Arboricultural Impact Assessment

Bungendore North Campus High School

NSW Department of Education

9 May 2025

→ **The Power of Commitment**

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Acknowledgement of Country

GHD acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. GHD is committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.

Contents

Table index

Figure index

Appendices

Abbreviations and acronyms

Abbreviation/acronym	Definition
AQF	Australian Qualification Framework
AS	Australian Standard
BNHS	Bungendore North Campus High School
cm	Centimetre
DBH	Diameter at breast height
DoE	Department of Education
DOF	Diameter over root flare
DPHI	Department of Planning, Housing and Infrastructure
EP&A Act	*Environmental Planning and Assessment Act 1979*
GDA94	Geocentric Datum of Australia 1994
ha	Hectare
IACA	Institute of Australian Consulting Arboriculturists
m	Metre
NSW	New South Wales
REF	Review of Environmental Factors
SRZ	Structural Root Zone
STARS	Significance of a Tree, Assessment Rating System
SULE	Safe useful life expectancy
T&I SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
AS4970-2009	Australian Standard 4970-2009: *Protection of Trees on Development Sites*
TPZ	Tree Protection Zone
UTM	Universal Transverse Mercator
VTA	Visual tree assessment

1. Introduction

This Arboricultural Impact Assessment report has been prepared to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for the construction and operation of the new Bungendore North Campus High School (the Activity).

The purpose of the REF is to assess the potential environmental impacts of the Activity prescribed by State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI) as well as the Addendum Division 5.1 guidelines for schools and Addendum October 2024 (Consideration of environmental factors for health services facilities and schools).

GHD Pty Ltd was engaged by the NSW DoE to prepare an updated Arboricultural Impact Assessment report in relation to trees potentially impacted as a result of the proposed refurbishment of the former Council administration building and car park located at 10 Majara Street, Bungendore. The purpose of this report is to provide an updated assessment of the Arboricultural Impact Assessment prepared by Eco Logical Australia (2024). The Arboricultural Impact Assessment report prepared by Eco Logical Australia (2024) covered a broader area and included demolition and construction of buildings. The project design has changed since this Arboricultural Impact Assessment report was prepared hence the need for an updated impact assessment.

The majority of trees described herein occur in part on Lot 1 DP 1276279 and part on Lot 1 DP 1276282. Four trees occur in the neighbouring rail corridor. Tree details, including current health, structural conditions, and dimensions are included within the Arboricultural Impact Assessment report (Eco Logical Australia, 2024). This updated Arboricultural Impact Assessment report identifies the impact of the proposed refurbishment of the former Council administration building and placement of demountable buildings on trees recommended for retention within the Activity site.

Retained trees are afforded protection measures prior to, during and post construction as according to the Australian Standard 4970-2009 *Protection of Trees on Development Sites* (AS4970-2009). The measures for tree protection detail what is required to avoid any long-term damage to both the structural integrity and the functional implications of retained trees throughout the term of development. AS4970-2009 provides guidance for:

– A balanced approach on deciding which trees are appropriate for retention
– Effects of trees on design considerations
– Means of protection and monitoring retained trees during development.

1.1 Terminology

The following terminology used throughout the report is outlined in Table 1.1.

Table 1.1 Terminology

Terminology	Definition
Activity	The proposed construction and operation of the new Bungendore North Campus High School. The high school will accommodate the operational needs of the high school on a temporary basis.
Project area	The Project area and land to which the REF applies (the site) includes Nos. 4-6, and 10 Majara Street, part Lot 1 DP 1276279 (previously Majara Street road reserve) and part Lot 1 DP 1276282 as identified in Figure 1.2

1.2 Purpose of this report

The purpose of the Arboricultural Impact Assessment is to provide the basis for retention or removal of trees in proximity to the project during the Activity with particular regard to:

– Tree Protection Zone (TPZ) area and requirements for tree preservation as detailed in AS4970-2009
– Likely direct and indirect impacts associated with the proposed Activity.

This Arboricultural Impact Assessment includes:

– The identification of hazards/risks to retained trees associated with the proposed Activity
– The calculation of TPZ and Structural Root Zones (SRZ) for all trees that may be directly or indirectly impacted by the proposed Activity. These calculations will be in accordance with the Australian Standard 4970-2009: *Protection of Trees on Development Sites*
– A list of trees to be retained and those that would require removal as part of the development of the Activity
– The tree retention value of surrounding trees that may be impacted by the Activity
– Preparation of a tree protection plan to identify protection works such as exclusion zones and trunk guards to reduce the impact of the Activity on the retained trees
– Identification whether the potential impact of the Activity on retained trees is none, low, moderate, or major.

1.3 Scope and limitations

This report: has been prepared by GHD for NSW Department of Education and may only be used and relied on by NSW Department of Education for the purpose agreed between GHD and NSW Department of Education as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than NSW Department of Education arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on information obtained during a site inspection at LSPS on 8th and 9th of July. Investigations undertaken in respect of this report are constrained by the particular site conditions encountered at the time of inspection. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.1 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.4 Background

1.4.1 Project overview

The proposed activity is for the construction and operation of the new Bungendore North Campus High School. The high school will accommodate the operational needs of the high school on a temporary basis (together with the existing high school located within the grounds of Bungendore Public School) as students and enrolments continue to grow. These facilities will be utilised until such time the permanent high school at Birchfield Drive is established.

