Part E: Environmental Assessment

6.0 Environmental Assessment

This section of the report assesses and responds to the environmental impacts of the Concept Plan proposal. It addresses the matters for consideration set out in the Director-General's Environmental Assessment Requirements (DGRs).

In accordance with the requirements of the Director General for the preparation of a planning study to support the proposed inclusion of the UTS Kuring-gai site as a State significant site under Schedule 3 of SEPP (Major Projects) 2005, this Part also addresses the suitability of the site for the proposed Concept Plan, and implications of the proposed land uses.

The draft Statement of Commitments at **Appendix L** complements the findings of this section.

6.1 Director General's Environmental Assessment Requirements – Concept Plan

Table 12 provides a detailed summary of the individual matters listed in the Director General's Environmental Assessment Requirements (DGRs) and / or identifies where each of these requirements has been addressed in this report and the accompanying technical studies.

Table 12 – Director General's Environmental Assessment Requirements

Director General's Requirements	**Location in Report/ Application**
State significant site Study Director General's Requirements as advised by letter dated 1 February 2006	**Appendix B**
A state significant study will need to include (but not limited to) the following: ▪ Address the criteria at Clause 8(2) of the Major Projects SEPP	Section 2.2
▪ Address the criteria for Sate Significant Sites in the attached Draft Guidelines dated 24 July 2006, with particular focus on criterion (a)	Section 2.3.3
▪ Summarise and document any consultation with the Ku-ring -gai Council any other relevant agencies, and the community and explain how issues raised by the Council, agencies or the community have been addressed	Section 1.5
▪ Detail the proposed land use controls (including zoning) and justify the necessity for these controls against the existing planning instruments;	Section 3.3.1
▪ Indicate the future approval regime for development on the site sought by identifying the circumstances when Part 3A or Part 4A (including exempt or complying development) would apply.	Section 3.1
Special Provision On 14 June 2007, the Minister for Planning formed an opinion pursuant to clause 6 of State Environmental Planning Policy (Major Projects) 2005 (MP SEPP) that the proposal is a major Project under Part 3A of the Environmental Planning and Assessment Act 1979. On that date the Minister also authorised lodgement of a concept plan for the proposal.	**Appendix B**

Director General's Requirements	Location in Report/ Application
General Requirements	
The Environmental Assessment (EA) must include	
▪ Executive Summary	Executive Summary
▪ Description of the proposal comprising : - textual and diagrammatic articulation of the proposal; - description of the site; - design, construction, operation, maintenance, rehabilitation and staging as applicable; - project objectives and need.	Sections 1.1, 5.12 and 2.3.3
▪ An assessment of the environmental impacts of the project, with particular focus on the key assessment requirements specified below: and ▪ a statement on the validity of the Environmental Assessment , the qualifications of person(s) preparing the assessment and the information contained in the Environmental Assessment is neither false nor misleading.	Section 6.0
Key Assessment Requirements	
Part A – Heads of Consideration	
▪ Suitability of the site;	Section 6.2
▪ Likely environmental, social and economic impacts;	Section 6.3
▪ Justification for undertaking the project;	Section 1.0
▪ Consideration of alternatives; and	Section 5.3
▪ Public Interest	Section 2.5
Part B – Relevant EPIs, Guidelines and other requirements to be addressed	
▪ Planning provisions applying to the site including permissibility and the provisions of all the plans and policies (including the Kuring-gai PSO, Draft Heritage Conservation) LEP 30, relevant DCPs, SEPP 11, SEPP 19, SEPP 32, SEPP 53, SEPP 55 and SEPP 65).	Sections 3.3 and 3.5
▪ Nature and extent of non compliance with relevant EPIs;	Sections 3.3 and 3.5
▪ Commonwealth Environment Protection and Biodiversity Conservation Act 1999;	Sections 2.3.4, 4.1.6, 6.2, 6.10
▪ Planning for Bush Fire Protection 2006 (NSW Rural Fire Service);	Section 6.11
▪ Guidelines for Threatened Species Assessment (DEC);	Sections 2.3.4, and 6.10
▪ Guidelines for Development Adjoining Department of Environment and Conservation Land (DEC);	Sections 2.3.4, and 6.10
▪ NSW Government Metropolitan Strategy – "City of Cities"; and	Section 2.3.3
▪ Consideration of alternatives to the proposal (and with respect to Ecological Sustainable Development outcomes);	Section 5.3

Director General's Requirements	Location in Report/ Application
Part C – Key Issues to be addressed	
Requirements of the Department are as follows: Urban Form and Design Key matters to be addressed include: ■ Urban design, height, density, bulk and scale of the proposal in relation to the surrounding development, landscape and topography; ■ Impact on streetscape/landscape; and ■ Details of proposed areas of and nature of landscaping and open space.	Volume 3, Sections 5.8, and 6.12 Section 5.9 Section 5.9
Land use Key matters to be addressed include: ■ Land use distribution - considering the existing and surrounding land use patterns, density, character, amenity and the existing built and natural environs; ■ Connectivity with and capacity of services including schools, hospitals, public transport and town centres; and ■ Impact on existing education and recreational land uses on-site.	Sections 5.2, 5.7-5.9, 5.11 and 6.5
Transport and Access Key matters to be addressed include: ■ Existing traffic conditions, road network and road capacity on and in the vicinity of the site; ■ Proposed internal road and access arrangements; ■ Appropriate connection(s) to the network; ■ Any changes to traffic generation resulting form the project and any required road/intersection upgrades; ■ measures to promote public transport usage and modal share including bus and train networks and connections; ■ Pedestrian and bicycle linkages; ■ Proposed ca r parking arrangements; and ■ Proposed emergency evacuation and public access.	Sections 4.1.13, 5.9, 5.11, 6.5 and 6.16
Heritage Key matters to be addressed include: ■ Impacts on the significance of the site as a cultural landscape, including buildings, landscape and potential European and Aboriginal archaeological impacts; ■ Aboriginal and cultural heritage values and any places listed on the national Heritage Register and protected under the EPBC Act; and ■ The study should be prepared in accordance with the publication "Statement of Heritage Impact" published by the Heritage Office 2002.	Sections 4.1.12, 6.8 and 6.9

Director General's Requirements	**Location in Report/ Application**
Bushfire Risk Assessment Key matters to be addressed include: ▪ Bushfire risk assessment to determine the level of hazard posed upon the proposal; ▪ Provision of setbacks, water supply, access supply of services and fuel management on the site; ▪ Identification of asset protection zones (to be identified on a site plan and demonstrated to be outside the boundary of the Lane Cove National Park) or building requirements to minimise the impacts of any bushfire hazard; and ▪ Identification of evacuation and relocation measures/ strategies to be implemented in a bushfire event.	Section 6.11
Environmental Impacts The Environmental Assessment must include details as to how the environmental impacts of the proposal will be managed. Matters to be addressed include:	
▪ A description of any contamination and its impacts on the environment, including mitigation and disposal measures as applicable;	Section 6.4
▪ Any likely geotechnical impacts for the development of the site;	Section 6.4
▪ Any likely flora and fauna impacts as a result of development on the site, including impacts on threatened species, including those listed in the EPBC Act, (particularly Darwinia biflora and the Red-Crowned Toadlet) , threatened populations or endangered ecological communities, critical habitat (including riparian habitat) and native vegetation generally. The study should include a field survey in accordance with the gazetted draft Guideline for Threatened Species Assessment and describe proposed actions to be undertaken to avoid, mitigate or compensate for impacts on threatened species and their habitats. The study shall also specifically report on the considerations listed in each step of the guideline.	Sections 6.2 and 6.10
▪ Impacts on the Lane Cove National Park including erosion and sediment control, stormwater runoff, management implications, pets, weeds, edge effects, boundary encroachments, ecological connectivity, fire and location of asset protection zones and their impact on threatened species and their habitats;	Sections 6.7 and 6.10
▪ Details of any future management regimes for environmental protection areas;	Section 6.10
▪ Flooding, drainage and stormwater management issues, including on-site detention of stormwater, WSUD, and drainage infrastructure;	Sections 5.10 and 6.7

Director General's Requirements	**Location in Report/ Application**
▪ Details of the development's proposed sustainability measures including NatHERS ratings, BASIX water sensitive urban design measures, energy efficiency, recycling and waste disposal; recycling and waste disposal;	Section 6.14
▪ Any impacts as a result of adjoining development/land use;	Sections 6.13, 6.3 and 6.16
▪ Details if any environmental offset; and	Section 6.3
▪ Details of any cut and fill and whether any fill is proposed to be imported or exported to/from the site.	Section 6.4
Services Key matters to be addressed include: ▪ Capacity of water, sewer, stormwater, gas, power and telecommunications infrastructure which will serve the project; and ▪ Any upgrading works to infrastructure necessary to service the development and contributions applicable under any adopted contributions plans.	Sections 5.10, 6.6 and 6.7
Planning Agreements and/or Developer Contributions ▪ The environmental assessment should address and provide th e likely scope of any contributions towards local/state infrastructure and the proposed legal delivery mechanism (e.g. Planning Agreements/S.94 Contributions Statement of Commitments).	Section 5.13
Part D - Draft Statement of Commitments ▪ Proposed mitigation and management of residual impacts; and ▪ A statement of Commitments detailing measures for environment management and mitigation measures and monitoring for the project.	**Appendix L**
Test of Adequacy The Environmental Assessment must address all of the Environmental Assessment Requirements. If the Director-General considers that the Environmental Assessment does not adequately address the Environmental Assessment Requirements, the Director-General may require the proponent to submit a revised Environmental Assessment to the matters notified to the proponent. The Director General may also modify these Requirements by further notice to the proponent.	Noted

