

ITEM 1

DRAFT PLANNING PROPOSAL LOT 101 825576 FARMBOROUGH ROAD,
FARMBOROUGH HEIGHTS

On 27 June 2016 Council resolved to prepare a draft Planning Proposal for Lot 101 DP 825516 Farmborough Road, Farmborough Heights, which seeks to facilitate the subdivision of the land into approximately 30 large residential lots, together with the dedication of land with funding to Council to re-vegetate and protect in perpetuity the riparian corridor in the north-west of the site and other features of environmental significance on site. This site was considered in the Farmborough Heights to Mt Kembla Concept Plan that was endorsed by Council (9 December 2013) and the Department of Planning (20 March 2014) to guide future development potential for this area. The draft Planning Proposal was exhibited between 29 August and 27 September 2016.

The purpose of this report is to provide feedback on the public exhibition and to finalise the Planning Proposal. It is recommended that the draft Planning Proposal be progressed to finalisation.

RECOMMENDATION

- 1 The draft Planning Proposal for Lot 101 DP 825516 Farmborough Road, Farmborough Heights be progressed by –
 - a Finalising the Planning Proposal that seeks to amend:
 - i the Land Zoning Map by rezoning 5.3 hectares of the site from RU2 Rural Landscape to E4 Environmental Living with a Minimum Lot Size of 2,000m² and Floor Space Ratio of 0.3:1;
 - ii rezoning 5.4 hectares from RU2 Rural Landscape to E4 Environmental Living with a Minimum Lot Size of 5,000m² and Floor Space Ratio of 0.3:1;
 - iii rezoning the remainder of the site, including the northern riparian corridor (7.8 hectares), from RU2 Rural Landscape to E2 Environmental Conservation with a Minimum Lot Size of 39.99ha; and
 - iv updating the Natural Resource Sensitivity – Biodiversity Map.
 - b The Planning Proposal also be finalised to rezone Lot 1 DP 720058 and Lot 1 DP 821495 (the paper road) located to the north of Lot 101 DP 825516 from RU2 Rural Landscape to E3 Environmental Management, consistent with the adjoining Lot 106 DP 825517.
 - c The final Planning Proposal being referred to the NSW Department of Planning and Environment for the making of arrangements for drafting to give effect to the final proposal; and
 - d Noting that the General Manager will thereafter proceed to exercise his delegation issued by the NSW Department of Planning and Environment under Section 69 in relation to the final proposal.
- 2 Council support the proposed dedication (with funding) of the area proposed to be rezoned E2 Environmental Conservation (7.8 hectares) to re-vegetate and protect in perpetuity the identified environmental values of the site.
- 3 The legal agreement for the transfer of E2 zoned land with funding to Council be finalised prior to development consent for subdivision.
- 4 During the next review of DCP - Chapter B2 Residential Subdivision, additional clauses be added that encourage subdivision layouts to minimise isolated areas of ecological significance through the prioritisation of local and regional biodiversity corridors. Where connectivity cannot be maintained or improved, consideration be given to creating ecological stepping stones for isolated areas.

REPORT AUTHORISATIONS

Report of: Renee Campbell, Manager Environmental Strategy and Planning
Authorised by: Andrew Carfield, Director Planning and Environment - Future City and Neighbourhoods

ATTACHMENTS

- 1 Site Locality Map and Current Zoning
- 2 Constraints Maps
- 3 Indicative Subdivision Plan
- 4 Vegetation Management Plan
- 5 Proposed Zoning, Minimum Lot Size, Floor Space Ratio and Natural Resource Sensitivity - Biodiversity Maps
- 6 Summary of Submissions
- 7 Isolated Environmental Lots

BACKGROUND

Location

In September 2015 a Planning Proposal request was submitted by Plannex Environmental Planning on behalf of the landowner for Lot 101 DP 825516 Farmborough Road, Farmborough Heights which seeks to facilitate the subdivision of the land into approximately 30 large residential lots, together with the dedication of land with funding to Council to re-vegetate and protect in perpetuity the riparian corridor in the north-west of the site and other features of environmental significance on site. The site comprises 18.5 hectares and is currently zoned RU2 Rural Landscape. It is bounded by land zoned R2 Low Density Residential in the east, E3 Environmental Management in the north, and RU2 Rural Landscape in the south and west (Attachment 1).

Farmborough Heights to Mt Kembla Concept Plan

This site was considered in the Farmborough Heights to Mt Kembla Concept Plan that was endorsed by Council (9 December 2013) and the NSW Department of Planning (20 March 2014). The Concept Plan provides a strategic framework to guide future development potential for this area in the context of active conservation. The key objectives of the Concept Plan were to provide certainty for the community by identifying land suitable for conservation and potential development within the study area. Additionally, the Concept Plan provides the opportunity to implement a number of mechanisms that will conserve and manage the environmental attributes of the foothills of the Illawarra Escarpment.

The focus of the development of the Concept Plan has been the long term management of the Illawarra Escarpment and the contribution that appropriately scaled and located residential development could make to conserving land of high ecological value, restoring degraded lands and providing an overall community benefit in terms of creating conservation opportunities. The Plan recognises that ongoing management of areas of high ecological value will be required in order to maintain or improve biodiversity values of the Illawarra Escarpment, and stipulates that any development is linked to the protection and enhancement of key identified environmental attributes.

The endorsed Concept Plan is importantly consistent with and complements the Illawarra Escarpment Strategic Management Plan (IESMP 2015) and the Illawarra Escarpment Land Use Review Strategy (IELURS 2007). Succinctly, the Management Plan and Review Strategy consider that limited development may be possible having regard to the environmental sensitivity of the receiving environment provided there are mechanisms in place to drive rehabilitation and restoration of the land and its surrounds. One of the principles of the IESMP is "recognition that the asset (the Escarpment) is in a degraded state and therefore continual improvement is required". The Concept Plan is also consistent with the objectives and targets of regional strategies including the Illawarra Biodiversity Strategy (2011) and the (then) Illawarra Regional Strategy 2006-31 (2007), with a focus on priority vegetation and important habitat corridors.

In developing the Concept Plan it was necessary for the consultant (GHD) to provide a high level estimate of potential dwellings as input into traffic and utilities modelling to assess the likely impact that

potential development might have on existing infrastructure and amenity. These estimates were used to develop a Concept Plan, with the GHD report clearly stating that these estimates did not constitute a guarantee of the estimated development potential nor a detailed subdivision plan. Additionally, it was acknowledged in the report to Council (13 December 2013) that the Strategic Planning Study conducted to inform the development of the Concept Plan included a number of high level investigations, and hence identified that more detailed site specific studies may produce some variations to the findings and associated recommendations contained in the Concept Plan. It was recommended that as new information and/or studies are completed in the future there may be the opportunity to revisit the Concept Plan recommendations, should amendments be justified. The role of the Concept Plan is to guide development in the area with individual Planning Proposals invited for specific land holdings, and updated and more detailed studies encouraged in this regard.

The endorsed Concept Plan identified potential to rezone this site at Farmborough Road Farmborough Heights to permit additional large lot residential development, subject to satisfying the accompanying Planning Principles and demonstration that an improved environmental outcome could be achieved for the land. The Concept Plan recommended an E4 Environmental Living zoning for the developable area (roughly half the area to have a minimum lot size of 5,000m² and half a minimum lot size of 2,000m²), which would enable approximately 25 lots/dwellings. An E2 Environmental Conservation zoning was recommended for the riparian corridor in the north-west of the site (containing approximately 6.2 hectares of Moist Box Red Gum Foothills Forest) and the south east corner (in recognition of stands of Illawarra Lowlands Grassy Woodland endangered ecological community – approximately 1.5 hectares). (Attachment 2). The Concept Plan identified the opportunity for the long term management, protection and enhancement of the riparian corridor in order to re-establish an east west biodiversity corridor.

Draft Planning Proposal request /development proposal

The development strategy seeks large lot residential development opportunity on land identified in the Concept Plan with little ecological value (areas dominated by cleared land, grazed areas and exotic vegetation), and proposes to undertake ecological conservation and rehabilitation works associated with the riparian corridor in the north-west of the site and other areas identified as containing environmental values (see Attachment 2 – Constraints Map).

The submitted draft Planning Proposal request is seeking a rezoning to the recommended E4 Environmental Living and E2 Environmental Conservation zoning. Consistent with the Concept Plan, a minimum lot size of 2,000m² is proposed adjacent existing residential development and 5,000m² lots are proposed for land in the west of the site, to provide a gradation of lot sizes toward the escarpment and to reflect potential geotechnical and bushfire constraints. The submitted draft Planning Proposal request would result in approximately 30 residential lots (21 at 2,000m² and 9 at 5,000m²) depending on further investigations and finalisation of a subdivision plan at the development application phase, and the conservation of 7.8 hectares of the site as four public reserve lots with funding provided (Attachment 3). Dedication of the E2 zoned parcels to Council and the timing of funding will be subject to further negotiations between Council and the land owner, and conditioned through the development application process.

The Office of Environment and Heritage (OEH) has identified that the subject site represents a strategically important linkage opportunity in the context of the foothills and escarpment, and strongly support a long term conservation outcome being achieved for the site through establishing the proposed conservation areas. The OEH supports public ownership with allocated funding as the preferred mechanism for the long term protection of conservation values, as this would secure the ongoing vegetation and habitat management and funding in perpetuity. A Vegetation Management Plan (February 2016) details the management and restoration efforts for the areas designated as conservation zones, with the intention of dedicating these areas (with funding) to Council for on-going management (Attachment 4). The VMP identifies an amount of \$370,000 to provide in perpetuity funding for on ground works (i.e. lump sum sitting in an interest bearing account).

On 27 June 2016, Council considered a report on the draft Planning Proposal request and resolved:

- 1 *A draft Planning Proposal be submitted to the NSW Department of Planning and Environment for Lot 101 DP 825516 Farmborough Road, Farmborough Heights, seeking a Gateway determination to:
 - a *rezone 5.3 hectares of the site from RU2 Rural Landscape to E4 Environmental Living with a Minimum Lot Size of 2,000m² and Floor Space Ratio of 0.3:1;*
 - b *rezone 5.4 hectares of the site from RU2 Rural Landscape to E4 Environmental Living zoning with a Minimum Lot Size of 5,000m² and Floor Space Ratio of 0.3:1;*
 - c *rezone the remainder of the site, including the northern riparian corridor (7.8 hectares) from RU2 Rural Landscape to E2 Environmental Conservation with a Minimum Lot Size of 39.99ha; and*
 - d *update the Natural Resource Sensitivity–Biodiversity Maps (Attachment 5).**
- 2 *The draft Planning Proposal also rezone Lot 1 DP 720058 and Lot 1 DP 821495 (the paper road) located to the north of Lot 101 DP 825516 from RU2 Rural Landscape to E3 Environmental Management, consistent with the adjoining Lot 106 DP 825517.*
3. *Council support the proposed dedication (with funding) of the area proposed to be rezoned E2 Environmental Conservation (7.8 hectares) to re-vegetate and protect in perpetuity the identified environmental values of the site.*
- 4 *Following the Gateway determination, the draft Planning Proposal be exhibited for 28 days.*
- 5 *The Department of Planning and Environment be requested to issue authority to the General Manager to exercise plan making delegations in accordance with Council's resolution of 26 November 2012.*
- 6 *A report be prepared which explores possible planning policies that reduce the creation of isolated lots of environmentally significant land separated from larger areas of similar land.*

A favourable Gateway determination was subsequently received on 11 July 2016 and the draft Planning Proposal was exhibited between 29 August and 27 September 2016.

PROPOSAL

The purpose of the draft Planning Proposal request is to facilitate a development strategy for the subject lands to allow large lot residential development on part of the site, together with the dedication of the remainder of the land to Council with funding to re-vegetate and protect in perpetuity the identified environmental values of the site, including rehabilitation of an important east-west corridor. This is in line with the Farmborough Heights to Mt Kembla Concept Plan and associated planning principles (2013), where any rezoning on a property must lead to an overall conservation improvement.

The development strategy for this site has the potential to support, rehabilitate and improve the following important environmental functions of the riparian corridor:

- providing a diversity of fauna and flora habitat resources;
- providing connectivity between wildlife habitats;
- providing bed and bank stability and reducing bank and channel erosion;
- protecting water quality by trapping sediment, nutrients and other contaminants; and
- conveying flood flows and controlling the direction of flood flows.

A site specific restoration strategy will be developed by Council's natural resources staff to provide guidance on a range of standard and other management actions to improve biodiversity values on site. Council's natural resources staff have conducted a number of site visits to confirm the vegetation communities and provide feedback on an appropriate plan for on-going conservation management. Standard management actions will include:

- weed control of noxious and environmental weed species;
- revegetation to restore native vegetation cover over areas of cleared and disturbed pasture;
- supplementary planting in areas of sparse native vegetation cover, to supplement natural regeneration and provide weed suppression;
- implementation of fire management regime that is designed to provide improved ecological function;
- sediment and erosion controls;
- vertebrate pest management; and
- maintenance of natural flow regimes in the riparian zone.

Depending on the site conditions, further assessment may identify additional management actions to those highlighted above to contribute to the improvement of biodiversity values. In addition to regeneration works, the natural resources staff also envisage the construction of defined walking tracks, to limit damage to bushland once the community begin using the reserves for bushwalking.

CONSULTATION AND COMMUNICATION

The draft Planning Proposal was exhibited between 29 August and 27 September 2016 following the Gateway determination. The Gateway determination required that the following public authorities be consulted:

- NSW Rural Fire Service
- NSW Office of Environment and Heritage
- Environment Protection Authority

The public exhibition was advertised through Council's website and in the Illawarra Mercury and Advertiser newspapers. Copies of the suite of documents were available for viewing on Council's website, in Wollongong and Unanderra libraries, and at Council's Customer Service Centre in the Administration Building, Wollongong. Adjoining property owners, public authorities, Neighbourhood Forum 5 and the Farmborough Heights Action Group were notified of the public exhibition by mail. The exhibition was included as an agenda item at the 24 February 2016 and 21 September 2016 meetings of the Escarpment Planning Reference Group (EPRG).

As a result of the public exhibition the website page received 210 views. A total of 26 submissions were received (through preliminary notification and public exhibition), as follows:

- Office of Environment and Heritage (OEH)
- NSW Rural Fire Service (RFS)
- Roads and Maritime Services (RMS)
- Sydney Water
- Environment Protection Authority (EPA)
- Jemena
- Community (20)

A summary of submissions is contained in Attachment 6. The key issues raised in submissions are discussed below.

Ecological value

The Office of Environment and Heritage (OEH) has identified that the subject site represents a strategically important linkage opportunity in the context of the foothills and escarpment, and strongly support a long term conservation outcome being achieved for the site through establishing the proposed

conservation areas. The OEH support public ownership with allocated funding as the preferred mechanism for the long term protection of conservation values. The Department of Primary Industries – Water also support public ownership of riparian corridors to ensure appropriate long term management of the function and health of these areas.

The focus of the Planning Proposal on riparian conservation to improve the ecological value of the watercourse is consistent with the Illawarra Biodiversity Strategy (2011), which highlights the degradation of native riparian vegetation and invasion of exotic weeds as major threats to biodiversity in the Illawarra, and identifies the importance of Council encouraging conservation and restoration efforts on private land in this regard. The value of landscape connectivity is well recognised by various state, regional and local policies, including Australia's Biodiversity Conservation Strategy (2009) and the Southern Rivers Catchment Action Plan (2013-23). Maintaining connectivity and enhancing existing connectivity within corridors by regenerating or revegetating missing links is also one of the three recommended approaches to managing biodiversity in the face of climate change.

The OEH recognises the potential for net conservation gains at this site as a result of the exhibited Planning Proposal.

Servicing

The Roads and Maritime Services (RMS) and Sydney Water raised no objections to the Planning Proposal. Sydney Water did note that preliminary investigation indicates that the existing water supply system can only service development up to a ground level of 144m AHD, and recommend the final subdivision road and lot configuration ensure that water service connections are not above this level. The Sydney Water submission advised that the proponent can lodge a feasibility application to obtain further advice to assist in planning the subdivision layout, and to ascertain the wastewater catchment boundaries.

As a result of the exhibition, twenty (20) submissions were received from the community. A key concern expressed in the community submissions centred on the pressure additional development would place on local infrastructure (particularly roads). Some 15 submissions sought a solution to existing problems along Farmborough Road before more development applications are approved. The narrowness of Farmborough Road and Panorama Drive was raised, with cars reportedly parking illegally on particularly narrow stretches identified as a key safety concern in the area. The Concept Plan identified sufficient capacity within the existing road network to accommodate the estimated traffic generation from the proposed development. Further traffic input will be sought at the development application phase.

Consistency with concept plan

Concern was also raised in relation to the indicative subdivision plan depicting 30 lots, in contrast to the estimation of 25 lots provided in the Concept Plan (14 submissions). In developing the Concept Plan it was necessary for the consultant (GHD) to provide a high level estimate of potential dwellings as input into traffic and utilities modelling to assess the likely impact that potential development might have on existing infrastructure and amenity. These estimates were used to develop a Concept Plan, with the GHD report clearly stating that these estimates did not constitute a guarantee of the estimated development potential nor a detailed subdivision plan. The subdivision plan provided as part of the Planning Proposal request is indicative only, based on high level investigations. Further investigations and consultation with relevant public authorities will be required at the development application phase, which will then inform the finalisation of a subdivision plan.

Whytes Gully Waste and Resource Centre

The proximity of the proposed development to Whytes Gully Waste and Resource Centre was raised as a concern in 14 submissions, in the context of odour complaints emanating from Whytes Gully and surrounding waste processing facilities. Submissions made reference to *"EPA Environmental Guideline: Solid Waste Landfill, Second Edition, 2016"*, requesting Council introduce an exclusion zone of 1000 metres for residential development.

The Farmborough Heights to Mt Kembla Concept Plan acknowledged the location of the Whytes Gully Waste and Resource Centre on the south west boundary of the Study Area, and the EIS Guidelines for

Landfilling (1996) recommendation that a distance of 250 metres should be observed between a residential zone and any proposed landfill. The Concept Plan acknowledged potential for impact on properties in close proximity to the site, and recommended that properties within 250 metres of Whytes Gully not be eligible for any further development for the next ten years, to be reviewed depending on operations at Whytes Gully.

New guidelines were introduced in 2016 by NSW EPA for solid waste landfills to provide guidance for the environmental management of landfills in NSW by specifying a series of 'Minimum Standards'. They involve a mix of design and construction techniques, effective site operations, monitoring and reporting protocols, and post-closure management. The NSW Environment Protection Authority (EPA) will use these guidelines to assess applications for new or varied landfill licences under the *Protection of the Environment Operations Act 1997* and to assess issues that arise during the operational and post-closure periods of landfills. The EPA clearly state that these guidelines do not contain express buffer distances or locational requirements, however do identify a number of recognised environmentally sensitive and inappropriate areas for landfilling, including (but not limited to) sites within 250 metres of an area of significant environmental or conservation value, residential zone or dwelling, school or hospital (referred to as "sensitive uses"). The guidelines state that, where practicable, buffers of at least 1000 metres should be provided to residential zones, schools and hospitals to protect the amenity of these land uses from odour, noise and other impacts in the case of large putrescible waste landfills (more than 50,000 tonnes of putrescible waste per year). Observance of such a buffer would be more likely to be achieved in the case of new operations being considered – in the case of Whytes Gully such a buffer is clearly not practicable, with approximately 400 existing properties in Farmborough Heights located within 1,000 metres of Whytes Gully.

