefighters/emergency workers;
- Adequate water supply and pressure; and
- Emergency management arrangements for fire protection and evacuation.

Relevant advice from the NSW RFS in relation to similar rezoning proposals for Jerberra Estate (dated 22 December 2011 and 18 September 2012) and Heritage Estates (dated 25 October 2005) is summarised below:

- Compliance with PBP is required regardless of whether the land is or is not considered to be a 'greenfield site'.

- APZ width must be determined in accordance with Addendum Appendix 3 of PBP, which aligns with Table 2 in the current AS3959 (Australian Standard for building in bushfire prone areas).

- The Planning Proposal should be based on a building construction standard of BAL-29[3] or less (to reduce the risk that dwellings will be subject to flame contact).

8.3.1 Minimum APZ and dwelling construction standards

APZs are required to ensure that buildings are not exposed to radiant heat levels above critical limits (29 kW/m^2) or to direct flame contact. Guidance on management of inner protection areas (IPA) and outer protection areas (OPA) is provided in PBP 2006 and *Standards for asset protection zones* (NSW RFS, 2005[4]). In summary, APZs should be managed as follows:

- Ground fuels should be removed on a regular basis.

- Grass needs to be kept short and where possible, green.

- Tree crowns should be separated from each other and the asset by at least two (2) to five (5) metres.

- Native shrubs and trees can be retained as clumps or islands covering no more than 20% of the area.

A legal mechanism such as a positive covenant (under section 88B of the *Conveyancing Act 1919*) is needed to ensure the APZ will be maintained in perpetuity. This effectively means that dwellings need to be positioned so that the APZs can be accommodated within the property boundary unless they are clustered so that the APZs are contiguous, overlap and mutually beneficial with those on adjoining properties.

APZ width must be determined in accordance with Addendum Appendix 3 of PBP. The determining factors are:

- Predominant vegetation, which in this case is forest (dry and wet sclerophyll forest).

- Effective slope, which in this case is 0-5 degrees (refer to Figure 7).

- Fire danger index (FDI) which is a measure of regional fire weather. The FDI for the Shoalhaven region is 100.

- Standard of construction under AS3959, which as previously advised by the RFS, must be BAL–29 or less in relation to similar rezoning proposals.

[3] BAL-29 is a construction standard under "AS3959 – Construction of buildings in bushfire prone areas". 'BAL' stands for bushfire attack level and '29' means the building is designed to withstand ember attack and radiant heat of up to 29 kW/m^2.

[4] http://www.rfs.nsw.gov.au/file_system/attachments/State/Attachment_20060130_7DE0A145.pdf Accessed 30 November 2012.

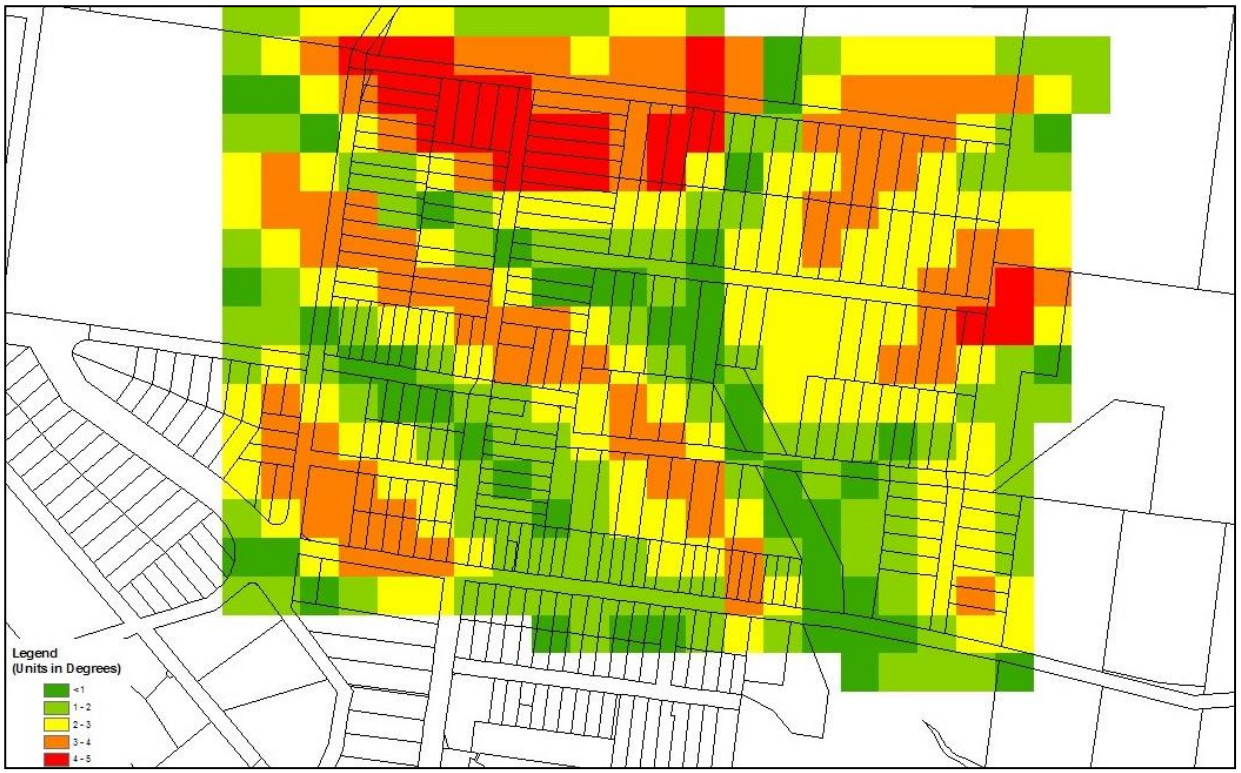


Figure 7 - Slope class analysis for the subject land determined over 50 metre grids

Dwellings would need to be constructed to the appropriate standard under AS3959 as determined using Addendum Appendix 3 in PBP. The categories of bushfire attack, the relevant bushfire asset protection zone (APZ) dimension and applicable construction level under AS3959 are identified in Table 4.

Table 4 – Summary of relevant APZ widths and applicable construction level under AS3959

Slope		**Construction level AS3959 Bushfire Attack Level (BAL)**[b]
Vegetation is *level or upslope* (m)	Vegetation is >5 degrees *downslope* (m)	
48≤100[a]	57≤100[1]	BAL-12.5
35≤48	43≤57	BAL-19
25≤35	32≤43	BAL-29

Notes:

a. No specific construction level is required if the source of bushfire attack is more than 100 metres from the dwelling. (100 metres applies to forests, woodlands and tall heaths. Smaller distances apply to other vegetation classes.)

b. Rezoning proposals must be based on BAL-29 or less.

For areas adjoining bushfire prone vegetation, the proposed minimum construction level of any dwellings and associated structures would generally be BAL-29 except where APZ's overlap with those of adjoining proposed building areas.

The proposed zoning and conceptual re-subdivision and development maps have been designed to accommodate the minimum APZs required for BAL-29, *i.e.* 32 metres or 25 metres, depending on the slope.

8.3.2 Access

Some of the existing road reserves are not formed/constructed or are not constructed to the standard required in PBP including the entire length of Nebraska Road. A minimum standard formation exists along 400 metres (approx.) of Pelican Road from Waterpark Road and there is currently no formal turning head at its eastern end. Fisherman Road is also currently a dead end road without a formal turning head.

Environmental and Aboriginal heritage constraints and associated costs need to be considered as part of any planned road upgrades.

The proposed road network is shown on Planning Proposal Map 5. A perimeter fire trail (with locked gates at either end) is proposed between Nebraska Road and Pelican Road on the eastern fringe of the north eastern sector.

For Options 2.1 and 2.2 a new perimeter road with a trafficable width of 8 metres would also be required on the eastern fringe of the north western sector, between Nebraska Road and Pelican Road.

Appropriately designed turning heads would be required at the dead ends. These turning heads may need to be aligned with indented property driveways and/or require the dedication of land to ensure firefighting and service vehicles have adequate turning room.

Each of the potential dwellings in the E Sector would be required to provide adequate access and defendable space for fire fighting vehicles. The southern most of these would gain access from Fisherman Road (as is the case for an existing approved shed on Lot 2, Section J, DP 9699) whereas the northern three would gain access from Pelican Road.

8.3.3 Provisions to be incorporated into planning controls

The LEP and DCP would reinforce the principles in Planning for Bush Fire Protection (PBP) including in relation to:

- The level of construction for dwellings under AS3959;
- Establishment of APZs in accordance with PBP;
- Provision of perimeter access before certain lots can be developed; and
- Where provision of access for fire fighting vehicles to the rear of dwellings is a requirement for individual landowners.

8.4 Water and sewerage

8.4.1 Reticulation

The following information is based on advice from Shoalhaven Water which is provided in full in the Appendices.

The subject land is not currently serviced by reticulated water and sewerage apart from the existing approved dwellings which are serviced by reticulated water only. Shoalhaven

Water has indicated that it is feasible to extend both water and sewerage services into the subject land.

Mains water could be extended from the existing main in Waterpark Road but consideration should be given to the appropriateness of this if the land is not serviced by reticulated sewerage.

Nearby residential land is served by a gravity sewerage line. The areas identified for rezoning to allow development in this Planning Proposal, are located on the opposite side of a watercourse, making connection to the existing gravity system problematic. The technical solution to this is to provide a pressure sewer system. A pressure sewer system could be provided in accordance with Council's Pressure Sewer Policy.