Specifically, the project involves the following:

– Use of the former Council administration building as part of the new Bungendore North Campus High School
– New demountable classrooms

– Landscaping, outdoor play areas, shade structure and basketball court
– On site staff parking which utilises the existing car park and access from Majara Street
– Public domain upgrades to part Lot 1 DP 1276279 (previously Majara Street Road reserve) and part lot 1 DP 1276282 to enable kiss and drop from Majara Street and pedestrian connectivity to surrounding areas.

The North Campus facilities proposed will supplement the existing high school facilities located within the Bungendore Primary School site.

Refer to the Review of Environmental Factors (REF) for the detailed scope of works and operational details.

Figure 1.1 provides an extract of the proposed Overall Campus Plan.

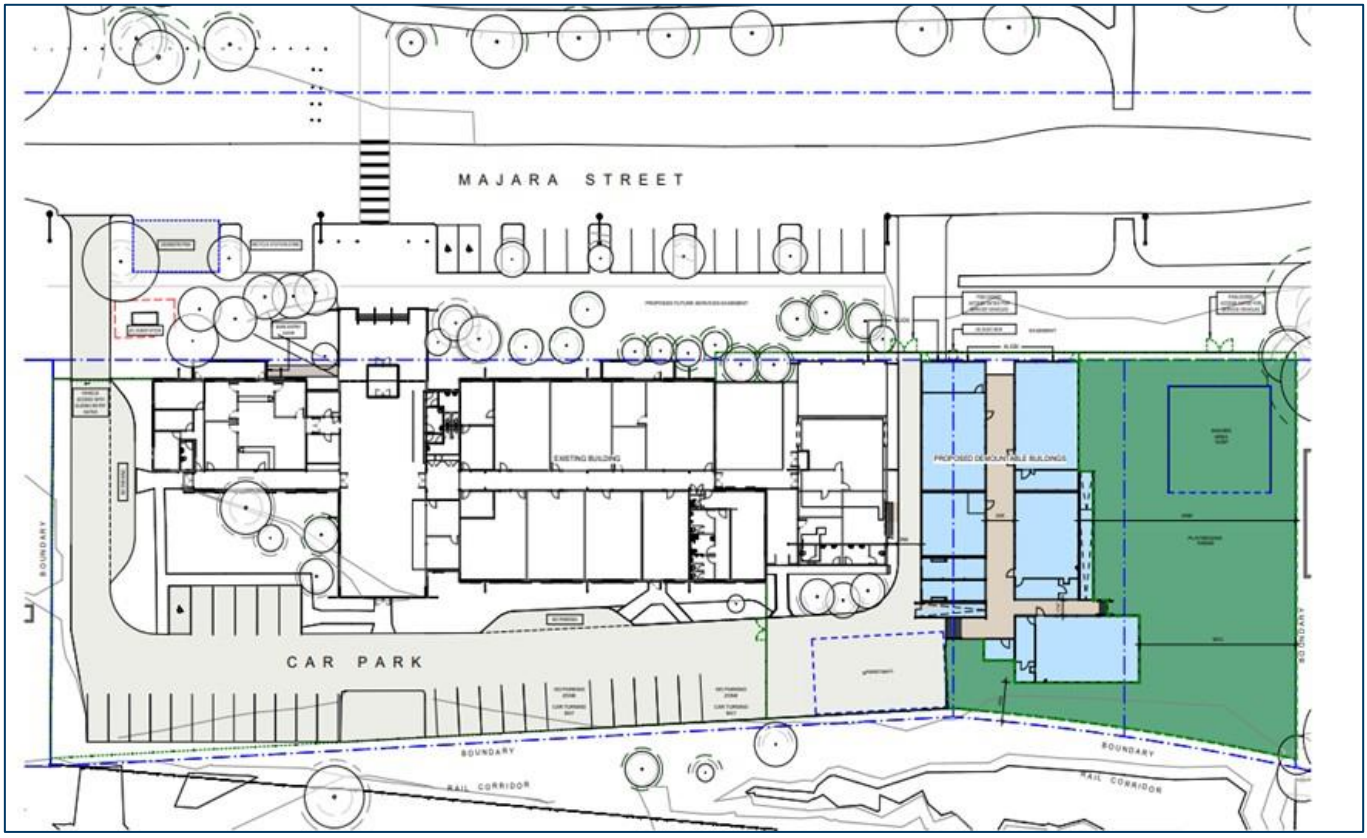

Figure 1.1 Overall Campus Plan Site and Roof Plan

1.4.2 Site Description

The project area, and land to which the REF applies (the site), includes Nos. 4-6, and 10 Majara Street, part Lot 1 DP 1276279 (previously Majara Street road reserve) and part Lot 1 DP 1276282 as identified in Figure 1.2.

As shown at Figure 1.1, the Bungendore North Campus High School will utilise the former Council administration building and car park located at 10 Majara Street. Demountable buildings are proposed to be placed north of the existing building. Public domain upgrades will feature in part Lot 1 DP 1276279 and part Lot 1 DP 1276282.

The site is located between Mick Sherd Oval (to the west) and the rail corridor (to the east). The site is located approximately 170 m north of the Bungendore Train Station and Bungendore Primary School. The Bungendore Primary School, located on the corner of Gibraltar Street and Majara Street currently accommodates Bungendore High School on a temporary basis.

Figure 1.2 Aerial Photograph of the Site

2. Methods

2.1 Tree assessment

The Arboricultural Impact Assessment included the assessment of the calculated TPZs and retention values to allow a determination of removal or retention for each tree in relation to the Activity within the Subject site. The assessment is based on the detailed design and the Arboricultural Impact Assessment undertaken across a broader Project area by Eco Logical Australia (2024). Details of tree assessments are detailed within the Arboricultural Impact Assessment report (Eco Logical Australia, 2024). Tree identification numbers follow those in the Eco Logical Australia (2024) report.