The Whytes Gully Centre has operated at this site for 16 years, demonstrating compliance with the Environment Protection Licence (5862) issued by the EPA under the *Protection of the Environment Operations Act 1997*. All landfills must meet the requirements of the Act and the regulations made under that Act. The landfill occupier must not pollute waters in breach of section 120, cause air pollution in breach of sections 124, 125 or 126, or emit offensive odour in breach of section 129 of the Act. The Whytes Gully facility is in relatively close proximity to residential development, and Council does receive complaints about odour from the facility. Council has instigated specific odour mitigation and management strategies to address these issues.

The EPA was consulted as part of the exhibition and confirmed the Whytes Gully facility is regulated under an Environment Protection Licence (EPL 5862) and has been working with the Council to deliver substantial improvements in relation to odour control. The EPA submission also stated that the Facility existed before the publication of the new Guideline and therefore the 1000 metre buffer zone for large landfills mentioned within the publication is not achievable in this instance. The EPA submission acknowledged that, while a variety of measures have been implemented as part of the EPA licence to improve odour control, adverse odour impacts are unlikely to be completely avoided and there has been a history of community complaints in the vicinity of the Facility. Consideration could be given to a notation being placed on 149 certificates for properties within 1000m of the Whytes Gully industrial area, should Council consider this necessary.

Proposed Public Reserves

Some 13 submissions expressed concern that the four areas identified for public reserves and conservation were fragmented and suggested that an improved environmental outcome may be possible by linking these four areas, to provide a continuous corridor for wildlife and vegetation. The suggestion was also made that an easement buffer on the eastern boundary in the vicinity of the eastern gas pipeline may create the opportunity for walking tracks linking the conservation areas and usable spaces for the wider community to enjoy. It was requested that the final subdivision plan provide for adequate access opportunities to the proposed conservation areas. These comments relate to the Council resolution that possible planning policies should be explored to reduce the creation of isolated lots of environmentally significant land separated from larger areas of similar land (Attachment 7).

It should be noted that a series of non-connected habitat parcels as depicted in the draft Planning Proposal can result in a stepping stone corridor effect which is widely recognised as assisting to reduce

the effects of fragmentation, as animals use these areas to find shelter, food or to rest. Advice from the Environment team confirms that a combination of riparian revegetation efforts in the large area in the north-west, and a series of stepping stone patches of habitat, will enhance the wildlife corridor on site and provide functional connectivity, contributing to animals moving more freely to find food, shelter and opportunities to breed. Street tree planting as part of any future subdivision design will also enhance the stepping stone effect. Further consultation will occur with the proponent in this regard in the finalisation of the subdivision design, noting the desire of the wider community for the creation of usable spaces to appreciate and gain access to the areas being set aside for conservation.

Attachment 7 provides a report which explores existing planning policies and strategies that reduce the creation of isolated lots of environmentally significant land. The report identifies the existing policies and strategies available to Council to enhance environmental outcomes from urban development which prioritise the importance of biodiversity corridors as well as less connected habitat parcels which create a stepping stone effect. In addition to existing policies and strategies, it is proposed that clauses be added to the DCP to achieve this intent during the next review of Chapter B2 Residential Subdivision.

Concern was expressed in 6 submissions that the amount of money to be set aside for establishing and maintaining the public reserve areas will not be sufficient with assurance sought that a legally binding arrangement be in place for the proposed dedication before approval is given to rezone. A Vegetation Management Plan (VMP) was prepared (February 2016) which included calculations of indicative costings for the proposed dedication of vegetation areas using the BioBanking standard management actions and a modified version of the OEH BioBanking Trust Fund Deposit spreadsheet methodology, applying the in perpetuity funding model (as advised by OEH). An amount of \$370,000 has been identified to provide in perpetuity funding for the on ground works (i.e. a lump sum sitting in an interest bearing account). This report is seeking a Council resolution that the legal agreement for the transfer of E2 zoned land with funding to Council be finalised prior to development consent for subdivision.

Stormwater and Flooding

Concern about flooding, drainage and stormwater was raised in 7 submissions, with accounts of an already overloaded drainage system. Submissions were seeking assurance that the developer would be responsible for upgrading the system and ensuring any runoff created is retained on site. The internal Council referral recommended that approval of the proposed layout and potential building envelopes be deferred until the DA stage when sufficient information will be requested to address any flooding and stormwater constraints in line with Council's policies. The proponent would be responsible for an upgrade of the pavement and stormwater within Farmborough Road adjacent the site.

Bushfire Management

The NSW Rural Fire Service (RFS) raised no objection to the Planning Proposal, subject to any future subdivision layout achieving a realistic building footprint and associated APZ wholly within each individual lot, and observance of sections 4.1.3 (1) Public Access and 4.1.3 (2) Property Access in *Planning for Bush Fire Protection 2006* in the design of future roads and access handles for battle-axe blocks.

Bushfire management was raised as a concern in 6 submissions, with the suggestion made to link the development to Panorama Drive as an alternative escape route. The RFS will be further consulted at the development application phase to ensure compliance with "*Planning for Bush Fire Protection 2006*", safety of access/egress in the event of a fire and that any future subdivision layout can achieve a realistic building footprint and associated APZ wholly within each individual lot. The potential for an alternative access through Panorama Drive will be subject to further investigation.

Visual Impact

A visual impact assessment was requested in 8 submissions, with the need for an additional study addressing European heritage raised in 6 submissions. In developing the Concept Plan a Visual Impact and Landscape Character Assessment was undertaken to investigate landscape sensitivity and capacity to accommodate change. This assessment identified areas with potential to be developed, sites that are marginal and would be subject to significant visual assessment controls, and those sites that cannot be developed. The majority of this site (with the exception of the stand of EEC in the south east) was

identified with potential to be developed in this regard, noting that the Wollongong Development Control Plan 2009 requires the submission of a visual impact assessment report. It is recommended that the potential visual impact of a subdivision on the upper ridges should be carefully considered at the development application stage through a visual impact analysis with respect to the principles and strategies outlined in the IESMP, given the heritage significance of the Illawarra Escarpment and the cultural significance of Mt Kembla. Due to the site context, further Aboriginal and European heritage investigation may be required to inform the subdivision development application.

Eastern Gas Pipeline

Five submissions raised concern about the proximity of the proposed development to the Eastern Gas Pipeline, with an E2 zoned buffer suggested to avoid potential accidents by private land owners. Australian Standard AS 2885 requires a risk review of the pipeline operation in the event of the land around a pipeline being rezoned resulting in a change in land use and change in risk exposure to the pipeline. Jemena has indicated they will undertake a review of the proposed development in accordance with requirements of AS 2885 and that these findings shall be included in any subsequent development application to ensure that the Pipeline risks are appropriately considered and managed in the planning and design of the development and subdivision. Jemena will work with the developer to ensure that a Pipeline Safety Management Study is included as part of the submission of any development application, with appropriate buffers and building envelopes ascertained.

Graduation of Lot Size towards Illawarra Escarpment

Support for the proposal focused on the opportunity to purchase larger blocks and an appropriate scale of proposed development in relation to the surroundings. The potential for environmental preservation of part of the site and to create enhanced public access to the escarpment for recreational activities was also raised as a positive outcome of the Planning Proposal. The possibility of creating walking tracks, linking to the Mt Kembla ring track was raised in this context.

Other Issues

The table below summarises other issues raised during the public exhibition.

Submission		Comment
Concern about clearing of vegetation for siting of houses/roads and the 10/50 ruling in bushfire zones.	2 community submissions	E2 zoning and dedication to Council would avoid any unintended impacts from the 10/50 Code, as the Code cannot be applied on Council land without landowner's consent.
Object to loss of beauty of the escarpment	2 community submissions	Noted
Concern that wildlife will be killed by domestic cats/dogs or forced to move further up the escarpment.	1 community submission	Noted
Concern that our existing services will be impacted by development – breakages in existing line/decrease in water quality or pressure	1 community submission	Noted – to be assessed further at DA stage.
Concern that the Proposal will not deliver the necessary environmental outcomes under Community Title subdivision.	1 community submission	In response to OEH feedback it was agreed that the proposed E2 lands be dedicated to Council with funding as the most appropriate mechanism to ensure in perpetuity conservation
Concept Plan suggests zoning some land identified as Managed Open Space RE1 for public recreation – object to inclusion of additional E4 lands in the north which	2 community submissions	Areas identified in the Concept Plan for potential RE1 zoning were areas without ecological constraints but considered potentially subject to bushfire constraints,

Submission		Comment
Concept Plan shows as constrained by bushfire, significant vegetation, riparian corridors and unstable land.		and hence would function as APZs. Updated ecological assessment confirmed part of the site in the north was not constrained by significant vegetation (and therefore bushfire hence removing the need for an APZ buffer. Updated geotechnical studies also confirmed potential for development. These areas were subsequently mapped "potential developable area", with a minimum lot size of 5,000m ² - suitable building envelopes to be identified at the DA stage when further studies will be required.
Request covenant specifying rural type fencing	1 community submission	Noted – WDCP 2009 fencing controls are designed to allow for (among other constructions) resident privacy. Fences in bush fire prone areas are to be metal or masonry construction.
No compelling case made to show that the proposed rezoning will contribute to protect the escarpment or benefit the community.	4 community submissions	The indicative subdivision plan is consistent with the recommendations of the Concept Plan. The focus on the development of the Concept Plan is the long term management of the Illawarra Escarpment and the contribution that appropriately scaled and located residential development could make to conserving land of high ecological value, restoring degraded lands and providing an overall community benefit in terms of creating conservation opportunities. The OEH has recognised the potential for net conservation gains at this site as a result of the exhibited Planning Proposal.
Concern about appropriate access to the site and safe intersection sight distances.	2 community submissions	Safe access and egress will be addressed when finalising a subdivision plan at the development application phase.
Geotechnically constrained areas	2 community submissions	The geotechnical report submitted is considered sufficient to demonstrate that the rezoning is feasible from a geotechnical perspective. Further geotechnical advice will be required to support the engineering designs for any subdivision which follows a successful rezoning
Seeking reassurance that the water board road won't become an access road for the subdivision	1 community submission	Noted – not shown on indicative subdivision plan.
Concern about acoustic impacts of the Maldon Dombarton Rail Line	1 community submission	Chapter B1 of Wollongong Development Control Plan 2009 "Residential Development" considers controls for residential development near rail corridors at the development application phase.
Planning proposal does not include supporting documentation from relevant servicing authorities in relation to water, sewer, electricity and gas supply. Need	1 community submission	Input from relevant authorities sought during preliminary notification, and included in report to Council. Authorities notified of public exhibition for additional feedback.

Submission		Comment
for buffer for power easement		Potential easements will be taken into consideration in the finalisation of the subdivision plan.
Object to inclusion of paper road in Planning Proposal – seek to retain current RU2 zone to protect rights with respect to long term use of the land	Land owner	Noted – the Planning Proposal would result in an isolated 10 metre wide paper road zoned RU2 – it is recommended that the paper road be rezoned to E3 to be consistent with the adjoining Lot 106 DP 825517.
Support proposal – property values will increase, good opportunity to purchase larger blocks, not overdevelopment	1 community submission	Noted
Support enhanced public access to escarpment for recreational activities – suggest public trails linking public land to local streets and Mt Kembla Ring Track.	1 community submission	Noted

PLANNING AND POLICY IMPACT

This report contributes to the delivery of Wollongong 2022 objective *“The natural environment is protected and enhanced”* under the Community Goal *“We value and protect our environment”*. It specifically delivers on the following:

Community Strategic Plan	Delivery Program 2012-2017	Annual Plan 2016-17
Strategy	5 Year Action	Annual Deliverables
1.6.1 Our urban environment minimizes impacts on habitat and biodiversity and areas of high conservation value are protected	1.6.1.1 Review planning controls for environmentally sensitive locations	Continue to assess Planning Proposals against environmental strategies, including the Illawarra Biodiversity Strategy and the Illawarra Escarpment Strategic Management Plan.

The Farmborough Heights to Mt Kembla Strategic Planning Study and resultant Concept Plan were developed in the context of relevant legislation such as the Environmental Planning and Assessment Act 1979, the Threatened Species Conservation Act 1995, the Environment Protection and Biodiversity Conservation Act 1999, and the Noxious Weeds Act 1993. Importantly the Strategic Planning Study builds on existing Council policy and studies adopted by Council to guide development in the vicinity of the escarpment, to reflect constraints of the land and community sentiment, by providing updated information. These include the Illawarra Escarpment Strategic Management Plan (2015), Illawarra Escarpment Land Use Review Strategy (2007), Wollongong DCP 2009 and the Illawarra Biodiversity Strategy (2012). The Planning Proposal is consistent with the objectives and goals of the Illawarra Shoalhaven Regional Plan (2015).

CONCLUSION

The dedication to Council with funding of ecologically constrained land in association with large lot residential development will provide a suitable development outcome for this site whilst significantly enhancing the biodiversity values of an important riparian and habitat corridor in the north west and protecting the stands of EEC in the south east of the site. The Office of Environment and Heritage has acknowledged the potential for net conservation gains at this site and supports Council ownership via dedication with funding to ensure the long term conservation and protection of the biodiversity values on the site. It is recommended that Council resolve to finalise the Planning Proposal.

WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

city of innovation

Planning Proposal
Lot 101 Dp 825516
Lot 1 Dp 720058
Lot 1 Dp 821495
Farmborough Heights

Legend

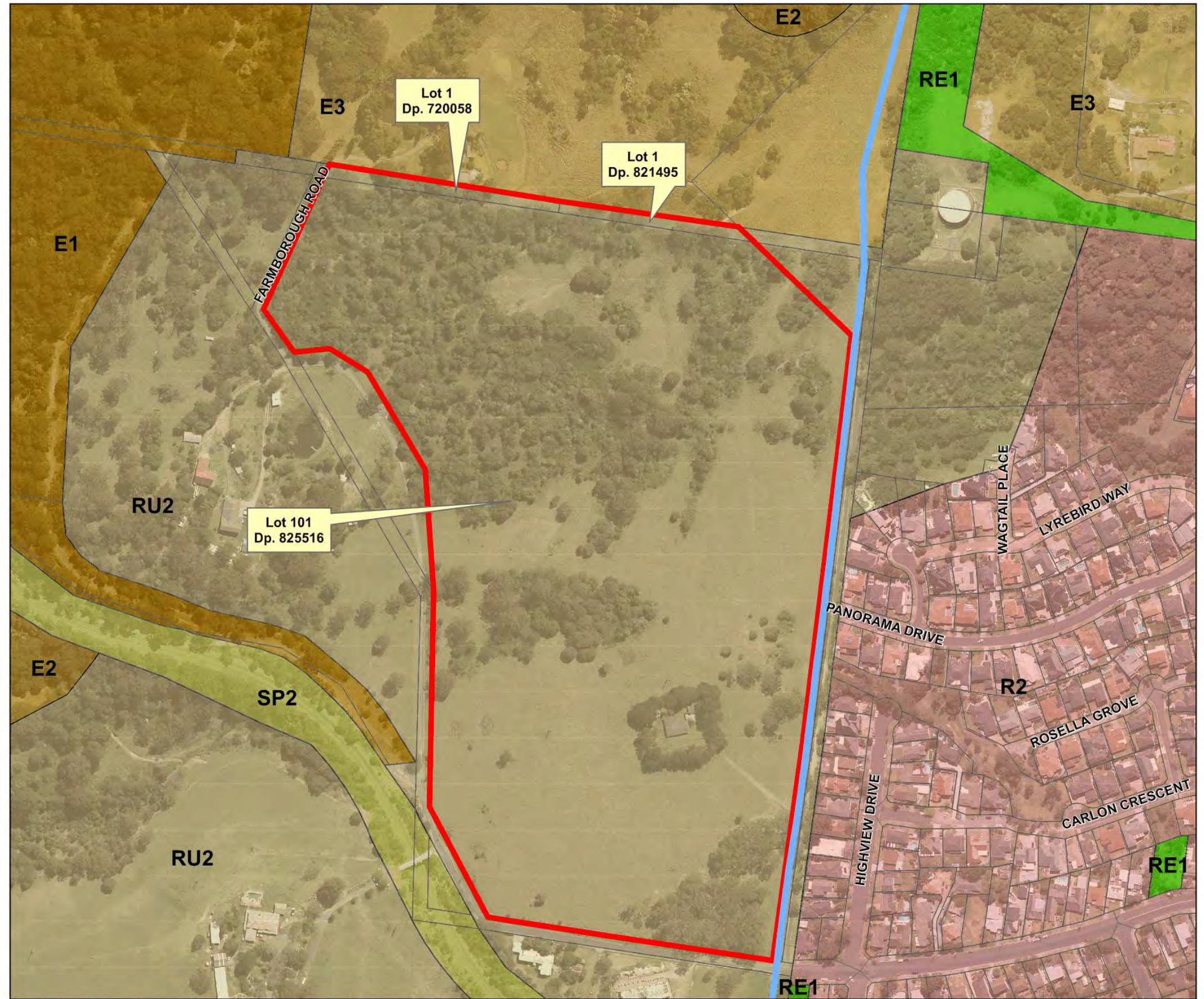
- Gas Pipeline
- Subject_Site
- E1 National Parks & Nature Reserves
- E2 Environmental Conservation
- E4 Environmental Management
- R2 Low Density Residential
- RE1 Public Recreation
- RU2 Rural Landscape
- SP2 Infrastructure

Cadastral
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Meters

Projection: GDA 1994
MGA Zone 56
Scale 1:3000 @ A3

Map Identification number:
Lot 101 Dp 825516_LEP2009.mxd



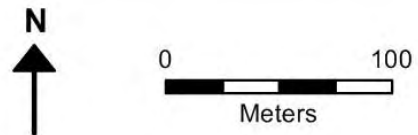
WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

Planning Proposal
Lot 101 Dp 825516 Farmborough Heights

Constraints Map

- Subject_Site
 - 2nd Stream Order
 - 3rd Stream Order
 - Gas Pipeline
 - Rail_Corridor
 - High Ecological_Constraint
- Vegetation Communities
- Coastal Grassy Red Gum Forest
Illawarra Lowlands Grassy Woodland EEC
 - Moist Box-Red Gum Foothills Forest
 - Whytes Gully 1000m Buffer

Cadastral
 Cadastral 19.04.16 © Wollongong City Council



Projection: GDA 1994
MGA Zone 56 Scale 1:6000 @ A3

Map Identification number:
Lot 101 Dp 825516_Constraints Map.mxd



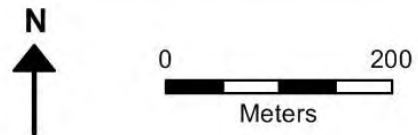
WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

Planning Proposal
Lot 101 Dp 825516 Farmborough Heights

Proximity to
Whytes Gully

- Subject_Site
- Whytes Gully 250m Buffer
- Whytes Gully 1000m Buffer

Cadastral
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Projection: GDA 1994
MGA Zone 56
Scale 1:6000 @ A3

Map Identification number:
Lot 101 Dp 825516_Whytes Gully Map.mxd



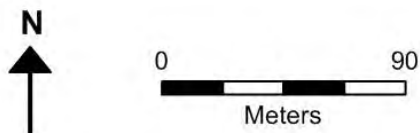
 **WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009**