Director General's Requirements	Location in Report/ Application
General Environmental Risk Analysis (all project components) Notwithstanding the above key assessment requirements, the Environmental Assessment must include an environmental risk analysis to identify: ▪ Potential environmental impacts associated with the project (construction and occupation); ▪ Proposed mitigation or compensation measures; and ▪ Potential residual environmental impacts after the application of the proposed mitigation or compensation measures. Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of the additional key environmental impacts must be included in the Environmental Assessment.	Throughout the document and Section 6.18

6.2 Site Suitability and Implications of Proposed Land Uses

Site Suitability

The site is currently used by the UTS as a tertiary educational campus and accommodates the UTS faculties of nursing, midwifery and health; teacher education; and business set in a mix of developed area and bushland. The site is zoned 'Special Uses – Education' reflecting the historic use of the site. As indicated previously, the site is now potentially surplus to the effective operation of the respective faculties and the UTS is contemplating consolidating faculties in the city campus. The proposal for mixed commercial, residential, recreational, commercial and educational uses on the site is only partly permissible in accordance with the current land use provisions in Kuring-gai PSO.

The Concept Plan incorporates uses that are considered to be compatible with the predominant character of the surrounding area, i.e. predominantly residential and recreational uses. The suitability of the site for the proposed development will be further tested and demonstrated by a range of more detailed technical assessments as part of the final design development.

The development proposed in this Concept Plan would be able to be completed in a manner which is consistent with relevant NSW Planning and Environmental legislation. Furthermore, this assessment has found that no controlled actions as defined by the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act would be required to implement the development as proposed.

6.3 Social and Economic Issues

Economy and Employment

The Metropolitan Strategy provides commentary and direction for the next 25-30 years at a regional level on issues such as land use, economic development, jobs, transport, innovation, centres and corridors and residential areas within Sydney.

The UTS City campus is situated within the Global Sydney strategic centre. The Metropolitan Strategy states that "Global Sydney" is:

> *"The main focus for national and international businesses, professional services, specialised health and education precincts, specialised shops and tourism, it is also a recreation and entertainment destination for the Sydney region and has national and international significance".*

The potential to consider the highest and best use of the of the UTS Kuringai–gai campus in terms of the need for UTS to rationalise its operational requirements most effectively will serve to strengthen the UTS City campus and the role of UTS in contributing to the growth of Sydney as a major Global City by strengthening the City centre's education precincts.

The redevelopment involves a direct investment (for construction only) of approximately $216 million. The investment plus the multiplier effect of 1.81 (i.e. every construction dollar of construction output requires another 81 cents of output from other parts of the economy), the total value of the development, including flow on effects will be in the order of $390 million. This has a significant beneficial effect on the economic growth and prosperity of the State. Further details of the economic impact of the proposal are out lined in Section 6.3 of this report.

Housing Supply and Choice

Medium density housing is undersupplied and opportunities for the development of medium density housing is limited in the Kuring-gai LGA due to lack of appropriately zoned sites.

The Metropolitan Development Program Residential Forecasts for 2004/2005 – 2013/14 by the Department of Planning concludes that infill sites i.e. areas located outside of Transit Nodes in established areas are declining as contributors to the State's housing stock from 32% for the last 5 years to 29% in the short term and 26% in the medium term.

The forecast for housing generated by infill sites in Kuring-gai, medium term (09/10-13/14) is for approximately 635 dwellings. The proportion of the total dwellings projected in the medium term in Kuring-gai is 2,100 dwellings, of which 80% is anticipated to be multi-unit.

Lindfield is located within a precinct projected to show an increase of 350 dwellings in the medium term. Of these, 200 are projected to be developed on one of the sites identified in SEPP 53, the Lindfield Avenue site.

The proposed development on the UTS Kuring-gai site could potentially assist in providing a land bank of appropriately zoned land to facilitate an increase in medium density housing stock, if the site is vacated by UTS.

If developed, the proposal would contribute towards a greater choice of housing to meet the varying needs of the community in the greater metropolitan area and the changing demographics of the Kuring-gai LGA, as advocated by the Sydney Metropolitan Strategy.

The proposed Concept Plan promotes urban consolidation and encourages urban land no longer required for its purpose to be rezoned, if appropriate, for multi-unit housing and related development.

As stated above, the proposed residential land uses would facilitate greater residential densities and multi-unit housing could be achieved in an urban area of metropolitan Sydney, capitalising on existing infrastructure, and therefore support the objectives of SEPP 32 and the metropolitan strategy.

Community Services and Facilities

The following facilities are provided for the UTS students and staff and are available for hire by the wider community, clubs and organisations:

- Indoor recreational facilities (gymnasium, dance studio, basketball court and squash courts);
- Sports oval and tennis courts;
- Theatre (Greenhalgh auditorium);
- Library; and
- Childcare centre.

The Municipality of Kuring-gai has a good standard of community services. The following services have been identified as requiring augmentation.

Childcare Facilities

The site provides a childcare centre with a licence to accommodate a maximum of 68 children. It is understood that approximately 50% of existing use is by children of UTS staff and students. The remaining 50% are children from the local community or Film Australia employees.

The Kuring-gai Section 94 Plan (2004-2009) identifies that the Kuring-gai LGA is currently expected to have a supply equivalent to around 80% of demand, and that approximately 1 in 5 working parent families requiring day care places are unable to find a place in Kuring-gai.

In response, the Section 94 Plan (2004-2009) carries forward the provisions of its previous plan and seeks to provide contributions towards the purchase of a site and development of a new multi-purpose child care centre in Kuring-gai.

Library

Council's main central library is located at Gordon, with three further branches at Turramurra, St Ives and Lindfield.

The Kuring-gai campus also currently provides a UTS library, primarily for staff and students. The library is also accessible to the local community for a fee.

Council's Section 94 Plan 2004-2009 identifies that there is a need for the upgrading and expansion of library buildings. A particular need is identified for the upgrade of Lindfield library and consideration of a new public library to serve the southern part of the LGA.

In addition to providing for contributions towards the book stock and computers for existing libraries, the plan proposes a new Multi-purpose Community Centre for the LGA, including a new library on a site yet to be determined.

Open Space

Approximately one third of the LGA is open space. The ownership and management responsibilities for this open space are shared between Council, NPWS and private sports clubs.

Lane Cove National Park adjoins the site and provides a range of informal recreational facilities including cycling, canoeing, jogging, etc. It also provides picnic areas, playgrounds, bike tracks and sports fields for more organised sports such as soccer, touch football, athletics and cricket.

Other smaller local parks in the vicinity of the site include Loyal Henry Oval to the east, the Recreation Reserve and Princes Park to the north.

The site has good access to a range of parks and sports clubs. Councils Section 94 Plan 2004-2009 identifies that Council controls approximately 1,406 ha of open space in Kuring-gai (or 128m^2 per person[3]).

However, Council-controlled open space comprises around 177ha of active local and district open space and 1,229ha of regional or other open space. A large proportion (almost 80%) is therefore 'natural area' of regional significance.

Council's sports grounds are understood to be well used and generally at or over capacity. It is noted, however, that this is off-set by the easing demand for these facilities, through population changes occurring in the LGA.

The indicative Concept Plan is proposing to retain 43% (equivalent to 6,970 m^2) of the existing playing field as publicly accessible private open space.

It is noted that the Kuring-gai Council Open Space Acquisition Strategy dated November 2006 (p.23) identifies acquisition requirements of 5.82m^2 per person for Lindfield based on an incoming population of 910 people.

The Kuring-gai Council Open Space Acquisition Strategy identifies that Kuring-gai has a range of excellent facilities and programs (including National Parks, Kuring-gai Bicentennial Park, St Ives Village Green, Echo Point Park and the Kuring-gai Wildflower Gardens). There are areas of needs and deficiencies including insufficient neighbourhood parks in some precincts, particularly in Lindfield, Gordon and Roseville.

The 'Village Green' will provide the equivalent of 8.39 m2 per person for an incoming population estimated to be 831. This means that the site will provide open space sufficient for the needs of the incoming population as well as provide access to open space within 500m for the population in the residential pocket to the west of the site which is now identified as not having a formal park within 500m in Figure 2 of the Kuring-gai Council Open Space Acquisition Strategy.

3 This is based on Kuring-gai Section 94 Plan 2004-2009 population estimate of 109,824 (p.39) and does not include National Parks controlled by NPWS

Tertiary Education Facilities

UTS Kuring-gai is a regional facility with approximately two thirds of its student base drawn from the southern and western areas of Sydney and the remaining third coming from north of Chatswood as far as Gosford. The impact on existing and potential tertiary students should the facility close or substantially change will be minimal as students would have the opportunity to attend one of the many universities well serviced by public transport including Macquarie University, UTS Broadway, University of New South Wales (UNSW) or the University of Sydney.