In a pressure sewer system, each lot has a pressure sewer unit (i.e. a small pumping station) which is connected to the common pressure main in the road reserve via a pressure sewer drainage line. As in a gravity system, sewage gravitates from the dwelling to the pressure sewer unit. The pressure unit then pumps it thought the pressure mains, discharging into the existing gravity system.

Pressure sewer systems have significant practical and environmental advantages over traditional gravity systems, including:

- Pressure systems are much less constrained by topography.
- Pressure sewer systems do not have potential infiltration points that gravity systems have.
- Pressure lines are laid much shallower than gravity lines and have a much smaller diameter.
- There are no large chambers for manholes and the like. This means the mains can generally be located within the road reserve, minimising the need for easements over private land.
- The potential build-up of solid waste in gravity pipes is avoided because the pressure sewer unit has a grinder pump which macerates the waste to a consistent slurry.

Preliminary cost estimates for water and sewerage reticulation are provided in section 9.1.

8.4.2 On-site effluent management

Risks to downstream water quality would be minimised by providing a pressurised reticulated sewerage network (see above).

However, if reticulated sewerage is not proposed a strategic onsite effluent management assessment will need to be undertaken to ascertain the suitability of the site for managing effluent on site.

The Planning Proposal has been designed to comply with the relevant acceptable solution in Chapter G8 (Onsite Sewage Management) of Shoalhaven DCP in respect of subdivision lot sizes (2,500 m^2).

A preliminary analysis of the suggested lot layout for lower density residential option indicates that at least 950 m^2 would be available for pressurised sub-surface application of secondary-treated effluent for each dwelling. This takes into consideration the required setbacks to dwellings, property boundaries and driveways. Less room would be available for above ground application because larger buffers are required for this method of application.

A strategic on-site effluent management assessment would identify any necessary limitations in respect of dwelling size and water supply to ensure that there is ample area for on-site effluent application on each lot.

The development potential of the lots will be reduced if reticulated sewerage is not provided because of the need to set aside sufficient land area on each lot for effluent application. It may also be necessary to withhold access to reticulated water to minimise household water use (and hence wastewater generation).

8.5 Soil erosion and stormwater management

8.5.1 Managing stormwater – water sensitive urban design

An integrated water cycle and stormwater management assessment is proposed to be prepared once the preferred development option has been determined (to minimise the cost). This would include preparation of a stormwater treatment system that is consistent with Chapter G2 (Sustainable Stormwater Management and Erosion/Sediment Control) in Shoalhaven DCP, and to Water Sensitive Urban Design (WSUD) principals.

Rather than the traditional 'end of pipe' approach to stormwater management which results in significant impacts on hydrological and water quality regimes, WSUD aims to minimise the negative impacts on the natural water cycle and protect the health of aquatic ecosystems. WSUD principles include:

- Managing stormwater in the landscape rather than in waterways.
- Protecting waterways so that they can remain valuable community assets that enhance liveability and support the ecosystems that rely on them.
- Adding multiple benefits such as improved amenity and safety, while minimising development costs.
- Minimising drainage infrastructure costs by managing stormwater at source as far as possible, allowing reduced pipe sizes and minimising the need for large scale reticulated water systems.

The key strategy would be to manage stormwater at-source as far as possible, *i.e*. within the individual lots and road reserves. Factors which favour this approach include:

- The catchments are relatively small.
- The proposed lot sizes, including for Option 2.2 (average lot size = 750 m^2) are relatively large in comparison to those in most urban release areas.

On-lot measures might include a combination of rainwater tanks and rain gardens / stormwater infiltration trenches on lots. On-lot measures such as these would be implemented by the landowner as part of the development.

In addition to the on-lot measures, stormwater treatment measures may also needed on public land, more so for Option 2 than Option 1. Any such measures would be maintained by Council. The costs including design, land acquisition (where relevant), construction and maintenance, would be borne by the benefiting landowners.

The conceptual subdivision and development map identifies areas within the road reserves that could potentially be utilised for the provision of grassed or landscape swales/bioretention systems. An integrated stormwater assessment would determine the extent of which these areas would need to be utilised in combination with on-lot stormwater measures.

For Options 2.1 and 2.2, inter-lot drainage would need to be provided (at the developers' expense) to ensure that development upslope does not impact on development downslope. It may also be necessary to provide additional stormwater treatment downslope such as grassed or landscaped swales and/or bioretention systems.

8.5.2 Managing soil erosion during construction

In 1994, Morse McVey and Associates completed an urban land capability assessment for Council as part of the Nebraska Estate rezoning investigations. The assessment found that there are significant soils constraints, but that these can be addressed with appropriate soil and water management measures (sediment retention basins and constructed wetlands). The particular soil constraints that were identified included:

- High soil erodibility (values of 0.026 and 0.046 used in the universal soil loss equation - USLE)

- Moderately dispersive subsoil, meaning that the clay particles can be more readily eroded and transported to the downstream environment. As noted in the report, the risk to water quality can be minimised through best practice design, construction and management techniques.

Given the soil constraints and the site's close proximity to a sensitive waterway, a combination of erosion and sediment control measures and stormwater management measures will need to be incorporated to ensure the downstream environment is not adversely impacted.

Provision of formal roads and appropriate roadside drainage in place of eroding informal vehicle tracks, will help to offset some of the adverse impacts on water quality and flow resulting from development of the land.

Guidance on managing erosion and protecting water quality during construction would be provided as part of the stormwater assessment. All development applications will need to be accompanied by appropriate plans in accordance with the Landcom manual "Managing Urban Stormwater, Soils and Construction" Volume 1, 4th Edition, 2004 (commonly referred to as the "Blue Book"):

- Where less than 2,500 m^2 of disturbance is proposed, applications will need to be accompanied by an erosion and sediment control plan (ESCP).

- Where more than 2,500 m^2 is proposed, applications will need to be accompanied by a soil and water management plan (SWMP).

8.6 Acid sulfate soils (ASS)

8.6.1 ASS mapping

Land shown on Figure 8 is identified on the Huskisson Acid Sulfate Soils Risk map as having a high probability of occurring within one (1) metre of the ground surface. The affected area is located within the lower lying part of the flood prone land and is encompassed within the area that is proposed to be zoned E2 – Environmental Conservation.

According to the accompanying "Guidelines for the Use of Acid Sulfate Soil Risk Maps" (Department of Land and Water Conservation, 1998) there is "a severe environmental risk because of the likelihood of disturbance of ASS materials by various land uses". However, as stated in the Guidelines, this does not imply that any particular land use should be excluded. Soils investigations should be undertaken and an ASS management plan prepared for that use.

8.6.2 Potential acid sulfate soil (PASS) investigation for Park Road

In 2001, Environmental and Earth Sciences P/L undertook an ASS investigation along the path of the proposed sewerage line for Park Road, Nebraska Estate. This investigation involved soil and groundwater testing at the southern end of the subject land.

The results of the investigation are summarised below:

- There was negligible PASS. A borehole within the main watercourse contained low concentrations of soil sulphides but these were considered non-reactive.
- As a cautionary measure, it was recommended that any soil excavated from the watercourse, should be mixed with 4 kg of lime per ton of soil.
- Groundwater should be monitored if dewatering is undertaken for periods exceeding one week.
- Any concrete or metallic structures placed between the banks of the watercourse should have a buffer of at least 150 mm of sand mixed with lime at a ratio of 5 kg per ton of sand.

8.6.3 Conclusions

In terms of the Planning Proposal, no residential development is proposed within the affected area. Appropriate investigations, including preparation of an ASS management plan, would be undertaken prior to undertaking any works associated with upgrading of Fisherman Road or excavation for the purpose of providing water or sewerage services.

8.7 Flooding

The Flood Planning Area map that forms part of the Shoalhaven LEP 2014 is currently based on the '*St Georges Basin Flood Study*' completed by Webb, McKeown and Associates P/L in 2001. In due course, this will be replaced with flood mapping from the adopted '*St Georges Basin Floodplain Risk Management Study and Plan Climate Change Assessment*' completed by WMA Water in 2013. This will occur as part of a 'housekeeping' amendment to Shoalhaven LEP 2014. The 2013 flood study considered the effect of climate change and sea level rise on flood behaviour. It also utilised a detailed digital elevation model.

Plate 1 – Localised flooding/inundation at Pelican Road, circa 1991

In addition to the above mentioned St Georges Basin-wide flood studies, a site specific draft preliminary catchment analysis was prepared in late 2006 utilising a digital elevation model derived from an airborne laser scanning (ALS) survey undertaken over Nebraska Estate in 2006. This study shows the modelled extent of stormwater inundation within Nebraska Estate.

Historical anecdotal evidence of the extent of flooding in the subject land is depicted in the Rural 1(g) Flood Liable zoning under the City's former local environmental plan Shoalhaven LEP 1985.

The extent of flooding in a 1 in 100 year flood event based on this modelling is shown in Figure 8.