Indicative Subdivision Plan
Lot 101 DP 825516
Farmborough Heights

Legend

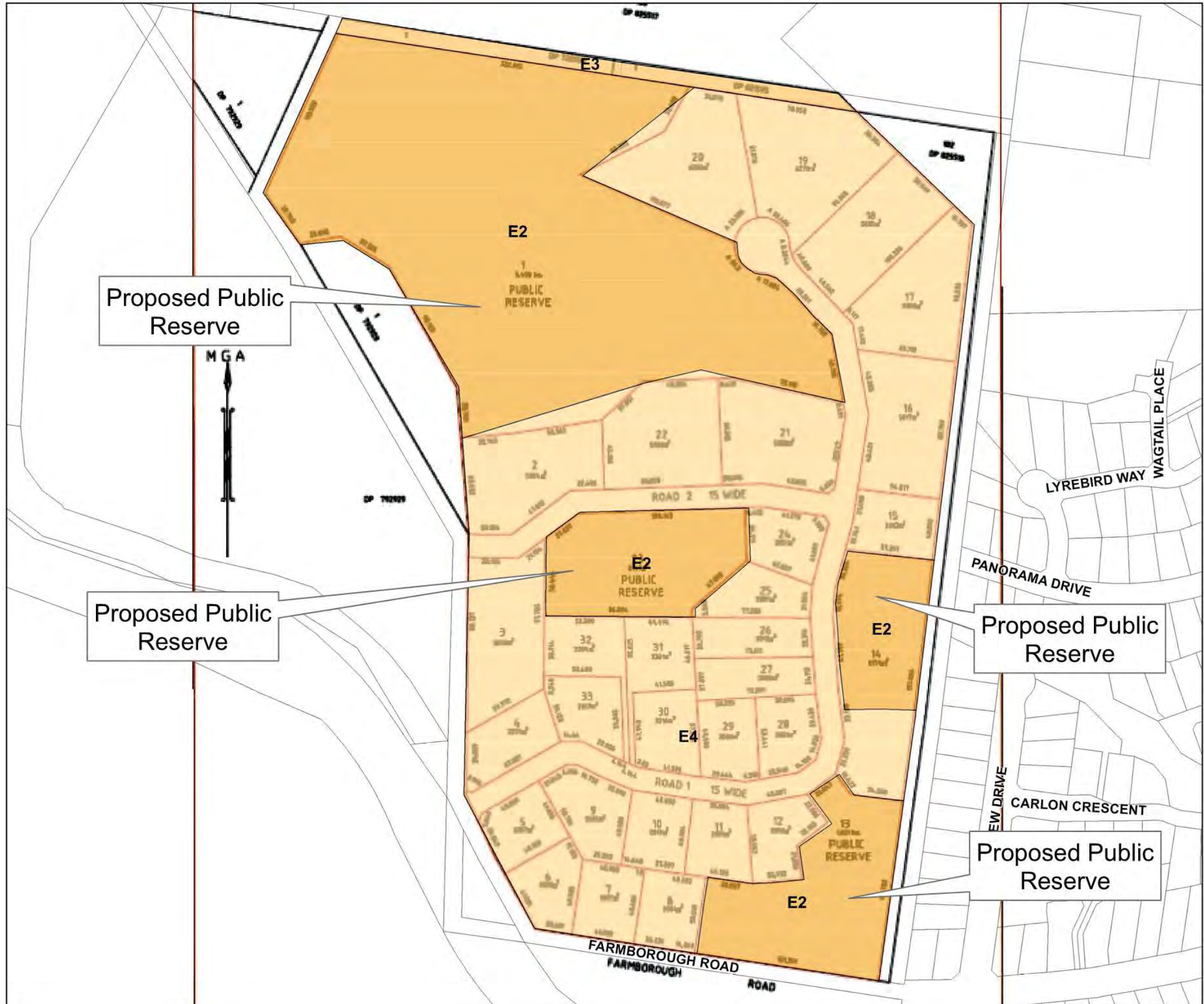
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living

Cadastral
Cadastral 07.06.16 © Wollongong City Council



Projection: GDA 1994
MGA Zone 56 Scale 1:2500 @ A3

Map Identification number:
Lot 101 Dp 825516_PP_Environ.mxd





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Vegetation Management Plan



Lot 101 // DP825516

Farmborough Road, Farmborough Heights, NSW

Proposed Lots 1 and 23, within a residential subdivision

Prepared for: Plannex, on behalf of Ali Yagmur

26 February 2016

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

PROJECT NUMBER	2015-032		
PROJECT NAME	Vegetation Management Plan		
PROJECT ADDRESS	Lot 101 // DP 825516; Farmborough Road, Farmborough Heights		
PREPARED FOR	Plannex, on behalf of Ali Yagmur		
AUTHOR/S	Eilysh Thompson, Gary Leonard and Lucas McKinnon		
REVIEW	Lucas McKinnon		
VERSION	Version	Draft/Final	Date to client
	1.0	Draft	21 February 2016
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**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

Glossary and abbreviations

ABBR./TERM	DESCRIPTION
*	Denotes exotic species
DA	Development Application
DBH	Diameter at breast height
DCP	Development Control Plan
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
LEP	Local Environment Plan
LGA	Local Government Area
masl	Metres above sea level
Mm/cm/m/km	Millimetres/centimetres/metres/kilometres
TEC	Threatened ecological community, listed as vulnerable, endangered or critically endangered under either the TSC and/or EPBC Acts
TPZ	Tree Protection Zone
TSC Act	NSW Threatened Species Conservation Act 1995
VMP	Vegetation Management Plan

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

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Vegetation Management Plan
Farmborough Road, Farmborough Heights

1. Introduction

1.1 Description of project and purpose of Vegetation Management Plan

This Vegetation Management Plan (VMP) has been prepared to accompany a Planning Proposal and Development Application (DA) for the proposed residential subdivision of Lot 101 // DP 825516, Farmborough Road, Farmborough Heights, NSW (**Figure 1.1**). This report provides management and restoration methods for the areas designated as conservation zones (proposed Lots 1 and 23), which will be dedicated and managed by Wollongong City Council (WCC). Performance criteria and monitoring indicators to assess vegetation management success are provided

This report provides approximate management costings using a modified version of the OEH Biobanking Trust Fund Deposit spreadsheet, which has removed the 'Recurring Costs' element (i.e. costs associated with Biobanking site, e.g. Annual reporting, 5 yearly review of Management Actions Template). This approach was undertaken following consultation with WCC (Brett Morrissey and Kathy Adams) and OEH (Jedda Lemmon and Daniel Robson), during a post-lodgement meeting for the Planning Proposal and subdivision DA.

1.2 Site description

1.2.1 Subject site and study area

The **study area** is defined as the whole of the proposed residential sub-division. The **subject site** includes two vegetation conservation zones, one comprising the vegetation in Lot 23 and the other in Lot 1. These vegetation conservation zones are the areas of the site that will be the subject of treatment in this VMP, and for the purposes of this report will cover the area to be reserved and managed for conservation within the proposed residential sub-division.

The study area is located approximately 9.3 kilometres (km) to the south-west of Wollongong CBD, and 1.7 kilometres (km) south-west of Unanderra Railway Station, in the Wollongong Local Government Area (LGA) (**Figure 1.2**).

A large proportion of the area proposed for subdivision development consists of grassland of both exotic and native species. These paddocks appear to be occasionally grazed with both cow, horse and deer scats found on site. The areas directly east and south of the subject site are rural residential with the area further upslope of the study area consisting of large swathes of intact Moist Coastal White Box Forest (MU9) (see NPWS 2003). There is one dwelling present within the study area, surrounded by a number of exotic trees including *Pinus radiata** (Radiata Pine) and *Cupressus sempervirens** (Mediterranean Cypress).

Several riparian corridors extend across the study area. The upper tributaries of Dapto Creek traverse the North Western parts of the study area and the headwaters of Gibsons Creek traverse the north-eastern extremities of the study area.

Regional vegetation mapping undertaken by NPWS (2003), has mapped three main vegetation types within the site. There are two patches of Coastal Grassy Red Gum Forest (MU23) mapped

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

in the south eastern portion of the subject site, with one other patch to the west. The vegetation patches further upslope in the western portion of the subject site have been classified as Acacia Scrub (MU56a). The remaining patches of vegetation toward the northern end of the subject site have been classified as Weeds and Exotics (MU56c). Field validation of this mapping associated with this study and an Ecological Constraints Assessment (Ecoplanning 2015) confirmed the occurrence of MU23, but a number of native species were recorded within the MU56 patches, including mature trees which form components of Moist Box-Red Gum Foothills Forest (MU 13) (**Figure 1.3**).

The topography of Lots 1 and 23 are gently to gradually inclined. The aspect of Lot 1 is westerly and the aspect of Lot 23 is westerly to south-westerly. Creeklines flow downslope through both Lots to a private access road, adjacent to the western boundary of the study area. Both creeklines enter culverts, to flow beneath this access road.

Regional-scale soil mapping of Soil Landscape Groups by Hazelton and Tille (1990) indicates the occurrence of soils derived from the Gwynneville Residual Group. Soils of the Gwynneville Group are derived from the Illawarra Coal Measures, and consist of "...resistant interbedded quartz-lithic sandstone, grey siltstone and claystone, carbonaceous claystone, clay and laminate..." (Hazelton and Tille 1990)

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Figure 1.1: Study Area, including Lots 1 and 23 (the subject site).

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Farmborough Road, Farmborough Heights

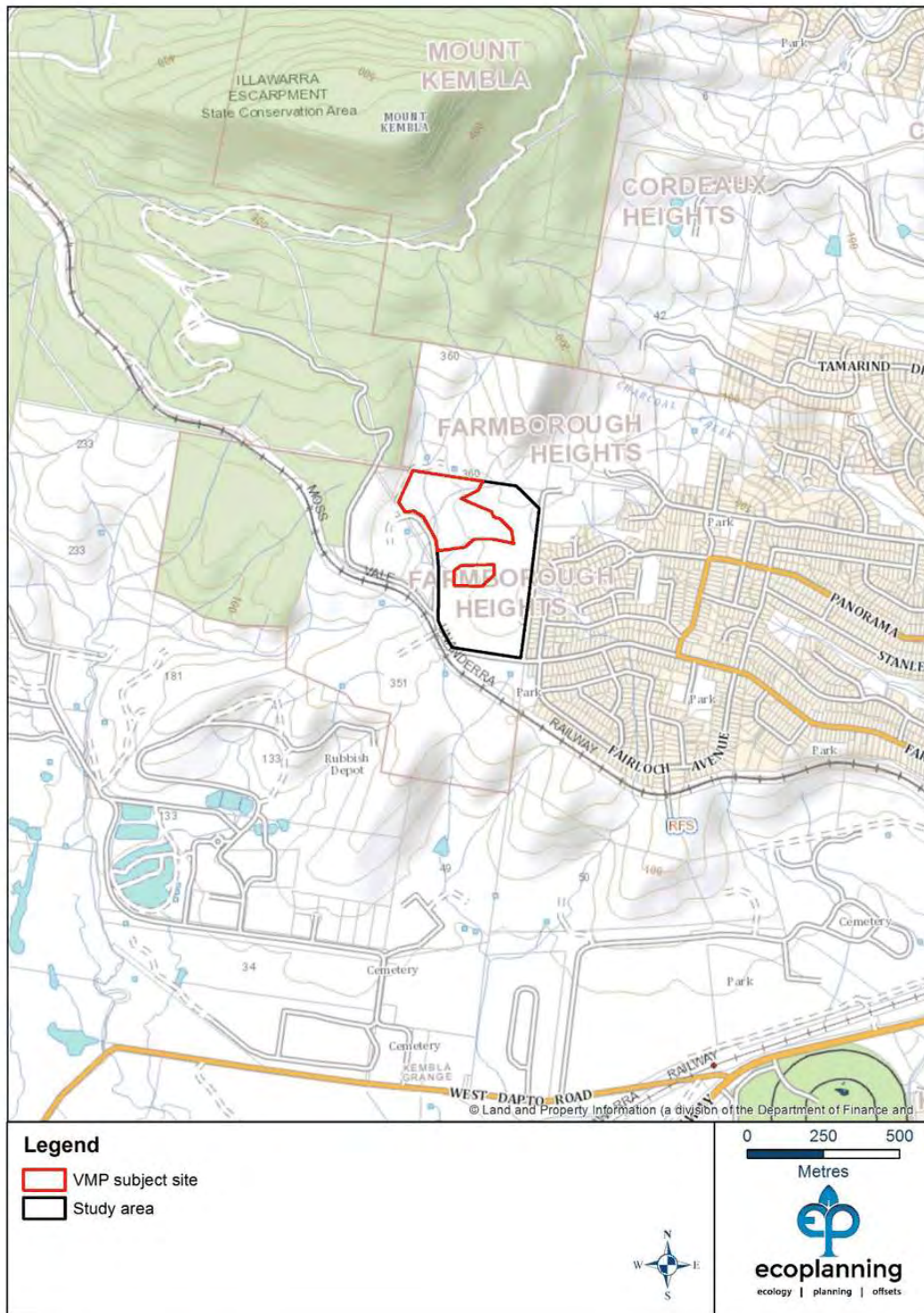


Figure 1.2: Regional context.

Vegetation Management Plan
Farmborough Road, Farmborough Heights



Figure 1.3: Vegetation in the study area following field validation of NPWS (2003) regional vegetation mapping.

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2. Site assessment

2.1 Methods

Flora surveys of the study area have been undertaken over a number of survey events to document native, exotic and introduced flora and fauna species. The initial survey of the study site was conducted by Lucas McKinnon (Principle Ecologist) and Gary Leonard (Arborist and Senior Botanist), 11 June 2015. During this survey all vegetation patches were assessed, to determine their location and extent, and to confirm their structure and floristics. Further searches were conducted to investigate the occurrence of threatened flora and fauna habitat on site and to confirm the approximate alignment of waterways.

A second survey that focused on the subject site was undertaken by Gary Leonard and Eilysh Thompson (Ecologist), 13 January 2016. This survey of the subject site focussed on identifying specific management issues, including levels of weed infestation, potential revegetation areas, proposed water infrastructure locations and specific trees designated for retention/removal.

Exotic species are identified as weeds within the subject site where they are:

- Weeds listed as noxious under the NSW *Noxious Weeds Act 1993*
- Weeds of National Significance (WoNS) (www.wons.org.au)
- Environmental weeds
- Not indigenous to the Wollongong LGA

Environmental weeds are those weeds not listed as either noxious or WoNS that also pose a serious threat to the environment. Non-indigenous species are those Australian native species that do not occur naturally in the Wollongong LGA, and are identified following the Flora of NSW (Harden 1993-2002) and updates provided in the PlantNET (RBGDT 2015).

2.1.1 Survey limitations

The flora survey aimed to record as many species on the subject site as possible. However, it is acknowledged that a greater number of species are likely to be detected if carried out over various seasons. Therefore, the species list collected is unlikely to be a complete inventory of species within the subject site. Nevertheless, the techniques used in this investigation are adequate to gather the data necessary to validate the plant communities and their condition onsite and to detect the occurrence of any threatened flora with the potential to occur in the available habitat.

Vegetation Management Plan
Farmborough Road, Farmborough Heights

2.2 Results

2.2.1 Plant communities

Mapping of vegetation by NPWS (2003), was found to be consistent with the results of previous flora surveys, although it is apparent that existing vegetation edges have increased, mainly as a result of self-recruitment of native species, especially *Maclura cochinchinensis* (Cockspur Thorn), *Rubus rosifolius* (Native Raspberry) and *Acacia melanoxylon* (Blackwood), as well as weed species, particularly *Lantana camara** (Lantana).

The two patches of vegetation in the south-eastern portion of the study area were confirmed to be Coastal Grassy Red Gum Forest (MU23), a component of the Illawarra Lowlands Grassy Woodland EEC. Although BES (2008) recorded one medium hollow in the corner patch, three medium hollows in two trees were recorded during the survey's (**Figure 2.1**). The understorey and midstorey of the EEC patches identified on site are degraded, most likely as a result of grazing and slashing. The canopy species representative of Coastal Grassy Red Gum Forest present within the subject site include, *Eucalyptus tereticornis* (Forest Red Gum) and *E. eugenioides* (Thin-leaved Stringybark). The occurrence of this patch is of interest because it probably occurs near the altitudinal limit for this vegetation type.

Patches of vegetation further north, especially to west (and including Lot 23) include floristic and structural features which are more consistent with the vegetation type described by NPWS (2003) as Moist Box-Red Gum Foothills Forest (MU13) (**Figure 2.1**). It is likely that this vegetation, in association with Lowland Dry Subtropical Rainforest (MU4) (NPWS 2002) along the creeklines, would have formed the original, pre-European vegetation cover over the higher parts of the subject site. The main canopy components of Moist Box-Red Gum Foothills Forest present at the subject site include, *E. tereticornis* and *E. quadrangulata* (Coastal Grey Box). The other species characteristic of this community, occurring within the vegetation patch included *Syzygium* (syn. *Acmena*) *smithii* (Lilly Pilly), *Pittosporum undulatum* (Brush Daphne) and *Streblus brunonianus* (Whalebone Tree). The main species characteristic of Lowland Dry Subtropical Rainforest present at the subject site included, *E. tereticornis*, *A. maidenii* (Maiden's Wattle), *Clerodendrum tomentosum* (Hairy Clerodendrum), *Callistemon salignus* (Willow Bottlebrush), *P. multiflorum* (Orange Thorn) and *Alectryon subcinereus* (native Quince).

The vegetation patches to the north-west (including Lot 1) appear to be an artefact of more recent regrowth, in comparison with the western patch, as there are (proportionately) less mature and over-mature Eucalypts and greater representation of weedy shrubs. BES (2008) has recorded one medium hollow in the western patch and two medium hollows in the north-western patch **Figure 2.1**.

The remaining vegetation on site consists of regenerating vegetation and mixed exotics and pasture grasses *Pennisetum clandestinum** (Kikuyu Grass), *Microlaena stipoides* subsp. *stipoides* (Weeping Grass) and planted trees including *P. radiata**, *C. sempervirens** and *E. cinerea* (Argyll Apple). The areas of each vegetation type on site are provided in **Table 2.1**.

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Farmborough Road, Farmborough Heights



Figure 2.1: Validated vegetation mapping and condition class.

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Farmborough Road, Farmborough Heights

Table 2.1: Area of each vegetation type on subject site.

Vegetation type	Area of study area (ha)	% of study area (%)	Area Lot 1	Area Lot 23
Coastal Grassy Red Gum Forest (MU23)- Illawarra lowlands grassy woodland (EEC)	1.2	6.3	0	0
Moist Box-Red Gum Foothills Forest (MU13)-regenerating vegetation with some mature trees	6.2	33.5	4.9	0.6
Regenerating vegetation and mixed exotics	1.4	7.4	0.2	0
Pasture grasses and planted trees	9.8	52.9	0.5	0.2
Total	18.5*	100%	5.6	0.8

* Note: rounding errors apply



Figure 2.2: Coastal Grassy Red Gum Woodland patch, located within proposed Lot 12.

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**



Figure 2.3: Northern edge of Moist Box – Red Gum Forest vegetation patch in Lot 23.