The main campus building will be retained to respect the heritage significance of the building and the adaptive reuse of the building will be driven by market demand, within the context of the permissible uses, and is likely to consist of either a single or a mix of education, community and/or commercial facilities. The proposed uses that would be permissible include:

- child care centres;
- community facilities;
- neighbourhood shops;
- places of public worship;
- educational establishments;
- office premises;
- auditorium;
- library; and
- indoor recreation facility.

The range of uses permissible has been assessed to have minimal environmental impact and the exact mix of uses will be subsequent to further approvals. The key assessment issues relevant to the re-use of the building relate to heritage conservation and traffic generation. Both have been assessed and commitments have been made to ensure the integrity of the building is not disturbed and any future parking demands will be addressed in future project applications. The difference in impacts of the alternative adaptive reuse mixes have been addressed in the Transport Report prepared by ARUP at **Appendix K**.

6.4 Geotechnical and Contamination

Landform and Geotechnical Capability

Consistent with much of northern Sydney, the site is underlain with Hawkesbury Sandstone. Patterson Britton & Partners reviewed geological conditions and the potential impact of tunnelling associated with the former alignment of the (then) Parramatta to Chatswood Line (PCL).

The original alignment of the railway line associated with the PCL passes directly under the site in a tunnel at a depth of at least 25m. Although the original proposal for the rail link has been modified, however there is still some tunnelling directly beneath the subject site.

Patterson Britton & Partners reviewed the Environmental Impact Statement prepared for the PRL and found:

- The tunnelling below the UTS Ku-ring-gai site is shown to be located under approximately 25m of cover to the ground at its shallowest point.; and
- Where tunnels are excavated in shale or sandstone and the cover of ground above the tunnel crown is at least 15m or more, surface settlement is not expected to exceed 1mm or 2mm above the tunnel centreline.

Given that the depth of tunnelling is greater then 15m below the subject site and the excavation is likely to be located in Hawkesbury Sandstone, the settlement trough formed above the tunnel in these cases will have negligible impact on surface buildings or underground service utilities proposed as part of the re-zoning application and potential development of the site.

Given the underlaying geological formation (Hawkesbury Sandstone) and the negligible impact created by the rail tunnel, it is considered that with good engineering design, the site would be generally suitable for urban development. Notwithstanding, prior to any future development occurring on the site, it is recommended that detailed geotechnical investigations be completed.

The topography of the site and the design of the development would allow for a balance of cut and fill being accommodated on the site. Accordingly, no spoil or fill will need to be transported to or from the site.

Contamination

A Phase 1 contamination audit of the site has been undertaken by WSP Environmental Pty Ltd.

Based on the preliminary environmental audit conducted by WSP, the following issues were identified.

- Potential contamination migrating onto the site from the adjoining Film Australia facility;
- Potential chemical residue in shallow soils in the sporting fields form the application of herbicides and pesticides;
- Asbestos roofing, lagging and building materials as well as lead flashing from the roof; and
- Chemical storage including hazardous material storage and storage of old or unused chemicals (low risk).

The report concludes that based on the findings of the Phase 1 contamination audit, there is no evidence to suggest that the past and present site activities would have grossly contaminated the site and that any contamination that may exist is likely to be isolated, and therefore there are no contamination issues identified that would prevent the site from being rezoned for residential use. WSP therefore concludes that the site is likely to be suitable for sensitive land uses (including residential).

WSP makes the following recommendations as part of any Phase 2 site assessment undertaken as part of future project applications to target the items discussed above

- A hazardous material audit (with sampling and identification of asbestos and PCB) should be completed to fine tune the extent and integrity of the hazardous building materials which exist on the site.
- Any demolition/removal of PCB and asbestos containing material should be conducted in accordance with current NSW EPA waste classification and disposal guidelines, and WorkCover occupation health and safety procedures.
- A limited and targeted Phase 2 intrusive contamination assessment at the northern property boundary to assess whether any contamination, from potentials sources identified on the Film Australia site, has migrated onto the UTS property. This would involve the drilling and collection of soil samples as the installation of ground water wells. The contaminants of concern that should be tested include heavy metals, volatile and semi-volatile organic compounds. In addition, limited surface soil sampling should be conducted across the sports oval and any other sporting fields which may have been treated with organochlorine/organophosphate pesticides. By conducting an intrusive study, the risks can be effectively quantified and managed.
- The results of Phase 2 soil and groundwater investigation should be assessed against the relevant land use criteria stated by NSW EPA, NEPM and ANZECC guidelines. If concentrations of contaminants exceed the relevant land use guideline a remedial action plan should be developed, with remediation and validation works completed in accordance with NSW EPA guidelines, CLM Act (1997) and SEPP 55.

Soil Erosion

Storm water Run-off and erosion:

- Above ground swales are to be constructed and vegetated with native species and indigenous flora conserved wherever possible;
- Water detention areas are to be provided within the development area; and
- An erosion and sediment control plan is to be prepared for the subdivision development and dwelling construction phases in accordance with acceptable standards, to ensure development does not contribute to environmental damage of the waterways, bushland or air quality.

Weeds:

A Weed Management Plan will be prepared as part of project applications to link into storm water control strategies.

- Feral and Domestic Animals:
- Management strategies to minimise habitats post construction for feral animals and restrictions and controls for domestic cats and dogs will be prepared.

6.5 Traffic and Transport

Traffic Generation

As mentioned previously, vehicular access to the site is from Eton Road which links to the Pacific Highway some 1.2km east of the site. An augmented internal circulation network provides vehicular access to service buildings and car parking areas.

A Traffic and Transport Report prepared by Arup is included in **Appendix K.** The report has analysed traffic count data. The report concludes that the proposed use including 440 dwellings and some 27,167m ^{2} of non residential GFA would generate between 442 to 502 vehicle movements in peak hour. This is slightly higher than the average traffic generation of 400 vehicles in peak hours associated with the existing use, under current operations. The campus at historical full operational capacity has generated 600 vehicle movements per hour.

The parking requirement of some 685 spaces (including visitor spaces) for the residential component and some 417 spaces for the non residential component is consistent with the minimum provisions of the Kuring-gai Parking DCP.

Potential Traffic Impact

Traffic flows on local roads will be similar as a result of the proposed Concept Plan. On street parking external to the site will be significantly reduced.

This report found that the traffic impacts on surrounding road network of the proposed would have less impact than the existing university campus.

A second access via Lady Game Drive is not required to accommodate the traffic generated by the proposed Concept Plan. Although peak traffic is slightly higher, the proposal reduces traffic generation compared with the historical use of the site. In addition, a second access would not substantially change traffic flows on local roads.

Pedestrian Environment

Pedestrian circulation has been derived from the original concept of the internal street incorporated into the campus as described in **Figure 24.** The pedestrian circulation integrated into the Concept Plan includes best practice by application of the principles of permeability, legibility and safety (including lighting):

- The pedestrian network leads pedestrian movement to public transport, recreation areas and community facilities;
- The pedestrian network provides clear direction;
- All pathways are to be illuminated; and
- Opportunities to maximise passive surveillance of pedestrian movement from dwellings by integration with the illuminated road network to ensure safety and security.

Cycle Facilities

Cycling on the access road system is in shared road arrangement with traffic volumes and local road cycling conditions considered adequate.

Recommendations

The primary sustainable transport initiative recommended is to maintain the regular bus service that services the campus. In addition, the establishment of a Transport Behavioural Program is advocated, that would comprise an information pack on transport options for all households and consultation with a facilitator able to offer advice on transport planning options.

- The information pack could include:
- bus routes, bus stops locations;
- timetables train timetable information;
- bicycle facilities and route locations;
- travel time comparisons by mode;
- free travel incentives;
- school access arrangements;
- discount schemes where available for bicycle shops; and
- car pooling schemes available.

6.6 Infrastructure and Utilities

The site is serviced by electricity, gas, sewer, water, stormwater and telecommunications. Patterson Britton and Partners has assessed the Concept Plan (at a higher density) in terms of its likely impact on infrastructure services including the provision of potable water, sewer reticulation, telecommunications and electricity.

The report confirmed that services can be provided or augmented to accommodate the additional development of the site up to the level of development proposed as follows:

Water Supply

The campus is located in the Chatswood/Killara/Pymble water supply system. The supply is drawn from major mains along the Pacific Highway.

A feasibility letter has been prepared by Sydney Water that outlines Sydney' Water's requirements for potable water. The proposed rezoning and potential development would require the augmentation of the water main at Eton Road.

A bushfire hazard assessment by Barry Edie Consulting Pty Ltd requires that a reticulated hydrant supply serve the site and which must be addressed in future development applications for the site.

Subject to the above requirements being undertaken the proposed development can be supplied with potable water and provide adequate supply for fire fighting purposes.

Sewerage Services

The campus is within the East Lane Cove sewerage system. Sydney Water has advised that it would require a sewer main extension from the sewer sub main within the National park below the development site.

Subject to the above requirements being completed the proposed development can be served by the Sydney Water sewerage system.

Electrical Services

The campus power supply is from Eton Road via supply mains that service a substation in Film Australia and on the western end of Building 2. Notification of satisfactory arrangements for the provision of electricity supply for the proposed development has been made to Energy Australia. This confirms that the proposed development can be supplied with power by Energy Australia.