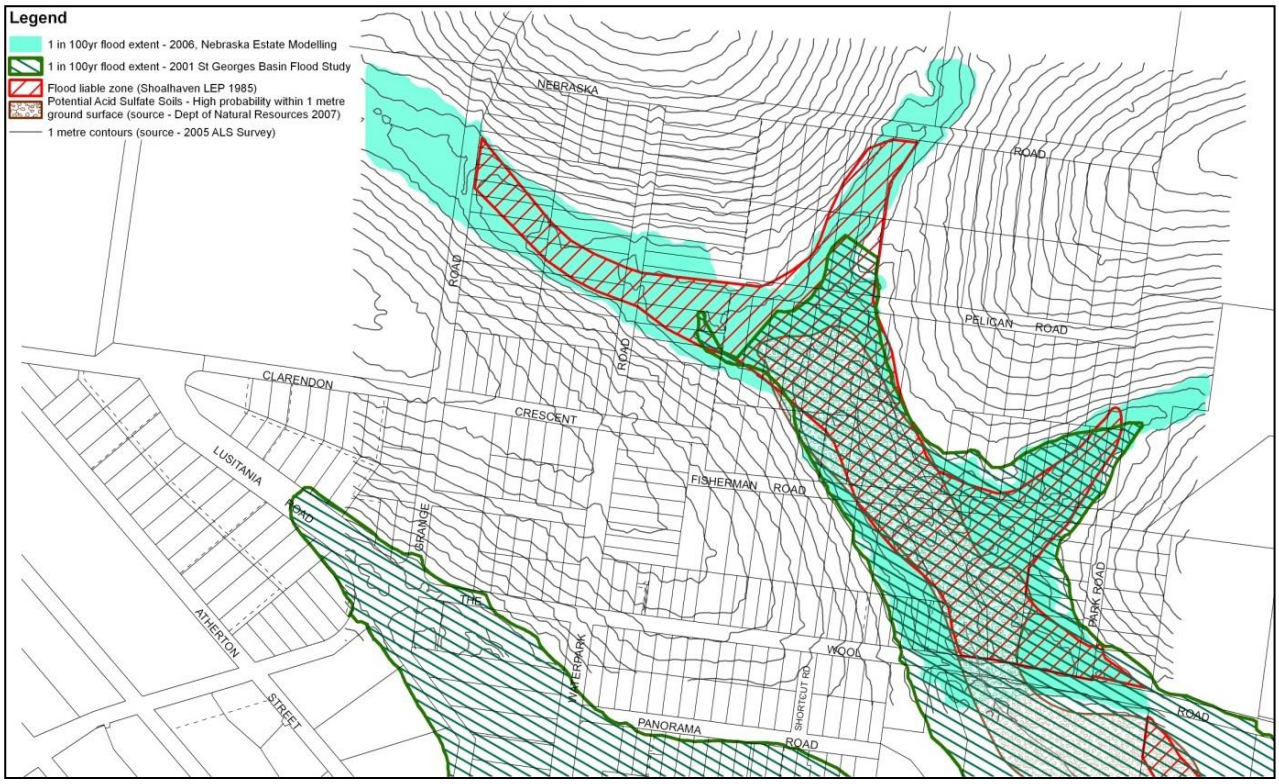


Figure 8 - Flood-related information

As shown in Figure 5, the flood affected land is within broader areas of land which supports threatened biodiversity habitat. Consequently, no new dwellings are proposed to be located within the floodprone land.

Any infrastructure such as roads, stormwater drainage and sewerage would need to be designed and constructed so flooding is not exacerbated.

9 Financial considerations

Council's efforts to resolve the planning status of Nebraska Estate are on the basis that the benefiting landowners will meet the costs of rezoning the land and of providing essential infrastructure.

This section provides a rough guide on the infrastructure costs associated with each option (section 9.1), comparable sale values (section 9.2) and potential cost recoupment mechanisms (section 9.5).

9.1 Preliminary infrastructure cost estimates

Disclaimer: The following preliminary financial information is a rough guide only. While all reasonable efforts have been made to gather the most current and appropriate information, Council gives no warranty to the accuracy, reliability, fitness for purpose, or otherwise of the information. To the extent permitted by law, Council disclaims liability to any person or organisation in respect of anything done, or omitted to be done, in reliance upon information contained below.

Actual costs may be higher than the preliminary cost estimates and as discussed in section 9.5, all costs will need to be met by the benefiting landowners in accordance with Council's longstanding policy.

9.1.1 Summary of infrastructure costs

Potential infrastructure costs associated with each option are summarised in Table 5. An explanation on how these estimates were arrived at is provided in Appendix 5.

Table 5 - Rough guide to infrastructure costs per dwelling for each option

Option	Water	Sewerage	Roads and Drainage	Stormwater treatment	Electricity	Total cost per dwelling
Option 1: 21 new dwellings	$18,600	$23,100	$97,851	(included in road costs)	$35,800	**$175,351**
Option 2.1: 27 new dwellings	$12,900	$20,700	$78,930	$6,900	$21,500	**$140,930**
Option 2.2: 36 new dwellings	$11,500	$20,300	$62,427	$11,000	$17,100	**$122,327**

9.2 Comparable sale prices

To determine the feasibility of the rezoning and development options considered in this Planning Proposal it is necessary to consider the potential land value after the land has been rezoned and infrastructure provided. To this end, the sale prices of comparable vacant land in the surrounding areas of St Georges Basin, Basin View and Tomerong from January 2012 to August 2014 are presented in Figure 9.

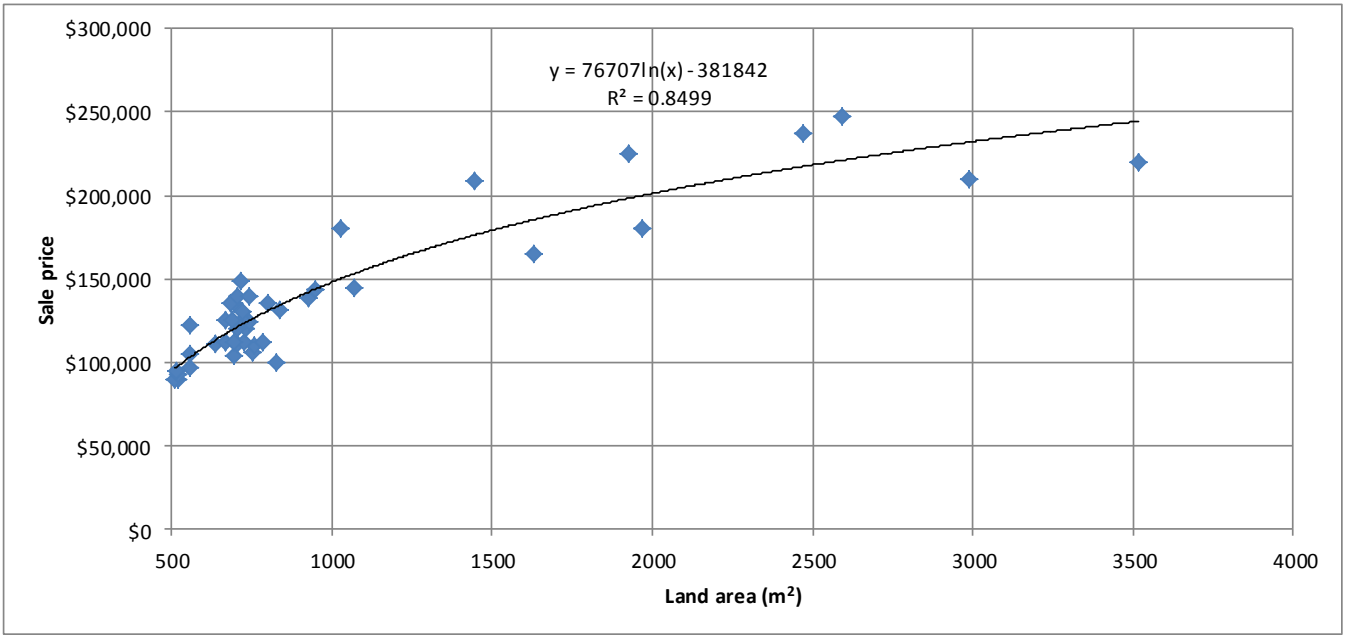


Figure 9 - Sale prices of vacant R2 and RU5 land in St Georges Basin, Basin View and Tomerong from January 2012 to August 2014

The regression line and R-squared value were prepared using Microsoft excel. The results suggest that as at August 2014, land value was partly influenced by the size of the property. In respect of the options presented in this Planning Proposal, comparable land values are in the order of:

$220,000 for 2,500 m^2 (Option 1)

$150,000 for 1,000 m^2 (Option 2.1)

$130,000 for 750 m^2 (Option 2.2)

9.3 Implications for feasibility

The difference between the infrastructure costs presented in section 9.1 and the comparable land values presented in section 9.2 provides a rough indication the residual land value and/or profit per dwelling, as shown in Table 6.

Table 6 - Summary of infrastructure costs and potential land value (per dwelling)

Option	Typical lot size (m^2)	Infrastructure cost per dwelling	Indicative potential land value	Residual land value/profit per dwelling (rough guide only)
1	2,500	$ 175,351	$ 220,000	$ 44,649
2.1	1,000	$ 140,930	$ 150,000	$ 9,070
2.2	750	$ 122,327	$ 130,000	$ 7,673

Notwithstanding the preliminary nature of the above financial information, it would appear that from a financial perspective, Option 1 is currently the most feasible of the three options presented.

9.4 Considerations for determining preferred option for NW Sector

A comparison of the options for the NW Sector is provided in Table 7.

Table 7 - Comparison of options for NW Sector

Option	Positives	Negatives
1	Appears to be most cost effective option. Requires less landowner coordination. Lesser infrastructure needs than Option 2. Proposed density/lot size consistent with those directly to the south of the subject land.	Lower yield and hence, fewer lots to share infrastructure costs. Localised land pooling and subdivision will still be required.
2.1	Higher dwelling yield than Option 1. Density comparable to residential land along the Wool Rd to the south. Perimeter would clearly define boundary between development area and conservation land to the east.	Greater infrastructure needs than Option 1. Least cost effective option. Requires more landowners to pool and re-subdivide their land than Option 1. Land would need to be dedicated to Council for new roads road.
2.2	More cost effective than Option 2.1. Infrastructure requirements similar to Option 2.2.	Greater infrastructure needs than Option 1. Requires landowners to work collectively to pool and re-subdivide their land (as per Option 2.1). Densities higher compared to those currently in nearby residential areas. More stormwater infrastructure may be required than Option 2.1 (pending stormwater assessment). Land would need to be dedicated to Council for new roads road.