Figure 2.4: Southern edge of Moist Box – Red Gum Forest vegetation patch in Lot 1.

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Figure 2.5: Pine trees encircling the existing dwelling on Lot 27.



Figure 2.6: Hollow bearing tree. This specimen is located within proposed Lot 13.

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

2.2.2 Flora species

A total of 181 flora species were identified within the subject site during field investigations, of which 50 are exotic species (**Appendix A**). Three (3) noxious weeds listed under the NSW *Noxious Weeds Act 1993* are known within the study area (**Table 2.2**), these being *R. fruticosus** spp. aggr. (Blackberry), *L. camara** (Lantana) and *Senecio madagascariensis** (Fireweed) and were recorded in the subject site.

Table 2.2. Noxious weeds and Weeds of National Significance (WONS).

COMMON NAME	SCIENTIFIC NAME	WONS	CLASS	REQUIREMENT
Blackberry	<i>Rubus fruticosus*</i> spp. aggr.	Y	4	Locally controlled weed The growth of the plants must be managed in a manner that continuously inhibits the ability of the plant to spread and the plants must not be sold, propagated or knowingly distributed.
Lantana	<i>Lantana camara*</i>	Y	4	Locally controlled weed The growth of the plants must be managed in a manner that continuously inhibits the ability of the plant to spread and the plants must not be sold, propagated or knowingly distributed.
Fireweed	<i>Senecio madagascariensis*</i>	Y	4	Locally controlled weed The growth of the plants must be managed in a manner that continuously inhibits the ability of the plant to spread and the plants must not be sold, propagated or knowingly distributed.

Vegetation Management Plan
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3. Vegetation management and restoration

Vegetation management works outlined in this VMP should be implemented for the subject site and referred to if necessary for elsewhere in the study area. A suitably qualified and experienced bush regeneration contractor as per **Section 4.2** must be engaged to carry out vegetation management works.

3.1 Preliminary Works

3.1.1 Seed collection

Seed collection will be required to ensure endemic species are available for revegetation works; species identified for revegetation are outlined in **Appendix B**. All plantings should preferably be of local provenance stock collected from seed onsite however nurseries that supply endemic seedling stock, not horticultural varieties, may also be used to supplement the plantings.

Seed collection zones can extend within a radius of 3 km for groundcover, shrubs and trees and up to 10 km for grasses. The collection site should reflect the natural conditions that exist for the area being regenerated.

Record keeping of seed collection and planting locations is to be as per the Flora Bank guidelines (Mortlock 2000), the bush regeneration contractor is responsible for recording this information. A Section 132C licence under the NSW *National Parks and Wildlife Act 1974* will be required to undertake seed collection works.

3.1.2 Fencing

Protective fencing will be erected consisting of treated pine or hardwood posts and loose chain. Post should be installed with 10m spacing.

3.1.3 Signage

Signage in accordance with WCC standardised signs for conservation areas will be installed at each Lot.

3.2 Weed Management Techniques

Weed management will be carried out using primary and secondary weed control, revegetation and then ongoing maintenance. Weed control will include mechanical removal techniques, herbicide application and natural shading technique. Disturbance of the soil during the weed management process should be minimised at all times (see Buchanan 2000, Bradley 2002).

Primary weed control

Primary weed control is the initial removal of weed species. Mechanical removal techniques relevant to the weed being removed (Buchanan 2000; Bradley 2002; DPI 2015) should be used for all woody weeds and herbaceous plants. Exotic grasses can be slashed then spot-sprayed using a monocot-specific herbicide. Care must be taken to avoid spray drift into adjacent vegetated areas.

**Vegetation Management Plan
Farmborough Road, Farmborough Heights***Secondary weed control*

Secondary weed control involves follow-up weed control to remove seedlings that have emerged after primary control and treatment of any existing plants that reshoot. Any new weed infestation areas identified must also be treated.

Weed disposal

Weeds removed must be disposed of according to their disposal requirements being either mulched, solarised or removed off-site to a registered green waste disposal facility.

Revegetation

Plantings are required to supplement natural regeneration and self-recruitment as well as providing natural shading weed suppression of exotic pasture grasses such as, *Pennisetum clandestinum** (Kikuyu). Planting will take place in cleared areas of the site only.

Planting of tube-stock for trees and shrub species and Hiko or Viro cells for grasses and other groundcover species is the preferred method. Local provenance species are to be used for revegetation, as discussed above (**Section 3.1**). Planting should be done via a low impact method such as hand digging or hand auger. The holes dug for each tubestock should be at least 1.5x the width and 2x the depth of the rootball. Fertiliser and wetting agent should be added to each hole dug as per the label specifications. Revegetation plantings should follow primary weed control.

Plantings should be planned for spring or autumn when regular rainfall is naturally occurring however irrigation will be required if rainfall does not occur within a 5-day period. Irrigation should continue *in lieu* of rainfall for a period of 6 weeks or until plantings have taken, in order to improve seedling survival plan for plantings prior to small rainfall events.

It is likely that tree guards will be required, for protection against small grazing animals. If, however, deer are active in the area, there may be a need to install electric fencing.

Any mulch that is generated on the site as a result of tree removal should be used within vegetation management areas improve soil health.

Natural shading

Natural shading is the technique of promoting canopy growth over a broad area to reduce the UV light penetration reaching the groundcover species therefore impeding light dependant exotic flora growth. This technique is a long-term solution and generally needs to be implemented with a supplementary control measure.

Vegetation Management Plan
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3.3 Vegetation Management Zones

The subject site can be divided into two distinct vegetation management zones, each comprising specific vegetation management measures. The two zones include:

- Zone 1 – Lot 1
- Zone 2 – Lot 23

Revegetation planting for each zone should be selected from the planting schedule in **Appendix B** (summarised below) and follow the planting density guide outlined in **Table 3.1**.

Table 3.1: Planting density table for revegetation works

Zones / Treatment area	Area (m ²)	Density		Approx. total*
		Shrubs	Trees	
1. Lot 1	6,500	1 / 6 m ²	1 / 10 m ²	1,100 shrubs 650 trees
2. Lot 23	1,500	1 / 6 m ²	1 / 10 m ²	250 shrubs 150 trees

* Note these total are estimates and actual numbers may vary subject to site evaluation at time of implementation

Zone 1 – Moist Box-Red Gum Foothills Forest; Lot 1

Lot 1 which covers an area of approximately 5.6 ha, will be established as a conservation zone, to be eventually managed by Wollongong City Council. Lot 1 occupies the north-western corner of the study area and mainly includes vegetation patches of various regenerating ages, as well as some areas of grassland, in which regeneration may be inhibited by deer grazing. Over-mature trees are rare in this patch, although at least one hollow-bearing tree occurs. The suite of regenerating species is consistent with Moist Box-Red Gum Foothills Forest, although invasive exotic shrub, forb and climber species are also common. The edge in some areas mainly consists of invasive species, especially Lantana, Privet and Blackberry, while other sections of edge contain dense patches of typical indigenous pioneer shrub and climber species, especially Cockspur Thorn, Whalebone Tree and Brush Daphne. Weed management and revegetation techniques will be used to enhance the existing condition of this area to replicate the structure and diversity of areas of patches of Moist Box-Red Gum Foothills Forest adjacent to the study area.

A localised site assessment will first be undertaken to determine areas of exotic infestations and areas of high native resilience, specific management measures according to condition status will then be implemented. Areas of high weed infestation will undergo primary weed control using methods suitable to the weeds present. For large areas of exotic grasses, initial slashing and broad-scale herbicide application should be undertaken. Subsequently, areas of medium to low weed infestation should undergo primary weed control requiring a targeted approach to ensure native resilience is not compromised.

Following completion of primary weed control, revegetation plantings must be carried out at the density outlined in **Table 3.1** and with species selected from the planting schedule detailed in **Table 3.2** and/or **Appendix B**, to reflect natural community structure and provide a shrub

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

stratum allowing refuge and foraging habitat for small insectivorous birds. Revegetation plantings will be focused in the cleared areas and areas of high weed infestation to inhibit regrowth of exotic species and encourage recolonisation of native flora.

Regeneration within this zone will provide ongoing management of exotic grass species by providing natural shading as the community structure develops.

Secondary weed control and ongoing weed management will include targeted spot spraying and slashing of any broad scale exotic grass regrowth.

Table 3.2: Suggested planting schedule Zone 1 – Lot 1.

Genus	Species	Quantity
<i>Acacia</i>	<i>mearnsii</i>	35
<i>Acacia</i>	<i>implexa</i>	35
<i>Alphitonia</i>	<i>excelsa</i>	
<i>Eucalyptus</i>	<i>quadrangulata</i>	50
<i>Melaleuca</i>	<i>styphelioides</i>	50
<i>Eucalyptus</i>	<i>tereticornis</i>	50
<i>Backhousia</i>	<i>myrtifolia</i>	600
<i>Myrsine</i>	<i>variabilis</i>	600
<i>Syzygium</i>	<i>smithii</i>	2,000
<i>Gymnostachys</i>	<i>anceps</i>	2,000
<i>Elaeodendron</i>	<i>australe</i>	
<i>Clerodendrum</i>	<i>tomentosum</i>	
<i>Croton</i>	<i>verreauxii</i>	2,000
<i>Oplismenus</i>	<i>aemulus</i>	2,000

* Where unavailable (refer to **Appendix B** for appropriate species).

Zone 2 – Moist Box-Red Gum Foothills Forest; Lot 23

The vegetation in Lot 23 contains a similar suite of species to that in Lot 1, although there are, proportionately, a greater number of mature and over-mature trees. The vegetation follows a creekline and is more-or-less complete and continuous, following the full extent of Lot 23 and extending downslope into Lots 2 and 3. Weed species are common, both along the edges as well as in the creekline, but, in comparison with Lot 1, weed management and assisted revegetation will be less labour-intensive, with more obvious short-term responses.

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Table 3.3: Suggested planting schedule Zone 2 – Lot 23.

Genus	Species	Quantity
<i>Acacia</i>	<i>mearnsii</i>	35
<i>Acacia</i>	<i>implexa</i>	35
<i>Alphitonia</i>	<i>excelsa</i>	
<i>Eucalyptus</i>	<i>quadrangulata</i>	50
<i>Melaleuca</i>	<i>styhelioides</i>	50
<i>Eucalyptus</i>	<i>tereticornis</i>	50
<i>Backhousia</i>	<i>myrtifolia</i>	600
<i>Myrsine</i>	<i>variabilis</i>	600
<i>Syzygium</i>	<i>smithii</i>	2,000
<i>Gymnostachys</i>	<i>anceps</i>	2,000
<i>Elaeodendron</i>	<i>australe</i>	
<i>Clerodendrum</i>	<i>tomentosum</i>	
<i>Croton</i>	<i>verreauxii</i>	2,000
<i>Oplismenus</i>	<i>aemulus</i>	2,000

* Where unavailable (refer to **Appendix B** for appropriate species.

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Figure 3.1: Vegetation management zones.

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Vegetation management works will be carried out concurrently with civil construction works, therefore planning between the bush regeneration contractor and civil works supervisor must be undertaken. Planning must ensure that vegetation management works are programmed to follow the completion of the OSD and bio-retention area to ensure revegetation works are not compromised.

The civil works team will install environmental management controls across the site including exclusion zone fencing and erosion and sediment control. It is the responsibility of the bush regeneration contractor not to damage these controls and if any damage is observed or inadvertently caused it must be notified to the civil works supervisor immediately.

3.5 Maintenance

The maintenance phase must continue for in-perpetuity and include inspections of each vegetation management zone and then subsequent weed removal of any newly identified or re-occurring areas of weed growth. Inspections and site monitoring must occur every 3 months during winter and autumn and every 1-month during summer and spring. This schedule could be revised depending on performance criteria recorded.

Weed maintenance works will include:

- Removal and/or treatment of weeds; and
- Slashing of open exotic grass areas.

Re-vegetation maintenance works will include:

- Replacement of poorly growing or diseased individuals consistent with the prescribed planting;
- Management of insect damage, if necessary;
- Watering during dry periods.

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4. Performance criteria and monitoring

4.1 Performance criteria

The progress and compliance with the VMP will be monitored and reviewed annually. This process will be the responsibility of the bush regeneration contractor. The performance criteria listed in the table below are considered to be best practice and are not linked with any specific legislation. The bush regeneration contractor or WCC bush regeneration staff can adapt these criteria as required in response to the success of rehabilitation works. The performance criteria are outlined in **Table 4.1**.

Based on the success of the management works, further performance criteria may need to be developed for the maintenance phase.

Table 4.1. Revegetation performance monitoring criteria following end of establishment phase.

Treatment Zones	Year 1	Year 2	Year 3
All Zones	Commencement of all tasks outlined in the VMP or evidence of planning for their implementation.		
	A demonstrated increase in native cover and diversity and a demonstrated decrease in exotic cover and diversity by the end of the 3 rd year.		
	A minimum of 85% survival rate of all revegetation.		
Zone 1 – Lot 1	Proportion of exotic groundcover, grasses and understorey species cover no greater than 80%.	Proportion of exotic groundcover, grasses and understorey species cover no greater than 40%.	Proportion of exotic groundcover, grasses and understorey species cover no greater than 10%.
Zone 2 – Lot 23	Minimum native vegetation groundcover no less than 30% of zone.	Minimum native vegetation groundcover no less than 50% of zone.	Minimum native vegetation groundcover no less than 90% of zone.

4.2 Bush regeneration contractors

Suitably qualified and experienced bush regeneration contractors that are members of the Australian Association of Bush Regenerators or fulfil the membership criteria must undertake all vegetation management works. In addition to this, team leaders should hold a Certificate III in Conservation & Land Management or possess equivalent field experience and certification. The contractor should carry out best practice bush regeneration techniques as described by Buchanan (2000).

A flexible approach to this site is recommended as is consistent with adaptive management and allows the contractor to develop and build on site knowledge whilst implementing this VMP.

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4.3 Monitoring reports

The bush regeneration contractor will monitor the vegetation during the monitoring phase. The objective of the monitoring and reporting program is to record changes to the vegetation as a result of vegetation management works. Monitoring works will require liaison with the bush regeneration contractor and WCC.

Short and long term monitoring must be documented and compiled into an annual report to determine the effectiveness of the works undertaken. Site conditions should be recorded on the work plan template at the beginning and end of on-ground works. This data should be included in the annual report.

An example report is detailed in **Table 4.2**, the report should include:

- Works carried out, including weed species targeted and their location;
- An approximation of the time spent on each task;
- Any observations, such as the occurrence of new weed species;
- Rates of regeneration of native species;
- A description of any problems encountered and how they were overcome;
- A summary of how the site-specific objectives have been met (or not);
- Herbicide and other chemicals used, including quantity, dilution rate and other relevant information;
- Weed control mechanisms used during the period;
- Climatic conditions which may have influenced weed germination and growth;
- Performance criteria and success; and
- If required, maps of weed distribution and density.

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Table 4.2. Example monitoring report template

Date			
Name of Contractor:			
Hours worked on site since last monitoring report:			
Site Condition			
Zone			
Weed cover %			
Seedling survival %			
Planting numbers			
Herbicide used (Litres)			
Other			
Describe relevant weed management techniques:			
Describe problems; e.g. weed invasions, damage to planted material, etc.:			
Photographic evidence:			
Planned work before next monitoring report:			

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Appendix A: Flora inventory and revegetation species

Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
Acanthaceae	<i>Brunoniella</i>	<i>australis</i>	Blue Trumpet	Native	Herb	u	u
	<i>Pseuderanthemum</i>	<i>variabile</i>	Pastel Flower	Native	Herb	u	u
Adiantaceae	<i>Adiantum</i>	<i>aethiopicum</i>	Maidenhair Fern	Native	Fern	u	u
	<i>Adiantum</i>	<i>formosum</i>	Giant Maidenhair Fern	Native	Fern	u	o
	<i>Cheilanthes</i>	<i>sieberi</i>	Poison Rock Fern	Native	Fern	o	u
	<i>Pellaea</i>	<i>falcata</i>	Sickle Fern	Native	Fern	o	o
Amaranthaceae	<i>Alternanthera</i>	<i>denticulata</i>	Lesser Joyweed	Native	Herb		u
	<i>Nyssanthes</i>	<i>erecta</i>		Native	Herb		u
Apiaceae	<i>Centella</i>	<i>asiatica</i>	Indian Pennywort	Native	Herb	o	o
	<i>Hydrocotyle</i>	<i>peduncularis</i>	Pennywort	Native	Herb	o	u
Apocynaceae	<i>Araujia</i>	<i>sericifera</i>	Mothvine	Exotic	Vine	u	u
	<i>Parsonsia</i>	<i>straminea</i>	Common Silkpod	Native	Vine	u	u
Araceae	<i>Gymnostachys</i>	<i>anceps</i>	Settlers Flax	Native	Herb		o
Arecaceae	<i>Livistona</i>	<i>australis</i>	Cabbage Palm	Native	Tree	u	u
Asclepiadaceae	<i>Gomphocarpus</i>	<i>fruticosus</i>	Narrow-leaved Cotton Bush	Exotic	Shrub	u	u
	<i>Gomphocarpus</i>	<i>physocarpus</i>	Balloon Cotton Bush	Exotic	Shrub	u	u
	<i>Marsdenia</i>	<i>suaveolens</i>	Scented Marsdenia	Native	Shrub		u
	<i>Tylophora</i>	<i>barbata</i>	Bearded Tylophora	Native	Vine	u	u
Asparagaceae	<i>Asparagus</i>	<i>aethiopicus</i>	Asparagus Fern	Exotic	Shrub	u	u

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Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
	<i>Asparagus</i>	<i>plumosus</i>	Climbing Asparagus	Exotic	Climber	u	
Asteraceae	<i>Ageratina</i>	<i>adenophora</i>	Crofton Weed	Exotic	Shrub	o	o
	<i>Cirsium</i>	<i>vulgare</i>	Spear Thistle	Exotic	Herb	u	u
	<i>Conyza</i>	<i>bonariensis</i>	Flaxleaf Fleabane	Exotic	Herb	u	u
	<i>Conyza</i>	<i>sumatrensis</i>	Tall Fleabane	Exotic	Herb	u	u
	<i>Delairea</i>	<i>odorata</i>	Cape Ivy	Exotic	Herb	u	
	<i>Hypochaeris</i>	<i>radicata</i>	Cat'sear	Exotic	Herb	u	u
	<i>Senecio</i>	<i>madagascariensis</i>	Fireweed	Exotic	Herb	u	u
	<i>Tagetes</i>	<i>minuta</i>	Stinking Roger	Exotic	Herb	u	
	<i>Taraxacum</i>	<i>offinale</i>	Dandelion	Exotic	Herb	u	u
	<i>Bidens</i>	<i>pilosa</i>	Cobbler's Pegs	Native	Herb	u	u
	<i>Euchiton</i>	<i>sphaericus</i>	Cudweed	Native	Herb	u	u
	<i>Sigesbeckia</i>	<i>orientalis</i> subsp. <i>orientalis</i>	Indian Weed	Native	Herb	o	o
Bignoniaceae	<i>Pandorea</i>	<i>pandorana</i> subsp. <i>pandorana</i>	Wonga Wonga Vine	Native	Vine	u	u
Blechnaceae	<i>Doodia</i>	<i>aspera</i>	Rasp Fern	Native	Fern	u	u
Campanulaceae	<i>Wahlenbergia</i>	<i>gracilis</i>	Native Bluebell	Native	Herb	u	u
Caryophyllaceae	<i>Stellaria</i>	<i>pungens</i>	Prickly Starwort	Native	Herb	u	o
Casuarinaceae	<i>Casuarina</i>	<i>glauca</i>	Swamp Oak	Native	Tree		
Celastraceae	<i>Celastrus</i>	<i>australis</i>	Staff Vine	Native	Vine	u	u
	<i>Elaeodendron</i>	<i>australe</i>	Red-fruited Olive-plum	Native	Shrub/tree	u	o
Chenopodiaceae	<i>Einadia</i>	<i>hastata</i>	Saloop	Native	Herb	u	u
Clusiaceae	<i>Hypericum</i>	<i>gramineum</i>	Small St John's Wort	Native	Herb	u	u

