Travers environmental

Tree Assessment Report

OXFORD FALLS SENIORS LIVING RESORT

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TREE ASSESSMENT REPORT

OXFORD FALLS ROAD AND BARNES ROAD, OXFORD FALLS

SEPTEMBER 2008

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EXECUTIVE SUMMARY

This Tree Assessment Report has been prepared by *Travers environmental* to provide information regarding the current and potential health and condition of trees within and in close proximity to the proposed retirement resort structures at Lots 1110, 1111, 1113, & 1336 DP 752038, Lot 20 DP 842523 and Lot 80 DP 846099, Oxford Falls Road, Oxford Falls.

Director Generals Requirements

The proposal has been declared as a major project under Part 3A and Director General Requirements (DGR's) have been issued.

This assessment has been prepared in accordance with the Director Generals Requirements (DGR's), issued by the NSW Department of Planning (DoP) in August 2006. The issue relevant to this report is identified in Table 1 below.

Table 1: Director General Requirements

Item	Director General Requirement	Relevant section of this report
General Requirements		
3	A draft statement of commitments, outlining environmental management, mitigation and monitoring measures	Section 6

DECC's Recommended EA Requirements specific to the Flora and Fauna Assessment

Attachment 1 of the DGR's provides a list of the DECC's recommended EA requirements. Item 1 – Impacts on threatened species and their habitats is pertinent to this flora and fauna assessment and has been addressed below. Each of the DGR's pertinent to this assessment has been provided in Table 1 within the Executive Summary.

b) Describe the actions that will be taken to avoid or mitigate impacts or compensate for unavoidable impacts of the project on threatened species and their habitat. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

Table 1 below outlines each of the mitigation actions being taken as well as an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

Table 1: Mitigation Measures Proposed and Assessment of Effectiveness.

Mitigation Action	Effectiveness and Reliability	Residual Impacts
Creation of an Environmental corridor	The waterway is currently unprotected with the majority of the creekline is overgrown with weeds. The corridor will provide a no development zone thus allowing the ability for not only ecological functioning but also open space use and scientific education opportunites on riparian and aquatic observation for local schools. This is a highly effective and reliable mitigation measure with proven benefits for water quality, habitat and vegetated connectivity.	Ongoing weed management required. This will be implemented as part of the ongoing site management requirements of the Waterway Impact Study.

Revegetation of drainage lines to provide habitat connectivity.	The provision of a permanent vegetated link within the corridor will enhance not only vegetated links but also ecological functioning in the form of aquatic, riparian and terrestrial habitat creation.	Ongoing weed management required and potential edge effects. The implementation of a monitoring program (weeds, plant establishment and growth) will ensure these impacts are kept to a minimum.
Development Design	The development has been designed to utilise the cleared portions of the site with minimal clearing of vegetation required. The development has been designed to increase the amount of native vegetation on the site and provide water quality treatment and increased habitat potential through the creation of development / creekline buffers and increased aquatic habitat.	Increased human use of the site. Residual impact upon native flora and fauna.
Retention of Hollow Bearing Trees	The retention of hollow bearing trees is an effective means of preserving roosting and breeding habitat for a range of arboreal mammals as well as birds.	Twenty-one (21) hollow-bearing trees were observed within the subject site. Three (3) of these trees will be required to be removed. However, as 85% of the hollow-bearing trees are to be retained with the majority of them being protected within the environmental corridor a significant impact is not considered likely.

Conclusion

It is concluded that the proposed development of Lots 1110, 1111, 1113 & 1336 DP 752038, Lot 20 DP 842523 and Lot 80 DP 846099 Oxford Falls Road and Barnes Road, Frenchs Forest, is unlikely to result in a significant impact on any threatened species, populations or endangered ecological communities or their habitats.

As such no further assessments are considered to be required under the *EP&A Act 1979, EPBC Act 1999, FM Act 1994 or WM Act 2000.*
Each of these issues has been taken into consideration during the design of this development to ensure that there are no short or long term ecological impacts to this site. The management of this corridor has been discussed in detail within the Waterway Impact Study (*Travers environmental*, 2008)

There is potential on this site to achieve a better environmental outcome than the current situation. The subject site is currently an unmanaged landscape with uncontrolled weed growth adjacent the Middle Creek Tributary and also throughout the site. The site is owned by mulitiple parties with an inconsistent approach to its management. Upon implementation of the recommendations from each of the reports prepared for this proposal, there will be a consistent management approach across the entire lands with retained and managed vegetation areas providing protection to the watercourse.

Vegetative connectivity will be enhanced and maintained in perpetuity to ensure the link between higher quality habitat is maintained. Water quality will be enhanced through the implementation of WSUD objectives which meet the required targets for water quality. Aquatic habitat will be enhanced within the creekline through the creation of a more natural stream sequence of riffle, pools and runs. This will not only improve the aesthetic qualities of the site, but provide an enhanced aquatic habitat for native flora and fauna utilising the site.

Building locations, asset protection zones and retained vegetation areas have been designed for the proposal to ensure that the bulk of the development has been contained within the already cleared portions of the site.

The Middle Creek Tributary is to be protected within the environmental corridor. This corridor is designed to increase the distance between development and the watercourse and reduce possible edge effects. The retention and protection of these items will require the implementation of the *Waterway Impact Study* (including Riparian Plan of Management).

PROJECT TEAM

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1 ASSESSMENT

1.1 BACKGROUND

This report provides an assessment of the current and potential health and condition of trees located within and in close proximity to the proposed retirement resort structures at Lots 1110, 1111, 1113, & 1336 DP 752038, Lot 20 DP 842523 and Lot 80 DP 846099, Oxford Falls Road, Oxford Falls within the Warringah LGA.