9.5 Cost recoupment options

Preferably the landowners or a developer acting on their behalf would coordinate the provision of essential infrastructure. Failing this, Council may be required to put in place arrangements to secure funding from the owners and coordinate the site works on their behalf.

It is imperative that Council's financial risks are minimal in any arrangements to recoup costs for the necessary infrastructure.

Site costs could be recovered upfront or over a period of time. If the roads are to be sealed at a later stage, the funding arrangement could also be staged.

Cost recoupment options are briefly discussed below.

9.5.1 Development contributions and developer charges (S 94 and S 64)

In 2010 the State Government introduced a cap on Section 94 contributions as follows:

- a cap of $20,000 for established areas,
- a cap of $30,000 for greenfield areas,
- the Minister to consider, on the application of a council and request of a developer, approving a higher contribution amount, subject to review by the Independent Pricing and Regulatory Tribunal (IPART).

It is likely that the site costs may exceed these caps, particularly given other section 94 contributions.

Section 64 contributions relate to the provision of water and sewerage services. They are one-off charges that must be paid before a compliance certificate under the Water Supply Authorities Act 1987 can be issued.

In this case, a cost recovery strategy centred around developer contributions would present significant financial risks to Council because infrastructure would be required upfront whereas development/cost recoupment will be staggered over an indefinite period of time of the time.

9.5.2 Voluntary planning agreements

Voluntary planning agreement/s (VPA) could be used as a mechanism to establish a legally binding agreement with each landowner to pay their proportion of site costs upfront or through a schedule of payments. However, given the number of landowners involved it may be difficult to get agreement from all landowners.

9.5.3 Special rates

Section 495 of the Local Government Act (1993) allows Council to levy Special Rates. A Council may make a special rate for or towards meeting the cost of any works, services, facilities or activities provided or undertaken, or proposed to be provided or undertaken, by the Council within the whole or any part of the Council's area, other than domestic waste management services. The special rate is to be levied on such rateable land in the council's area as, in the council's opinion:

- *benefits or will benefit from the works, services, facilities or activities; or*
- *contributes or will contribute to the need for the works, services, facilities or activities; or*
- *has or will have access to the works, services, facilities or activities.*

In 2006, Council determined that the most appropriate way to raise the funds necessary to carry out the re-zoning and associated road design for Nebraska Estate was via a special rate. Council was granted a special variation and subsequently introduced special rates in 2006/2007 to repay loans taken out by Council for the rezoning investigations and road design. These special rates will cease after 2015/2016 when the loans will have been repaid.

A road construction special rate was introduced in 2008/2009 to allow some upgrading to be undertaken. The amount raised by this special rate is small in comparison to the cost of completing the road network to the minimum required standard. This arrangement will need to be reviewed as the planning process continues.

Council could seek to borrow funds required to complete the necessary site works (upgrading the roads and road drainage) and recoup costs via special rates from the benefitting properties over a given period, as is proposed for Jerberra Estate, Tomerong.

9.5.4 Schedule 5, Environmental Planning and Assessment Amendment Act, 2008

Provisions for developing land in paper subdivisions under the *Environmental Planning and Assessment Amendment Act, 2008* and the *Environmental Planning and Assessment Amendment (Paper Subdivisions) Regulation 2013* became effective on 8 March 2013. The provisions recognise that the existing subdivision layout in paper subdivisions may be inappropriate and the difficulties with getting the necessary commitments from multiple landowners to fund infrastructure provision. Importantly, the provisions do not override or circumvent existing legislative requirements concerning the rezoning process and identification of developable land.

The provisions are designed to enable land in paper subdivisions that is suitable for development to be developed and to specifically overcome the situation where a minority of landowners could potentially hold up, or prevent development of the land. A prerequisite to be able to utilise the provisions would be that at least 60% of the owners AND owners of at least 60% of the land area, consent to the proposed development plan. This has to be assessed by formal ballot.

The provisions were originally put forward to enable paper subdivisions in the Riverstone and Marsden Park (Blacktown LGA) to be developed, where Landcom is likely to be designated as the relevant authority. Other potential relevant authorities include a development corporation established under the Growth Centres (Development Corporations) Act 1974, a Council, or any other body prescribed by the regulations.

The provisions include additional means of recouping development costs from landowners. However, Council would need to carefully consider whether it would seek to be appointed as the relevant authority by the Minister and prepare a “development plan”. Doing so would put Council in the role of developer and potentially create a conflict of interest. There would need to be strong justification for seeking this role and a high level of certainty that the necessary landowner support exists.

Appendices

Press ctrl click on the links to open

A1. Checklist for State Environmental Planning Policies and Ministerial Directions

A2. Council Reports and Resolutions

Report to Development Committee on 17 July 2012 - zoning options:
http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D12/166751

Council resolution on 31 July 2012 to prepare and submit a Planning Proposal:
http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=MIN12.868

Report to Development Committee on 6 April 2010 regarding rezoning investigations :
http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D10/71836

Council resolution 13 April 2010 – identification and adoption of areas with development potential:
http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=min10.376

Report to Council on 24 January 1995 on issues associated with the Nebraska Estate rezoning investigations:
http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D13/77186

A3. Planning and environmental assessments

Nebraska Estate Threatened Biodiversity Assessment (Ecological Australia 20--)
http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D13/31495
Note: Figures 4-6 have been removed having regard to Section 161 of the NSW National Parks and Wildlife Act 1974 and Clause 12, Schedule 1 of the Government Information (Public Access) Act, 2009.

A4. Overview of landowner meeting 13 March 2010

Summary of discussion:
http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D10/71840

A5. Infrastructure cost estimate information

A6. Photo montage

http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=D14/281786

A5. Infrastructure cost estimate information

Roads and road drainage

Due to the expense, detailed designs and cost breakdowns for Nebraska Estate cannot be prepared until there is greater certainty on the intended zoning and development outcomes. The indicative cost estimates provided below are based on detailed cost estimates for similar road and drainage works in Jerberra Estate, Tomerong.

The construction cost estimates in Jerberra Estate equate to around $1,100 per lineal metre for sealed roads. This includes tree and vegetation clearing, sediment and erosion control (during construction), earthworks, road drainage (comprising grassed swales and pipes), and road pavement and fire trail construction.

The Jerberra Estate designs and cost estimates were prepared by Footprint Sustainable Engineering in 2014. The Jerberra designs and itemised cost breakdowns can be viewed on Council's website at:
http://www.shoalhaven.nsw.gov.au/My-Council/Current-Projects/Jerberra-Estate-infrastructure

In Nebraska Estate some sections of roads will not necessarily need to be sealed, as shown on the Conceptual Subdivision and Development Layout map. To account for this, a rate of $1,000 per metre has been used for the sections of road that would not necessarily need to be sealed, including the perimeter fire trail.

Road construction cost estimates for Options 1 and 2 are provided in Tables A-1 and A-2 respectively.

Table A- 1. Road construction cost estimates: Option 1 – lower density residential

Road description	Sealed road length (m)	Unsealed road length (m)
Nebraska Road	108	501
Waterpark Road	161	59
Pelican Road	395	188
Fisherman Road	144	-
New fire trail between Nebraska and Pelican Roads	-	250
Total Length	706	1,100
Construction cost subtotal	$776,600	$1,000,000
Construction cost total	$1,876,600	
Design (5% of construction)	$93,830	
Project management (4.5% of construction)	$84,447	
Total	**$2,054,877**	
Average cost per dwelling	**$97,851**	

The costs referred to above do not include kerb and guttering, which is a likely requirement for approximately 850 metres of road for Options 2.1 and 2.2 in the NW Sector. Based on

advice from Council's Works and Asset Section, the estimated cost for kerb and guttering is $250 per metre of road, or $212,500 in total for the NW Sector.

Table A- 2. Road construction cost estimates: Option 2 – higher density residential

Road description	Sealed road length	Unsealed road length
Nebraska Road	397	158
Waterpark Road	220	-
Pelican Road	395	188
Fisherman Road	144	-
New fire trail between Nebraska and Pelican Roads	-	250
New road off Waterpark Road	137	-
New perimeter road between Nebraska and Pelican Roads[a]	230	-
Total Length	1523	596
Construction cost subtotal	$1,675,300	$596,000
Construction cost total		**$2,271,300**
Design (5% of construction)		**$113,565**
Project management (4.5% of construction)		**$102,209**
Total		**$2,487,074**
Kerb and guttering		**$212,500**
Average cost per dwelling for Option 2.1 [b]	**$71,636 (+ $7,870 for K&G in NW Sector)**	
Average cost per dwelling for Option 2.2 [b]	**$56,983 (+ $5,903 for K&G in NW Sector)**	

Notes

a. Based on dedication of land to Council at no cost.
b. To avoid unnecessary complication, at this stage the costs have been divided evenly across all three sectors.

Water and sewerage reticulation

A summary of preliminary cost estimates for water and sewerage reticulation is provided below. The cost estimates include the applicable headworks charges (Section 64 contributions).