As part of the preliminary tree assessment, the TPZ and SRZ of each tree were calculated. These calculations were undertaken in accordance with AS4970-2009. Data gained through the tree assessment (Eco Logical Australia, 2024) assisted with the attribution of a retention value for each tree. The retention value of trees was allocated with the use of the Institute of Australian Consulting Arboriculturists (IACA) Significance of a Tree, Assessment Rating System (STARS) (IACA, 2010). The STARS approach involves defining a tree's significance in the landscape (as high, medium or low) and using this significance rating and estimated life expectancy to determine its retention value (IACA, 2010). Derived retention values are independent of any development proposed for the Subject site. This unbiased approach to evaluating trees allows for the highest quality trees to be retained, which will be capable of tolerating the impacts associated with the development of the site.

A review of the relevant design drawings and results of the Arboricultural Impact Assessment report (Eco Logical Australia, 2024) was undertaken to assist with determining the extent of the Activity's impact and to ascertain how the identified impacts might be mitigated to promote continued health and stability of retained trees. The detailed design drawing of the proposed Activity was georeferenced within a GIS environment to allow an estimation of the degree of encroachment of the development footprint into the TPZ of each tree recommended for retention. Under AS4970-2009, a less than 10% encroachment is regarded as minor while >10% is considered major.

The following factors have also been considered in assessing the possible impacts of the proposed Activity on the surveyed trees:

– direct and indirect impacts associated with the proposed works
– infrastructure placement
– TPZ area and requirements for tree preservation as detailed in AS4970-2009
– future above and below ground management of retained trees.

2.2 Limitations

This assessment is limited to the detailed design of the Activity supplied in March 2025. The detailed design drawing of the proposed activity was georeferenced within a GIS environment. It should be noted that the georeferencing process is not accurate with the degree of encroachment into the TPZ of retained trees indicative rather than absolute. This assessment is based on data contained within Eco Logical Australia's (2024) Arboricultural Impact assessment report and has not been verified by GHD and is assumed to be accurate.

No aerial inspection of trees was undertaken as part of the preliminary tree assessment. Defects not apparent from the ground level visual inspection are therefore excluded from any discussion within this report. No decay detection equipment, root excavation, soil or plant material samples were collected for laboratory analysis. Some plant specimens were collected for identification purposes.

2.3 Coordinate system and map datum

Locations were recorded using he UTM coordinate system with a GDA94 datum. All location presented in this report are within UTM zone 54H and have an accuracy between 4-8 m

2.4 Nomenclature

Scientific names for terrestrial flora are consistent with those used in the Australian Plant Name Index and botanical binomials presently accepted by the National Herbarium of New South Wales (NSW).

3. Results

3.1 Overview

A total of 210 trees were assessed by Eco Logical Australia (2024). However, Eco Logical Australia's assessment was undertaken within a larger Activity footprint. This updated Arboricultural Impact Assessment is focussed on 46 trees occurring within the Project area indicated in Figure 1.2. The location and retention value of trees used in this updated Arboricultural Impact Assessment are illustrated in Figure 3.1. Dimensions of these trees appear in Appendix A. Through the results of the Arboricultural Impact Assessment (Eco Logical Australia, 2024), of the 46 trees assessed in this report, two were assigned to a high, 29 to a medium and 15 to a low retention value (Figure 3.1). These retention values are independent of any development proposed for the site.