Communication Services

The campus and Film Australia are served from a facility at the entrance to Eton Road. There is optical supply to both sites. Telstra has advised that it would supply the proposed development with sufficient telecommunications, including all design and planning prior to construction by Telstra.

Gas Services

There is a secondary main gas supply to the campus from Eton Road. It is AGL's policy to extend natural gas infrastructure into all new residential developments wherever economically viable.

6.7 Water Quality and Management

Stormwater Management

Groundwater bore data indicates that there are 5 registered groundwater bores located within a 2.5km radius of the site.

Groundwater on the site is anticipated at depths greater than 20m below ground level in sandstone with economic supplies (aquifers) at approximately 100m below ground level. The hydrological sensitivity classification of the site is considered to be low. Site activities are highly unlikely to impact on registered bores located within 2.5km radius of the site.

The nearest water bodies to the site are:

- College Creek which is on the south west part of the site;
- Blue Gum Creek around 100m south of the site in the Lane Cove National Park; and
- Sugarbag Creek around 100m to the east, which drains to the Lane Cove River and Sydney Harbour.

There are numerous small sub-catchments draining from the site to the surrounding area. Stormwater exiting the site is discharged via 22 outlets into the adjacent bushland that in turn drain to a number of tributary creeks and ultimately the Lane Cove River.

Further stormwater drainage details are provided in the Urban Infrastructure Management Strategy prepared by Patterson Britton & Partners included at **Appendix E**. It also examined issues of stormwater quality and quantity.

A water sensitive urban design approach (WSUD) was adopted and the report recommends a combination of at-source controls, such as rainwater tanks and drainage swales to minimise and treat the quantity of stormwater runoff. Additionally, the report recommends run off treatment measures, such as bio-retention basins, gross pollutant traps and stormwater detention tanks to improve the quality of water run-off.

The Management Strategy proposed by Patterson Britten & Partners would result in the following outcomes:

- The industry best practice stormwater quality and quantity control measures proposed in this strategy will have the combined beneficial effects of improving the existing conditions of the surrounding bushland and the water quality in receiving water bodies.
- Peak runoff flow rates would be reduced to significantly less than existing and even below those for natural conditions to ensure that erosion of flow paths and streams is not perpetuated.
- The export of suspended solids, total nitrogen and total phosphorus would be reduced significantly in comparison to the existing state, thereby placing less pressure on native vegetation due to the nutrient load and weed infestation.
- The demand for potable water will be reduced by 46% compared to that of a traditional household with the introduction of water saving devices and rainwater tanks.
- The strategy would more than achieve the State government's stated objective for new development to achieve a 40% reduction in potable water use.
- The introduction of welded sewer pipes will further reduce the possibility of ex-filtration of nutrients into the water cycle.

With the above strategies in place, stormwater can be effectively and appropriately managed and conditions in the surrounding bushland improved compared with the existing state as part of the proposed re-zoning application and potential development.

A detailed drainage plan and stormwater and flood management plan will need to be submitted with any future application.

6.8 Heritage

Assessment of Heritage Significance

The architectural significance of the college building and the landscape setting have formed a central theme of the rezoning investigations and have been the basis of the extensive consultation with the original architects. A Heritage Assessment and Conservation Strategy and Heritage Impact Assessment prepared by Graham Brooks and Associates are included at **Appendix I.**

In the context of the State Significant Site Amendment/Concept Plan proposal and in the absence of any listing on Federal, State or local heritage registers, the Heritage Assessment and Conservation Strategies report identified strategies that should reasonably be applied to the whole site.

Several key strategies have emerged as part of the conservation, re-use and development of the overall site. These have emerged in part from the Heritage Assessment in combination with a number of other specialist studies of the site and in part from a series of workshops which included the participation of David Don Turner and Bruce Mackenzie, in addition to CRI Australia, DEM and Graham Brooks and Associates, in early 2004.

'1 New development on the site should be largely contained within the areas that have already been developed for either buildings, roads and parking areas or recreation facilities.

2 The strongly defined bushland character of the site should be retained and the close integration of major buildings with the bushland, primarily by way of sharply defined edges and interfaces, be regarded as a core principle for future development.

3 The bushland edges of the site should be regarded as a community asset and be available for as many members of the on-site population as possible. Close visual connections within the surrounding bushland are preferred to direct physical access, if the natural qualities of the bushland are to be protected.

4 The existing buildings should be largely retained, with uses that support its on-going conservation and relevance to the wider community. Re-use of the main building complex should respect its architectural character and integrity.

5 The existing roads and parking areas, combined with pedestrian pathways and stairways, particularly within the eastern and southern portions of the site should be retained and re-used where possible.

6 New roads within the area identified for development should be reduced to the minimum necessary for residential and emergency vehicle access.

7 The introduction of new roads or landscaped road reservations into the bushland should be restricted to those required for emergency and fire fighting vehicles.

8 The embankment below the existing Oval, that delineates the change in levels in that part of the site should be retained as a significant site feature, although some limited modification is permissible.

9 Any new semi formal common open space should be located near the entry road to retain the contrast with the retained bushland character around the edges of the site.

10 New buildings or extensions to the existing building complex should not be erected to the east, south or south west of the complex. In these locations new building elements would obscure the original architectural imagery, alter its profile on the skyline or reduce its immediate relationship with the surrounding bushland.

11 New development is acceptable, in principle, within the zone extending to the northwest of the main building complex, including on the Oval, Tennis Courts and north western car park. The zone to the north east, associated with the existing car parks, roads and adjacent existing residential development, is also considered appropriate for development.

12 *New development should be arranged on site in a manner that respects the philosophy of a strong interface with the edge of the surrounding bushland, with the main pedestrian and vehicle access routes being located away from the bushland edges. New parking should be underground to minimise additional impacts on the site character. Building footprints and circulation routes should be compact to reflect the scale and compactness of the original college layout and maximise opportunities for new or retained natural landscape. New development should respond to the existing topography of the site.*

13 *New development to the north west of the main building complex should include a network of pedestrian ways that connect to the original pedestrian street and link the new development into the public functions or new uses of the existing complex.*

These pathways might be partially enclosed and partially open within the circulation networks of the site.

14 *New development on the boundary north-western car park should be scaled to respond to the surrounding residential areas. Major trees should be retained if possible. New roadways should respond to the location of major trees.*

15 *New development on the site, with the possible exception of single houses on the north-western and integrated houses in the north-eastern extremities, should achieve a unity in design and external materials that reflect the unity of the retained college buildings. This is not to say that the architectural style or external materials should be replicated, but that the sense of a unified development character and imagery should be achieved.*

16 *Future construction management activities should be modelled on those utilised during the initial development stages, to minimise the extent of any damage to existing bushland and maximise the potential for regeneration. Limited clearing of the bushland edge interface to new or existing buildings in order to reduce fire damage, should respond to the techniques used to the south of Stage One, with limited areas of grass and stone retaining walls.*

17 *Careful management of the bushfire asset protection zones will be required to retain as much of the bushland character as possible, within constraints for controlling fuel loads under the tree canopies. New fire fighting vehicle access routes across the bushland frontage of any new or existing development should be limited to fire trails in preference to public roadways.*

18 *There is no requirement to retain the existing child care centre or outbuildings located to the north west of the Oval, although this facility may be relocated on site.*

19 *There is no requirement for the retention of the Oval and Tennis Courts on site, given the most likely future change in or departure from an educational focus.*

20 *If the Gymnasium building is removed or extensively adapted, the facilities could be relocated on site.*

21 *Any future use or redevelopment of the site should include a reliable and enduring procedure, appropriately resourced, for the management and maintenance of the site's landscape qualities.*

Other conservation strategies were developed for the future re-use of the main building complex. These are not relevant to the current State significant site Amendment/Concept Plan application, but will provide future guidance if and when the project proceeds to that stage.

Impact Assessment

In heritage terms the following aspects are of particular interest.

- The main building complex, with the exception of the Gymnasium (Stage 3) of the original development, will be retained and re-used for educational, commercial, community, neighbourhood retail and other appropriate uses.
- The original Stage 3 Gymnasium is illustrated as being replaced with new residential accommodation. This is considered to be acceptable although a future detailed design of this precinct may enable part of the Gymnasium building to be retained and re-used.
- The original Stage 5, at the western end of the original Stage 1, may be converted to residential. This may result in some modification of the existing external façade treatment of openings and projections, to be managed within design guidelines.
- The vast bulk of the existing natural bushland surrounding the complex, to the east, south and west of the major buildings will be retained. There will be some intervention in the areas that must be modified to serve as a bushfire Asset Protection Zone. Some of this upgrading will be required under current legislation, irrespective of whether the site is rezoned and the buildings re-used. Future fire trails that are required for bush fire management will take on a natural appearance, avoiding the use of hard paving.
- Areas of sensitive flora and fauna will be protected. Stormwater management and run-off into the surrounding bushland will be greatly improved.
- New roads will be severely limited, with most the proposed vehicle access utilising existing roads. The existing bus turning circle will be retained. Large buses will continue using the current arrangements.
- New building development will be largely contained on areas that have already been developed as part of the College, primarily as playing fields and recreational facilities. This will extend to the north-western most corner of the overall site, into the area currently used as a surface car park.
- A series of medium rise residential buildings will be located in the zone extending to the north-west of the main building complex. This zone has been identified as of lesser significance than the surrounding bushland.
- Several buildings will be located on the existing north-eastern car park.
- A small number of free standing and integrated dwellings will be located in the degraded bushland immediately adjacent to the existing adjoining residential houses, on the northeast corner of the overall site.
- An area of active public open space will be located adjacent to the entry to the site from Eton Road.