A pressure sewerage system is proposed and Council's Pressure Sewer Policy would apply. The intention would be to construct all water supply and pressure sewer mains within the road reserves. No allowance has been made for any easements that may be required though private land to serve lots which do not have frontage/access to the new assets should the need arise.

The estimated cost per dwelling for extending reticulated water and sewerage into the NW and E Sectors is shown in Table A-3.

Table A- 3. Cost estimates per dwelling for provision of reticulated water and sewerage

Sector(s)	Option	# new dwellings	# dwellings to share costs [a]	Water [b]	Sewerage [c]	Total
NW Sector Only	1	13	Water = 13 Sewer = 14	$15,550	$22,026	$37,576
	2.1	27	Water = 27 Sewer =28	$12,821	$20,679	$33,500
	2.2	36	Water = 36 Sewer =37	$11,467	$20,217	$31,684
All Sectors	1	21	Water = 21 Sewer = 24	$18,549	$23,080	$41,629
	2.1	35	Water = 35 Sewer =38	$14,688	$21,614	$36,302
	2.2	44	Water = 44 Sewer =47	$13,198	$20,914	$34,112

Notes

a. Including existing approved dwellings not currently serviced. The three existing approved dwellings may not have to connect to the pressure sewer system if their onsite waster systems are operating well and in accordance with their approvals.
b. No allowance has been made for any internal modifications to existing internal water service lines if their connection points need to be changed.
c. Including pressure sewer unit at $9,347 each (July 2014).

Other essential infrastructure

Stormwater treatment

As stated in section 8.5, a stormwater management plan has not been prepared at this stage. Hence, the cost of managing stormwater cannot be accurately estimated at this stage.

The Jerberra Estate road construction cost estimates referred to above include the provision of grassed swales and pipes. Such measures may suffice for Option 1 and therefore no additional stormwater management costs have been identified for this Option.

The higher densities proposed for the NW Sector in Options 2.1 and 2.2 however, would potentially require more expensive stormwater management measures such as bio-retention swales or on-street rain gardens. The stormwater costings provided in Table A-4 have been published by Melbourne Water[5].

[5] Melbourne Water (2013) Water sensitive urban design – Life cycle costing data. Accessed online on 21/5/2014 at: http://www.melbournewater.com.au/Planning-and-building/Forms-guidelines-and-standard-drawings/Documents/Life%20Cycle%20Costing%20-%20WSUD.pdf

Table A- 4. Typical stormwater treatment costs – unit rates (Melbourne Water, 2013)

Stormwater treatment asset	Parameters	Construction cost[a]	Maintenance	
			Establishment (first two years)	Ongoing (annual)
On-street rain gardens	<50 m^2	\$2000/m^2	2 to 5 times ongoing maintenance	\$30/m^2
	50-250 m^2	\$1000/m^2		\$15/m^2
	>250 m^2	\$500/m^2		\$10/m^2
Grassed swales	using native grasses	\$60/m^2		\$3/m^2
Bioretention swales		\$150/m^2		\$5/m^2

[a] Includes planning and design. Excludes equipment hire.

The area that could actually be used for stormwater treatment within the road for Option 2 is estimated to be 1,800 m^2 (approximately one third of the area shown on the conceptual subdivision and development map).

Table A- 5. Stormwater cost estimates for Option 2 over 10 years based on published data (Melbourne Water, 2013)

Option 2 cost scenario	construction	Establishment (first 2 years) [a]	Ongoing annual maintenance	Total over 10 years	Cost per dwelling	
					Option 2.1 (*n*=25)[b]	Option 2.2 (*n*=34)[b]
Lower/mid estimate: grassed swales with native grasses	\$108,000	\$18,900	\$5,400	\$170,100	\$6,804	\$5,002
Upper/mid estimate: bioretention swales	\$270,000	\$31,500	\$9,000	\$373,500	\$14,940	\$10,985

Notes

a. Based on multiplier of 3.5 (mid-point of Melbourne Water's range of 2 to 5 times the cost of ongoing maintenance cost).
b. Number of dwellings that would directly benefit from stormwater treatment adjacent to roads.

For the purpose of this exercise the lower/middle estimate has been used for Option 2.1 and the upper/middle estimate has been used for Option 2.2

Electricity

Based on advice from AKH Design and Council's Commercial Electrical Engineer, the estimated total cost for providing reticulated electricity would be in the vicinity of \$650,000 and \$750,000 for underground reticulation. No estimate was provided for overhead reticulation for Option 1 as it is unknown at this stage whether this option will be allowed (Such requirements can change over time and this will need to be determined in due course.)

For budgeting purposes, the following costs have been assumed at this point in time:

Option 1: $650,000, equating to approximately $31,000 per dwelling. This would be lower if overhead electricity was allowed.

Options 2.1 and 2.2: $750,000, equating to approximately $21,500 and $17,000 per dwelling respectively.

A preliminary design and cost estimate will not be prepared until the land's planning status has been resolved.

Advice provided by Shoalhaven Water

Purpose of Report

This report's aim is to provide options for water supply and sewerage services to Nebraska Estate as marked on attachments 1 and 2 of this report. This report will also provide preliminary construction costs and applicable developer (Section 64) contributions.

Background

Nebraska Estate covers lands on the western of Saint Georges Basin. A natural water course diagonally dissects the estate (refer to attachment 1). Park Road was the first stage where water and sewer services have been provided by special arrangement with Council.

"Stage 2" covers certain lands which are along Pelican Rd, Waterpark Rd, Nebraska Rd and Fisherman Rd. Council's Planning and Development Services has provided revised Conceptual Residential Subdivision and Development plans with varying lot yields to be considered for water supply and sewerage servicing (refer to attachment 1).

Summary

Two scenarios were assessed in request of provision of water and sewerage services. The first covered the two area (ie, north-western and eastern areas). The second scenario assessed just the north-western area. The density options were explored for both scenarios. Tables 1 and 2 outline the costs for the two scenarios and varying densities of development.

Currently "stage 2" of Nebraska estate is not served by water and sewerage systems. Extension of the town water supply and sewerage system can be achieved to serve all the proposed lots for either scenario and/or density option. A pressure sewer system is proposed in servicing the areas to be developed. Council's Pressure Sewer policy would apply.

No allowance has been made for any internal modifications to existing internal water service lines if their connection points need to be changed.

It is intended to construct all water supply and pressure sewer mains within the road reserve. No allowance has been made for any easements that may be required through private land to serve lots which do not have frontage/access to the new assets should the need arise.

Recommend

The information in this report be submitted as an initial assessment for the provision of water supply and sewerage services to "stage 2" Nebraska Estate, Saint Georges Basin.

Scenarios

The investigations considered two scenarios; the first was both the north-western and eastern areas developing with three different lots yields. The second scenario only examines the north-western area developing with three different lots yields.

Scenario 1

Option 1 – Low Density Residential

Option 1 proposes a yield in two separate areas (refer to attachment 1) of 24 lots. Of the 24 lots, 21 are not connected to the town water supply.

In relation to sewer servicing all 24 lots are assessed as connecting to the town sewerage system by a pressure sewer system. It is noted that the three (3) existing developed properties may not have to connect to the pressure sewer system if their onsite wastewater disposal system is operating well within its approval.

Option 2.1 – Minimum Lot Size 1,000 m^2

Option 2.1 proposes a yield of 38 lots. Of the 38 lots, 35 are not connected to the town water supply.

In relation to sewer servicing all 38 lots are assessed as connecting to the town sewerage system by a pressure sewer system. It is noted that the three (3) existing developed properties may not have to connect to the pressure sewer system if their onsite wastewater disposal system is operating well within its approval.

Option 2.2 – Minimum Lot Size 700 m^2

Option 2.2 proposes a yield of 47 lots. 44 of the proposed new lots are not connected to the town water supply.

In relation to sewer servicing all 47 lots are assessed as connecting to the town sewerage system by a pressure sewer system. It is noted that the three (3) existing developed properties may not have to connect to the pressure sewer system if their onsite wastewater disposal system is operating well within its approval.

Water Supply for Options 1, 2.1 and 2.2

It is proposed to extend the town water supply from the existing 100mm uPVC/12 main in Waterpark Rd to and along Nebraska Rd to serve the proposed lots. In addition to this a new water main will be extended via a new road between Nebraska and Pelican Roads and extended along Pelican Rd to serve the Eastern Sector.

An extension along Fisherman Rd is proposed to serve proposed lot 8. Alternatively, an easement for water supply through proposed lot 5 could be created to serve proposed lot 8.

At each end, the water main will be looped to remove dead-ends which can lead to dirty water complaints.

Approximately 1,500 metres of pipe would be required for option 1 and approximately 1,650m for options 2.1 or 2.2.

Sewerage Services for Options 1, 2.1 and 2.2

The existing parts (southern parts) of Nebraska Estate have been served by extending the gravity sewerage system. However, as these proposed new areas are on the opposite of an existing water course, it is proposed to provide a pressure sewer system to serve all the proposed lots. Council's Pressure Sewer Policy would apply.

In a pressure sewer system each lot has a pressure sewer unit (ie, a small pumping station), which is connected to the common pressure main in the road reserve via a pressure sewer drainage line. As in a gravity system, sewage gravitates from the dwelling to the pressure sewer unit. The pressure unit then pumps it through the pressure mains discharging into the existing gravity system.

A pressure sewer system is more environmentally friendly than the traditional gravity sewer system. The pressure sewer system does not have potential infiltration points as there are no manholes or lampholes. Potential infiltration point/s is/are limited to the gravity drainage line from the dwelling to the pressure sewer unit.