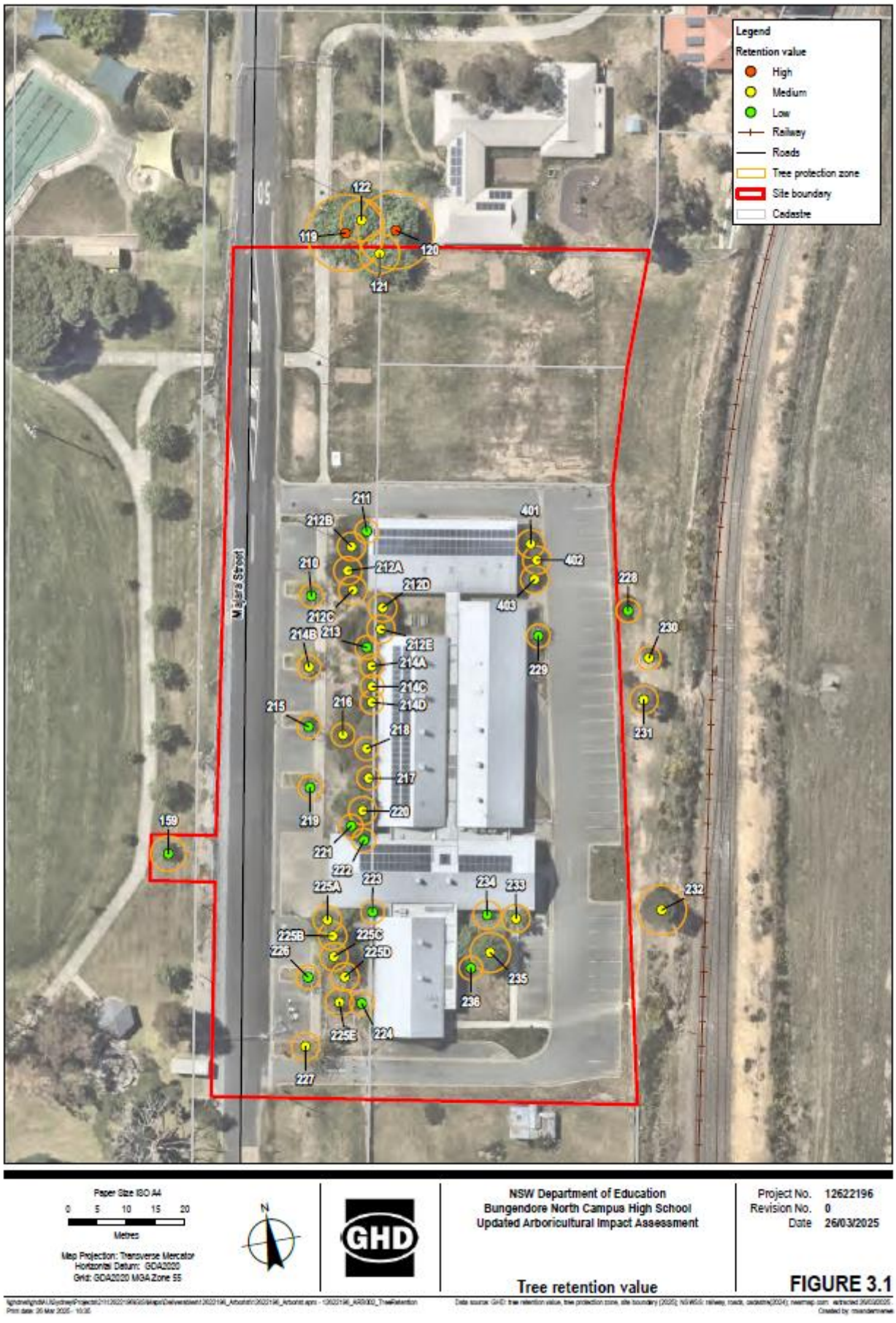

Figure 3.1 Tree locations and retention value (Source: Eco Logical Australia, 2024)

3.2 Trees to be retained and protected

All 46 trees assessed within this Arboricultural Impact Assessment are recommended to be retained (Table 3.1). Since the project involves refurbishing existing buildings to be fit for purpose and placement of demountable buildings within a cleared grassed area, it is anticipated that all trees can be maintained. Many of the trees assessed already have encroachment into their TPZ from existing infrastructure. Any potential impact within the TPZ of the retained trees is anticipated to be able to be managed during construction so that the long-term tree health is likely to be maintained. The calculated TPZ radius for all proposed retained trees is also listed in Table 3.1. It is recommended that the TPZ and SRZ dimensions calculated within this report are overlaid onto all plans and detailed designs of the proposed Activity. This will allow a more accurate assessment of the degree of encroachment, if any.

Tree #223 occurs near to an area to be paved. An established paved pathway already passes through the TPZ of this tree and the proposed paved area is outside of the calculated TPZ area. A proposed pathway passes through the TPZ of tree #159 to allow connection to an existing pathway in Mick Sherd Oval. The proposed pathway can be positioned to reduce the amount of encroachment into the TPZ of this tree. The proposed shaded area has encroachment into the TPZ of trees #119, #120 and #121 (Table 3.1). This structure can be positioned towards the south to reduce the degree of encroachment into the TPZ of these trees. Trees #228, #230, #231 and #232 occur in the adjacent rail corridor and would not require any protection measures.

All retained trees should be incorporated into the landscape masterplan developed for the Activity. Trees recommended for retention will need to be clearly indicated prior to any works beginning on the site and should be monitored post development to assess their health. It is believed that careful construction measures and implementation of the tree protection plan will benefit the long-term health of these individuals.

Table 3.1 Details of trees recommended for retention within the Activity site

Tree ID	Botanical Name	Retention	TPZ (m)	TPZ Area (m2)	Encroachment into TPZ (%)	Degree of Encroachment	SRZ (m)	SRZ Area (m2)	Proposed works within TPZ	Comments
159	*Platanus orientalis*	Low	3.0	28.3	12	Major	1.8	10.4	Pedestrian pathway	Proposed pathway to avoid TPZ
119	*Quercus robur*	High	6.6	136.9	20	Major	2.6	20.8	Shaded area	Existing pathway passes through TPZ. Proposed shaded area structure occurs within TPZ.
120	*Quercus robur*	High	6.6	136.9	24	Major	2.6	20.8	Shaded area	Proposed shaded area structure occurs within TPZ.
121	*Quercus robur*	Medium	3.4	35.5	72	Major	1.9	11.5	Shaded area	Proposed shaded area structure occurs within TPZ.
122	*Quercus robur*	Medium	3.6	40.7	0	None	2.0	12.5	None	
210	Deciduous unknown sp.	Low	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing carpark.
211	Deciduous unknown sp.	Low	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing building and pathway.
212A	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
212B	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
212C	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
212D	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
212E	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
213	Deciduous unknown sp.	Low	2.0	10.2	0	None	1.5	7.0	None	
214A	Group of native spp.	Medium	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing building
214B	Group of native spp.	Medium	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing carpark.
214C	Group of native spp.	Medium	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing building
214D	Group of native spp.	Medium	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing building
215	Unknown sp.	Low	2.0	4.5	0	None	1.5	7.0	None	TPZ already encroached by existing carpark.