Recommendations

Graham Brooks and Associates conclude as follows:

'There is not doubt that the advice of the Heritage Consultant has been taken and implemented in the formulation of the Development Scheme. The early concepts and land use proposals have altered dramatically during the formulation process, respecting the advice of heritage, environmental, urban design, fire management, traffic and engineering consultants.

The final Development Scheme represents a responsible and sensitive response to the significance and other characteristics of the site, the landscaped setting and the buildings.

The potential impacts on significance have been minimised by carefully formulating the proposed Development Scheme with a high regard for the protection and conservation of the heritage values of the site and the building complex. This process has been based on a detailed understanding of the integrated nature and significance of the place and in close consultation with the original design architect and landscape architect.

New development is required to be close to the existing building complex and to the surrounding bushland for two reasons:

- *It is concentrated onto those sections of the site that have already experienced intervention.*
- *The original design concept was to integrate buildings and bushland in close proximity to each other.*

The remaining areas of the site are characterised by outstanding bushland which should remain undisturbed, subject to the requirements of bush fire Asset Protection Zone requirements.

Based on the above analysis and from the deeply involvement of the heritage consultant in the heritage assessment of the place and the formulation of the Indicative Development Scheme, it can confidently be concluded that the proposed rezoning will have no unacceptable adverse affect on the heritage significance or significant features of the place.'

6.9 Indigenous Heritage

Archaeological Background

A survey and assessment of Indigenous heritage issues has been undertaken by Jo McDonald Indigenous Heritage Management Pty Ltd included in **Appendix J.**

This survey concluded that the site has limited (low to no) archaeological sensitivity in terms of Indigenous heritage. In particular, the existing bushland areas are steeply sloping with few likely opportunities for Indigenous habitation. No evidence was found along the creek lines for archaeological sites.

No new or previously unrecorded Aboriginal sites were located during the survey.

Discussion with the MLALC in September 2007 indicated that no archaeological sites or Aboriginal objects had been found within the study area, and that there were no inherent cultural values to be discussed.

Accordingly, it is concluded that there are no indigenous heritage constraints to the proposed redevelopment of the UTS lands.

A commitment will be included in the Statement of Commitments to provide copies of the report prepared by Jo McDonald Indigenous Heritage Management Pty Ltd to the Chairperson MLALC and Manager Cultural Heritage Division DECC.

Recommendations

The following recommendations are made on the basis of: legal requirements under the terms of the National Parks and Wildlife Act of 1974 (as amended) whereby it is illegal to damage, deface or destroy an Aboriginal Relic without the prior written consent of the Director-General, Department of Environment and Climate Change; the regional and local archaeological and ethno historic context for the area; the findings of the field survey done within the study area; the interests of the Metropolitan Local Aboriginal Land Councils (MLALC); and the likely impacts resulting from the proposed concept plan design.

It is concluded that there are no indigenous heritage constraints to the proposed redevelopment of the UTS lands.

It is recommended that:

- Assessment of the social significance of the study area be the responsibility of the MLALC. Preliminary discussions with MLALC representatives indicate that there is unlikely to be an issue within the current development area.
- Copies of the report prepared by Jo McDonald Indigenous Heritage Management Pty Ltd be sent to the Chairperson MLALC and Manager Cultural Heritage Division DECC.

6.10 Biodiversity, Flora and Fauna

Legislative Framework

The legislation that is relevant to the assessment of the impact of the proposed Concept Plan on the Flora and Fauna on this site includes the New South Wales (NSW) Threatened Species Conservation Act 1995 (TSC Act) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPCB Act).

The EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of matters of National Environmental Significance (NES). The EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of matters of National Environmental Significance (NES). No "Controlled Actions" as defined by the EPBC Act would be required for the development of the site.

The Environmental Planning and Assessment Act requires that the potential environmental impact as a result of a development proposal be assessed including schedules listed in the TSC Act including threatened species, threatened populations; and threatened communities.

Existing Flora and Fauna

ERM has undertaken a detailed ecological assessment of the site, based on the proposed Concept Plan. The findings of their assessment are reported in the Ecology Report at **Appendix C.**

Flora

Native vegetation within the site consists of remnant woodland, heathland and forests on ridges and slopes. This vegetation forms a contiguous corridor from the Lane Cove National Park.

Some of the ridge top vegetation on the site and in areas to the north has been impacted by urban development and replaced with buildings, hard surface areas or introduced landscaping.

Native vegetation on the site is located mainly around the periphery of the site and is relatively undisturbed. Weeds are restricted to the edges and along drainage lines where stormwater outlets discharge from the site.

Four vegetation communities were mapped on the site. These include

- Heath–leaved Banksia/Scribbly Gum Closed Shrubland;
- Sydney Red Gum/Sydney Peppermint/Red Bloodwood Open Forest;
- Sydney Red Gum/Sydney Peppermint Forest; and
- Blackbutt/Blue Gum Tall Forest.

None of these is listed as an endangered community under the *Threatened Species Conservation Act or Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act).*

The bushland supports small areas of the threatened plant species *Darwinia biflora* which is listed as vulnerable under the *EPBC Act.* This shrub occurs in restricted and scattered patches within the upper hillside areas, near the north-western and eastern car parking areas. The locations of *D. biflora* plants on the site are shown in **Figure 10**. The location of *D. biflora* appears t be restricted to locations where there is a shallow capping of yellow sandy/shale soil over sandstone or grey sandy soil.

Fauna

The native vegetation and other habitat features, such as rock outcrops, drainage lines and soil types, provide potential habitat for a range of fauna that are typical of Sydney sandstone vegetation. This includes birds, mammals, reptiles and amphibians.

The majority of fauna is well conserved in the Sydney region, including the adjacent National Park.

Two threatened fauna species, the Powerful Owl and the Red-crowned Toadlet have been previously recorded on the site.

A known breeding site for the Red-crowned Toadlet occurs on the site and is shown on **Figure 10**. It is the only threatened fauna species likely to inhabit the site. The Powerful Owl has not been recorded breeding on the site or in adjacent areas.

Impact Assessment

Direct Impact

Development of the site will result in some direct impact to native flora and fauna over a small area of the site. The potential direct impacts identified by ERM include the removal of 2.6 ha bushland for construction of residential buildings and infrastructure and approximately 0.1 ha for the construction of a fire trail and modification of some bushland for an Asset protection Zone.

Table 6.1 prepared by ERM (p.37 of **Appendix C**) shows the areas in hectares of each vegetation type identified within the site that may be removed as a result of the proposed Concept Plan.

The three vegetation types that are likely to be affected are widespread in the region. The table shows that the proposal would result in a relatively small reduction (0.24%) in the size of these vegetation types from the Lane Cove valley.

Asset Protection Zone

The Asset Protection Zone (APZ) is located on the southeast to the northwest sloping slopes. It consists of an Inner Protection Area (IPA) and an Outer Protection Area (OPA) resulting in a total APZ width of 35m.

Joint site visits with ERM ecologists in conjunction with bushfire consultant Barry Eadie Consulting Pty Ltd and CRI Pty Ltd were undertaken to ensure that areas of ecological significance are not impacted in the creation and maintenance of the APZ. The areas impacted by the fire trial were 'microsited' to ensure that all habitat considered to be significant was avoided.

Lane Cove valley corridor

The site is located on the eastern side of the widest point of the Lane Cove valley corridor, the majority of which is within Lane Cove National Park. The proposal will result in a small decrease in the amount of vegetation within this corridor. However, this is not likely to prevent the use of the corridor. Should a portion of the site proposed for dedication to Lane Cove National Park be accepted, the result would be an increase in the size of the corridor permanently reserved for conservation.

Indirect Impacts

A range of potential indirect impacts on flora and fauna arising form the proposed development have been identified along with measures to mitigate these impacts.

Storm water Run-off and erosion

Measures to ensure stormwater measures will be incorporated to ensure the protection of water quality in College Creek, Blue Gum Creel or drainage lines through the site. Including stringent controls during the construction period.

Weeds

Weeds exist throughout the site and are concentrated in bushland areas below stormwater outlets. Development of the site has the potential to spread weeds by soil disturbance, introduction of weeds from vehicles and machinery; increased run-off and nutrient laden run-off carrying seed.

Feral and Domestic Animals

Existing feral and domestic animals occurring on the site may increase with increased human population. Feral and domestic animals can impact on flora and fauna through predation, competition, soil degradation and by disturbing foraging and nesting patterns.

Threatened Species, Populations and Communities

Darwinia biflora

The current locations of D. biflora are shown in **Figure 10.** The proposed Concept Plan would result in the removal of the following plants:

- 12 individuals located in the car park in the east of the site;
- 25 individuals located in the car park northwest of the site
- 3 individuals located south car park in the north west of the site.