In addition it removes the potential build-up of solid waste in gravity pipes. The pressure sewer unit has grinder pump which macerates the waste.

From a construction perspective, the pressure lines are laid much shallower than traditional gravity lines and are also much smaller in diameter. As there are no large chambers to construct like manholes. This allows the pressure mains to be constructed within the road reserve which further removes the need to place easements to drain sewage over private lands. Flushing points need to be provided for maintenance and this pipe work is located within a small plastic pit (300mm x 500mm).

The pressure sewer mains would be extended in 40mm NS, 50mm NS and 63mm NS HDPE class 12.5 pipes and fittings to serve all lots. Approximately 1,620 metres of pipe would be required for option 1 and approximately 1,795m for options 2.1 and approximately 1,810m for option 2.2. The amount of pipe for each diameter varies based on the option. These pipelines would be constructed within the road reserve

Cost Estimates *for Options 1, 2.1 and 2.2*

Summary of costs for water supply and sewerage services are as per table 1. No allowance has been made for any easements that may be required through private lands to serve lots which do not have frontage/access to the new assets should the need arise.

Scenario 2

Option 1 – Low Density Residential

Option 1 proposes a yield of 14 lots (refer to attachment 1). Of the 14 lots, 13 are not connected to the town water supply.

In relation to sewer servicing all 14 lots are assessed as connecting to the town sewerage system by a pressure sewer system. It is noted that the one (1) existing developed property may not have to connect to the pressure sewer system if their onsite wastewater disposal system is operating well within its approval.

Option 2.1 – Minimum Lot Size 1,000 m^2

Option 2.1 proposes a yield of 28 lots (refer to attachment 1). Of the 28 lots, 27 are not connected to the town water supply.

In relation to sewer servicing all 28 lots are assessed as connecting to the town sewerage system by a pressure sewer system. It is noted that the one (1) existing developed property may not have to connect to the pressure sewer system if their onsite wastewater disposal system is operating well within its approval.

Option 2.2 – Minimum Lot Size 700 m^2

Option 2.2 proposes an increase in lot yield of 37 (refer to attachment 1). Of the 37 lots, 36 not connected to the town water supply.

In relation to sewer servicing all 37 lots are assessed as connecting to the town sewerage system by a pressure sewer system. It is noted that the one (1) existing developed property may not have to connect to the pressure sewer system if their onsite wastewater disposal system is operating well within its approval.

Water Supply for Options 1, 2.1 and 2.2

It is proposed to extend the town water supply from the existing 100mm uPVC/12 main in Waterpark Rd to and along Nebraska Rd to serve the proposed lots.

At each end, the water main will be looped to remove dead-ends which can lead to dirty water complaints.

Approximately 670 metres of pipe would be required for option 1 and approximately 960m for options 2.1 or 2.2.

Sewerage Services for Options 1, 2.1 and 2.2

The existing parts (southern parts) of Nebraska Estate have been served by extending the gravity sewerage system. However, as these proposed new areas are on the opposite of an existing water course, it is proposed to provide a pressure sewer system to serve all the proposed lots. Council's Pressure Sewer Policy would apply.

In a pressure sewer system each lot has a pressure sewer unit (ie, a small pumping station), which is connected to the common pressure main in the road reserve via a pressure sewer drainage line. As in a gravity system, sewage gravitates from the dwelling to the pressure sewer unit. The pressure unit then pumps it through the pressure mains discharging into the existing gravity system.

A pressure sewer system is more environmentally friendly than the traditional gravity sewer system. The pressure sewer system does not have potential infiltration points as there are no manholes or lampholes. Potential infiltration point/s is/are limited to the gravity drainage line from the dwelling to the pressure sewer unit.

In addition it removes the potential build-up of solid waste in gravity pipes. The pressure sewer unit has grinder pump which macerates the waste.

From a construction perspective, the pressure lines are laid much shallower than traditional gravity lines and are also much smaller in diameter. As there are no large chambers to construct like manholes. This allows the pressure mains to be constructed within the road reserve which further removes the need to place easements to drain sewage over private lands. Flushing points need to be provided for maintenance and this pipe work is located within a small plastic pit (300mm x 500mm).

The pressure sewer mains would be extended in 40mm NS, 50mm NS and 63mm NS HDPE class 12.5 pipes and fittings to serve all lots. Approximately 765 metres of pipe would be required for option 1 and approximately 945m for options 2.1 and approximately 960m for option 2.2. The amount of pipe for each diameter varies based on the option.

Cost Estimates *for Options 1, 2.1 and 2.2*

Summary of costs for water supply and sewerage services are as per table 2. No allowance has been made for any easements that may be required through private lands to serve lots which do not have frontage/access to the new assets should the need arise.

Ljupco Lazarevski
Unit Manager Projects / Development
Shoalhaven Water

Nebraska Estate - North-West & Eastern Sectors
Option 1

Water Supply Estimate

Description	Quantity	Unit	Rate	Amount
125mm HDPE	1500	m	$110	$165,000
Tree Removal	1	item	$20,000	$20,000
Sub-total				$185,000
S.I.D.			15%	$27,750
TOTAL				$212,750
Contingency			10%	$21,275
GRAND TOTAL				**$234,025**
No. of Lots				21
Cost per Lot				**$11,144**
Separate System Connection Fee		(2014/15)		$6,578
Cost for Water Service		(2014/15)		$827
Grand Total per Lot for Water		*(2014/15)*		$18,549

Nebraska Estate - North-West & Eastern Sectors
Option 2.1

Water Supply Estimate

Description	Quantity	Unit	Rate	Amount
125mm HDPE	1650	m	$110	$181,500
Tree Removal	1	item	$20,000	$20,000
Sub-total				$201,500
S.I.D.			15%	$30,225
TOTAL				$231,725
Contingency			10%	$23,173
GRAND TOTAL				**$254,898**
No. of Lots				35
Cost per Lot				**$7,283**
Separate System Connection Fee		(2014/15)		$6,578
Cost for Water Service		(2014/15)		$827
Grand Total per Lot for Water		*(2014/15)*		$14,688

Nebraska Estate - North-West & Eastern Sectors
Option 2.2

Water Supply Estimate

Description	Quantity	Unit	Rate	Amount
125mm HDPE	1650	m	$110	$181,500
Tree Removal	1	item	$20,000	$20,000
Sub-total				$201,500
S.I.D.			15%	$30,225
TOTAL				$231,725
Contingency			10%	$23,173
GRAND TOTAL				**$254,898**
No. of Lots				44
Cost per Lot				**$5,793**
Separate System Connection Fee		(2014/15)		$6,578
Cost for Water Service		(2014/15)		$827
Grand Total per Lot for Water		*(2014/15)*		$13,198

Rate of $110/m for water main based on recent contracts for minor mains augment
Rates for pressure sewer pipes based on Kangaroo Valley Project with 3.5% CPI increase per yr over 3 years
Contingency reduced from 15% to 10%
Construction Difficulty removed

Sewerage Services Estimate

Description	Quantity	Unit	Rate	Amount
40mm HDPE	590	m	59	$34,810
50mm HDPE	925	m	65	$60,125
63mm HDPE	45	m	71	$3,195
40mm HDPE	15	m	142	$2,130
50mm HDPE	45	m	142	$6,390
63mm HDPE	0	m	142	$0
Flushing Points	5	ea	1800	$9,000
Manhole	1	item	1500	$1,500
Tree Removal	1	item	$20,000	$20,000
Sub-total				$102,340
S.I.D.			15%	$15,351
TOTAL				**$117,691**
Contingency			10%	$11,769
GRAND TOTAL				**$129,460**
No. of Lots				24
Cost per Lot				$5,394
Pressure Sewer Unit		(2014/15)		$9,347
Total Cost per Lot				**$14,741**
Separate System Connection Fee		(2014/15)		$8,339
Grand Total per Lot for Sewer		(2014/15)		$23,080
OVERALL GRAND TOTAL / LOT		**(2014/15)**		**$41,629**

Sewerage Services Estimate

Description	Quantity	Unit	Rate	Amount
40mm HDPE	580	m	59	$34,220
50mm HDPE	865	m	65	$56,225
63mm HDPE	265	m	71	$18,815
40mm HDPE	15	m	142	$2,130
50mm HDPE	60	m	142	$8,520
63mm HDPE	0	m	142	$0
Flushing Points	6	ea	1800	$10,800
Manhole	1	item	1500	$1,500
Tree Removal	1	item	$20,000	$20,000
Sub-total				$117,990
S.I.D.			15%	$17,699
TOTAL				**$135,689**
Contingency			10%	$13,569
GRAND TOTAL				**$149,257**
No. of Lots				38
Cost per Lot				$3,928
Pressure Sewer Unit		(2014/15)		$9,347
Total Cost per Lot				**$13,275**
Separate System Connection Fee		(2014/15)		$8,339
Grand Total per Lot for Sewer		(2014/15)		$21,614
OVERALL GRAND TOTAL / LOT		**(2014/15)**		**$36,302**

Sewerage Services Estimate

Description	Quantity	Unit	Rate	Amount
40mm HDPE	565	m	59	$33,335
50mm HDPE	895	m	65	$58,175
63mm HDPE	265	m	71	$18,815
40mm HDPE	15	m	142	$2,130
50mm HDPE	60	m	142	$8,520
63mm HDPE	0	m	142	$0
Flushing Points	6	ea	1800	$10,800
Manhole	1	item	1500	$1,500
Tree Removal	1	item	$20,000	$20,000
Sub-total				$119,940
S.I.D.			15%	$17,991
TOTAL				**$137,931**
Contingency			10%	$13,793
GRAND TOTAL				**$151,724**
No. of Lots				47
Cost per Lot				$3,228
Pressure Sewer Unit		(2014/15)		$9,347
Total Cost per Lot				**$12,575**
Separate System Connection Fee		(2014/15)		$8,339
Grand Total per Lot for Sewer		(2014/15)		$20,914
OVERALL GRAND TOTAL / LOT		**(2014/15)**		**$34,112**