The subject site is situated on the south-western side of Oxford Falls Road and is adjoined to the south-east by Barnes Road. The subject site has frontage to Oxford Falls Road of approximately 390 metres, to Weardon Road of approximately100 metres and to Barnes Road of approximately 370 metres. Approximate GDA coordinates of the subject site are 337750E and 6264900N. The subject site is bounded to the south-west by residential land and elsewhere by fragmented natural bushland. The subject site encompasses an area of approximately 13.6 hectares.

The Concept Plan proposes a seniors living resort development on six parcels of land located at Frenchs Forest, within the Warringah Local Government Area. The Seniors Living development is made up of several components including a nursing home facility, serviced apartments, self care dwellings, community and retail facilities and 24 hour, seven days a week access to medical attention through the provision of on site doctor.

- The Seniors Living Resort will provide three levels of care within a number of types of buildings with ancillary facilities that overall will comprise:
- A three storey nursing home facility containing 60 beds, with a high level of care
- 391 self care dwellings contained within a mixture of three and four storey apartment buildings and six two storey townhouse buildings on site.
- 100 Serviced apartments (low level care) within two four storey buildings
- Two access entry and exit points off Oxford Falls Road. No through site access to the western residential areas off Barnes Road is proposed, only emergency access and access for the two existing residential properties will be maintained.
- Amenities and facilities such as a swimming pool, gymnasium and communal areas are proposed within the basement and ground floor of the serviced apartment building.
- Two existing residences on the western portion of the site will be retained for residential purposes.
- The existing tennis academy building on the northern portion of the site will be retained for amenities, office facilities and short term accommodation.
- A bowling green will be located to the north of the site.
- Car parking spaces for residents, staff and visitors located within single level basement car parks with limited visitor parking at street level;

- A comprehensive landscaping scheme including water features to create an accessible, tranquil and natural environment setting;
- Realignment and rehabilitation of the eastern tributary and creation of a natural wetland;
- 24 hour, seven days a week provision of medical facilities.

The Concept Plan seeks approval for the proposed uses, building envelopes and yield to facilitate the proposed development. The detailed design, including resolved elevations and internal layout will be provided within the Project Application.

History of Site
On 26 October 2006 a Concept Plan and Environmental Assessment were lodged with the Department of Planning. This Concept Plan proposed a Seniors Living development comprising:

- A residential care facility with 94 beds, associated amenities, staff facilities and 25 car parking spaces;
- 78 one bedroom serviced self care apartments with communal facilities and 25 car parking spaces;
- 400 two bedroom and 200 one bedroom self contained dwelling apartments; and
- Ancillary support services including a resident doctor and nursing staff, amenities, pharmacy, office facilities, overnight accommodation, mini market, lounges, libraries, games room, swimming pools, tennis courts, gymnasium, bicycle and walking routes, caretakers and mini bus service.

Further information was requested on two separate occasions by the Department of Planning. Subsequently in May 2007, Urbis became involved with the project to review the scheme and provide advice. A new Concept Plan was developed and discussed with the Department of Planning on 25 February 2008 and 15 April 2008, were it was agreed that the Concept Plan should be finalised and officially lodged.

Subject Site Legal Description

The subject site consists of six parcels of land, totalling an area of approximately 13.6 hectares. The site is legally described as follows:

- Lot 1110 in Deposited Plan 752088
- Lot 1111 in Deposited Plan 752038
- Lot 1113 in Deposited Plan 752038
- Lot 1336 in Deposited Plan 752038
- Lot 20 in Deposited Plan 842523
- Lot 80 in Deposited Plan 846099

1.2 SURVEY DETAILS

A Tree Survey and Assessment of the subject area was carried out on the 14th of September 2004.

The aims of this Tree Assessment are to review the current health and condition of trees within or in close proximity to areas proposed for development and to assess the potential life expectancy of these trees. To achieve these aims the following actions were undertaken:

- An inspection of the site and relevant trees;
- An assessment of the dimensions (age class, height, girth and crown diameter) of the trees;
- An assessment of the health and condition of the trees;
- An assessment of the Safe Useful Life Expectancy (SULE) of the trees; and
- Compilation of an appropriate report detailing the results of the above assessments.

Trees with diameter at breast height (DBH) greater than 6cm were assessed. Individual tree assessments are listed within the Tree Details (Schedule 1) and a description of terminology used is provided as Schedule 3.

Only the trees within or in close proximity to the proposed building footprints have been individually assessed as part of this report. All other trees occurring outside the areas to be occupied by the proposed structures are expected to be retained. All individual trees surveyed have been marked using metal tags labelled with their respective number ID (except in some areas where trees were very crowded, where approximately 1 in 3 trees were tagged). Locations of surveyed trees are shown on the Tree Plan (Schedule 2).

The SULE method (acronym for Safe Useful Life Expectancy) of tree assessment, as outlined by Jeremy Barrell (1993) has been adopted within this report. SULE categories give an indication of the safe useful life anticipated for each tree surveyed. Several factors are considered in determining this rating such as species, location, age, condition and health of the tree. The four SULE categories are outlined in detail within Schedule 3.

The management requirements of maintaining safe trees (pruning, thinning etc.) is also considered in determining this rating therefore SULE ratings given to trees within this report assumes that appropriate maintenance will be provided by a qualified arborist during the life of the assessed trees if they are retained. Incorrect tree maintenance practices can significantly accelerate tree suppression and increase hazard potential.

1.3 SURVEY RESULTS

A total of 138 trees were assessed within or in close proximity to the proposed building footprints with SULE 2A, 2C, 2D, 4A and 4C ratings given (Schedule 1).