The two largest areas of habitat for the species will be retained. These areas also contain the species in seed bank:

- 30 individuals and bush land east of the oval; and
- 8 individuals and surrounding habitat west of the oval.

Translocation of adult plants and soil from other areas that will be removed as a result of the development will be discussed with DECC.

Red-crowned Toadlet

The Concept Plan has been designed to protect the breeding habitat of the species.

- Redesign of the Concept Plan to avoid drainage lines that provide breeding and foraging habitat;
- Development of stormwater control to maintain hydrology;
- Avoidance of riparian habitats on site during construction of fire trail;
- Management of weeds and water quality upstream of the breeding site;
- Maintenance of shrub vegetation and sedges; and
- Retention of riparian vegetation.

Other threatened species that may be impacted

Other fauna has either been identified on the site or the site provides potential nesting or foraging habitat. The fauna includes the Powerful Owl, the Glossy Black-cockatoo, the Gang Gang Cockatoo, the Swift Parrot and Regent Honeyeater, Grey headed Flying–fox, Insectivorous Bats and Rufous Fantail. The reduction in bushland or potential foraging habitat is not considered significant as a result to the proposed development. The recommendations include the general protection of potential nesting and foraging habitat.

Recommendations

Direct Impact Mitigation Measures

Proposed Mitigation measures to reduce the significance and the magnitude of the impacts include:

- Retention of areas of native vegetation and habitat for threatened flora and fauna within the site, including retention of *D. biflora* plants and habitat;
- Fencing and flagging of all *D. biflora* plants to be retained within the development area;
- Translocation of soil from *D.biflora* habitat where this will be impacted by the development area. Translocation will be detailed within a plan prior to any works beginning on the site;
- Fencing all area of native vegetation that will not be removed for development, as protection from machinery and personnel;
- Retention and protection of trees, particularly hollow bearing trees within the development area where possible;
- Retention of existing understorey vegetation within landscaped areas. These pockets will be rehabilitated as required to remove exotic species and enhance native shrubs and ground covers;
- Pre-clearance surveys by ecologists to ensure all fauna are removed prior to clearance and ecologists on site during all vegetation clearance activities to capture any displaced fauna; and
- Harvesting of seed banks for the purposes of on-site regeneration. Greening Australia would be consulted regarding the best way to salvage soil seeds and canopy held seeds. These could be used in landscaping or regeneration of disturbed bushland areas adjacent to developed areas.

The following measures to avoid and minimise impacts on flora and fauna for the fire trail and APZ creation and maintenance are proposed to be implemented at the site:

- Prior to any clearance for the APZ and fire trail creation, a survey will be conducted to identify any hollow bearing trees or trees considered to provide important fauna habitat. Such trees will be flagged and locations recorded with a GPS and mapped. These trees will be avoided.
- All *D.biflora* will be flagged and locations recoded with a GPS and protected. A map and works plan will then be devised prior to any vegetation clearance or modification for the APZ creation. Areas within the APZ where soil seed banks or plants could be translocated will also be investigated and identified prior to any works beginning;
- Small shrubs and ground cover to 50cm will be retained within the APZ. Large shrubs can be retained in vegetation clumps where they will not result in fore spreading to tree canopies;
- Erosion and sedimentation controls will be put in place prior to any works beginning to ensure that any potential increase in runoff from removal of vegetation or leaf litter does not impact on downstream or off-site environments;
- Rocky outcrops and rock will be avoided by the fire trial. No rock will be removed from the APZ or fire trail areas; and
- Wooden bridges will be built over the drainage lines for construction of the fire trail so that these environments are not disturbed.

The following measures to minimise the impact on the Lane Cove valley corridor:

- Significant trees will be retained within the development area where possible and all trees will be retained in the APZ.
- Indirect impacts on bushland such as weeds, feral and domestic animals and fire will be managed by the implementation of management plans.

Indirect Impacts and Mitigation measures

Storm water Run-off and erosion

- Above ground swales are to be constructed and vegetated with native species and indigenous flora conserved wherever possible;
- Water detention areas are to be provided within the development area; and
- An erosion and sediment control plan is to be prepared for the subdivision development and dwelling construction phases in accordance with acceptable standards, to ensure development does not contribute to environmental damage of the waterways, bushland or air quality.

Weeds

- A Weed Management Plan will be prepared as part of project applications to link into storm water control strategies.

Feral and Domestic Animals

- Feral and domestic management strategies will be prepared to minimise habitats post construction for feral animals, and to control domestic cats and dogs.

6.11 Bushfire Risk Assessment

Existing Environment and Concept Plan Implications

A Bushfire Hazard Assessment by Barry Eadie Consulting Pty Ltd has been prepared in accordance with the requirements for development contained '*Planning for Bushfire Protection 2006"* guidelines[4] and AS 3959-1999: *Construction of Buildings in Bush Fire Prone Areas*.

Provided the recommendations are implemented in full, Barry Eadie Consulting Pty Ltd is of the opinion that the proposed development achieves the intent of the relevant legislation and in particular the requirements as set out in *'Planning for Bushfire Protection' (2006)*. The report is included in **Appendix H.**

4 Planning for Bushfire Protection defines bush fire prone areas as an area that can support a bushfire or is likely to be subject to bushfire attack. A bushfire prone area is an area that containing high, medium or low bushfire hazard, or any area within 100m of a high or medium bushfire hazard, or within 30m of a low bushfire hazard.

Recommendations

Construction of Buildings in Bushfire Prone Areas (AS 3959-1999).

The level of construction for residential dwellings is determined by the location of the proposed dwelling on the lot, the type of vegetation (forest in this case), the slope under the unmanaged vegetation and the available APZ. The required APZ's for the subdivision application ensure that all lots are capable of providing a building footprint in accordance with the requirements of ***'Planning for Bushfire Protection' (2006).***

In relation to any existing buildings the level of construction will be determined subject to the proposed use, available APZ / defendable space and the nature of possible upgrading where necessary.

Fire Fighting Personnel Access

Public Road Access

Kuring-gai Campus is accessed by Eton Road from the north. The road network to the north of the campus serves the residential community, connecting it to Lindfield and Roseville Village centres and the Pacific Highway. Lady Game Drive provides direct connections to Ryde Road, Epping Road and the M2 via Delhi Road as well as to Chatswood. All of these roads are capable of carrying a fully loaded fire appliance.

Property Access

Property roads will comply with the requirements of ***'Planning for Bushfire Protection' (2006)*** for Property Access Roads. As the proposal is for residential development vehicular access will be available throughout the developed area all of which will provide emergency services access to all buildings.

In respect to the bush land, the proposal for the management of the APZ includes a fire trail (in accordance with ***'Planning for Bushfire Protection' (2006)*** that will provide access and egress to the bush land for fire-fighters.

Electricity Supply

It is preferable that transmission lines providing power to the proposed development be installed underground. Satisfactory provisions are available.

Gas

Reticulated or bottled gas be installed and maintained in accordance with AS/NZS 1596-2002: ***Storage and Handling of LP Gas*** and the requirements of the relevant authorities.

Water Supplies

The existing hydrants provide public water supplies, which provide fire-fighting water with easy access for fire-fighters. The development of the site include the provision of hydrants for both building and bushfire fire fighting.

Evacuation Measures

A Bush Fire Evacuation Plan is to be developed following any consent of the Concept Plan and when a layout of the development is available to determine the most appropriate evacuation plan for the site. The Bushfire Evacuation Plan will to be submitted to be NSW Rural Fire Service – Development Control Services for approval.

The evacuation plan is to be consistent with the RFS Guidelines for the Preparation of Emergency / Evacuation Plan and detail the following:

- under what circumstances the complex will be evacuated;
- where all persons will be evacuated to;
- roles and responsibilities of persons coordinating the evacuation;
- roles and responsibilities of persons remaining with the complex after evacuation;
- a procedure to contact the New South Wales Rural Fire Services District Office or the New South Wales Fire Brigade to inform them of the evacuation procedure and timing and where they will be evacuated to.

6.12 Built Form

Built Form and Visual Impact

The site forms a sandstone plateau at the end of a ridgeline that extends from Lane Cove National Park to the Pacific Highway. Topography falls steeply away on all sides except the north.

Bushland vegetation exists in a horseshoe shape around the east, south and western parts of the site. This provides vegetation links into the adjoining Lane Cove National Park. Buildings and facilities are located within the bushland ring, on the northern and central parts of the site. These are described in the DEM report included in ***Volume 3.***

The sports oval is located in the central northern part of the site and to its south are 5 hard-surfaced tennis courts. A child care centre and surface parking area are located north-west of the oval. Additional surface car parking is provided in terraces on the sloping eastern part of the site.

The main campus building is generally stepped and staggered over 5 levels, with terraces interspersed reducing building mass.

The key environmental issues associated with the built form for the site will be:

- Density;
- Height;
- Floor space intensity:
- Scale and Massing
- Relationship of built form to open space i.e. the interface with the public domain:
- The incorporation of ESD principles;
- Impacts on view corridors;
- Impact on visual amenity;

Environmental impacts including solar access, maximisation of natural light, and overshadowing.

Detailed tables of compliance will be prepared with a future application and will provide a detailed assessment of the proposed development against the provisions of the controls identified.