Table 1 – Scenario 1 (North-western and Eastern Areas) – Covering All 3 Development Density Options

Nebraska Estate - North-West Sector Only
Option 1

Water Supply Estimate

Description	Quantity	Unit	Rate	Amount
125mm HDPE	670	m	$110	$73,700
Tree Removal	1	item	$10,000	$10,000
Sub-total				**$83,700**
S.I.D.			15%	$12,555
TOTAL				**$96,255**
Contingency			10%	$9,626
GRAND TOTAL				**$105,881**
No. of Lots				13
Cost per Lot				**$8,145**
Separate System Connection Fee		(2014/15)		$6,578
Cost for Water Service		(2014/15)		$827
Grand Total per Lot for Water		*(2014/15)*		$15,550

Rate of $110/m based on recent contracts for minor mains augment
Contingency reduced from 15% to 10%
Construction Difficulty removed

Sewerage Services Estimate

Description	Quantity	Unit	Rate	Amount
40mm HDPE	235	m	59	$13,865
50mm HDPE	455	m	65	$29,575
63mm HDPE	45	m	71	$3,195
40mm HDPE	0	m	142	$0
50mm HDPE	30	m	142	$4,260
63mm HDPE	0	m	142	$0
Manhole	1	item	1000	$1,000
Tree Removal	1	item	$10,000	$10,000
Sub-total				$48,030
S.I.D.			15%	$7,205
TOTAL				$55,235
Contingency			10%	$5,523
GRAND TOTAL				**$60,758**
No. of Lots				14
Cost per Lot				$4,340
Pressure Sewer Unit		(2014/15)		$9,347
Total Cost per Lot				**$13,687**
Separate System Connection Fee		(2014/15)		$8,339
Grand Total per Lot for Sewer		(2014/15)		$22,026
OVERALL GRAND TOTAL / LOT		**(2014/15)**		**$37,576**

Nebraska Estate - North-West Sector Only
Option 2.1

Water Supply Estimate

Description	Quantity	Unit	Rate	Amount
125mm HDPE	960	m	$110	$105,600
Tree Removal	1	item	$10,000	$10,000
Sub-total				**$115,600**
S.I.D.			15%	$17,340
TOTAL				**$132,940**
Contingency			10%	$13,294
GRAND TOTAL				**$146,234**
No. of Lots				27
Cost per Lot				**$5,416**
Separate System Connection Fee		(2014/15)		$6,578
Cost for Water Service		(2014/15)		$827
Grand Total per Lot for Water		*(2014/15)*		$12,821

Sewerage Services Estimate

Description	Quantity	Unit	Rate	Amount
40mm HDPE	185	m	59	$10,915
50mm HDPE	465	m	65	$30,225
63mm HDPE	265	m	71	$18,815
40mm HDPE	0	m	142	$0
50mm HDPE	30	m	142	$4,260
63mm HDPE	0	m	142	$0
Manhole	1	item	1000	$1,000
Tree Removal	1	item	$10,000	$10,000
Sub-total				$64,300
S.I.D.			15%	$9,645
TOTAL				$73,945
Contingency			10%	$7,395
GRAND TOTAL				**$81,340**
No. of Lots				28
Cost per Lot				$2,905
Pressure Sewer Unit		(2014/15)		$9,435
Total Cost per Lot				**$12,340**
Separate System Connection Fee		(2014/15)		$8,339
Grand Total per Lot for Sewer		(2014/15)		$20,679
OVERALL GRAND TOTAL / LOT		**(2014/15)**		**$33,500**

Nebraska Estate - North-West Sector Only
Option 2.2

Water Supply Estimate

Description	Quantity	Unit	Rate	Amount
125mm HDPE	960	m	$110	$105,600
Tree Removal	1	item	$10,000	$10,000
Sub-total				**$115,600**
S.I.D.			15%	$17,340
TOTAL				**$132,940**
Contingency			10%	$13,294
GRAND TOTAL				**$146,234**
No. of Lots				36
Cost per Lot				**$4,062**
Separate System Connection Fee		(2014/15)		$6,578
Cost for Water Service		(2014/15)		$827
Grand Total per Lot for Water		*(2014/15)*		$11,467

Sewerage Services Estimate

Description	Quantity	Unit	Rate	Amount
40mm HDPE	120	m	59	$7,080
50mm HDPE	575	m	65	$37,375
63mm HDPE	265	m	71	$18,815
40mm HDPE	0	m	142	$0
50mm HDPE	30	m	142	$4,260
63mm HDPE	0	m	142	$0
Manhole	1	item	1000	$1,000
Tree Removal	1	item	$10,000	$10,000
Sub-total				$71,450
S.I.D.			15%	$10,718
TOTAL				$82,168
Contingency			10%	$8,217
GRAND TOTAL				**$90,384**
No. of Lots				37
Cost per Lot				$2,443
Pressure Sewer Unit		(2014/15)		$9,435
Total Cost per Lot				**$11,878**
Separate System Connection Fee		(2014/15)		$8,339
Grand Total per Lot for Sewer		(2014/15)		$20,217
OVERALL GRAND TOTAL / LOT		**(2014/15)**		**$31,684**

Table 2 – Scenario 2 (Only North-western Area) – Covering All 3 Development Density Options


Option 1 - Lower Density Residential
Option 2.1 - Minimum lot size = 1000m²
Option 2.2 - Minimum lot size = 750m²
Nebraska
Pelican
Clarendon
Crescent
Fisherman
Road
Grange
Waterside
7.5m Setback
PROPOSED 125 OD HDPE WATER MAIN
EXISTING 100Ø W.M.
EASEMENT FOR SERVICES TO PROPERTY
Legend
Subject land
Boundary (conceptual subdivision plan).
Building line (all dwellings to be located within this).
Potential building area.
New road reserve to be created.
ROW 4m wide.
ROW 6m wide.
Proposed Road Network
Gravel or sealed
Sealed
Turning area: design of a suitable turning facility for fire fighting and service vehicles to be determined and may require dedication of land.
Significant roadside vegetation
Area within road reserve to be used for stormwater treatment (e.g. grassed swale) if required.
Perimeter fire trail (6m wide) with locked gates.
Bushfire asset protection zone (APZ).
Minimum APZ width.
Indicative dwelling.
Existing approved dwelling.
Existing approved shed.
Bushland conservation management area.
Scenic protection area.
Property with approved dwelling. No further development sought. Conservation obligations covered by conditions of consent and/or conservation agreement.
15
Dwelling reference number.
Indicative area available/suitable for sub-surface effluent application.
Nebraska Estate
Conceptual Residential Subdivision & Development
SCENARIO 1: NORTH-WEST & EASTERN AREAS - WATER SUPPLY CONCEPT PLANS FOR EACH OPTION.
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NTS
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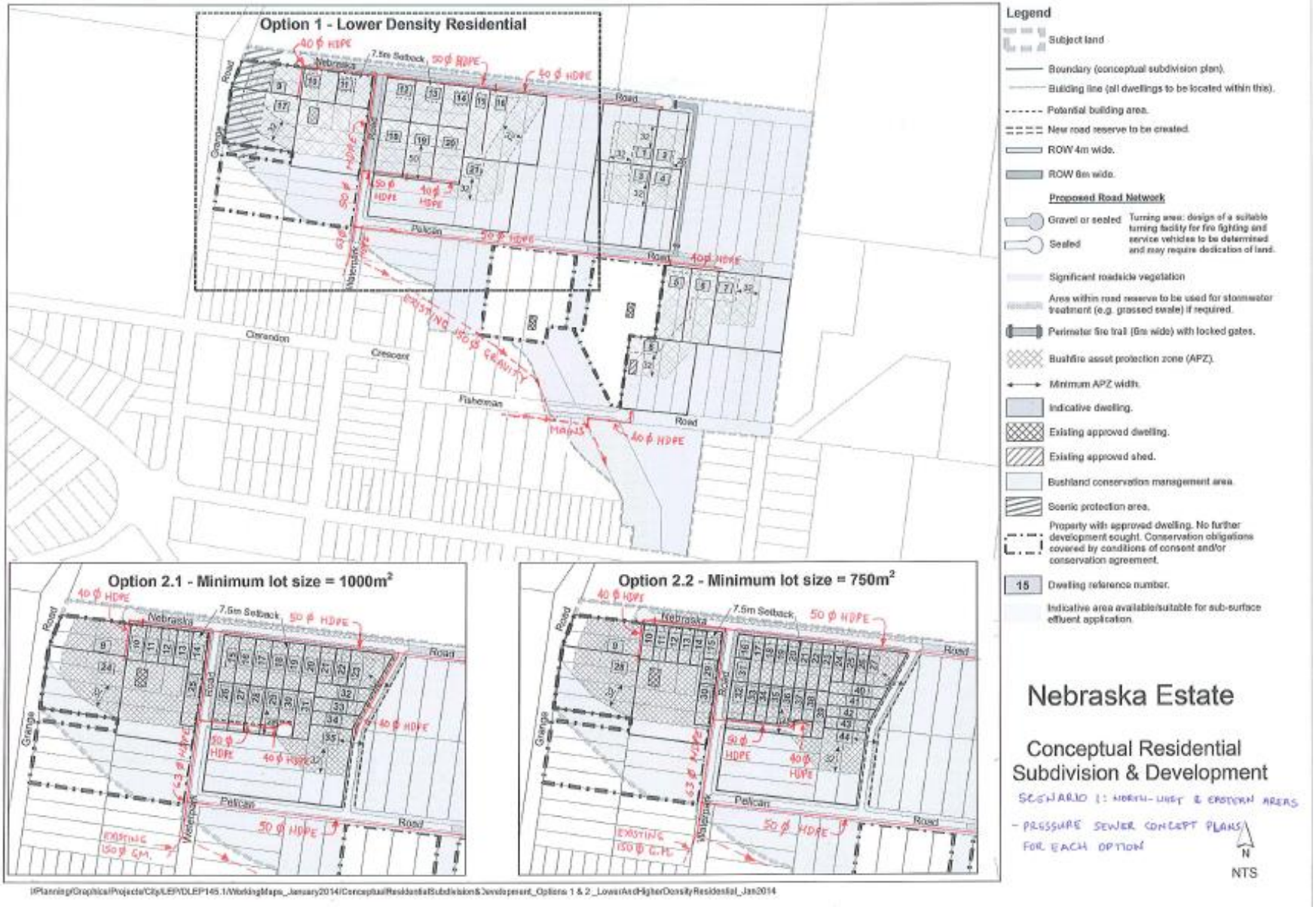
Scenario 1 (North-western and Eastern Areas) – Water Supply Concept Plans for all Development Density Options