1.3.1 Health and Condition of Trees on Site

The trees on this site are a mixture of endemic (naturally occurring local native) species and exotics. The tree species present include *Acacia floribunda* (Sally Wattle), *Acacia parramattensis* (Sydney Green Wattle), *Allocasuarina torulosa* (Forest Oak), *Angophora costata* (Smooth-barked Apple) *Corymbia maculata* (Spotted Gum), *Eucalyptus piperita* (Sydney Peppermint), *Eucalyptus paniculata* (Grey Ironbark), *Eucalyptus punctata* (Grey Gum) and *Eucalyptus sieberi* (Silvertop Ash). A full list of species and their characteristics is provided in Schedule 1.

In general the majority of trees on the site are of good health and condition, however some have been disturbed by earthworks in close proximity to the roots. These trees are now left standing on a small mound of soil and many have exposed roots as a result.

A high proportion of the trees within the site have either been recently planted as part of the amenity or aesthetic improvement for the existing facility, or are newly recruited from seed. Suppressed Eucalypt trees in nature are generally naturally thinned, suppressed Eucalypt

trees in a residential situation can be dangerous due to their natural decline and associated branch loss (Florence, 1996).

1.3.2 SULE Assessment

A detailed description of the SULE categories is contained in Schedule 1. The trees assessed within the proposed structure footprints were given SULE ratings of 2A, 2C, 2D, 4A and 4C.

Trees nominated as SULE 2A are considered suitable for retention (15-40 years) where remedial care is given. In most cases the remedial care required will be pruning (to prevent potentially dangerous falling branches), including lower branches and crown pruning. *Australian Standard (AS 4373)* for pruning should be adopted.

If pruning or thinning management is not achievable (either financially or practically) then it is recommended that these trees SULE 2A be removed. Retention is preferred but will have to be considered by the future managers of the site.

Trees nominated as SULE 2C indicates they are likely to live for more than 40 years but should be removed to prevent competition with more suitable individuals or to provide space for new planting.

Trees nominated as SULE 2D indicates a damaged or defective tree that could be made suitable in the medium term (15 – 40 Yrs) where remedial care is undertaken.

Trees nominated as 4A are considered for removal as they show signs of severe suppression, decline or are dead. In general any tree observed on site that was considered not capable of recovery (due to suppression or pathogen attack) was assessed as SULE 4A.

Trees nominated as 4C are considered to be a dangerous tree through structural defects (cavities, decay, included bark, wounds or poor form). It is recommended that trees with this SULE rating be removed for safety reasons.

It was generally considered most of the trees assessed on site may be suitable for retention with an acceptable level of risk. However, the majority of these assessed trees have been identified to be within the proposed development footprint and therefore have been identified for removal.

1.4 TREE REMOVAL

Following the assessment of both the trees and extent of the proposed development a total of approximately 102 trees have been identified for removal. Therefore 74% of the assessed trees within the proposed development area are to be removed to accommodate the proposed development. These trees will be replaced within the environmental corridor at a minimum ratio of 1:1 with much more expected to be planted in accordance with the Waterway Impact Study (including Riparian Plan of Management) (*Travers environmental*, 2008).

1.4.1 Tree Root Distribution and Soil Types

Tree roots in natural conditions predominantly grow in a variable radial direction from the trunk and occupy the upper soil profile (less than 60cm deep) directly under the tree canopy. In poorly structured, shallow or wet soils, tree roots will be close to the surface and extend well beyond the canopy.

The subject site is located within the Gymea Soil Landscape consisting of skeletal to deep sandy soils with numerous sandstone outcrops (Chapman and Murphy, 1989). Therefore considering the species, soils and topography on this site it would be expected that tree roots would be moderately deep rooted, and not extend beyond the tree canopy for most individuals.

1.4.2 Anticipated Impact of the Development to Trees on Site

In general, the construction of roads and structures creates areas of increased soil compaction with reduced infiltration potential. This can potentially decrease the rooting area of surrounding trees and create water stress. Stressed trees are more susceptible to insect and fungal attack (Florence 1996, Simpfendorfer, 1992) and are more likely to drop dangerous branches.

Earth movement and trenching associated with the construction of the proposed development will also have potential to create stressed trees through physical disturbance and altered hydrological regimes. Therefore any development will typically require the removal of trees located in and close to (within the tree protection zone – Section 5.1) potential roads and driveways, building locations and earthwork areas (trenches for services or soil stock piling).

The proposed development is most likely to require the removal of 102 of the assessed trees on the subject site, with retention of the remaining trees occurring out side the proposed development area.

1.5 TREE RETENTION AND PROTECTION

Tree removal and site modification are unavoidable consequences of development. Older trees are less tolerant of site disturbance. Therefore any tree with potential to be retained should be Semi-Mature to Mature and protected from development construction (applying Tree Protection Guidelines, Section 5.1).

No rare or threatened trees as listed under the Schedules of the (*TSC Act*, 1995), were observed on the site.

One specimen of *Eucalyptus robusta* (Swamp Mahogany) listed as a significant plant species within Warringah LGA by Smith and Smith (2002) was observed on site.

The proposed development is most likely to require the removal of 102 of the assessed trees on the subject site, with retention of the remaining trees occurring out side the proposed development area. It must be noted that the proposed development has been sited so that the structure footprints are located within existing cleared areas and that an effort has been made to retain as much native vegetation as possible.