Proposed Dwellings per hectare

The site area is 20.8 ha. The density of development is 21.15 dwellings per ha.

Proposed FSR

The proposed GFA is approximately 95,471 m^2 (including the existing buildings proposed to be retained). The FSR over the site area is 0.46:1. This density and FSR compares reasonably with the density of residential development in the suburb of Lindfield, over a smaller footprint of developable land and at the lower end of medium density development.

Controls in Kuring-gai Council

The land adjoining the subject site to the north is zoned residential 2(b) in which single dwellings only are permissible. The density of development is based on lot site as follows:

- 800sqm 0.4:1
- 801-1,000 sqm 0.4:1
- Over 1,700 sqm 0.3:1

The nearest comparable zones which represent the medium density residential development of the type proposed adjoining the existing campus buildings within the subject site are the following:

- 2(d) 1/150 (0.85:1)
- 2(e) 1/250 (0.5:1)
- 2(h) 1/300 (0.4:1)

A comparison of the proposed density of development results in the following yield:

Table 13 – Equivalent Residential Density applying Kuring-gai Council's controls

Indicative concept plan Site Area 208,101m ^{2}	2(b) 1/800m^2	2(d) 1/150m^2	2(e) 1/250m^2	2(h) 1/300m^2
Proposed Dwellings 440	260	1,387	832	693

Dwelling Yield

The density of development of 440 dwellings compares favourably with both the density of development in new release areas and as an infill site with the unique landscape constraints identified for the site. The Kuring-gai site is located within an established, existing residential suburb. Notwithstanding the constraints of the site the density of the Concept Plan is calculated as being low to medium density, when compared with standards applied to a new release area.

When compared with Kuring-gai Council controls, applying lowest density standard to yields of 260 dwellings over the site area, the proposed density is higher, approximately double over the developable area.

If medium density development standards are applied to the developable area, it can be demonstrated that the site yield is less than the lowest range which would be generated applying the Kuring-gai density controls, i.e. a yield ranging from 693 to1,387dwellings.

6.13 Solar Access & Overshadowing

The siting and orientation of dwellings has had regard to solar access and potential overshadowing of dwellings within the site and adjoining areas. The site generally lies due south of existing residential areas. Therefore, the potential for new development to create shadow is limited to the north western corner of the site. The separation distance is sufficient to preserve existing levels of solar access.

The minimal site coverage resulting from the proposed development has resulted in the possibility of locating buildings within the site to ensure that solar access is maximised and overshadowing is minimised.

The existing campus building is also located due south of proposed dwellings and will therefore not affect solar access.

The village green will receive full morning sun and potentially have some areas in shadow in the very late afternoon in winter from multi storey dwellings to the west.

6.14 Environmentally Sustainable Development (ESD)

The proposed Concept Plan is based on sound ESD principles that promote responsible development.

- The Concept Plan structure has taken into consideration the existing topography, drainage patterns, site orientation and existing urban street patterns of the surrounding area.
- The proposed new roads are only a minor addition to the existing road network on the site on areas already developed as car park and integrate with the local road network of the surrounding area.
- The siting and orientation of the medium density residential blocks have considered SEPP65 objectives to achieve good cross ventilation, maximise solar access to habitable rooms and open spaces, encourage deep soil planting and introduce endemic species in the landscape concept design.
- The Concept Plan also encourages use of public transport as the existing bus stop at the site entry is retained and is connected by legible pedestrian linkages throughout the new community with distances of no more than 400-500m.

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5 residential flat building means a building that comprises or includes:

(a) 3 or more storeys (not including levels below ground level provided for car parking or storage, or both, that protrude less than 1.2 metres above ground level), and

(b) 4 or more self-contained dwellings (whether or not the building includes uses for other purposes, such as shops),but does not include a Class 1a building or a Class 1b building under the Building Code of Australia.

Note. Class 1a and Class 1b buildings are commonly referred to as town houses or villas where the dwelling units are side by side, rather than on top of each other.

- Water sensitive urban design principles have been incorporated into the concept plan by way of bio-retention basins and swales that capture and retain stormwater runoff to minimise the impact of uncontrolled and unmanaged stormwater from entering the existing natural creek systems on and around the site.

6.15 Internal Residential Amenity

State Environmental Planning Policy (SEPP) 65 – Design Quality of Residential Flat Development, which aims to improve the design quality of all residential flat buildings[5] in NSW, applies to the UTS site. To create high quality residential buildings, all residential flat buildings should generally comply with or exceed the design standards set out in SEPP 65 and the accompanying guidelines in the Residential Flat Design Code (RFDC).

The building envelopes designated for residential development are typically orientated to the north, east and west to ensure excellent light and solar access and consequently provide a high level of internal residential amenity. Where this cannot be practicably achieved, dwellings are compensated where possible by an outlook to the surrounding bushland.

DEM has confirmed that the proposed layout will generally allow the requirements of SEPP 65 to be met. This will be detailed at the project application stage when building designs are completed.

6.16 Access and Mobility

Equitable access is required for all persons as a design requirement for the site. Appropriate access for all persons is to be provided throughout the site in the following locations:

- from the adjacent locality via links from existing footpaths to proposed new footpaths;
- from public transport stops;
- from on site parking;
- to the proposed principal building entrances;
- to all unique use facilities, including open space/park and landscaped facilities; and
- to any proposed public accessible sanitary facilities.

The detailed design of the buildings within the UTS development will meet relevant Building Code of Australia standards to achieve equitable access.

6.17 Crime and Public Safety

The Concept Plan has been designed in accordance with the principles of Crime Prevention through Environmental Design (CPTED).

Safety and security issues were considered as important elements in the development of the street layout of the Concept Plan. Lindfield is perceived as a safe area and has lower crime rate when compared with the NSW average in crime categories associated with assault, robbery, 'break and enter' and fraud.

The Concept plan has introduced the following design measures to promote safety in the public domain:

- Permeability: The pedestrian network forms a 'lattice' with as few barriers to pedestrian movement to encourage the use of public transport, recreation areas and community facilities;
- Legibility: The pedestrian network proposes a clear direction as well as a clear choice of routes;
- Lighting: All pathways are to be illuminated; and
- Safety: Opportunities for to maximise passive surveillance of pedestrian movement from dwellings and the road carriageway is proposed by integration with the road network and lighting to ensure safety and security.

6.18 Environment Risk Assessment

Approach

The Environmental Risk Analysis at **Table 14** for UTS Kuring-gai Campus has been adapted from Australian Standard AS4369:1999 Risk Management and environmental risk tools developed by other organisations. The Environmental Risk Assessment establishes a residual risk by reviewing the 'significance of environmental impacts' and the 'ability to manage those impacts'.

The significance of environmental impacts assigned a value between 1 and 5 based on:

- The receiving environment;
- The level of understanding of the type and extent of impacts;
- The likely community response to the environmental consequence of the project;

The manageability of environmental impact is assigned a value between 1 and 5 based on:

- The complexity of mitigation measures;
- The known level of performance of the safeguards proposed; and
- The opportunity for adaptive management.

The sum of the values assigned provides an indicative ranking of potential residual impacts after the mitigation measures are implemented.

Table 14 – Environmental Risk Matrix

Significance of Impact	Manageability of Impact				
	5 Complex	4 Substantial	3 Elementary	2 Standard	1 Simple
1 - Low	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)	2 (Low)
2 - Minor	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)
3 - Moderate	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)
4 - High	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)
5 - Extreme	10 (High)	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)

Table 15 – Environmental Risk Assessment

Item	Phase	Potential Environmental Impact	Proposed Mitigation Measures	Risk Assessment		
				Significance of Impact	Manageability of Impact	Residual Impact
Bushfire	C + O	Bushfire risk to new development	Construction of Buildings in Bushfire Prone Areas will comply with AS 3959-1999. An Asset Protection Zone will be provided in accordance with the requirements of 'Planning for Bushfire Protection' (2006). A Bush Fire Evacuation Plan to be submitted to NSW Rural Fire Service – Development Control Services for approval.	3	2	5 (Low/ medium)
Transport, traffic and access	C + O	Increased traffic on local roads	The campus at historical full operational capacity has generated 600 vehicle movements per hour. The proposed use (including 440 dwellings and some 27,167m ^{2} of non residential GFA) would generate 442 to 502 vehicle movements in peak hour. On street parking external to the site will be significantly reduced.	2	1	3 (Low)
Heritage and urban design	C	Visual impact of new development Loss of heritage buildings	Buildings and facilities are to be located within the bushland ring, on the northern and central parts of the site to minimise impacts on the heritage buildings, bushland and adjoining residential properties. Any potential for new development to create shadow is limited to the north western corner of the site. The separation distance is sufficient to preserve existing levels of solar access. The main building complex, with the exception of the Gymnasium (Stage 3) of the original development, will be retained and re-used for educational, commercial, community, neighbourhood retail and other appropriate uses.	2	1	3 (Low)

Item	Phase	Potential Environmental Impact	Proposed Mitigation Measures	Risk Assessment		
				Significance of Impact	Manageability of Impact	Residual Impact
Educational Facilities	C	Relocation of educational facilities	Fewer than one third of current UTS students reside in the area defined as North Sydney to Gosford. Consolidating the campus will deliver significant social and educational benefits to UTS students: ▪ Immediate proximity to whole-of-campus student facilities such as libraries, pastoral care services and sporting associations; ▪ 24-hour access to multiple forms of public transport to greater Sydney ▪ Increased range of available subjects; and ▪ Access to social networks associated with university life.	2	1	3 (Low)
Flora and fauna	C + O	Loss of flora and fauna	Most of the proposed development would occur on land which has already been developed or disturbed. Areas of sensitive flora and fauna will be protected. Stormwater management and run-off into the surrounding bushland will be greatly improved.	2	2	4 (Low/ medium)

Summary

The environmental risk analysis illustrates that there are no anticipated high residual risks associated with the project. The balance of the potential impacts identified are generally categorised as low or as low/medium residual impact. The two low/medium residual impacts include:

- Risk of bushfire due to proximity to Lane Cove National Park; and
- Damage / disturbance to flora and fauna as a result of the new development.