Tree ID	Botanical Name	Retention	TPZ (m)	TPZ Area (m2)	Encroachment into TPZ (%)	Degree of Encroachment	SRZ (m)	SRZ Area (m2)	Proposed works within TPZ	Comments
216	Unknown sp.	Medium	2.0	10.2	0	None	1.5	7.0	None	
217	Group of 5 acacia sp.	Medium	2.0	10.2	0	None	1.5	7.0	None	
218	Deciduous sp.	Medium	2.0	10.2	0	None	1.5	7.0	None	
219	Deciduous sp.	Low	2.0	4.5	0	None	1.5	7.0	None	TPZ already encroached by existing carpark.
220	Deciduous sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
221	Deciduous sp.	Low	2.0	10.2	0	None	1.5	7.0	None	
222	Deciduous sp.	Low	2.0	4.5	0	None	1.5	7.0	None	TPZ already encroached by existing building
223	Deciduous sp.	Low	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing pathway
224	Deciduous sp.	Low	2.0	4.5	0	None	1.5	7.0	None	TPZ already encroached by existing building
225A	Deciduous sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	TPZ already encroached by existing pathways
225B	Deciduous sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	TPZ already encroached by existing pathway
225C	Deciduous sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	TPZ already encroached by existing pathway
225D	Deciduous sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
225E	Deciduous sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
226	Deciduous sp.	Low	2.0	10.2	0	None	1.5	7.0	None	TPZ already encroached by existing carpark
227	Deciduous sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	TPZ already encroached by existing carpark
228	*Acacia* sp.	Low	2.0	10.2	0	None	1.5	7.0	None	
229	Deciduous unknown sp.	Low	2.0	4.5	0	None	1.5	7.0	None	
230	*Eucalyptus* sp.	Medium	2.0	4.5	0	None	1.5	7.0	None	
231	*Eucalyptus* sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
232	*Pinus radiata*	Medium	4.2	55.4	0	None	2.1	13.6	None	

Tree ID	Botanical Name	Retention	TPZ (m)	TPZ Area (m2)	Encroachment into TPZ (%)	Degree of Encroachment	SRZ (m)	SRZ Area (m2)	Proposed works within TPZ	Comments
233	Deciduous unknown sp.	Medium	2.4	18.1	0	None	1.7	9.1	None	TPZ already encroached by existing building and pathway
234	*Acacia* sp.	Low	2.4	18.1	0	None	1.7	9.1	None	TPZ already encroached by existing building
235	Deciduous unknown sp.	Medium	3.4	35.5	0	None	1.9	11.5	None	
236	Deciduous unknown sp.	Low	2.0	4.5	0	None	1.5	7.0	None	
401	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	
402	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	TPZ already encroached by existing carpark.
403	Group of mix native spp.	Medium	2.4	18.1	0	None	1.7	9.1	None	

Figure 3.2 Location of trees marked for retention or removal

3.3 Trees to be removed

None of the 46 trees assessed in this Arboricultural Impact Assessment are proposed to be removed.

4. Impact Assessment

Maintaining the long-term health and vigour of retained trees on development sites requires an understanding of how susceptible trees are to direct and indirect impacts. In general, the following should be noted:

– Older trees are generally more at risk than younger trees and less able to withstand changes to landscape and soil conditions or pruning
– The root system of most mature trees spread beyond the canopy drip-line with most roots typically found in the top 100 cm of the soil profile
– Alteration to the soil levels within the TPZ will normally result in damage or death to root systems resulting in a decline in the condition of the tree
– Compaction of the soil profile through the operation of vehicles and machinery within the TPZ destroys the natural soil structure and porosity resulting in decreased aeration and loss of water absorption resulting in root death
– Spillage of chemicals, fuels or cement within the TPZ will cause root death leading to a decline in the condition of the tree.

Tree protection measures need to be in place to ensure that those trees recommended for retention are incorporated into the general landscape and continue to provide ecological services once development of the site is completed. Recommended tree protection measures are detailed and explained further within the tree protection plan (Section 5); however detailed mitigation measures have been provided in Section 6. The Activity will not have a significant impact on the environment.

5. Tree Protection Plan

Forty-six trees are recommended for retention within the Project area. All trees proposed to be retained require exclusion of construction works within their delineated protection zones. This Tree Protection Plan identifies methods that should be implemented in order to retain the trees on site in accordance with AS4970-2009.

Impacts on trees during construction can be direct or indirect. Direct damage includes mechanical injury to the trunk, severing of roots or alterations of the soil environment in the immediate vicinity of tree roots (i.e. compaction or loss of organic matter). Indirect effects of development are usually related to changes to exposure or soil hydrology. This includes alterations to soil moisture content, changes to the level of the water table and drainage patterns (Coder, 1996). Fencing and other tree protection measures during construction will be required to ensure ongoing health and stability of retained trees on the site.

5.1 Tree Protection in the Construction Phase

Prior to the commencement of any construction works at the site, a suitably qualified consulting arborist shall be appointed to supervise all tree protection procedures detailed in this report. The consulting arborist shall have a minimum level 5 Australian Qualification Framework (AQF) qualification in arboriculture and will undertake all appropriate arboricultural measures to ensure the survival and long-term health of retained trees. They will also liaise directly with construction personal and be responsible for completing certification of tree and root protection measures throughout the various stages of construction.

5.1.1 Establishing the TPZ

The TPZ assists with the protection of retained trees from mechanical injury to the trunk, severing of roots, or alterations of the soil environment in the immediate vicinity of tree roots (i.e. compaction or loss of organic matter). The TPZ is defined in AS4970-2009 as the principle means of protecting trees on development sites. The TPZ is the combination of crown and root area requiring protection. It is an area isolated from direct construction disturbances so that the tree remains viable in the long term. AS4970-2009 defines the SRZ as the area required for ongoing tree stability of the tree. However, an area larger than the SRZ is required to maintain a viable tree. The SRZ is only required to be calculated when greater than 10% encroachment into the TPZ is proposed. No disturbance is to take place within the SRZ. Table 3.1 includes the TPZ and SRZ radius required to protect retained trees within the WHS Subject site.