Several factors have the potential to affect the long-term viability of any tree with the potential to be retained, including:

- Changes to site hydrology characteristics (decreased infiltration from compaction) following development;
- Increased erosion and soil movement following clearing for development;
- Exposure of retained trees to altered wind and light intensities from the removal of neighbouring trees;
- Physical damage to retained trees from the removal of neighbouring trees;

- Damage to rooting areas from the excavation and construction of roads, dwellings and trenches for utility (water/electricity etc.) connections;
- Physical damage from development construction works; and
- Damage from future resident/land manager activities.

The following guidelines should be followed for any tree (or TPZ) located within potential development areas (refer to Section 5.1), if retained (considering SULE determinations (Tree Details, Schedule 1 and Section 3.2)):

- Earthworks around subject trees are to be undertaken in the presence of a qualified arborist who may provide additional on-site advice;
- Machine digging within the root mass of the subject tree be minimised and where possible be replaced by hand digging;
- Any exposed roots of the subject tree should be wrapped and protected during exposure and be replaced in a similar position prior to disturbance; and
- Inspection of retained tree by a qualified person should be conducted at 6 and 12 months and 3 years after development completion.

Any retained tree on site will require protection both during and after development construction, applying the following Tree Protection Guidelines.

1.5.1 Tree Protection Guidelines

The following guidelines are proposed in relation to any trees that may be retained on the site and the proposed development:

i. Implementation of an adequate ***Tree Protection Zone (TPZ)*** will be required surrounding any retained tree. This *tree protection zone* can generally be provided by preserving an area around a tree with a radius of at least 1.25 x the average canopy radius from the trunk (of typical tree forms) or 0.5 x the tree height (*British Standard BS 5837* 1991);
ii. Tree protection zones should be adequately marked and sign posted;
iii. All trees not nominated for retention are to be removed prior to any construction activity or bulk earthworks. Approved tree removal operations in the vicinity of retained trees are to be undertaken in a manner that avoids canopy damage and soil compaction. Such works are to be supervised by a qualified Arborist;
iv. Stumps are to be ground - not dozed or dug out;
v. All trenches footings and major earth movement should avoid *tree protection zones;*
vi. Stockpiling materials and soils within *tree protection zones* is to be avoided*;*
vii. Machinery is to avoid *tree protection zones* during all operations; and
viii. Any trenching or construction works undertaken within *tree protection zones* should be witnessed, supervised and recorded (photographed + documented) by a qualified Arborist.

1.6 STATEMENT OF COMMITMENTS

Based on the results of the tree assessments and consideration of the proposed development the following recommendations are provided:

i. Remove trees as required for development construction considering SULE determinations (Tree Details and Section 3.2) and Tree Protection Guidelines within Section 5.1;

ii. Earthworks around subject trees are to be undertaken in the presence of a qualified arborist who may provide additional on-site advice;

iii. Machine digging within the root mass of the subject tree be minimised and where possible be replaced by hand digging;

iv. Any exposed roots of the subject tree should be wrapped and protected during exposure and be replaced in a similar position prior to disturbance; and

v. Inspection of retained tree by a qualified person should be conducted at 6 and 12 months and 3 years after development completion.

vi. Implement appropriate tree protection measures for trees which are to be retained. Replant trees using appropriate species in appropriate locations where future growth can be accommodated. Species used for replanting could include *Corymbia maculata* (Spotted Gum), *Eucalyptus paniculata* (Grey Ironbark) and *Eucalyptus piperita* (Sydney Peppermint).

vii. Undertake regular (at least every second year) inspections of retained trees and undertake management (predominantly pruning following *Australian Standard (AS 4373*) by a suitable qualified person when required; and

viii. Inspection of retained and planted trees by a qualified Arborist should be conducted at 6 and 12 months and 3 years after development completion.

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SCHEDULE 1 – Tree Details

Tree No	Scientific Name	Common Name	DBH (cm)	Height (m)	Spread (m)	Vigour %	SULE	Comments & Reccomendations	Retained / Removed
1	*Eucalyptus piperita*	Sydney Peppermint	100	16	16	75	2D	small deadwood, poor form, leaning	Removed
2	*Eucalyptus piperita*	Sydney Peppermint	10, 6, 6, 8	8	9	90	2D	poor form	Removed
3	*Eucalyptus punctata*	Grey Gum	40	10	10	85	2A	small deadwood	Removed
4	*Eucalyptus piperita*	Sydney Peppermint	30	13	8	70	2D	exposed roots, leaning	Removed
5	*Erythrina sykesii*	Coral Tree	60,80,40,30	12	15	80	2D	exposed roots, poor form	Removed
6	*Eucalyptus piperita*	Sydney Peppermint	90	16	18	70	2D	exposed roots, crown dieback	Removed
7	*Angophora costata*	Sydney Red Gum	70, 30	18	14	90	2D	exposed roots	Removed
8	*Eucalyptus punctata*	Grey Gum	45	15	14	90	2A		Removed
9	*Eucalyptus piperita*	Sydney Peppermint	100	18	8	30	4C	(H17) hollow trunk, exposed roots	Removed
10	*Eucalyptus sieberi*	Silvertop Ash	35	18	6	90	2A		Removed
11	*Acacia parramattensis*	Sydney Green Wattle	25	8	8	90	2A		Removed
12	*Acacia parramattensis*	Sydney Green Wattle	25	12	10	90	2A		Removed
13	*Acacia parramattensis*	Sydney Green Wattle	20	12	9	90	2A		Removed
14	*Eucalyptus punctata*	Grey Gum	20, 20	6	9	85	2D	poor form	Removed
15	*Acacia floribunda*	Sally Wattle	30	7	9	85	2A	small deadwood	Removed
16	*Eucalyptus punctata*	Grey Gum	10, 10	5	8	85	2D	poor form	Retained
17	*Allocasuarina torulosa*	Forest Oak	40	18	12	90	2A		Retained
18	*Allocasuarina torulosa*	Forest Oak	15	12	5	90	2D	suppressed, poor form	Retained
19	*Allocasuarina torulosa*	Forest Oak	60	18	16	90	2A		Retained
20	*Corymbia maculata*	Spotted Gum	20	10	8	80	2D	suppressed, poor form	Retained
21	*Allocasuarina torulosa*	Forest Oak	35	15	8	90	2A		Retained
22	*Allocasuarina torulosa*	Forest Oak	40	18	9	90	2A		Retained
23	*Allocasuarina torulosa*	Forest Oak	30	15	10	90	2A		Retained
24	*Allocasuarina torulosa*	Forest Oak	40	15	12	90	2A		Retained
25	*Allocasuarina torulosa*	Forest Oak	55	15	14	90	2A		Retained
26	*Archontophoenix alexandrae*	Alexandra Palm	30	6	6	90	2A		Removed