The key recommendations for mitigation of all impacts include:

- To minimise risk to life and property, an Asset Protection Zone will be maintained by ensuring buildings are designed in accordance with relevant Australian Standards and "Planning for Bushfire Protection", and Rural Fire Service endorsement of a Bushfire Evacuation Plan for the site; and
- Preventing encroachment of stormwater and building runoff into the National Park to minimise any introduction of weed species and protecting areas containing sensitive species;
- Ensuring the built form is sympathetic to the existing heritage buildings on the site, surrounding bushland and adjoining residential properties; and
- Regularly monitor traffic impacts generated by the new development.

7.0 Conclusion

The UTS is reviewing its options for the continuation of educational uses at the Kuring-gai campus. A decision has not yet been made whether educational uses will continue or expand on the site, or whether UTS will seek to consolidate its activities elsewhere.

UTS seeks the introduction of a new site specific land use zones to permit a wider range of uses, including residential, commercial and community related uses, as well as the continuation of the educational use. This will provide UTS with sufficient flexibility to manage its land and building assets more effectively to achieve the most viable outcome across its campuses.

The site has enormous potential for the adaptive reuse of the existing campus building and development for a predominantly residential development with a commercial component, including a significant area of open space uses as proposed in the Concept Plan.

Australia's recent economic success depends on innovation and knowledge creation. Sydney and the CBD in particular, as Australia's dominant centre for these services, need to remain at the forefront of the country's economic performance. In this context, the future of the UTS Kuring-gai campus may need to be considered in terms of the city campus to maintain efficiencies and strengthen UTS activities in the CBD.

The location of the Kuring-gai campus is to some extent a historical accident. By virtue of its size and access to infrastructure and services, the redevelopment of the UTS Kuring-gai site is ideally suited for higher density urban development. It also has the potential to contribute in the growth and success of Sydney in demonstrating excellence in urban design, planning, architecture and environmental sustainability in accordance with State Environmental Planning Policies.

The potential to develop the site also provides a unique opportunity to create new public parks and roads and as well as the conservation of a building of State architectural significance heritage.

State Environmental Planning Policies

With increasing population pressures, and as recognised in the Sydney Metropolitan Strategy, it is imperative that Sydney continues to provide significant additional housing and employment opportunities in centres serviced by public transport and other services and infrastructure. It is also imperative to the success of these higher density projects that they are planned and designed in an integrated manner to optimum environmental standards.

The proposed development will result in change to the physical environment and an increase in the residential and working population of Lindfield. The Concept Plan will not give rise to any significant adverse environmental impact as a result of the incoming population.

The proposed development is consistent with or able to comply with the relevant State Environmental Planning Policies. In particular, the proposed development will provide for a high standard of residential amenity as required by SEPP 65 and maximise the use of existing urban infrastructure and urban consolidation

Land Use

The proposal seeks to develop the site as a mixed use extension to the existing residential neighbourhood precinct for residential, commercial and local retail and community use. Under the current zoning provisions redevelopment for residential, commercial office and retail uses is prohibited. However, the proposed use of the site for residential purposes would be more consistent with the adjoining land to the north, which is zoned residential.

The land use mix will provide for a diversity of land use in part to accommodate an appropriate use of the existing campus building for non educational purposes, if necessary, and as recommended by the heritage impact assessment. In addition, the range of permissible mixed uses also reflect the desire to retain community infrastructure such as the auditorium, library and gymnasium.

Heritage

The Concept Plan proposes to conserve the campus building, acknowledged as a significant 20th century building of exceptional significance. The building is to be retained and conserved. In addition, the proposed amendment to Schedule 3 of the Major Projects SEPP identifies the campus building as a heritage item, and includes provisions to ensure any works are carefully considered from a heritage perspective.

The Heritage Impact Assessment report concludes that the Concept Plan provides a very high degree of compliance with the assessment of Heritage Significance and its recommendations.

FSR and Density

The site area is 208,010m2. The total GFA is 95,471m 2. The overall FSR of the proposed Concept Plan is 0.46:1. This is comparable to the density of development based on lot size of the land adjoining the site. Notwithstanding the majority of dwellings are medium density residential apartment buildings, the density of development proposed is 21.15 dwellings per ha. This is comparable to the density of new release areas.

The proposed density is relatively low and consistent with the site's size and contextual location within the broader metropolitan area and its accessibility to established services and infrastructure.

Height

The proposed built form provides a transition in building height and scale across the site.

The building height ranges from 2 storeys in the interface areas, through 3 and 4 storeys adjacent to Film Australia and around the existing sports oval. Residential flat buildings of 5 storeys will be located closer to the main campus building in keeping with existing heights.

Car parking spaces

Regarding the amount of parking proposed for the residential component, the Concept Plan provides for a parking rate, which is the same as the Kuring-gai DCP 43. The Concept Plan proposes 685 spaces, including 97.5 visitor spaces.

Traffic

The report found that the development of the UTS site as proposed by the Concept Plan would:

- Generates less traffic than the University Campus (at full operational capacity).
- Provide adequate emergency access via the main entry from Eton Road.
- Improve parking conditions for existing residents as parking for new residences will be provided within the site.

Key elements to minimising car use are:

- Provision of a mix of land uses to encourage live/work arrangements;
- Maximising walking/cycling catchments; and
- Direct convenient access to public transport.

Asset Protection Zone

The Asset Protection Zone (APZ) is located on the southeast to the northwest sloping slopes. It consists of an Inner Protection Area (IPA) and an Outer Protection Area (OPA) resulting in a total APZ width of 50m.

Joint site visits with ERM ecologists in conjunction with bushfire consultant Barry Eadie Consulting Pty Ltd and CRI Pty Ltd were undertaken to ensure that areas of ecological significance are not impacted in the creation and maintenance of the APZ. The areas impacted by the fire trial were 'microsited' to ensure that all habitat considered to be significant was avoided.

A Bushfire Hazard Assessment has been prepared in accordance with the requirements for development contained in '*Planning for Bushfire Protection 2006"* guidelines and AS 3959-1999: *Construction of Buildings in Bush Fire Prone Areas*. Provided the recommendations are implemented in full, Barry Eadie Consulting Pty Ltd is of the opinion that the proposed development achieves the intent of the relevant legislation and in particular the requirements as set out in *'Planning for Bushfire Protection' (2006)*.

Environmental Impacts

Development of the site will result in some direct impact to native flora and fauna over a small area of the site. The potential direct impacts identified by ERM include the removal of 2.6 ha bushland for construction of residential buildings and infrastructure and approximately 0.1 ha for the construction of a fire trail and modification of some bushland for an Asset Protection Zone.

The bushland supports small areas of the threatened plant species *Darwinia biflora* which is listed as vulnerable under the *EPBC Act.* This shrub occurs in restricted and scattered patches within the upper hillside areas, near the north-western and eastern car parking areas. The two largest areas of habitat for the species will be retained. These areas also contain the species in seed bank:

- 30 individuals and bush land east of the oval; and
- 8 individuals and surrounding habitat west of the oval.

Translocation of adult plants and soil from other areas that will be removed as a result of the development will be discussed with DECC.

The report concludes that based on the findings of the Phase 1 contamination audit, there is no evidence to suggest that the past and present site activities would have grossly contaminated the site and that any contamination that may exist is likely to be isolated, and therefore there are no contamination issues identified that would prevent the site from being rezoned for residential use.

The redevelopment of the UTS Kuring-gai site presents an opportunity to implement best practice techniques in ecologically sustainable design (ESD). Water and energy have the largest ecological impact on the site and are in the forefront in the community's attitude to environmental conservation and resource management.

Community Aspirations

Community and Stakeholder Consultations have identified key issues surrounding the Concept Plan for the community.

A key aspiration identified is the retention of community facilities, and in particular the sports oval. The Concept Plan proposes to retain half the area of the existing sport oval as 'Village Green'. The retention of the sports oval and the proposed residential development are incompatible uses. The proposed open space will provide a focus for the local community, in addition to the large informal spaces and access provided on and through the site to natural bushland.

The evolution of the Concept Plan has benefited from a number of iterative processes and resulted in a robust and excellent planning and urban design solution for the site. It provides a basis upon which future project applications can build and upon which the owner and the whole community can rely to deliver continued design excellence and public benefits. The State, Regional and local interests and the public interest generally will be well served by the proposed development into a high amenity residential neighbourhood.