Characteristics of individual trees, particularly irregular canopies and root spread may allow for modification of calculated TPZs (Figure 5.1). Guidance on the potential to modify protection zones of retained trees should be sought from the consulting arborist.

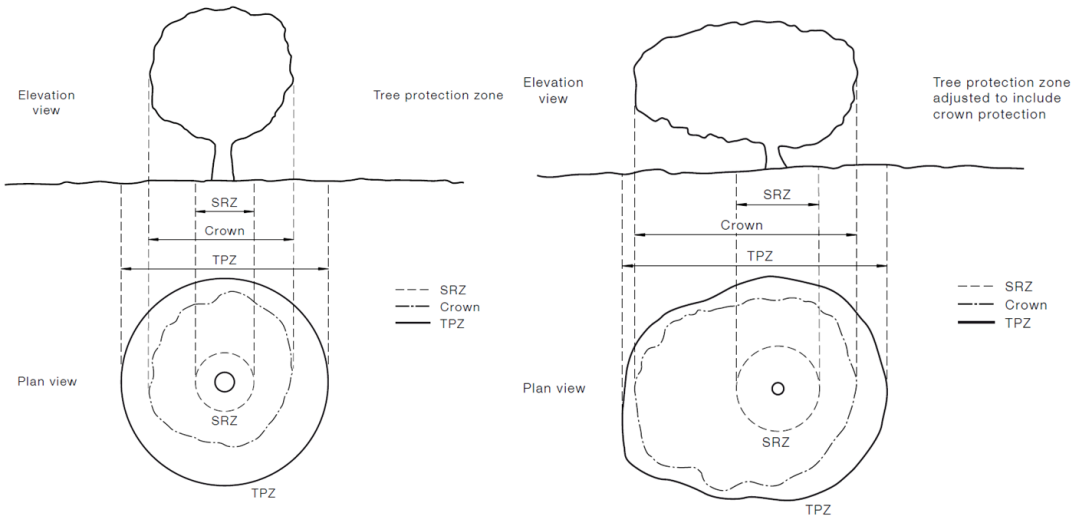

Figure 5.1 Indicative tree protection zones for regular and irregular canopies (Source: AS4970-2009)

All tree protection measures must conform to AS4970-2009. TPZ guidelines need to apply to all stages of the design and construction process. The following procedures need to be followed:

– Temporary fencing will be erected around the edge of the determined TPZs prior to any works on the subject lot including demolition, site preparation and construction (see Figure 5.2).

Figure 5.2 Example of appropriate TPZ fencing

– At a minimum TPZ fencing should be rigid (chain link or mesh), no less than 1.8 m in height, and be robust enough to provide sufficient protection for the duration of the project for the trees nominated for retention. Fencing should be firmly attached to a removable concrete or similar base.

– Signs labelled “Tree Protection Zone – Keep Out”, or similar, must be placed at regular intervals along the TPZ fence prior to construction and be visible from all sides (see Figure 5.3).

Figure 5.3 Example of a tree protection sign (Source: AS4970-2009)

- The TPZ fencing must be maintained in good condition and remain in place at all times for the duration of the construction phase. TPZ fencing will not be repositioned or interfered with during the construction phase unless approved by the consulting arborist.
- TPZ fencing will only be removed once the construction phase has been completed.
- Where approved works encroach within TPZs, the fence must be repositioned as close to the works as is practically possible.
- The TPZ area should be mulched to a depth of 100 mm with suitable composted mulch. The depth of mulch should be maintained for the duration of the construction phase and the mulched area kept weed free.
- No filling or excavation is to occur within TPZs except as approved by the responsible authority. Any roots encountered when excavating must be cut cleanly with a pruning saw.
- The existing ground level and soil profile will be maintained within the designated TPZ.
- TPZ fencing must not restrict wildlife access to or from the protected tree.
- The consulting arborist must supervise any unavoidable excavation or construction works within TPZs. Where any structural roots (roots with a diameter of greater than >20 mm) are encountered by excavation, these are to be pruned. Clean, sharp pruning tools are to be used for pruning of structural roots and undertaken in consultation with the consulting arborist.

5.1.2 Excluded Activities within the TPZ

Careful adherence to the following excluded activities within the TPZ will maintain the long-term condition of retained trees. In general, any activity that may impact on the tree, roots or natural environment of the soil will be excluded from the delineated TPZ.

- No construction activities that may have a detrimental impact on the retained tree are to be undertaken within the fenced TPZ.
- No soil disturbance to occur within the TPZ. This includes compaction, stripping or grade changes.

– Materials and machinery are not to be stored in TPZs.
– Waste materials are not to be dumped within the TPZ. No residual herbicides are to be used within the TPZs.
– Underground utilities should be located outside of TPZs. However, if utilities must pass through these zones, then exploratory excavation works by a suitability qualified arborist may be required to verify root spread and determine the level of impact that could occur on the retained tree. Mechanical trenching within the TPZ should be avoided with trenching undertaken by hand or by vacuum excavation.
– No pedestrian access through and no parking of vehicles within the TPZ.
– All landscaping within TPZs must be on the existing soil grade and with minimal impervious surfaces.
– Where incursion into a designated TPZ is unavoidable, further discussion with a consultant arborist will be required. This may include any measures that need to be implemented to mitigate any possible negative impacts on the retained tree.