Tree No	*Scientific Name*	Common Name	DBH (cm)	Height (m)	Spread (m)	Vigour %	SULE	Comments & Reccomendations	Retained / Removed
27	*Archontophoenix alexandrae*	Alexandra Palm	30	6	6	90	2A		Removed
28	*Archontophoenix alexandrae*	Alexandra Palm	35	6	6	90	2A		Removed
29	*Archontophoenix alexandrae*	Alexandra Palm	30	6	6	90	2A		Removed
30	*Archontophoenix alexandrae*	Alexandra Palm	15	6	6	70	2D		Removed
31	*Archontophoenix alexandrae*	Alexandra Palm	20	6	6	90	2A		Removed
32	*Archontophoenix alexandrae*	Alexandra Palm	35	6	6	90	2A		Removed
33	*Livistona australis*	Cabbage Palm	40	5	5	90	2A		Removed
34	*Banksia integrifolia*	Coast Banksia	10, 15	10	8	90	2A		Removed
35	*Banksia integrifolia*	Coast Banksia	20	10	8	90	2A		Removed
36	*Banksia integrifolia*	Coast Banksia	15	10	8	90	2A		Removed
37	*Banksia integrifolia*	Coast Banksia	20	10	8	90	2A		Removed
38	*Banksia integrifolia*	Coast Banksia	20	10	8	90	2A		Removed
39	*Eucalyptus paniculata*	Grey Ironbark	18	12	9	85	2D	suppressed	Retained
40	*Eucalyptus paniculata*	Grey Ironbark	35	16	14	90	2A		Retained
41	*Eucalyptus piperita*	Sydney Peppermint	20	14	3	30	4A	70% of crown is dead	Retained
42	*Eucalyptus paniculata*	Grey Ironbark	15	15	9	90	2A		Retained
43	*Casuarina glauca*	Swamp Oak	30, 25	18	10	90	2A		Retained
44	*Casuarina glauca*	Swamp Oak	20	18	8	90	2C	crowded	Retained
45	*Casuarina glauca*	Swamp Oak	20	16	6	90	2C	crowded	Retained
46	*Casuarina glauca*	Swamp Oak	20	15	6	90	2C	crowded	Retained
47	*Eucalyptus sieberi*	Silvertop Ash	25	18	10	90	2C	crowded	Retained
48	*Eucalyptus sieberi*	Silvertop Ash	25	18	12	90	2A		Retained
49	*Casuarina glauca*	Swamp Oak	35	18	8	90	2A		Retained
50	*Casuarina glauca*	Swamp Oak	20	15	6	90	2A		Retained
51	*Casuarina glauca*	Swamp Oak	35	18	10	90	2A		Retained

Tree No	*Scientific Name*	Common Name	DBH (cm)	Height (m)	Spread (m)	Vigour %	SULE	Comments & Reccomendations	Retained / Removed
117	*Casuarina cunninghamiana*	River She-oak	40	18	8	90	2A	small dead wood	Retained
118	*Casuarina cunninghamiana*	River She-oak	30	8	6	80	2C	suppressed, poor form	Retained
119	*Pinus elliotti*	Slash Pine	12	9	5	80	2C	suppressed	Retained
120	*Pinus elliotti*	Slash Pine	25	12	5	80	2C	suppressed	Retained
121	*Pinus elliotti*	Slash Pine	15	8	4	80	2C	suppressed	Retained
122	*Casuarina cunninghamiana*	River She-oak	50	18	9	90	2A		Retained
123	*Eucalyptus deanei*	Round-leaved Gum	90	24	16	90	2A		Retained
124	stag	stag	75	10	5	0	4A	dead	Removed
125	*Eucalyptus deanei*	Round-leaved Gum	75	22	15	90	2A		Retained
126	*Eucalyptus piperita*	Sydney Peppermint	100	20	20	90	2C	suppressed, canopy entangled with tree 127	Retained
127	*Eucalyptus deanei*	Round-leaved Gum	30	18	10	80	2C	suppressed, canopy entangled with tree 126	Retained
128	*Eucalyptus punctata*	Grey Gum	25	14	10	80	2C	leaning & poor form	Retained
129	*Eucalyptus deanei*	Round-leaved Gum	35	20	12	90	2A		Retained
130	*Eucalyptus punctata*	Grey Gum	60	15	16	85	2A	small dead wood	Removed
131	*Eucalyptus piperita*	Sydney Peppermint	10	8	6	90	2A		Removed
132	*Eucalyptus punctata*	Grey Gum	30, 30	8	10	50	4C	1x trunk dead, poor form	Removed
133	*Eucalyptus punctata*	Grey Gum	35	15	8	70	4C	large dead wood	Removed
134	*Eucalyptus punctata*	Grey Gum	40	20	10	90	2A		Retained
135	*Eucalyptus punctata*	Grey Gum	30, 30	7	6	20	4C	1x trunk dead, 1x trunk 70% dead	Removed
136	*Eucalyptus sieberi*	Silvertop Ash	50	15	12	40	4C	large dead wood, epicormic growth at base of trunk, stressed	Removed
137	*Eucalyptus sieberi*	Silvertop Ash	20	5	8	50	4C	leaning, poor form, dieback	Removed
138	*Eucalyptus punctata*	Grey Gum	40	15	15	75	4C	large dead wood, poor form	Removed
139	*Harpephyllum caffrum*	Kaffir Plum	10, 10, 9	7	7	0	4A	fallen	Removed
140	*Harpephyllum caffrum*	Kaffir Plum	5, 8	4	4	70	2C	roots exposed, poor form	Removed
141	*Harpephyllum caffrum*	Kaffir Plum	4	4	3	70	2C	roots exposed, poor form	Removed
142	*Allocasuarina torulosa*	Forest Oak	5	8	3	90	2A		Removed