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Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
Commelinaceae	<i>Tradescantia</i>	<i>fluminensis</i>	Wandering Jew	Exotic	Herb	o	o
	<i>Commelina</i>	<i>cyanea</i>	Scurvy Weed	Native	Herb	o	o
Convolvulaceae	<i>Dichondra</i>	<i>repens</i>	Kidney Weed	Native	Herb	o	o
Cupressaceae	<i>Cupressus</i>	<i>sempervirens</i>	Mediterranean Cypress	Exotic	Tree		
Cyperaceae	<i>Cyperus</i>	<i>eragrostis</i>		Exotic	Sedge	u	u
	<i>Carex</i>	<i>appressa</i>	Tall Sedge	Native	Sedge	o	o
	<i>Carex</i>	<i>longebrachiata</i>	Drooping Sedge	Native	Sedge	c	c
	<i>Cyathochaeta</i>	<i>diandra</i>	Sheath Rush	Native	Sedge		u
	<i>Cyperus</i>	<i>brevifolius</i>	Mullumbimby Couch	Native	Herb	u	u
	<i>Cyperus</i>	<i>gracilis</i>		Native	Herb		u
	<i>Gahnia</i>	<i>clarkei</i>	Tall Saw-sedge	Native	Sedge	u	u
Dennstaedtiaceae	<i>Pteridium</i>	<i>esculentum</i>	Bracken	Native	Fern	o	o
Dicksoniaceae	<i>Calochlaena</i>	<i>dubia</i>	Common Ground Fern	Native	Fern	u	o
Dilleniaceae	<i>Hibbertia</i>	<i>scandens</i>	Climbing Guinea Flower	Native	Vine	o	o
Ebenaceae	<i>Diospyros</i>	<i>australis</i>	Black Plum	Native	Shrub/tree	u	u
Euphorbiaceae sens. str.	<i>Claoxylon</i>	<i>australe</i>	Brittleweed	Native	Shrub/tree	u	o
Fabaceae - Caesalpinoideae	<i>Senna</i>	<i>pendula glabrata</i> var.	Cassia	Exotic	Shrub	u	u
Fabaceae - Faboideae	<i>Trifolium</i>	<i>repens</i>	White Clover	Exotic	Herb	o	u
	<i>Desmodium</i>	<i>varians</i>	Desmodium	Native	Herb	u	u
	<i>Glycine</i>	<i>clandestina</i>	Twining Glycine	Native	Vine	u	u
	<i>Glycine</i>	<i>tabacina</i>	Variable Glycine	Native	Vine	u	u

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Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
	<i>Hardenbergia</i>	<i>violacea</i>	Purple Twining Pea	Native	Vine	u	u
Fabaceae - Mimosoideae	<i>Acacia</i>	<i>implexa</i>	Hickory	Native	Tree	o	o
	<i>Acacia</i>	<i>maidenii</i>	Maiden's Wattle	Native	Tree	c	c
	<i>Acacia</i>	<i>mearnsii</i>	Mearns' Wattle	Native	Tree	c	c
	<i>Acacia</i>	<i>melanoxylon</i>	Sickle Wattle	Native	Tree	c	c
Gentianaceae	<i>Centaurium</i>	<i>erythaea</i>	Centaury	Exotic	Herb	u	u
Geraniaceae	<i>Geranium</i>	<i>solanderi</i> var. <i>solanderi</i>	Australian Cranesbill	Native	Herb	u	u
	<i>Juncus</i>	<i>cognatus</i>		Exotic	Sedge	u	
Juncaceae	<i>Juncus</i>	<i>continuus</i>		Native	Sedge		u
	<i>Juncus</i>	<i>usitatus</i>	Common Rush	Native	Sedge	o	o
	Lamiaceae	<i>Clerodendrum</i>	<i>tomentosum</i>	Hairy Clerodendrum	Native	Shrub/tree	c
<i>Plectranthus</i>		<i>parviflorus</i>	Cockspur Flower	Native	Shrub	u	u
Lauraceae	<i>Cryptocarya</i>	<i>microneura</i>	Murrogun	Native	Tree	o	o
Lindsaeaceae	<i>Lindsaea</i>	<i>linearis</i>	Screw Fern	Native	Fern	u	u
Lobeliaceae	<i>Pratia</i>	<i>purpurascens</i>	White root	Native	Herb	o	o
Lomandraceae	<i>Lomandra</i>	<i>longifolia</i>	Spiny-headed Mat-rush	Native	Sedge	u	u
Loranthaceae	<i>Muellerina</i>	<i>eucalyptoides</i>		Native	Shrub		u
Malacea	<i>Cotoneaster</i>	<i>pannosus</i>		Exotic	Shrub	u	
Malvaceae sens lat.	<i>Malva</i>	<i>parviflora</i>	Small-flowered Mallow	Exotic	Herb	u	u
	<i>Modiola</i>	<i>caroliniana</i>	Red-flowered Mallow	Exotic	Herb	u	u
	<i>Sida</i>	<i>rhombifolia</i>	Paddy's Lucerne	Exotic	Shrub	o	o
	<i>Sida</i>	<i>corrugata</i>	Variable Sida	Native	Shrub	u	u

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Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
Meliaceae	<i>Melia</i>	<i>azedarach</i>	White Cedar	Native	Tree	o	o
Moraceae	<i>Morus</i>	<i>alba</i>	White Mulberry	Exotic	Shrub/tree	u	
	<i>Ficus</i>	<i>coronata</i>	Sandpaper Fig	Native	Shrub/tree	o	o
	<i>Maclura</i>	<i>cochinchinensis</i>	Cockspur Thorn	Native	Shrub	c	c
	<i>Streblus</i>	<i>brunonianus</i>	Whalebone Tree	Native	Shrub/tree	c	c
Myrtaceae	<i>Leptospermum</i>	<i>petersonii</i>	Lemon-scented Teatree	Native	Shrub/tree		
	<i>Acmena</i>	<i>smithii</i>	Lilly Pilly	Native	Shrub/tree	u	o
	<i>Callistemon</i>	<i>citrinus</i>	Crimson bottlebrush	Native	Shrub	u	
	<i>Callistemon</i>	<i>salignus</i>	Willow Bottlebrush	native	Shrub/tree	o	o
	<i>Eucalyptus</i>	<i>cinerea</i>	Argyle Apple	Native	Tree		
	<i>Eucalyptus</i>	<i>eugenioides</i>	Thin-leaved Stringybark	Native	Tree	u	o
	<i>Eucalyptus</i>	<i>quadrangulata</i>	Coast Grey Box	Native	Tree	o	c
	<i>Eucalyptus</i>	<i>tereticornis</i>	Forest Redgum	Native	Tree	c	c
	<i>Melaleuca</i>	<i>decora</i>		Native	Shrub/tree	o	u
	<i>Melaleuca</i>	<i>styphelioides</i>	Prickly-leaved Paperbark	Native	Shrub/tree	c	o
	<i>Syzygium</i>	<i>paniculatum</i>	Magenta Lillypilly	Native	Shrub/tree		
Ochnaceae	<i>Ochna</i>	<i>serrulata</i>	Mickey Mouse Plant	Exotic	Shrub	u	u
Oleaceae	<i>Ligustrum</i>	<i>lucidum</i>	Large-leaved Privet	Exotic	Shrub/tree	o	o
	<i>Ligustrum</i>	<i>sinense</i>	Small-leaved Privet	Exotic	Shrub/tree	o	o

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Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
	<i>Olea</i>	<i>europaea</i> subsp. <i>cuspidata</i>	African Olive	Exotic	Tree	u	u
	<i>Notelaea</i>	<i>longifolia</i> forma <i>intermedia</i>	Native Olive	Native	shrub/tree	u	u
	<i>Notelaea</i>	<i>longifolia</i> forma <i>longifolia</i>	Native Olive	Native	shrub/tree	u	o
	<i>Notelaea</i>	<i>venosa</i>	Smooth Native Olive	Native	Shrub/tree	u	u
Oxalidaceae	<i>Oxalis</i>	<i>corniculata</i>	Yellow Wood-sorrel	Exotic	Herb	u	u
	<i>Oxalis</i>	<i>perennans</i>		Native	Herb		u
Phormiaceae	<i>Dianella</i>	<i>caerulea</i> var. <i>producta</i>	Paroo Lily	Native	Herb	u	u
Phyllanthaceae	<i>Breynia</i>	<i>oblongifolia</i>	Coffee Bush	Native	Shrub	o	o
	<i>Glochidion</i>	<i>ferdinandi</i> var. <i>ferdinandi</i>	Smooth Cheesetree	Native	Shrub/tree	o	c
	<i>Phyllanthus</i>	<i>hirtellus</i>	Thyme Spurge	Native	Herb	o	o
Pinaceae	<i>Pinus</i>	<i>radiata</i>	Monterey Pine	Exotic	Tree		
Pittosporaceae	<i>Billardiera</i>	<i>scandens</i>	Blackthorn	Native	Shrub	u	u
	<i>Pittosporum</i>	<i>multiflorum</i>	Orange Thorn	Native	Shrub	o	o
	<i>Pittosporum</i>	<i>revolutum</i>	Rough-fruited Pittosporum	Native	Shrub	o	o
	<i>Pittosporum</i>	<i>undulatum</i>	Brush Daphne	Native	Shrub/tree	c	c
Plantaginaceae	<i>Plantago</i>	<i>lanceolata</i>	Lamb's Tongues	Exotic	Herb	u	u
Poaceae	<i>Axonopus</i>	<i>fissifolius</i>	Carpet Grass	Exotic	Grass	o	o
	<i>Bromus</i>	<i>catharticus</i>	Prairie Grass	Exotic	Grass	o	o
	<i>Digitaria</i>	<i>ciliaris</i>	Summer Grass	Exotic	Grass	u	u

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Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
	<i>Lolium</i>	<i>perenne</i>	Perennial Ryegrass	Exotic	Grass	u	u
	<i>Paspalum</i>	<i>dilatatum</i>	Paspalum	Exotic	Grass	c	o
	<i>Pennisetum</i>	<i>clandestinum</i>	Kikuyu Grass	Exotic	Grass	c	c
	<i>Setaria</i>	<i>gracilis</i>	Slender Pigeon Grass	Exotic	Grass	u	u
	<i>Anisopogon</i>	<i>avenaceus</i>	Oat Speargrass	Native	Grass	u	u
	<i>Aristida</i>	<i>ramosa</i>	Three-awn Spear-grass	Native	Grass	u	u
	<i>Bothriochloa</i>	<i>macra</i>	Redleg Grass	Native	Grass		u
	<i>Chloris</i>	<i>divaricata</i>	Windmill Grass	Native	Grass		u
	<i>Cynodon</i>	<i>dactylon</i>	Couch	Native	Grass	c	c
	<i>Dichelachne</i>	<i>micrantha</i>	Shorthair Plumegrass	Native	Grass	o	o
	<i>Digitaria</i>	<i>diffusa</i>	Summer Grass	Native	Grass		u
	<i>Echinopogon</i>	<i>caespitosus</i> var. <i>caespitosus</i>	Tufted Hedgehog Grass	Native	Grass	u	u
	<i>Echinopogon</i>	<i>ovatus</i>	Forest Hedgehog Grass	Native	Grass	u	u
	<i>Entolasia</i>	<i>stricta</i> var. B	Wiry Panic	Native	Grass	u	u
	<i>Eragrostis</i>	<i>brownii</i>	Brown's Lovegrass	Native	Grass	u	u
	<i>Eragrostis</i>	<i>leptostachya</i>	Paddock Lovegrass	Native	Grass	u	u
	<i>Imperata</i>	<i>cylindrica</i> var. <i>major</i>	Blady Grass	Native	Grass	o	o
	<i>Microlaena</i>	<i>stipoides</i> var. <i>stipoides</i>	Weeping Grass	Native	Grass	c	c
	<i>Oplismenus</i>	<i>aemulus</i>	Basket Grass	Native	Grass	c	c

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
	<i>Oplismenus</i>	<i>imbecillis</i>	Basket Grass	Native	Grass	o	o
	<i>Panicum</i>	<i>simile</i>	Two colour Panic	Native	Grass		u
	<i>Poa</i>	<i>affinis</i>	Proliferous Tussock Grass	Native	Grass		u
	<i>Poa</i>	<i>labillardieri</i> var. <i>labillardieri</i>	Tussock Grass	Native	Grass	u	u
	<i>Rytidosperma</i>	<i>tenuius</i>	Wallaby Grass	Native	Grass	u	u
	<i>Themeda</i>	<i>australis</i>	Kangaroo Grass	Native	Grass	u	u
Polygonaceae	<i>Rumex</i>	<i>crispus</i>	Curled Dock	Exotic	Herb	u	
	<i>Persicaria</i>	<i>decipiens</i>	Slender Knotweed	Native	Herb	u	
	<i>Rumex</i>	<i>brownii</i>	Swamp dock	Native	Herb	u	
Primulaceae	<i>Anagallis</i>	<i>arvensis</i>	Scarlet Pimpernel	Exotic	Herb	u	u
	<i>Myrsine</i>	<i>howittiana</i>	Brush Muttonwood	Native	Shrub/tree	u	o
	<i>Myrsine</i>	<i>variabilis</i>	Muttonwood	Native	Shrub/tree	u	u
Proteaceae	<i>Banksia</i>	<i>integrifolia</i>	Coast Banksia	Native	Tree		
Rhamnaceae	<i>Alphitonia</i>	<i>excelsa</i>	Red Ash	Native	Tree	u	o
Rosaceae	<i>Rubus</i>	<i>anglocandicans</i>	Blackberry	Exotic	Shrub	u	u
	<i>Rubus</i>	<i>moluccanus</i> var. <i>triloba</i>	Molucca bramble	Native	Shrub	o	o
	<i>Rubus</i>	<i>parvifolius</i>	Native Raspberry	Native	Shrub	u	u
	<i>Rubus</i>	<i>rosifolius</i>	Native Raspberry	Native	Shrub	u	u
Rubiaceae	<i>Asperula</i>	<i>conferta</i>	Common Woodruff	Native	Herb		u
	<i>Galium</i>	<i>binifolium</i>	Bedstraw	Native	Herb		u
	<i>Opercularia</i>	<i>diphylla</i>	Stinkweed	Native	Herb	u	u
Rutaceae	<i>Zieria</i>	<i>smithii</i>	Sandfly Zieria	Native	Shrub	u	u

**Vegetation Management Plan
Farmborough Road, Farmborough Heights**

Family	Genus	Species	Common Name	Native/Exotic	Type	Zone 1	Zone 2
Sapindaceae	<i>Alectryon</i>	<i>subcinereus</i>	Native Quince	Native	shrub/tree	u	o
Scrophulariaceae	<i>Veronica</i>	<i>plebeia</i>	Creeping Speedwell	Native	Herb	u	u
Smilacaceae	<i>Eustrephus</i>	<i>latifolius</i>	Wombat Berry	Native	Vine	o	o
	<i>Geitonoplesium</i>	<i>cymosum</i>	Scrambling Lily	Native	Vine	o	o
Solanaceae	<i>Solanum</i>	<i>mauritianum</i>	Wild Tobacco	Exotic	Shrub/tree	u	u
	<i>Solanum</i>	<i>nigrum</i>	Black-berry Nightshade	Exotic	Herb	u	u
	<i>Solanum</i>	<i>pseudocapsicum</i>	Jerusalem Cherry	Exotic	Shrub	u	u
	<i>Solanum</i>	<i>prinophyllum</i>	Forest Nightshade	Native	Herb	u	u
Thymelaeaceae	<i>Pimelea</i>	<i>linifolia</i> subsp. <i>linifolia</i>	Slender Rice-flower	Native	Herb	u	u
Verbenaceae	<i>Duranta</i>	<i>erecta</i>	Sky Flower	Exotic	Shrub		
	<i>Lantana</i>	<i>camara</i>	Lantana	Exotic	Shrub	o	o
	<i>Verbena</i>	<i>bonariensis</i>	Purple top	Exotic	Herb	u	u
	<i>Verbena</i>	<i>rigida</i>	Veined Verbena	Exotic	Herb		u
Violaceae	<i>Melicytus</i>	<i>dentatus</i>	Tree Violet	Native	Shrub		u
	<i>Viola</i>	<i>hederacea</i>	Native Violet	Native	Herb	u	u
Vitaceae	<i>Cayratia</i>	<i>clematidea</i>	Slender Grape	Native	Vine	u	u
	<i>Cissus</i>	<i>antarctica</i>	Water Vine	Native	Vine		u

WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

Planning Proposal = Floor Space Ratio

Lot 101 Dp 825516

Lot 1 Dp 720058

Lot 1 Dp 821495

Farmborough Heights

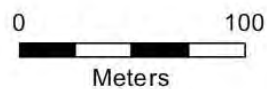
Maximum Floor Space Ratio (n:1)

A 0.3

Subject_Site

Cadastral

Cadastral 18.04.16 © Wollongong City Council



Projection: GDA 1994
MGA Zone 56

Scale 1:3000 @ A3

Map Identification number:
Lot 101 Dp 825516_PP_FSR.mxd



WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009


city of innovation


Planning Proposal - Minimum Lot Size
 Lot 101 Dp 825516
 Lot 1 Dp 720058
 Lot 1 Dp 821495
 Farmborough Heights

Minimum Lot Size (Sqm)