5.1.3 Trunk Protection

Tree #159, a *Platanus orientalis*, occurs in proximity to a proposed pedestrian pathway between Mick Sherd Oval and Majara Street. It is recommended that trunk protection measures be implemented to protect the lower trunk during construction if TPZ fencing is not adequate. Trunk protection will follow specifications detailed in AS4970-2009 and will include the following:

– At a minimum trunk height protection is to be 2 m.
– Tree padding shall be multiple layers of orange polypropylene woven mesh to a thickness of 2.5 cm.
– Tree padding will be held in place by untreated hardwood timber battens. These battens to be strapped to trees, not nailed or screwed, with a 5 cm spacing and 30 cm from ground level. Strapping will not be in direct contact with the bark.
– No other trees require trunk protection measures to be implemented.

5.1.4 Soil and Root Protection

If there is a major incursion into the TPZs of retained trees with both the construction of the new facility, ground protection in accordance with AS4970-2009 may be required to protect soil and roots. Rumble boards or steel plates can be used to protect soil from compaction and to protect roots between the stages of demolition and construction of the new facility. Where any structural roots (those with a diameter greater than 20 mm) are encountered by excavation, these are to be pruned with clean, sharp pruning tools by a suitably qualified arborist. If temporary access into any TPZ is required for machinery during construction, then ground protection measures would be required preventing soil compaction and rooting damage. Measures may include permeable membranes such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.

5.1.5 Canopy Works

Pruning of the canopy of trees #211, #212A-E and #213 is required for installation of 2.1 m tall corromesh fencing. Furthermore, canopy works may be required on a number of the retained trees to gain access for high clearance vehicles during construction. Any remedial pruning should be done prior to the commencement of any construction works. Pruning works are likely to be restricted to the removal of any larger diameter deadwood (i.e. any dead branches 50 mm or greater in diameter) and/or the raising of the canopies where necessary for fencing, building or vehicle clearance or other reasons. Pruning works are to be undertaken by a suitably qualified and experienced arborist complying with the Australian Standard for the Pruning of Amenity Trees, AS4373-2007. Natural Target Pruning methods should be used wherever possible when removing sections from retained trees. Lopping (as defined within AS4373-2007) is detrimental to trees, often resulting in decay and poorly attached epicormic shoots. As such, lopping should not be undertaken.

5.2 Tree Protection in the Post-Construction Phase

At completion of construction work, the consulting arborist should carry out an assessment of all trees retained &/or affected by the works. This assessment is to document condition of retained trees, and any on-going remedial

care required to ensure viable retention of trees affected. It is recommended that retained trees be assessed by a suitably qualified arborist immediately after completion of the project and then again 18 months after completion.

6. Mitigation measures

The measures outlined in Table 6.1 are to be implemented to avoid or minimise potential impacts associated with the Activity.

Table 6.1 Mitigation measures for the Activity

Mitigation number/name	Aspect/section	Mitigation measure	Reason for mitigation measure
Tree protection	Design	All retained trees will have a defined TPZ to minimise impact.	Minimise the encroachment into the TPZ of retained trees.
Canopy works (if required)	Pre-construction	Pruning works are to be undertaken by a suitably qualified and experienced arborist complying with the Australian Standard for the Pruning of Amenity Trees, AS4373-2007. Natural Target Pruning methods should be used wherever possible when removing sections from retained trees.	Increasing viability of pruned trees if access for high clearance vehicles during demolition or construction is required.
Tree protection	Demolition and Construction	Installation of tree protection fencing to exclude construction from the TPZ. TPZ fencing will be installed as per Section 4.1.1.	Exclude construction measures impacting retained trees.
Soil and root protection (if required)	Demolition and Construction	Where any structural roots (those with a diameter greater than 20 mm) are encountered by excavation, these are to be pruned with clean, sharp pruning tools by a suitably qualified arborist. If temporary access into any TPZ is required for machinery during construction, then ground protection measures are required. Measures may include permeable membranes such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.	Protect retained trees by preventing soil compaction and root damage.
Excavation within TPZ	Construction	Any unavoidable excavation within the demarked TPZ will be undertaken by hydro excavation. Any exposed roots >20 mm in diameter will be assessed by the appointed consulting arborist to determine if they require pruning.	Protect roots within TPZ by preventing root damage during unavoidable excavation.
Tree assessment	Post construction	Immediately after the completion of construction work and 18 months after, the consulting arborist will carry out an assessment of all trees retained and/or affected by the works.	The assessment will document condition of retained trees and on-going remedial care required to ensure viable retention of trees affected.

7. Conclusion

GHD Pty Ltd was engaged by the NSW DoE to prepare an updated Arboricultural Impact Assessment report in relation to trees potentially impacted as a result of the proposed refurbishment of the former Council administration building. The purpose of this report is to provide an updated assessment of the Arboricultural Impact Assessment prepared by Eco Logical Australia (2024). Tree details, including current health, structural conditions, dimensions, and retention value are included within the Arboricultural Impact Assessment report (Eco Logical Australia, 2024). The Arboricultural Impact Assessment report prepared by Eco Logical Australia (2024) covered a broader area and included demolition and construction of buildings. The project design has changed since this Arboricultural Impact Assessment report was prepared hence the need for an updated impact assessment. This updated Arboricultural Impact Assessment report identifies the impact of the proposed Activity on trees recommended for retention within the site.

In total, 46 trees were assessed as part of this updated impact assessment. Of the 46 trees assessed, all are recommended for retention. All trees recommended for retention would require some form of protection during development of the site as detailed in the tree protection plan. The mitigation methods described in this report should be included within the contractor's construction environmental management documentation to address the requirements of AS4970-2009 and protect the retained trees from potential adverse impacts.