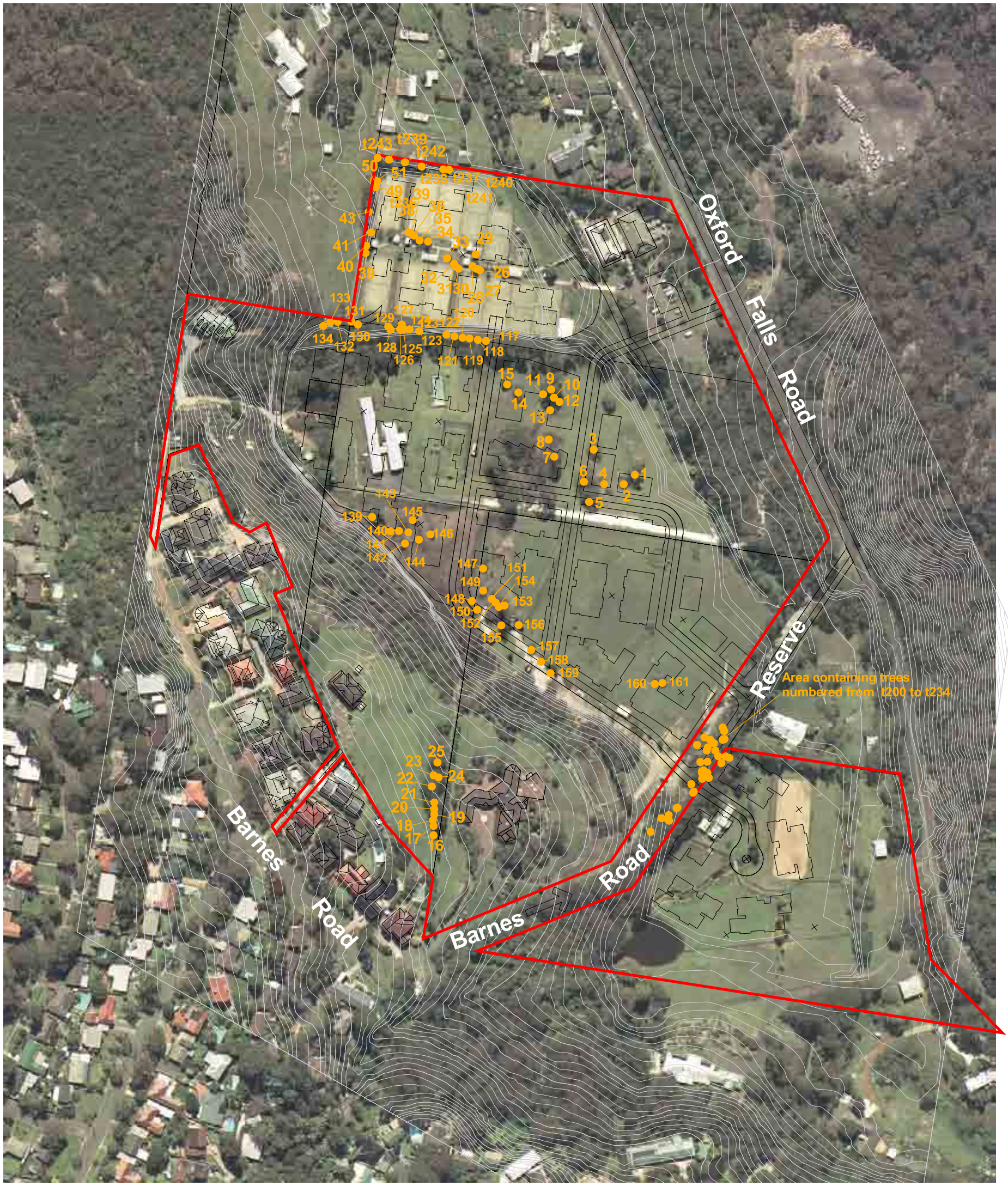
Tree No	*Scientific Name*	Common Name	DBH (cm)	Height (m)	Spread (m)	Vigour %	SULE	Comments & Reccomendations	Retained / Removed
143	*Allocasuarina torulosa*	Forest Oak	9	9	3	90	2A		Removed
144	*Allocasuarina torulosa*	Forest Oak	9	8	3	90	2A		Removed
145	*Allocasuarina torulosa*	Forest Oak	12	8	6	90	2A		Removed
146	*Allocasuarina torulosa*	Forest Oak	6	6	4	70	4C	poor form, leaning s	Removed
147	*Eucalyptus robusta*	Swamp Mahogany	25	15	8	90	2A		Removed
148	*Eucalyptus piperita*	Sydney Peppermint	30	18	9	80	4C	epicormic growth at base of trunk, roots exposed	Removed
149	*Eucalyptus robusta*	Swamp Mahogany	40	22	8	80	2D	damaged at base	Removed
150	stag	stag	35	16	8	0	4A	dead	Removed
151	*Poplus sp*	Poplar	25	18	10	90	2A		Removed
152	*Poplus sp*	Poplar	25	18	10	90	2A		Removed
153	*Eucalyptus piperita*	Sydney Peppermint	150	18	14	60	4C	1x large broken trunk, poor form	Removed
154	Pinus elliotti	Slash Pine	30	15	10	90	2A		Removed
155	*Pinus elliotti*	Slash Pine	40	15	12	90	2A		Removed
156	*Toxicodendron succedanium*	Rhus Tree	10,10,10,10,15	6	6	80	4C	poor form, toxic hazard	Removed
157	*Toxicodendron succedanium*	Rhus Tree	15,15,10	7	7	80	4C	poor form, toxic hazard	Removed
158	*Toxicodendron succedanium*	Rhus Tree	10,15,10,15	7	7	80	4C	poor form, toxic hazard	Removed
159	*Araucaria heterophylla*	Norfolk Island Pine	25	8	8	90	2A		Removed
160	*Eucalyptus piperita*	Sydney Peppermint	20	6	6	90	2A		Removed
161	*Eucalyptus piperita*	Sydney Peppermint	25	7	6	90	2A		Removed
t200	*Eucalyptus sieberi*	Silvertop Ash	43	13	8	80	2B	in powerlines	Removed
t201	*Eucalyptus sieberi*	Silvertop Ash	25	13	3	80	2D	leans s	Removed
t202	*Eucalyptus sieberi*	Silvertop Ash	28, 25	14	6	50v	3D	larger trunk rotten	Removed
t203	*Eucalyptus sieberi*	Silvertop Ash	33, 27	13	12	70	2D	slight lean	Removed
t204	*Angophora costata*	Smooth Barked Apple	75	22	15	80	2A	minor dead wood, small kino	Removed
t205	*Eucalyptus piperita*	Sydney Peppermint	60, 30, 20	17	15	90	1A	good health and form	Removed
t206	*Eucalyptus piperita*	Sydney Peppermint	55	18	13	75	2D	slight lean e	Removed
t207	stag	stag	25	11	3	0	4A	dead	Removed
t208	*Eucalyptus sieberi*	Silvertop Ash	35	21	10	85	1A	good form	Removed