- U 1999
- W1 4999
- AB 39.99ha
- Subject_Site

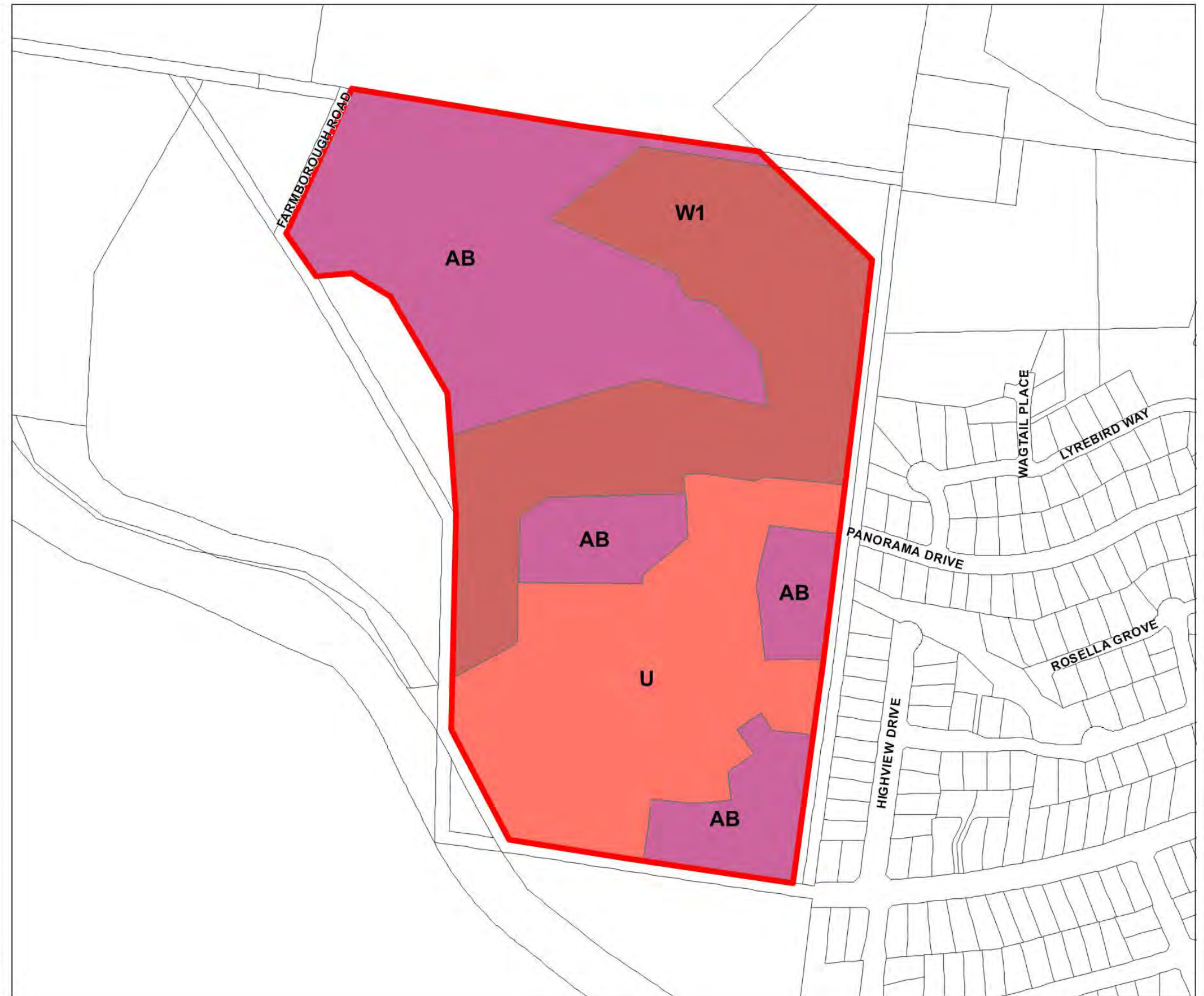
Cadastral
 Cadastre 18.04.16 © Wollongong City Council



N

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Projection: GDA 1994
 MGA Zone 56
 Scale 1:3000 @ A3

Map Identification number:
 Lot 101 Dp 825516_PP_MLZ.mxd



WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

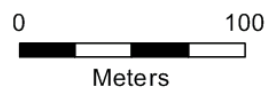
Planning Proposal
 Proposed Changes to
 Natural Resource Sensitivity Map
 Lot 101 Dp 825516
 Lot 1 Dp 720058
 Lot 1 Dp 821495
 Farmborough Heights

Legend

- Subject_Site
- Add
- Existing
- Remove
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living

Cadastral

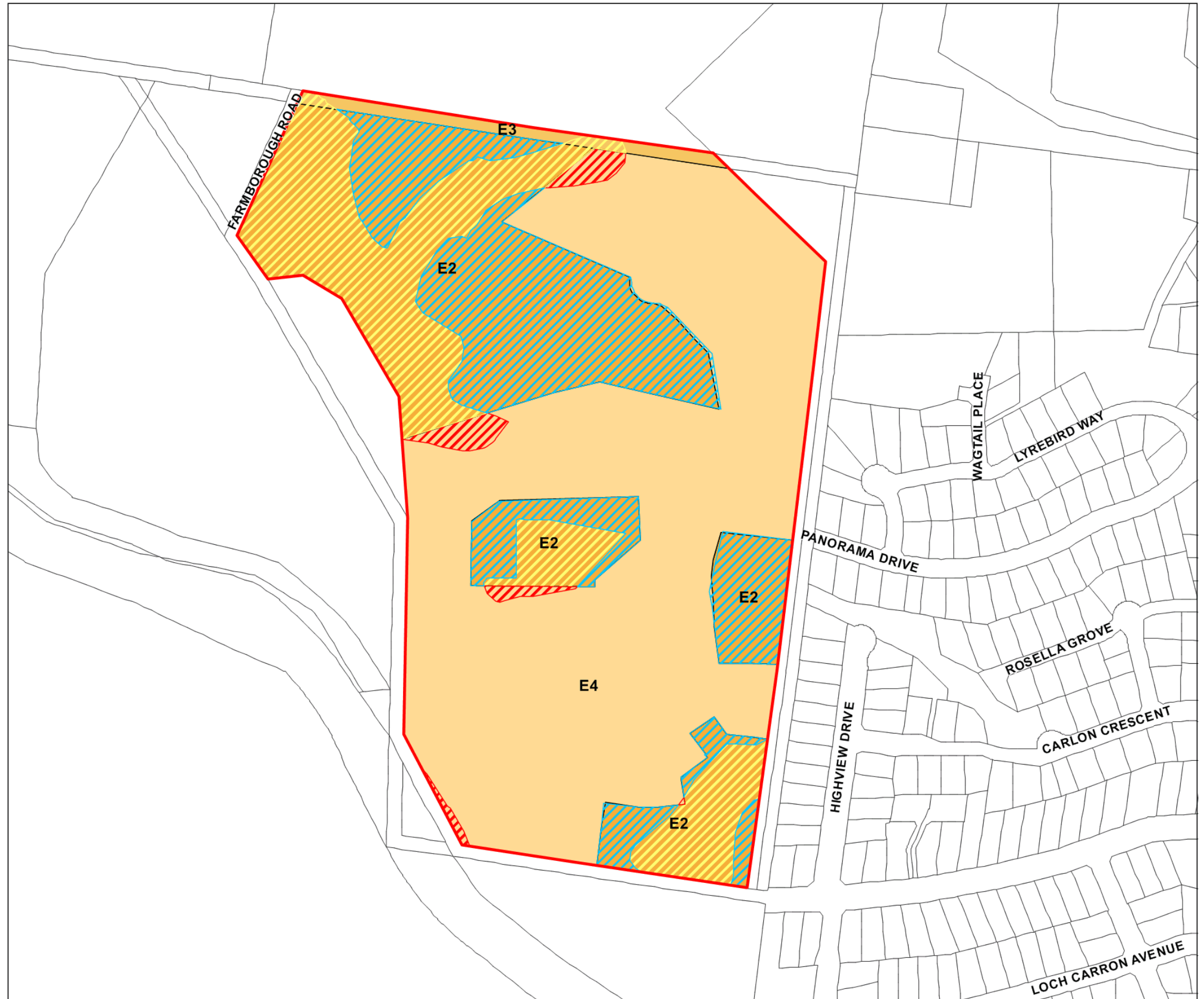
Cadastral 18.04.16 © Wollongong City Council



Projection: GDA 1994
 MGA Zone 56

Scale 1:3000 @ A3

Map Identification number:
 Lot 101 Dp 825516_PP_Zone Sig Veg Rip.mxd




WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

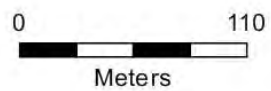
Planning Proposal = Zoning
Lot 101 Dp 825516
Lot 1 Dp 720058
Lot 1 Dp 821495
Farmborough Heights

Legend

-  Subject_Site
-  E2 Environmental Conservation
-  E3 Environmental Management
-  E4 Environmental Living

Cadastral

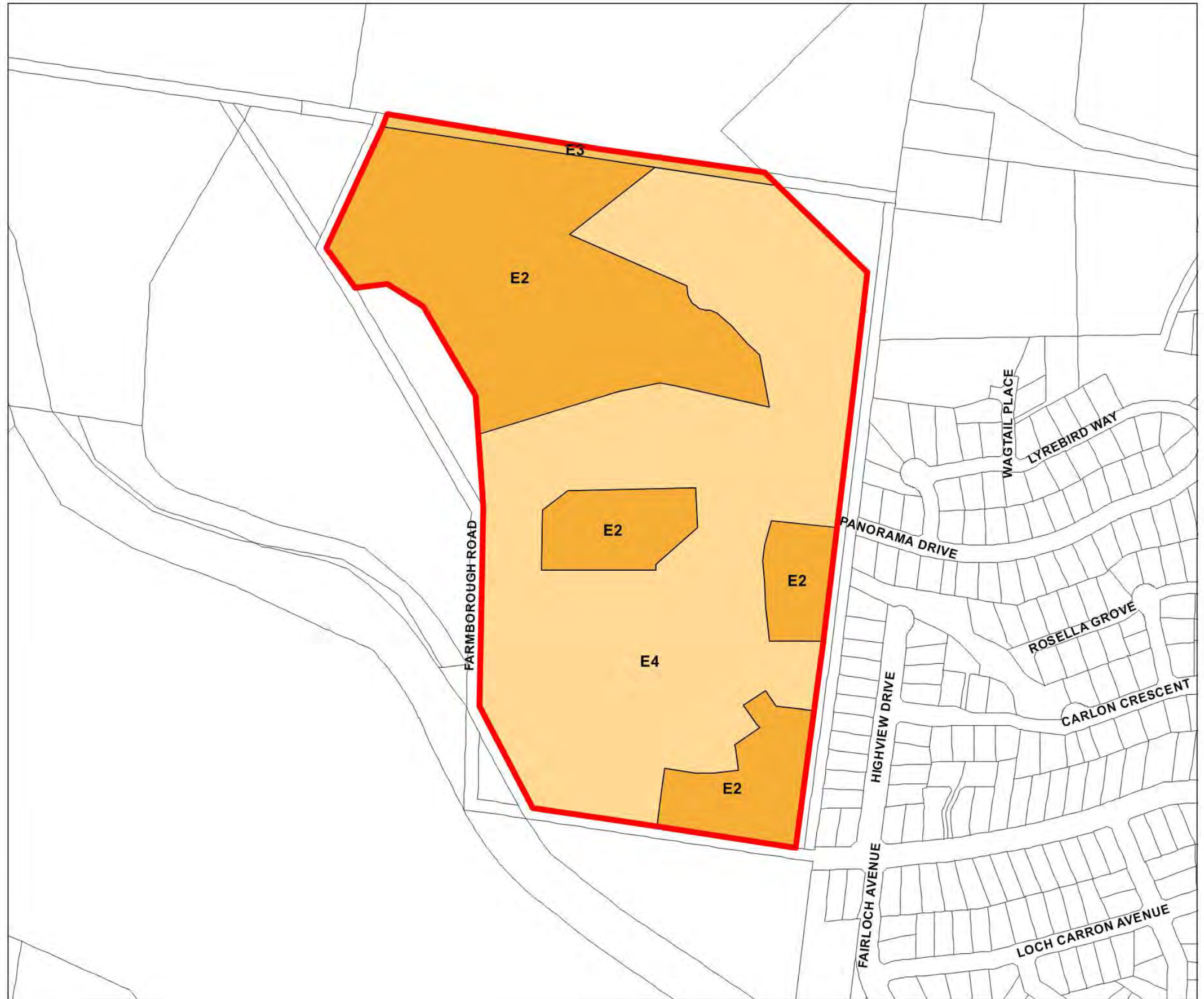
 Cadastral 18.04.16 © Wollongong City Council



Projection: GDA 1994
MGA Zone 56

Scale 1:3000 @ A3

Map Identification number:
Lot 101 Dp 825516_PP_Zoning.mxd



SUMMARY OF SUBMISSIONS

Community

	Comment
Farmborough Heights Action Group	<ul style="list-style-type: none"> • Appeal to WCC to reject the application in its current form • The Concept Plan produced by an independent consultant (GHD) provided a blueprint for development between Farmborough Heights and Mount Kembla that provided developers and residents with a clear understanding of what could and could not be done bearing in mind that any rezoning must lead to an overall conservation improvement for the escarpment • We cannot see how allowing a housing development and putting aside a few public reserve areas that mostly could not be built on anyway is enhancing the escarpment • Whytes Gully Solid Waste Refuse: new guidelines for solid waste landfills were released in 2016 which increased exclusion zones for a waste dump to 1000m – this makes Lot 101 DP 825516 fall into the recommended exclusion zone. A 10 year moratorium should apply. WCC has decided it is “impractical” because other residents are already within the zone and the guidelines are “really for new Waste Facilities”. For WCC to disregard guidelines as to exclusion zones from a waste dump are a blatant disregard for rules which have been set down to safeguard members of our community. WCC must make a stand, as it legally obliged to do so, and protect future residents by not permitting housing within the exclusion zone. WCC say that reports of odour have fallen and only 10 complaints were received in 2015 – most long term residents have given up complaining because nothing appears to have improved. Also when WCC outsourced the green waste processing the public was advised to ring the EPA. The odour complaints reported to the EPA have shown an increase in the last few years. WCC was fined twice in 2014 for odours emanating from Whytes Gully. • Need to comply with Concept Plan – the developers have applied for 30 blocks but the Concept Plan clearly says for this property “up to 25 lots”. • Traffic: a solution to the existing problems along Farmborough Road is needed before any more development approvals are approved – due to the double lines on Farmborough Road between Kotara Cres and Bristol Pde parking is illegal but on any day between 8 and 30 cars are parked illegally making it extremely dangerous to pass oncoming traffic. With 30 blocks proposed there would be potentially up to 60 extra vehicles using the road each way each day – Farmborough Road cannot handle any more traffic. Numerous approaches to WCC in the past 5 years (individual letters and Neighbourhood Forum) regarding the narrowness of Farmborough Road and Panorama Drive have been brushed aside. • Security fencing along Sydney Water owned road giving access to the reservoir needs fixing. • Flooding and drainage: the waterway that flows down the gully on the western side of Lot 101 and under the Sydney Water road and into an open and piped drain between the northern end of Highview Drive and Panorama Drive is not shown on any development plans and needs to be taken into account. When it rains there is a torrent of water flowing down there. This in turn ends up crossing Farmborough Road, flows down the creek behind the houses in Loch Carron Ave and then across Fairloch Ave just north of the southern end of Loch Carron Ave and over the waterfall in the bush behind the fire station down to Kembla Grange. This water is obviously overloaded and any further water added to the system needs to be taken into account and managed. • Our understanding is that to cover off on the “be seen to enhance the escarpment” clause developers are setting aside areas, usually sections of land that are restricted from building due to geodetic restraints or similar and offering to dedicate these sections for Public Reserve. Access to the Public reserve in the NW section is very restricted – most of the

	<p>border is adjoining properties with only a small access point near the roundabout. If we are serious about these so-called Public reserve areas which double as a corridor for native wildlife the four areas suggested should be joined. That might mean a reduction in the number of lots but the Concept Plan says “up to 25” and there are 30 listed. It is good practice for riparian corridors and hopefully public reserves to be joined in some way. The overriding factor from the Concept Plan is that escarpment land has to be enhanced - more needs to be done to accommodate these principles.</p> <ul style="list-style-type: none"> • Concern regarding the amount of money set aside for establishing and maintaining the public reserve areas
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • As a long term resident I am horrified at the extent of the proposed development. • The areas identified as public reserve should be joined to create an extensive corridor if there is any hope for the animals (190 bird species and many other native animals) to survive. • The COI stated that this development was inappropriate for so many reasons – it should stay the same. • The Concept Plan recommended up to 25 lots – why has this changed to about 30? Please don’t let it happen.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Concern about increase in traffic on Farmborough Road – it is a narrow road, and perhaps requires “No Standing” signs?
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • The COI findings state that “the provision of limited residential development must be considered within the context of active conservation and as a secondary outcome”. The Planning proposal is designed primarily to create residential lots rather than enhance the escarpment; instead of making conservation a principle aim, areas unsuitable for housing construction are set aside for environmental protection as a secondary outcome. • The applicants must be requested to provide a comprehensive study juxtaposing the scenario of leaving the area in a rural state against a scenario of opening it up to development – they must prove that their proposal truly enhances the natural beauty of the escarpment. • An Aboriginal archaeological assessment has been carried out – an additional study is requested addressing European heritage items – suggest that this area be declared a Heritage area to support the existing heritage values. The southern part of the Farmborough Heights area represents a unique period of settlement. • Do not agree that visual impact should be assessed at DA stage – a plan should be prepared now clearly showing where houses may or may not be built, to ascertain feasibility of development. Consideration should be given to viewpoints from Dapto and West Dapto, and a ridgeline running south-north across the property. • The latest EPA recommendations state that no residential development should take place within a radius of 1000m of a large putrescible waste landfill. This guideline should be respected. At the very least a 10 year moratorium ought to be imposed. Council could use the moratorium time to engage in serious studies about deleterious health effects caused by their waste dump. • Land set aside for environmental conservation is disjointed – it should be linked to create a natural corridor for flora and fauna. An easement along the Eastern Gas Pipeline could form part of the E2 area and this land brought into public ownership (parkland, community garden etc.). A walking track could be established through the easement to the water tank and from there to the Mount Kembla ring track. Request that a buffer for the Gas pipeline easement is shown on any proposed subdivision map and zoned E2.

	<ul style="list-style-type: none"> • Legally binding arrangements must be in place for the proposed land dedication to Council before any approval to rezone. Concern that the amount of \$370,000 to provide for costs of the proposed Vegetation Management Plan appears low – ought to be increased to make sure ratepayers are not going to finance part of the proposed development. • The Concept Plan stated that the land should be subdivided into 25 lots. Drawings submitted by the proponent show over 30. Council must make it clear that 25 dwellings is the maximum that may be created in this subdivision. • Already overloaded drainage system in the area – developers should be made responsible for upgrading the system downstream to cope with new loads/ensure any runoff created by the new roads and houses is retained on site. • Additional traffic from the development will exacerbate the current situation of illegal parking along Farmborough Road. The developer should contribute to the widening of Farmborough Road to make room for legal parking. • The internal roads of this subdivision should be linked up with Panorama Drive to establish a second escape route in case of bushfires. • A covenant should be applied to any rezoning demanding that only rural type fencing may be used to match the existing character of the area.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Object to Planning proposal • Proposal does not confirm to the stringent guidelines in the Concept Plan. The Concept Plan allowed up to 25 allotments – looks as though Council is prepared to approve 30 or more. It would seem that Council is prepared to allow development which will eventually have a negative environmental impact on the foothills leading to the escarpment – to satisfy a developer’s profitability • Appears that the areas set aside for reserves and corridors are merely patches that can’t be built on or where stands of trees should not be removed. These green patches should be linked and joined to allow for native fauna and flora – i.e. the escarpment land should be enhanced as the initial priority before any development approvals, not the other way round as is the case with the current proposal. • Parts of Farmborough Road are congested at peak times – the proposed development will exacerbate this. • Farmborough Road is dangerously narrow between Kotara Cres and Bristol Pde where there are double lines – vehicles park here which further narrows the road to a dangerous level. This situation needs to be permanently addressed before allowing for any more development. • Proximity to Whytes Gully Refuse Dump: the proposed development is within the new exclusion zone of 2000m for any new housing – over the years there have already been numerous complaints about insalubrious odours.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Object to Planning Proposal • Whytes Gully Waste Refuge – we have over the past 24 months made several complaints. Based on the smells we experience at times, it would be a terrible error to allow more homes to be built even closer to it • Farmborough Road and Panorama are already crowded. Farmborough Road requires cars to cross over double lines to navigate up and down it when cars are parked on the side of the road • Concern about drainage and flooding – we have had to call Council in the past to ask for drains to be cleared due to flooding.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Consideration should be given to the existing gas pipe line running parallel to the Sydney Water service road – better to consider a public reserve, minimum 20 metres in order to avoid potential accidents by private land owners. • Like to know who will be responsible in the event of an accident with the gas pipeline.