Prior to the commencement of any construction works at the site, a suitably qualified consulting arborist shall be appointed to supervise all tree protection procedures detailed in this report. The consulting arborist shall have a minimum level 5 AQF qualification in arboriculture and will undertake all appropriate arboricultural measures to ensure the survival and long-term health of retained trees. They will also liaise directly with construction personal and be responsible for completing certification of tree and root protection measures throughout the various stages of construction.

Subject to implementing the mitigation measures set out in Section 6 of this report, the conclusion of this assessment is that the proposed activity is not likely to significantly impact the environment in relation to arboricultural matters.

8. References

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Appendices

Appendix A

Tree Impact Assessment

(Source: Eco Logical Australia, 2024)

Tree ID	Botanical Name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	SULE	Landscape Significance	TPZ (m)	SRZ (m)	Retention	Retain
159	*Platanus orientalis*	1	5	3	250	Fair	Fair	Long	Low	3.0	1.8	Low	Retain
119	*Quercus robur*	1	10	10	550	Good	Good	Long	High	6.6	2.6	High	Retain
120	*Quercus robur*	1	10	10	550	Good	Good	Long	High	6.6	2.6	High	Retain
121	*Quercus robur*	1	8	6	280	Good	Good	Long	Medium	3.4	1.9	Medium	Retain
122	*Quercus robur*	1	7	10	300	Good	Good	Long	Medium	3.6	2.0	Medium	Retain
210	Deciduous unknown sp.	1	4	4	150	Good	Good	Long	Medium	2.0	1.5	Low	Retain
211	Deciduous unknown sp.	1	7	3	150	Good	Good	Long	Medium	2.0	1.5	Low	Retain
212A	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain
212B	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain
212C	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain
212D	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain
212E	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain
213	Deciduous unknown sp.	1	4	5	150	Good	Fair	Long	Medium	2.0	1.5	Low	Retain
214A	Group of native spp.	1	5	3	150	Fair	Fair	Short	Medium	2.0	1.5	Medium	Retain
214B	Group of native spp.	1	5	3	150	Fair	Fair	Short	Medium	2.0	1.5	Medium	Retain
214C	Group of native spp.	1	5	3	150	Fair	Fair	Short	Medium	2.0	1.5	Medium	Retain
214D	Group of native spp.	1	5	3	150	Fair	Fair	Short	Medium	2.0	1.5	Medium	Retain
215	Unknown sp.	1	3	3	100	Good	Good	Long	Medium	2.0	1.5	Low	Retain
216	Unknown sp.	1	7	4	150	Good	Fair	Long	Medium	2.0	1.5	Medium	Retain
217	Group of 5 acacia sp.	5	5	4	150	Fair	Fair	Short	Medium	2.0	1.5	Medium	Retain
218	Deciduous sp.	1	5	4	150	Good	Good	Long	Medium	2.0	1.5	Medium	Retain
219	Deciduous sp.	1	3	4	100	Good	Good	Long	Medium	2.0	1.5	Low	Retain
220	Deciduous sp.	1	6	5	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain

Tree ID	Botanical Name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	SULE	Landscape Significance	TPZ (m)	SRZ (m)	Retention	Retain
221	Deciduous sp.	1	5	4	150	Good	Good	Long	Medium	2.0	1.5	Low	Retain
222	Deciduous sp.	1	3	3	100	Good	Good	Long	Medium	2.0	1.5	Low	Retain
223	Deciduous sp.	1	4	3	150	Good	Fair	Long	Medium	2.0	1.5	Low	Retain
224	Deciduous sp.	1	3	6	100	Fair	Fair	Long	Medium	2.0	1.5	Low	Retain
225A	Deciduous sp.	1	6	5	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain
225B	Deciduous sp.	1	6	5	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain
225C	Deciduous sp.	1	6	5	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain
225D	Deciduous sp.	1	6	5	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain
225E	Deciduous sp.	1	6	5	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain
226	Deciduous sp.	1	5	5	150	Good	Fair	Long	Medium	2.0	1.5	Low	Retain
227	Deciduous sp.	1	7	9	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain
228	*Acacia* sp.	1	4	5	150	Poor	Poor	Remove	Low	2.0	1.5	Low	Retain
229	Deciduous unknown sp.	1	4	2	100	Good	Good	Long	Medium	2.0	1.5	Low	Retain
230	*Eucalyptus* sp.	1	3	2	100	Good	Fair	Long	Medium	2.0	1.5	Medium	Retain
231	*Eucalyptus* sp.	1	6	4	200	Good	Fair	Long	Medium	2.4	1.7	Medium	Retain
232	*Pinus radiata*	1	7	7	350	Fair	Fair	Long	Medium	4.2	2.1	Medium	Retain
233	Deciduous unknown sp.	1	4	4	200	Good	Good	Long	Medium	2.4	1.7	Medium	Retain
234	*Acacia* sp.	1	6	4	200	Poor	Poor	Remove	Low	2.4	1.7	Low	Retain
235	Deciduous unknown sp.	1	6	6	280	Good	Good	Long	Medium	3.4	1.9	Medium	Retain
236	Deciduous unknown sp.	1	4	3	100	Good	Good	Long	Medium	2.0	1.5	Low	Retain
401	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain
402	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain
403	Group of mix native spp.	1	5	4	200	Fair	Fair	Short	Medium	2.4	1.7	Medium	Retain

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