Tree No	*Scientific Name*	Common Name	DBH (cm)	Height (m)	Spread (m)	Vigour %	SULE	Comments & Reccomendations	Retained / Removed
t209	*Eucalyptus piperita*	Sydney Peppermint	35	17	7	60	3D	moderate dead wood	Removed
t210	*Eucalyptus sieberi*	Silvertop Ash	40	21	9	40	3D	moderate dead wood	Removed
t211	stag	stag	35	21	5	0	4A	dead	Removed
t212	*Angophora Costata*	Smooth Barked Apple	40	17	15	15	4A	declined health	Removed
t213	*Erythrina sykessii*	Coral Tree	40, 35	9	16	60	3D	stabilibilising creek bank	Removed
t214	*Eucalyptus sieberi*	Silvertop Ash	40, 15	18	7	55	3D	large dead branch	Removed
t215	*Angophora Costata*	Smooth Barked Apple	40	26	11	55	3D	moderate dead wood	Removed
t216	stag	stag	50	23	6	0	4A	dead	Removed
t217	*Eucalyptus sieberi*	Silvertop Ash	38	22	8	60	3D	moderate dead wood, good form	Removed
t218	*Eucalyptus sieberi*	Silvertop Ash	30	21	5	80	2D	slight lean e	Removed
t219	*Eucalyptus piperita*	Sydney Peppermint	20	16	4	90	1A	good form	Removed
t220	*Eucalyptus sieberi*	Silvertop Ash	42	15	15	60	3D	moderate lean nw	Removed
t221	*Eucalyptus sieberi*	Silvertop Ash	35, 15	23	5	0	4A	dead	Removed
t222	*Eucalyptus sieberi*	Silvertop Ash	35	22	10	70	2D	slight lean sw, minor dead wood	Removed
t223	*Eucalyptus sieberi*	Silvertop Ash	45, 25	16	8	25	3D	large trunk dead, smaller, healthy	Removed
t224	*Eucalyptus sieberi*	Silvertop Ash	27	7	3	0	4A	dead	Removed
t225	stag	stag	27	14	5	0	4A	dead	Removed
t226	*Eucalyptus sieberi*	Silvertop Ash	27	11	9	75	2A	good form	Removed
t227	*Angophora Costata*	Smooth Barked Apple	38	23	16	85	2A	kino excretion on trunks	Removed
t228	*Eucalyptus bosistoana*	Coast Grey Box	55	22	12	75	2A	good form	Removed
t229	*Eucalyptus bosistoana*	Coast Grey Box	60	22	18	85	1A	good form	Removed
t230	*Erythrina sykessii*	Coral Tree	25, 25	12	12	75	3A	weed spp	Removed
t231	*Eucalyptus punctata*	Grey Gum	30	18	8	85	2A	good form, suppressed a little	Removed
t232	*Angophora Costata*	Smooth Barked Apple	37	24	17	85	2A	kino excretion in branches	Removed
t233	*Eucalyptus punctata*	Grey Gum	30	12	10	70	2A	suppressed	Removed
t234	*Angophora costata*	Smooth Barked Apple	40	20	8	90	1A	good form	Removed
t235	*Allocasuarina torulosa*	Forest Oak	26	7	5	70	3A	old tree, minor dead wood	Removed
t236	*Melaleuca ericifolia*	Swamp Paperbark	30	6	5	85	3A	old tree, good form	Removed
t237	*Melaleuca styphelioides*	Prickly-leaved Paperbark	24	5	5	85	2A	good form	Removed
t238	*Melaleuca ericifolia*	Swamp Paperbark	35	7	7	75	3A	old tree, good form	Removed