<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Object to Planning proposal. • The proposed rezoning will allow for subdivision creating approximately 31 lots – this proposal exceeds the recommendation of the Concept Plan, being 25 lots • Areas proposed for E2 are disjointed – these areas should be considered as riparian corridors in which case connectivity between the sites is highly desirable from an environmental management perspective. By proposing minimal and disjointed areas for environmental protection, the planning proposal does not reflect the principles of escarpment conservation nor is it consistent with environmental and conservation findings of the Concept Plan – no proposed connectivity between the areas identified for conservation. • Concept plan suggests zoning some of the subject land RE1 Managed Open Space – the dedication of land zoned RE1 would provide for additional public recreational land/open space • Subject lot lies within the 1000m residential exclusion zone to Whytes Gully Waste Depot – the fact that previously established dwellings lie within the updated exclusion zone should not set a precedence to allow for further development within the identified zone. • Consideration needs to be given to appropriate access to the subject site prior to determination of the planning proposal – the proposed southern access is located at the crest of a hill and would require excavation and stabilisation of the batter slope adjoining the northern side of Farmborough Road – questionable whether the appropriate safe intersection sight distance to this intersection will be achieved. The proposed northern access shows connectivity to an adjoining private access, rather than Farmborough Road – questions if appropriate locations for the intersections of the loop road with Farmborough Road can be achieved. • Question traffic modelling findings for Concept Plan – onsite observation and calibration of queue lengths may not have been considered • Recognised that development of the site may be able to be achieved while supporting and enhancing the environmental values of the escarpment, however the planning proposal encourages over development of the site – request a more environmentally sensitive solution for the site.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Concern about 30 dwellings – it was agreed in the Concept Plan that it would not be any more than 25 dwellings. • New guidelines now make an exclusion zone for a waste dump 1000m, however Council has decided it's impractical because other residents are already within the zone and the guidelines are really for new Waste Facilities. WCC also reports 10 odour complaints in 2015. We are new to the area but it is our understanding that most residents who have lived in the area for a long time have given up complaining because nothing appears to have improved – it is absurd to assume that the problem has somehow resolved itself just because people have grown tired of complaining in vain. The odour complaints reported to EPA have shown an increase in the last few years not a decrease as WCC reports. • Any development must enhance the escarpment – this requirement has seen the developers set aside areas (usually sections of land that they are restricted from building on) and offering to dedicate these sections for public reserves. It would be great to see some clear land set aside – it is good practice for Riparian Corridors and public reserves to be joined in some way. My family and many others would be grateful to see this happen – creating usable public reserves for children to safely enjoy. Joining the proposed public reserves behind Highview Drive would go a long way to enhancing the escarpment for local residents.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Concerned that the proposal will have a detrimental effect on the environment and amenity of local residents – the proposal will not contribute to the preservation of the escarpment or provide any benefit to the community at large.

	<ul style="list-style-type: none"> • No compelling case made to show that the proposed rezoning will contribute to protect the escarpment • Current rural classification enhances the European heritage value of heritage listed properties nearby • Proposed development contravenes the latest EPA regulations which state that no residential properties should be within 1000m of a putrescible waste dump – Council should impose a 10 years moratorium on any development • Land set aside for environmental conservation should be linked to create a continuous corridor for wildlife and plants • Land on the eastern boundary should be declared an easement linking the conservation areas – that land could be used for communal purposes e.g. playground, community garden, a walking track linking up with the Mt Kembla ring track • Previous studies highlight the importance of avoiding any negative visual impact of developments on the escarpment – the current proposal is on a ridge and will be an eyesore • The proposed \$370,000 to maintain preservation areas in perpetuity is very low and should be doubled – the ratepayers should not have to subsidise private developers • The proposal shows more than 30 lots – the Concept Plan permits a maximum of 25 lots • The proposal will adversely affect Farmborough Road – the proponent should contribute financially to make Farmborough Road safe by providing parking on one side of the road • The internal roads of the subdivision should be linked to Panorama Drive to create an alternative exit in case of a bush fire • Need legally binding contract with the developers about land to be transferred to Council including associated financial contributions • Request opportunity to review documents before approval to subdivide given.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Concerned that the proposal will have a detrimental effect on the environment and amenity of local residents – the proposal will not contribute to the preservation of the escapement or provide any benefit to the community at large. • No compelling case made to show that the proposed rezoning will contribute to protect the escarpment • Current rural classification enhances the European heritage value of heritage listed properties nearby • Proposed development contravenes the latest EPA regulations which state that no residential properties should be within 1000m of a putrescible waste dump – Council should impose a 10 years moratorium on any development • Land set aside for environmental conservation should be linked to create a continuous corridor for wildlife and plants • Land on the eastern boundary should be declared an easement linking the conservation areas – that land could be used for communal purposes e.g. playground, community garden, a walking track linking up with the Mt Kembla ring track • Previous studies highlight the importance of avoiding any negative visual impact of developments on the escarpment – the current proposal is on a ridge and will be an eyesore • The proposed \$370,000 to maintain preservation areas in perpetuity is very low and should be doubled – the ratepayers should not have to subsidise private developers • The proposal shows more than 30 lots – the Concept Plan permits a maximum of 25 lots • The proposal will adversely affect Farmborough Road – the proponent should contribute financially to make Farmborough Road safe by providing parking on one side of the road • The internal roads of the subdivision should be linked to Panorama Drive to create an

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<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Concerned that the proposal will have a detrimental effect on the environment and amenity of local residents – the proposal will not contribute to the preservation of the escarpment or provide any benefit to the community at large. • No compelling case made to show that the proposed rezoning will contribute to protect the escarpment • Current rural classification enhances the European heritage value of heritage listed properties nearby • Proposed development contravenes the latest EPA regulations which state that no residential properties should be within 1000m of a putrescible waste dump – Council should impose a 10 years moratorium on any development • Land set aside for environmental conservation should be linked to create a continuous corridor for wildlife and plants • Land on the eastern boundary should be declared an easement linking the conservation areas – that land could be used for communal purposes e.g. playground, community garden, a walking track linking up with the Mt Kembla ring track • Previous studies highlight the importance of avoiding any negative visual impact of

	<p>developments on the escarpment – the current proposal is on a ridge and will be an eyesore</p> <ul style="list-style-type: none"> • The proposed \$370,000 to maintain preservation areas in perpetuity is very low and should be doubled – the ratepayers should not have to subsidise private developers • The proposal shows more than 30 lots – the Concept Plan permits a maximum of 25 lots • The proposal will adversely affect Farmborough Road – the proponent should contribute financially to make Farmborough Road safe by providing parking on one side of the road • The internal roads of the subdivision should be linked to Panorama Drive to create an alternative exit in case of a bush fire • Need legally binding contract with the developers about land to be transferred to Council including associated financial contributions • Request opportunity to review documents before approval to subdivide given.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Object to Planning proposal • The proposal is to create 30 to 35 lots – the GHD Concept Plan says “up to 25” • Object to loss of the natural beauty of the escarpment • Visual impact not considered at this stage – to be determined later? • Additional traffic on an already congested Farmborough Road and Panorama Drive (especially narrow) – dangerous stretch of road east of Bristol Street – reduces the traffic flow to a single lane. The construction vehicles and extra service and domestic vehicles from any new subdivision will add to this already dangerous stretch of road • Health concerns re vicinity of Whytes Gully – latest EPA guidelines recommend no residential habitation within 1000m • Additional stress on an already overloaded drainage system • Land set aside for environmental conservation is disjointed rather than linked – the addition of one lot between the conservation areas appears to negate the good. If the E2 conservation land is for public use and recreation how is this possible with a dwelling in the middle? • Seeking assurance that the water board access road is not subsumed into the subdivision and becomes an access road – no property owner should be expected to have a property surrounded by front and back traffic.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Strongly object • Loss of natural beauty of the escarpment • Visual impact not considered and at this stage to be determined later • Additional traffic on an already congested Farmborough Road and Panorama Drive (especially narrow) • Vicinity of Whytes Gully causing health concerns – latest EPA regulations recommend no residential habitation within 1000m • Additional stress on an already overloaded drainage system • Land set aside for environmental conservation is disjointed rather than linked • Area of European heritage lost forever
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Under the Concept Plan approval has been given for “up to 25 lots, half of which must be 2000m² and half 5000m² – any increase on 25 should not be approved. • Good start ensuring some small part of the property is preserved as escarpment land – seems good practice to link bushland areas – this should also provide a corridor for native wildlife which this property, adjacent ones and other escarpment areas currently allow. • Would like to see the Red Gum treed public reserve area in the south east joined to the other proposed public reserve area bordering the Sydney Water access road – the clear area between the two proposed public reserves will propagate slowly over time with regrowth of Red Gums. • Under the Concept Plan there was to be no removing of trees/bush for siting of houses or

	<p>roads – concerned about the 10/50 new ruling in a bushfire zone</p> <ul style="list-style-type: none"> • Wildlife and native animals live on this part of the escarpment – snakes, wallaby, deer, echidnas, possums, sugar gliders, powerful owl. The bush has regenerated over the years but without the deer the lantana would be impenetrable. If this proposal proceeds a large proportion of the native animals will be either killed by domestic cats/dogs or be forced to move further up the escarpment • Water and drainage: there is some form of water table under some parts of the property – after reasonable rain, run off water from and maybe through the water table pours down a dilapidated cement drain on parts of the western side of the Sydney Water road. This drain needs repair/replacement even if the development doesn't proceed as it has been washed away in many parts during heavy rain. Water runs across the Sydney Water road for up to 3 weeks after the rain has stopped down to Highview Drive • Narrowness of Farmborough Road is a big issue – a permanent solution would be welcomed by residents to stop people parking. If this development is approved maybe by extending Panorama Drive as an access road to the property it would spread the additional traffic load produced by this development between Farmborough Road and Panorama Drive? • Whilst I appreciate WCC officers have been working hard to reduce odours emanating from Whytes Gully, odours do occur and there really has been no significant reduction in the prevalence of dump odours at my premises over the years. This has affected my family's lifestyle and I don't think other potential residents should have to put up with odours – odours worse on the south of this site. Have been recording odours by date, time, prevailing conditions etc. from 2011 to present. Think 10 year moratorium should apply to this property due to closeness of Whytes Gully Waste.
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Our property adjoins Lot 101 and our water metre is located at the junction of Farmborough Road and the Water Board road – will our metre be replaced and moved within our boundary lines at the cost of the developer? Concerned that the proposed development (digging etc.) will cause pressure/breakages in our existing line (electricity, water, phone) • Will our water supply/quality and pressure decrease because of this development? • Concerned about water run off and contaminated water into our grazing paddock – what measures are in place to prevent this? • What containments are going to be put in place for road runoff and excess water from new development? Previous discussion about development of this land recommended that a pond be built to collect runoff, the water cleaned and then diverted back to the creek. • Need to ensure construction doesn't interfere with access to our property • Will the public reserves be fenced?
<p>Resident Cordeaux Heights</p>	<ul style="list-style-type: none"> • Support Planning proposal • Current residents will see the value of their properties increase and good opportunity for potential buyers looking for larger blocks with private surrounds, nestled adjacent the escarpment • Seems a boutique development and not a greedy grab by developers to squeeze hundreds of small lots (which would not suit the surroundings so close to the escarpment and farmland).
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Concern about bushfire risk – 1968 bushfires came close to our house. • Concern about traffic congestion – seems number of additional traffic movements at peak times has been grossly underestimated – at peak time traffic build up is already concerning. • Concerns about vicinity to Whytes Gully waste site – EPA regulations recommend no residential development within 1000m. I have to ring the EPA fairly regularly re odour complaints – combination of WCC facility and the contracted out green waste disposal nearby producing the odour problem.

	<ul style="list-style-type: none"> • The GHD plan says “up to 25” lots – discounting the four E2 lots there seem to be at least 27 – what is the point of specifying a maximum number of lots and then ignoring it?
<p>Resident Farmborough Heights</p>	<ul style="list-style-type: none"> • Object to inclusion of paper road in Planning proposal – additional two allotments not included in original lodged Planning proposal. Property owners seek to retain the current RU2 zone to protect their rights with respect to the long term use of the land. • Concern about encroachment of residential dwellings and associated amenity impacts – object of removal of buffer zones • Concern about potential traffic impacts – no site specific traffic impact assessment undertaken to address increase in traffic volumes and site distance requirements for intersections. Access should be clarified and the proximity of the two access points should be considered within the site specific traffic assessment. • Concern about capacity of existing service availability and need for a buffer for power easement that transects the site • Adequate justification not given for departures from the Concept Plan – object to inclusion of additional E4 lands in the north which are constrained by bushfire, significant vegetation, riparian corridors and unstable land and shown on Concept Plan as recommended for Managed Open Space. Concern about potential need to remove vegetation to achieve Asset Protection Zones. Need to ensure buffers to riparian corridors. • Concern about visual and acoustic impacts of the Maldon to Dombarton Rail line • Concern that the Planning proposal will not deliver the necessary environmental outcomes under Community title subdivision – need to ensure bank guarantee of adequate amount to ensure the revegetation of riparian corridors occurs and that ongoing maintenance occur. Further detail required of an appropriate mechanism to ensure the management and revegetation of sensitive lands and riparian corridors. • No provision to restrict the number of dwellings – require locality based precinct plan to prevent the site from being developed more intensely than currently proposed. • Concern that the Planning Proposal seeks to significantly reduce the proportion of lots exceeding 5000m² down to 20% (as opposed to 50% in Concept Plan) and is seeking 29 lots, an additional 4 over and above the endorse Strategic Plan. • The Planning proposal does not include supporting documentation from relevant servicing authorities in relation to water, sewer, electricity and gas supply. The gas pipeline has not been adequately assessed and addressed in the proposed LEP amendments – no clause relating to the EGP nor are there site specific clauses or covenants proposed in relation to building envelope restrictions as a result of the pipeline.

Maps provided to illustrate requested linking of public reserves



State Authorities and other Stakeholders

<p>Office of Environment and Heritage (OEH)</p>	<ul style="list-style-type: none"> • Support long term conservation outcome for the site by establishing proposed conservation areas – note presence of EECs • Preferred mechanism for securing and managing conservation lots is VMP with associated costings for management works, with proposed conservation lots dedicated to Council with appropriate funding • Need to ensure subdivision plan at DA stage reflects requirements for riparian buffers in line with the Riparian Corridor Management Study (2004) • Further Aboriginal cultural heritage assessment of the proposed development area in accordance with OEH guidelines required – in addition to archaeological values, there may be broader cultural values associated with the cultural landscape and travel routes between Mt Kembla and the coastline. Archaeological excavation recommended to more accurately determine the level of archaeological potential. • Revised planning proposal is considered to be generally consistent with the Concept Plan intent and provisions, and provisions in the Illawarra-Shoalhaven Regional Plan 2015. • Additional vegetation should not be cleared for APZs.
<p>Department of Primary Industries - Water</p>	<ul style="list-style-type: none"> • Riparian corridor widths consistent with requirements of DPI Water's Controlled Activity guidelines. Rehabilitated riparian corridors should provide fully structured vegetation representative of the mapped native vegetation communities within the site and any proposed riparian corridor encroachment will require offsetting in accordance with the Guidelines. • Public ownership of riparian corridors most effective mechanism for ensuring appropriate long term management of the function and health of these areas.
<p>Jemena</p>	<ul style="list-style-type: none"> • Australian Standard AS 2885 requires a risk review of the pipeline operation in the event of the land around a pipeline being rezoned resulting in a change in land use and change in risk exposure to the pipeline. Jemena has indicated they will undertake a review of the proposed development in accordance with requirements of AS 2885 and provide the developer with a review of findings. These findings shall be included in any subsequent development application to ensure that the Pipeline risks are appropriately considered and managed in the planning and design of the development and subdivision. Jemena will work with the developer to ensure that a Pipeline Safety Management Study is included as part of the submission of any development application
<p>EPA</p>	<ul style="list-style-type: none"> • The Whytes Gully Disposal Facility operated by Council is an important infrastructure asset for the Wollongong LGA and will be operational for a number of decades. The EPA regulates the facility under an Environment Protection Licence (EPL 5862) and has been working with Council over the years to deliver substantial improvements in relation to odour control. EPL prohibits the emission of offensive odours. • The Facility currently exists in close proximity to residences and existed before the publication of the "EPA Environmental Guidelines: Solid Waste Landfill, Second Edition 2016" and therefore the 1000 metre buffer zone for large landfills mentioned in the publication is not achievable in this instance. The EPA guideline also mentions a buffer distance of 250 metres and this could be reasonably applied in this instance. However, the application of this buffer must be taken cautiously and with due consideration by Council – due to the location, nature of the activity, age of the Facility and limitations in the practicable measures available to control air emissions, adverse odour impacts on nearby residents are unlikely to be completely avoided. Unforeseen events can sometimes also happen. There has been a history of community complaints in the vicinity of the Facility – there is also a risk of future community complaints if the proposal is approved. Council must consider the current and future liabilities that may exist in relation to the operation of the Facility. The EPA may take regulatory action if EPL 5862 is not complied with at all times.

NSW Rural Fire Service (RFS)	<ul style="list-style-type: none"> No objection subject to any future subdivision layout achieving a realistic building footprint and associated APZ wholly within each individual lot, and that the design of any future public road being in accordance with section 4.1.3 (1) Public Access in Planning for Bush Fire Protection 2006 and that access handles for battle-axe blocks should be designed in accordance with section 4.1.3 (2) Property Access in Planning for Bush Fire Protection 2006.
Sydney Water	<ul style="list-style-type: none"> The existing wastewater network located adjacent the proposed development has adequate capacity to service the proposed subdivision, and any lots not serviced by a Sydney Water wastewater main will need to make arrangements with Council regarding on-site wastewater management system requirements. Preliminary investigation indicates that the existing water supply system can only service development up to a ground level of 144m AHD, and it is recommended that the subdivision road and lot configuration ensure the water connections are not above this level. Sydney Water advises that a feasibility application can be lodged with Sydney Water to obtain further advice to assist in planning the final subdivision layout, to be addressed at any future subdivision application phase.
Roads and Maritime Services (RMS)	<ul style="list-style-type: none"> No objection in principle

Internal Consultation

Geotechnical Issues	<ul style="list-style-type: none"> The geotechnical report submitted is considered sufficient to demonstrate that the rezoning is feasible from a geotechnical perspective. Further geotechnical advice will be required to support the engineering designs for any subdivision which follows a successful rezoning.
Environmental Issues	<ul style="list-style-type: none"> Council's natural resources staff inspected the site to confirm vegetation types and determine support for the proposed dedication to Council with on-going funding of the areas proposed for E2 Environmental Conservation zoning. Support was indicated for dedication with funding.
Access Issues	<ul style="list-style-type: none"> Prior to submitting a development subdivision application the applicant will be required to undertake further detailed design of the road network to demonstrate it is trafficable by a large rigid vehicle (LRV) and that waste collection and emergency vehicles are able to turn safely within the proposed cul-de-sacs. The proponent will be responsible for an upgrade of the pavement and stormwater within Farmborough Road adjacent the site.
Flooding Issues	<ul style="list-style-type: none"> Need to defer support for the proposed lot layout (including potential building envelopes) until such time as sufficient information is presented that addresses any flooding constraints, in line with Council's Floodplain policies.