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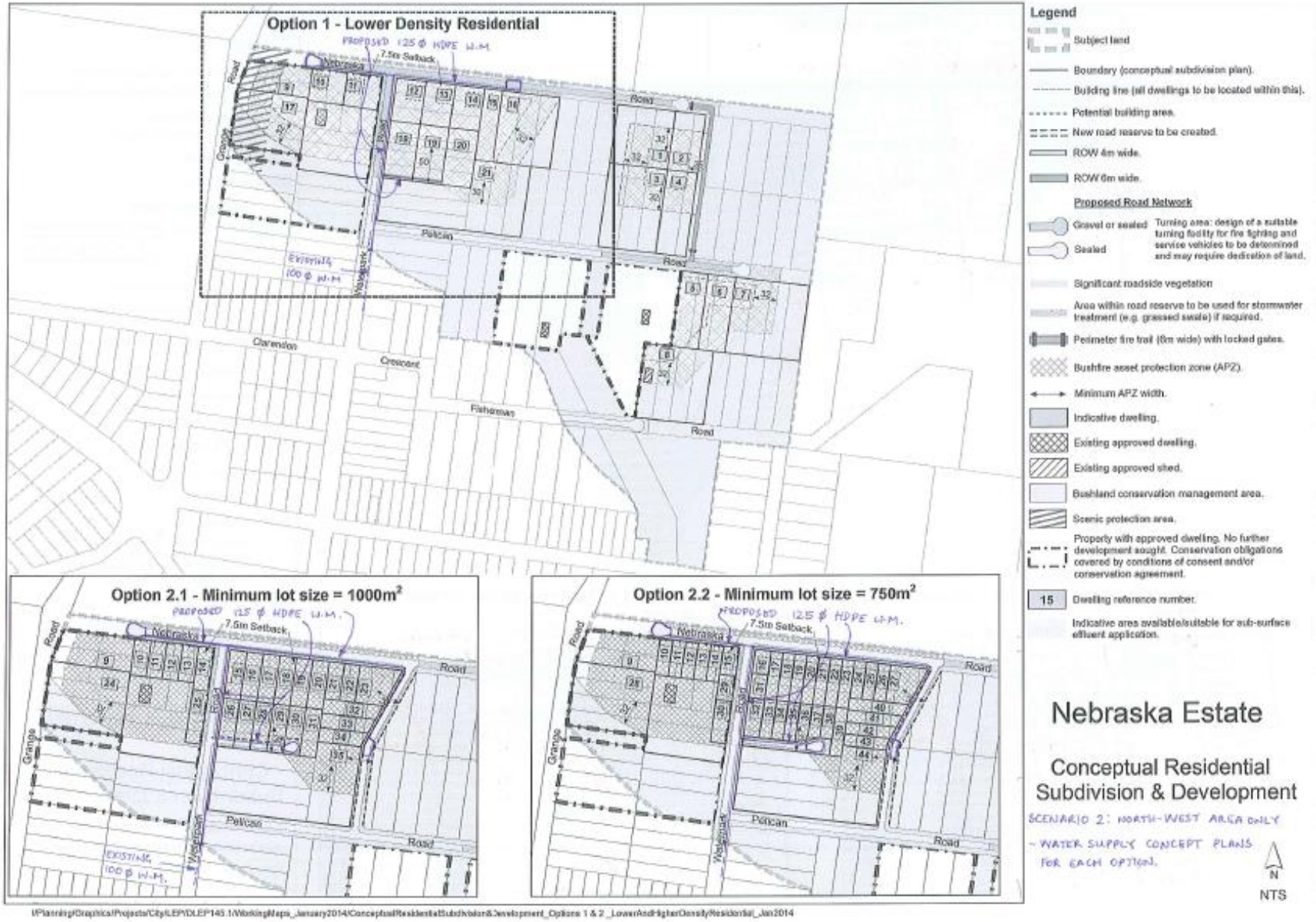
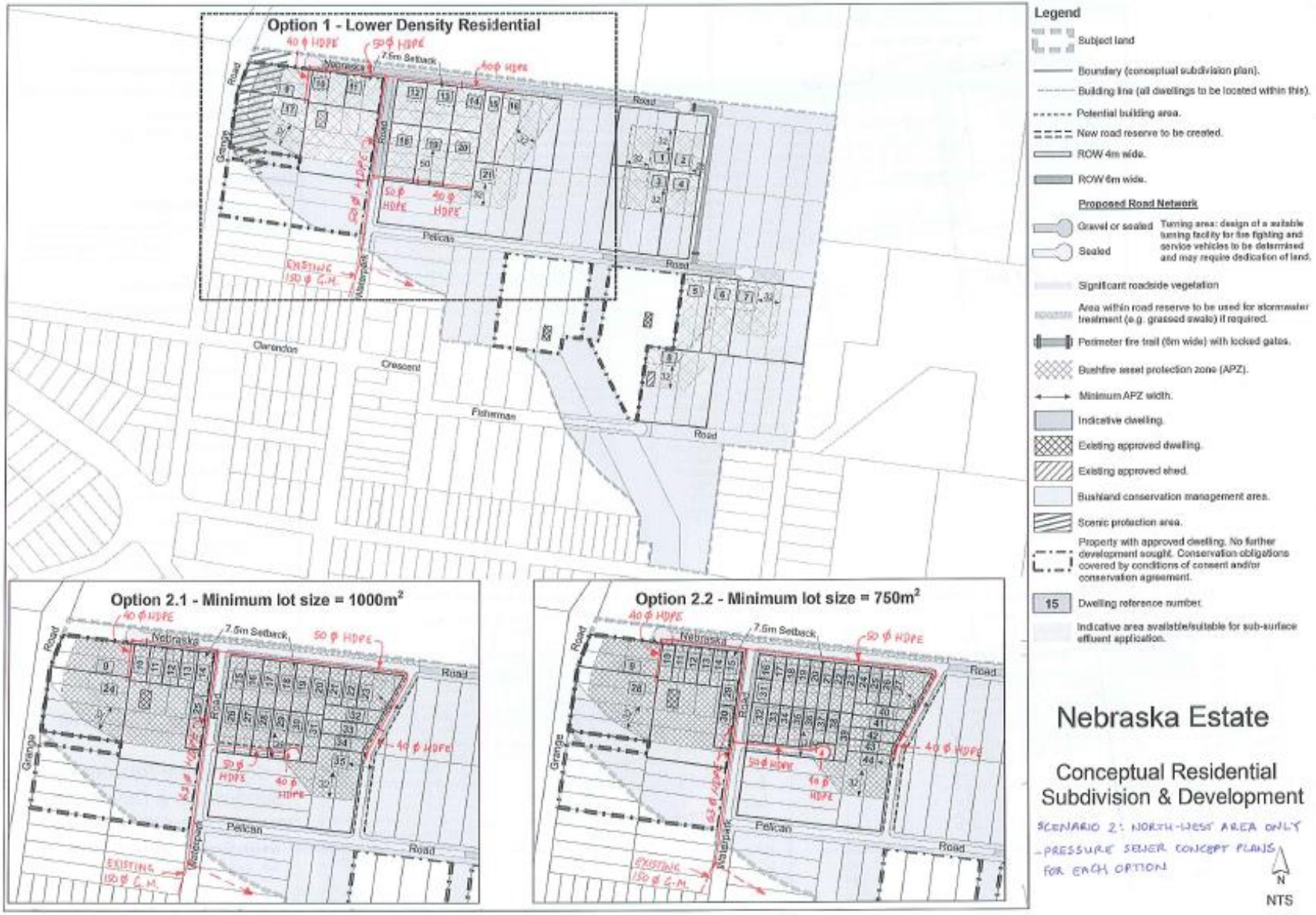
Scenario 1 (North-western and Eastern Areas) – Pressure Sewer Concept Plans for all Development Density Options



Scenario 2 (North-western Area) – Water Supply Concept Plans for all Development Density Options



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Scenario 2 (North-western Area) – Pressure Sewer Concept Plans for all Development Density Options