Tree No	*Scientific Name*	Common Name	DBH (cm)	Height (m)	Spread (m)	Vigour %	SULE	Comments & Reccomendations	Retained / Removed
t239	*Melaleuca styphelioides*	Prickly-leaved Paperbark	27	7	5	80	2A	good form	Retained
t240	*Casuarina glauca*	Swamp Oak	22	18	5	90	1A	good form	Removed
t241	*Casuarina glauca*	Swamp Oak	22	13	5	90	1A	good form	Removed

* Note - Trees numbered 51 - 116 have been removed from the assessment as this area (Lot 1108 DP 752038) no longer forms part of the proposal.

SCHEDULE 2 – Tree Plan



Legend

- *Subject Site Boundary
- 1 Numbered Tree
- Building Layout

Travers environmental

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Central Coast Highway, Kariong NSW 2250
Ph (02) 4340 5331 Fax (02) 4340 2151

e-mail: ecology@traversenvironmental.com.au

50 0 50 100 metres

Scale 1:2,500

Schedule 2 -

Tree Plan - Oxford Falls

Ver.S1 By TM 28/10/08 Ref.No.8054

Source: DLWC 1:25,000 Aerial Photograph, GA Architects International Pty. Ltd.

SCHEDULE 3 – SULE Determinations and Terminology

SULE (an acronym for **Safe Useful Life Expectancy**). Particular consideration is given to the following points when making the final SULE assessment for each tree;

- Obvious past influences (suppression)
- Present health and condition and future potential in current position
- Estimated age at assessment in relation to the life expectancy for the species
- Observed and potential structural defects which may influence potential life expectancy
- Potential remedial work which may allow retention in the existing location.

An outline of the four relevant SULE categories and their subgroups used in this report is as follows:

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1 Long **SULE** (Trees that appear to be retainable at the time of assessment for more than 40 years with an acceptable level of risk)

A A structurally sound tree, located where potential future growth can be accommodated
B A damaged of defective tree that could be made suitable in the long term (40+ years) where remedial care is given
C A tree of particular significance (historical / commemorative merit or rarity) that warrants extensive efforts in securing long term retention.

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2 Medium **SULE** (Trees that appear to be retainable at the time of assessment for 15 to 40 years with an acceptable level of risk)

A A tree predicted to only live between 15 and 40 more years
B A tree that may live for more than 40 years but should be removed to prevent safety or nuisance problems.
C A tree that may live for more than 40 years but should be removed to prevent competition with more suitable individuals or to provide space for new planting
D A damaged of defective tree that could be made suitable in the medium term (15-40 years) where remedial care is given.

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3 Short **SULE** (Trees that appear to be retainable at the time of assessment for 5 to 15 years with an acceptable level of risk)

A A tree predicted to only live between 5 and 15 more years
B A tree that may live for more than 15 years but should be removed to prevent safety or nuisance problems
C A tree that may live for more than 15 years but should be removed to prevent competition with more suitable individuals or to provide space for new planting
D A damaged of defective tree that could be only made suitable in the short term (5-15 years) and would require significant remedial work.

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4 Removals (Trees with a high level of risk and should be removed within the next 5 years)

- **A** A dead, dying, suppressed or declining tree
- **B** A dangerous tree through instability or recent loss of neighbouring trees
- **C** A dangerous tree through structural defects (cavities, decay, included bark, wounds or poor form)
- **D** A damaged tree that is clearly not safe to retain
- **E** A tree that is damaging or may cause damage to existing structures within 5 years
- **F** A tree that will become dangerous after removal of neighbouring trees for the reasons given in A) to E).

SULE ratings given to any tree in this report assumes that appropriate maintenance (if required) will be provided by a qualified arborist. Incorrect tree work practices can significantly accelerate tree suppression and increase hazard potential

EXPLANATION OF TERMINOLOGY USED

DBH - An acronym for Bole **Diameter** at **Breast Height** (1.4 m from ground level).

Health - An indication of the vigour of a tree and is determined by the observed crown colour, density and insect attack, the percentage of dead or dying branches and the amount epicormic growth. The health of the canopy and that of the root system is interdependent and significant loss of tree vigour can result through both root and canopy (pruning, suppression) damage.

Suppressed, unhealthy trees have reduced ability to initiate internal defence systems (by the process of compartmentalisation) thus predisposing them to attack by insects and pathogenic decay organisms which increase the potential to drop dangerous branches.

Condition - An evaluation of the structural integrity of a tree, including defects that may affect the useful life of an otherwise healthy individual. Such influencing factors include cavities and decay, weak unions between branches or trunks and faults of form or habit.

Kino - A dark reddish exudate, rich in polyphenols (tannins), developed in the cambial region of eucalypts often as a result of injury; incorrectly called gum (Boland *Et. Al.*, 1992).

Deadwood - The mature crown of a eucalypt maintains itself by the continual production of new crown units, which die in turn. Thus there will always be some dead branches in a healthy mature crown (Florence, 1996). Minor deadwood refers to dead branchlets, Major deadwood refers to main branches from the trunk.