Isolated Environmental Lots

On 27 June 2016 as part of the consideration of a draft Planning Proposal request (Lot 101 DP 825516 Farmborough Road Farmborough Heights), Council resolved (in part) that:

“A report be prepared which explores possible planning policies that reduce the creation of isolated lots of environmentally significant land separated from larger areas of similar land”.

The consideration of Planning Proposal requests and development applications requires the identification of any environmental and physical constraints on site, and an assessment of the potential impacts of intensification of land use on existing environmental qualities and having regard to the site’s setting and context. Landscape modification arising from urban development can result in the creation of isolated lots of environmentally significant land separated from larger areas of similar land, and Councillors have requested the consideration of possible planning policies to provide guidance in this regard.

Biodiversity Conservation and Corridors – Current Policy

There are a number of relevant Biodiversity Conservation and Corridor Policies Wollongong City Council refer to in the context of increased urban development pressures and threats from climate change and environmental weed and pest species. The following policies highlight issues of biodiversity loss, climate change and fragmentation, and provide guidance on addressing these issues when considering Planning Proposal requests and development applications:

- **State Level:** Part 7A Biodiversity Banking and Part 7AA Biodiversity Certification of the *Threatened Species Conservation Act 1995* establish the “improve or maintain” outcome via the Biodiversity Banking and Offsets Scheme and Biodiversity Certification mechanism. Both BioBanking and Biocertification aim to achieve secure, funded and in perpetuity conservation outcomes, underpinned by the best available science. The separate methodologies apply biometrics to a range of environmental features including measurements of vegetation patch size, vegetation condition, patch connectivity, length and width of corridors, riparian zones and buffers at a local and landscape scale. This approach aims to achieve social, economic and environmental outcomes while optimising investment in biodiversity so that the most effective actions are undertaken in locations that can provide lasting biodiversity benefits and cost-effectiveness.
- **Regional Level:** Biodiversity conservation areas and corridors are considered at a landscape scale and the following are relied upon for decision making on significant biodiversity values and biodiversity corridors:

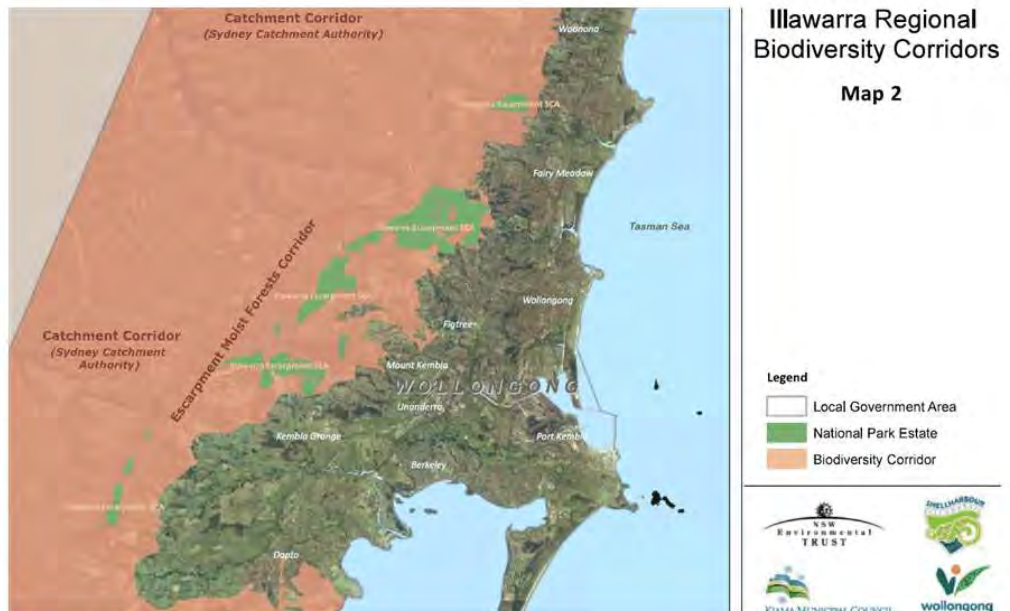
- The “High Environmental Values” and “Biodiversity Corridor” map units of Fig 1 of the Illawarra Shoalhaven Regional Plan 2015

Illawarra-Shoalhaven's environmental values map

[Click to enlarge.](#)



- The Illawarra Biodiversity Strategy (2010) which identifies threats to biodiversity, conservation measures and biodiversity priority areas/regional biodiversity corridors



- **LGA Level:** priority biodiversity values and biodiversity corridors are major units (building blocks) of the landscape scale conservation areas and corridors, and in places reflect localised extensions of these. The following are relied on for decision making on local priority biodiversity values and biodiversity corridors:
 - WLEP 2009 Clauses 7.2 Natural resource sensitivity—biodiversity; 7.4 Riparian lands and 7.8 Illawarra Escarpment area conservation and related mapping
 - Illawarra Escarpment Strategic Management Plan (2015)
 - Mt Kembla to Farmborough Heights Strategic Planning Study and Concept Plan (2013), and mapping
- **Site Specific Scale:** decision making is based on
 - Studies prepared according to Wollongong Development Control Plan Chapters E18 Threatened Species Impact Assessment and E23 Riparian Land Management
 - Review and balanced assessment of all the above.

Impact of Landscape Modification on Biodiversity

Biodiversity is fundamental to human health and well-being and issues of biodiversity loss are a major area of concern. *“Australia’s Biodiversity Conservation Strategy 2010-2030”* highlights destruction and disturbance of native vegetation, the introduction of pest species (exotic animals and weeds) and climate change as key threats to biodiversity.

At the city level biodiversity is impacted on by habitat degradation and fragmentation. In *Habitat Fragmentation and Landscape Change (2006)*, landscape modification is shown as potentially resulting in the decrease in the average size of remaining vegetation patches, an increase in the average distance between these patches, a decrease in landscape connectivity between patches, and an increase in the ratio of patch edges to patch sizes. This can result in habitat loss and degradation (decline in food resources, shelter and nest availability). Other things being equal, larger patches tend to support more species than smaller patches. and vegetation that is structurally complex tends to support more species than structurally degraded vegetation.

Species richness is often found to be higher in larger patches of remnant vegetation. Likely mechanisms for higher species richness in larger patches include lower extinction rates, higher immigration rates, and greater habitat diversity. Overall levels of species richness tend to be reduced in landscapes subject to extensive human modification. Grazing by livestock can cause soil compaction and therefore water infiltration into the soil, damage remnant native vegetation and add nutrients to the soil, which can in turn promote the invasion and growth of non- native plants. Barriers such as roads and fences can negatively affect a wide range of species, reducing a landscape’s permeability and also reducing habitat connectivity for many individual species and changing ecological processes. Landscapes that retain more connections between patches of otherwise isolated areas of vegetation and therefore have higher levels of landscape connectivity are assumed to be more likely to

maintain populations of various species. Landscapes altered by agricultural or urban development can maintain permeability for many species if trees, rocky outcrops or other “stepping stones” between larger areas of habitat remain in good condition.

The loss of landscape connectivity can affect habitat connectivity of many species, especially for those dependent on native vegetation. It may also disrupt ecological processes, such as waste decomposition or seed dispersal, thereby reducing ecological connectivity. Loss of native vegetation may equate to habitat loss; loss of structural complexity and edge effects may translate into habitat degradation; and large distances between vegetation patches may equate to increased habitat isolation for many species.

The ***National Wildlife Corridors Plan (2012)*** identifies **Wildlife Corridors** and **Stepping Stones** as features contributing to landscape connectivity, and provides guiding principles for wildlife corridor design and implementation. The Plan highlights the fact that different species will require different scales of connectivity, for example some bird species require continuous cover while other species are able to traverse landscapes via “stepping stones” such as paddock trees.

The ***Office of Environment and Heritage*** similarly identify the importance of some corridors at a regional scale, assisting migratory and nomadic species to move across large areas and connecting gene pools, however also recognise the significance of corridors on a local or property scale as they connect two or more areas of isolated habitat.

Wildlife corridors are physical linkages between patches of native vegetation which contribute to landscape connectivity and may facilitate increased habitat connectivity for some species and the potential to increase ecological connectivity. Wildlife corridors range in size, from small corridors created by local communities to large corridors that stretch across many different landscapes. It should be noted, however, that not all species use corridors - attributes of corridors such as their width and length, habitat suitability for a particular species, location in the landscape and a range of other factors can affect corridor use by wildlife. Riparian corridors are a particular type of corridor that can often be particularly effective at maintaining habitat connectivity for many species, as well as contributing to ecological connectivity.

Stepping stones are relatively small patches of native vegetation scattered throughout a landscape that while not physically connected are functionally connected allowing movement between larger patches. They enhance landscape connectivity and may facilitate habitat connectivity for a variety of species. Mobile species are able to utilise resources in small habitat patches located many kilometres apart to help them move across the landscape. Stepping stones may assist connectivity in plant populations for genetic exchange between spatially isolated populations. Although wildlife corridors can be valuable for some taxa, for others habitat connectivity may be better provided by the maintenance or establishment of stepping stones or dispersed patches of vegetation. The

provision of stepping stones may be a good strategy for mobile species (e.g. butterflies and bats) that are unable to disperse long distances between isolated patches. A range of studies have highlighted the importance of stepping stones in contributing to landscape connectivity, including those of birds and butterflies. Stepping stones may also be valuable for plants as sources of pollen to maintain gene flow over larger distances between scattered plant populations. Steeping stones and corridors can provide additional habitat for those species that use native vegetation but which are not area sensitive – hence even small areas of native vegetation when protected and managed can be of conservation value. Although perhaps not as effective as larger patches for conservation, small patches are nevertheless valuable, and special conservation efforts are required.

The following excerpt from *“Australia’s Biodiversity Conservation Strategy 2010-2030”* highlights the important role different scales of connectivity play in achieving overall conservation gains.

Figure 4: Conceptual spatial planning for terrestrial connectivity conservation

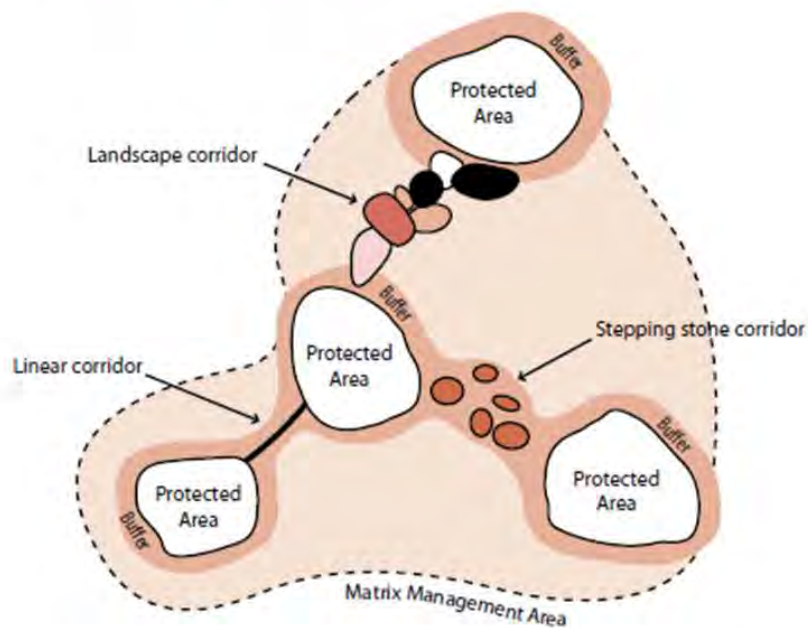


Figure 4 illustrates the way in which connectivity is not just about corridors. It includes both small patches and larger distinct areas, including core protected areas: areas managed for conservation, the broader landscape in which these areas exist, and remnant native vegetation outside reserves (which provides habitat and serves as stepping stones and linear corridors to aid the movement of species). It also involves the use of sustainable land management practices in areas adjacent to dedicated conservation areas, to create a 'landscape matrix'. Source: Mackey et al. 2009.

Current Application of Strategies and Policies

Preservation of native vegetation is often viewed as a competing interest to urban development. However, *“Best Practice Guidelines for Greener Subdivision in Western Sydney”* highlight that a balance between environmental, social and economic issues can be achieved through the careful integration of these aspects during the initial stages of the planning process. The Guidelines identify an opportunity to promote vegetation management and connectivity as a feature of a development, rather than being viewed as a site constraint, and that where possible, subdivision design should maintain, or where necessary establish corridor links between existing habitat areas located both on and off site.

The biodiversity value of corridor networks has been documented in the *Illawarra Biodiversity Strategy*, with a regional corridor network flagged as core conservation areas as they are large, biologically diverse areas containing a diversity of habitats and vegetation communities, contain habitats for threatened species, and contain vegetation communities that are significant to New South Wales and the Illawarra region. This regional corridor, due to its size, supports many species and vegetation that is structurally complex, and exhibits high levels of species richness. The proposed objectives of the Illawarra biodiversity corridors are to:

- Delineate areas of high quality habitat;
- Conserve and protect areas of high quality habitat;
- Enhance existing connectivity within corridors by regenerating or revegetating missing links where possible;
- Consolidate and manage these continuous links to provide large scale connectivity through the landscape;
- Implement effective planning controls to prevent further fragmentation;
- Maintain viability of native vegetation and provide dispersal corridors for fauna;
- Minimising further clearing within these areas; and
- Minimise the impact of development on land within and adjoin the regional corridors.

Outside of the Regional Biodiversity Corridors is the opportunity to provide a strategic framework for delivering green infrastructure. A key finding from *The Green Infrastructure Project* was that a network of green spaces and water systems can also play a significant role in enhancing urban biodiversity, including countering habitat fragmentation. Research shows that retaining and enhancing “nature” in urban areas has a wide range of human benefits. Green networks include parks and reserves, backyards and gardens, waterways and wetlands, streets and transport corridors, farms and orchards, squares and plazas, roof gardens and living walls, sports fields and cemeteries. Green infrastructure secures the

health, liveability and sustainability of urban environments. Council is currently developing an **Urban Greening Strategy** for the city.

Developing a network of reserves is a regional-scale strategy to provide core habitat for many species. At a smaller scale patches of native vegetation scattered throughout a given human-modified landscape can fulfil similar complementary ecological roles. Structurally characteristic patches of relatively unmodified native vegetation are a key part of conservation in both forestry and farming landscapes, providing important habitat for numerous species. In addition to protection of patches of native vegetation, there is also a need to restore and expand structurally characteristic but degraded patches across the LGA. Active management efforts are sometimes required to enhance vegetation structure and condition. In some landscapes, vegetation restoration involves the complete re-establishment of native vegetation cover, involving long term active replanting and revegetation. Water courses and associated riparian vegetation provide a high conservation return for effort.

Planning Proposal requests and development applications require a site specific management plan to conserve and enhance environmental attributes, and consideration of an appropriate legal and financial mechanism to ensure in perpetuity conservation works. As a result of the Farmborough Heights to Mt Kembla Concept Plan, sites in proximity to the escarpment are now required to demonstrate active conservation as part of any proposed development (IESMP 2015). The Planning Proposal request for the site located at the top of Farmborough Road, Farmborough Heights (Lot 101 DP 825516) was supported by a Flora and Fauna survey which identified ecological qualities to be retained and enhanced on site. An indicative Vegetation Management Plan (VMP) was prepared which included calculations of indicative costings for the proposed dedication to Council of vegetation areas using the BioBanking standard management actions and a modified version of the OEH BioBanking Trust Fund Deposit spreadsheet methodology, applying the in perpetuity funding model (as advised by OEH). At this site, the BioBanking “improve or maintain” outcome is achieved, with the retained patches of native vegetation rezoned to E2 Environmental Conservation and the retention and restoration works in the dedication patches maintaining existing structural connectivity and foreseeably improving functional connectivity (i.e. re-establishing plant species diversity by removing weeds and thereby improving the gene pool as well as improving habitat and desirability for some groups of fauna such as pollinators).

A series of non-connected habitat parcels as depicted in the Planning Proposal can result in a stepping stone corridor effect which is widely recognised as assisting to reduce the effects of fragmentation, as animals use these areas to find shelter, food or to rest. Creating corridors that link patches of native vegetation and providing stepping stones of native vegetation throughout the landscape are effective ways to enhance landscape connectivity. A combination of riparian revegetation efforts in the large area in the north-west, and a series of stepping stone patches of native vegetation habitat, will enhance the wildlife

corridor on site and provide functional connectivity, contributing to animals moving more freely to find food, shelter and opportunities to breed. Street tree planting as part of any future subdivision design will also enhance the stepping stone effect.

These current strategies and policies state the importance of encouraging biodiversity conservation efforts on private land (in recognition of large private holdings), in addition to any efforts undertaken on public land. Active conservation efforts are made possible on private land holdings, with limited and appropriately scaled development contributing the funding for in perpetuity conservation efforts.

Biodiversity Conservation and Corridors – Principles to observe in mitigating the negative effects of landscape change

The common guiding management principles to be observed through the above strategies, policies, plans and studies, from the State level through to the site specific scale, are:

- Ensure in perpetuity conservation that achieves the “improve or maintain the site’s overall biodiversity values” outcome
- Encourage conservation or offsetting, via Biocertification, BioBanking or compensatory measures, conservation covenant, dedication of conservation lands to a public authority or rezoning to increase environmental controls and extend areas of existing E zones to reflect environmental qualities requiring protection and enhancement.
- Encourage the reduction or removal of threatening processes.
- The biodiversity benefits of protecting and enhancing existing remnant vegetation outweigh those of compensatory planting in cleared areas:
 - retain first (conserving existing natural areas and protecting these areas from threatening processes such as weeds, grazing, stormwater, mowing etc. is the first priority),
 - regenerate second (where bushland is degraded by threats such as weed invasion, grazing or other disturbances, regeneration is the primary goal) and
 - replant last (where a site’s natural ability to regenerate has been assessed as very poor).

Conclusion

Council has available a range of strategies and policies to provide guidance in terms of mitigating the negative effects of landscape modification that results from population pressure, climate change, and the threat of environmental weed and pest species. These strategies and policies recognise a range of landscape attributes as contributing to overall biodiversity, including native vegetation cover, vegetation connectivity, patch size and the strategic location of sites identified for active conservation efforts.

A regional strategic corridor has been identified and documented in the Illawarra Biodiversity Strategy as core conservation areas, as they are large, biologically diverse areas containing a diversity of habitats and vegetation communities, contain habitats for threatened species, and contain vegetation communities that are significant to New South Wales and the Illawarra region. Outside of the Regional Biodiversity Corridors is the opportunity to provide a strategic framework for delivering green infrastructure in recognition that, at a smaller scale, patches of native vegetation scattered throughout a given human-modified landscape can fulfil important complimentary ecological roles.

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