ORICA BOTANY

CAR PARK WASTE ENCAPSULATION REMEDIATION PROJECT – PROJECT APPROVAL 06_0197 MODIFICATION 6

Revision 1 - 1 October 2015

CONTENTS

1. INTRODUCTION AND BACKGROUND

This Part 3A modification application seeks to modify Project Approval 06_0197 (Project Approval) granted for the Car Park Waste Encapsulation (CPWE) Remediation Project (Project) under section 75W of the *Environmental Planning and Assessment Act 1979* (the EP&A Act).

The proposed modifications are limited to:

- works ancillary to the already approved placement and reuse of the validated material from the Project at the Botany Industrial Park, Matraville NSW (BIP); and
- administrative amendments certain conditions of the Project Approval,

(the Proposal).

This modification application has been prepared by Orica Limited (Orica), based on a review of the current requirements of the Project Approval, relevant environmental and planning legislation and an assessment of the predicted environmental impacts of the Proposal.

This modification provides:

- a background to the Proposal (Section 1);
- an overview of the Project Approval (Section 2);
- an overview of the location and context of the Proposal (Section 3);
- a description of the Proposal (Section 4); and
- an environmental assessment of the key environmental issues (Section 5).

In summary, it is considered that the Proposal is broadly consistent with the works already approved under the Project Approval, is required to allow the Project to reach its conclusion and is likely to have minimal environmental impacts (Section 6).

2. PROJECT APPROVAL

On 12 November 2009, Orica was granted the Project Approval (06_0197) under Section 75J of the EP&A Act to undertake the remediation of the CPWE. The Project involves the remediation of the CPWE and includes:

- Construction of necessary facilities on the BIP including an Excavation Soil Building (ESB), Feed Soil Building (FSB), associated Emission Control Systems, the Directly-heated Thermal Desorption (DTD) Plant, hardstand areas, environmental controls, and internal haulage roads.
- Excavation and initial screening of contaminated soil within the ESB.
- Transportation of contaminated soil from the ESB to the FSB.
- Further screening, drying and testing of contaminated material within the FSB and feeding to the DTD Plant.
- Thermal treatment of contaminated material in the DTD Plant.
- Validation testing of material treated by the DTD Plant and soils underlying and around the CPWE.
- Stockpiling of treated validated material.
- Decommissioning and removal of DTD Plant, facilities and buildings.
- Subdivision of land.
- Retention of validated material for reuse on certain Orica owned land, including within the area of the BIP as it existed as at 12 November 2009.

The CPWE and BIP as it existed as at 12 November 2009 are shown in Figure 1 (Project Area). The location of the stockpiles of validated material to be reused are presented in Figure 2.

Since being granted, the Project Approval has been modified four times for treatment and management of soils, and for a minor update to the lots defined in the boundary readjustment.

The Project Approval currently authorises the beneficial reuse of the treated and validated material on the BIP.

The Proposal seeks to modify the Project Approval:

- to clarify that the Project includes the works required for the reuse of this material on the BIP including, but not limited to:
    - the removal of vegetation;
    - the spreading and compaction of treated soil and the capping of that treated soil with virgin excavated natural materials for erosion control;
    - the relocation of an internal private access road to facilitate placement of the material;
    - the construction of retaining walls and landscaping;
    - the resurfacing of existing hard stand areas; and
    - services relocation as required,

  (collectively, the Proposal Works);
- to make minor adjustments to the lot boundaries contained in Appendix D to the Project Approval; and
- to make minor administrative amendments to the Project Approval conditions including:
    - condition 7 of Schedule 2 to allow Orica beneficially reuse validated material on land on the BIP which is not currently owned by Orica, in

circumstances where Orica has entered into a contract for sale to purchase that land;

- condition 14 of Schedule 2 to update the timing of the staged boundary readjustment as shown in Appendix D of the Project Approval; and
- updating the boundary readjustment plan contained in Appendix D of the Project Approval to incorporate minor adjustments to the lot boundaries.

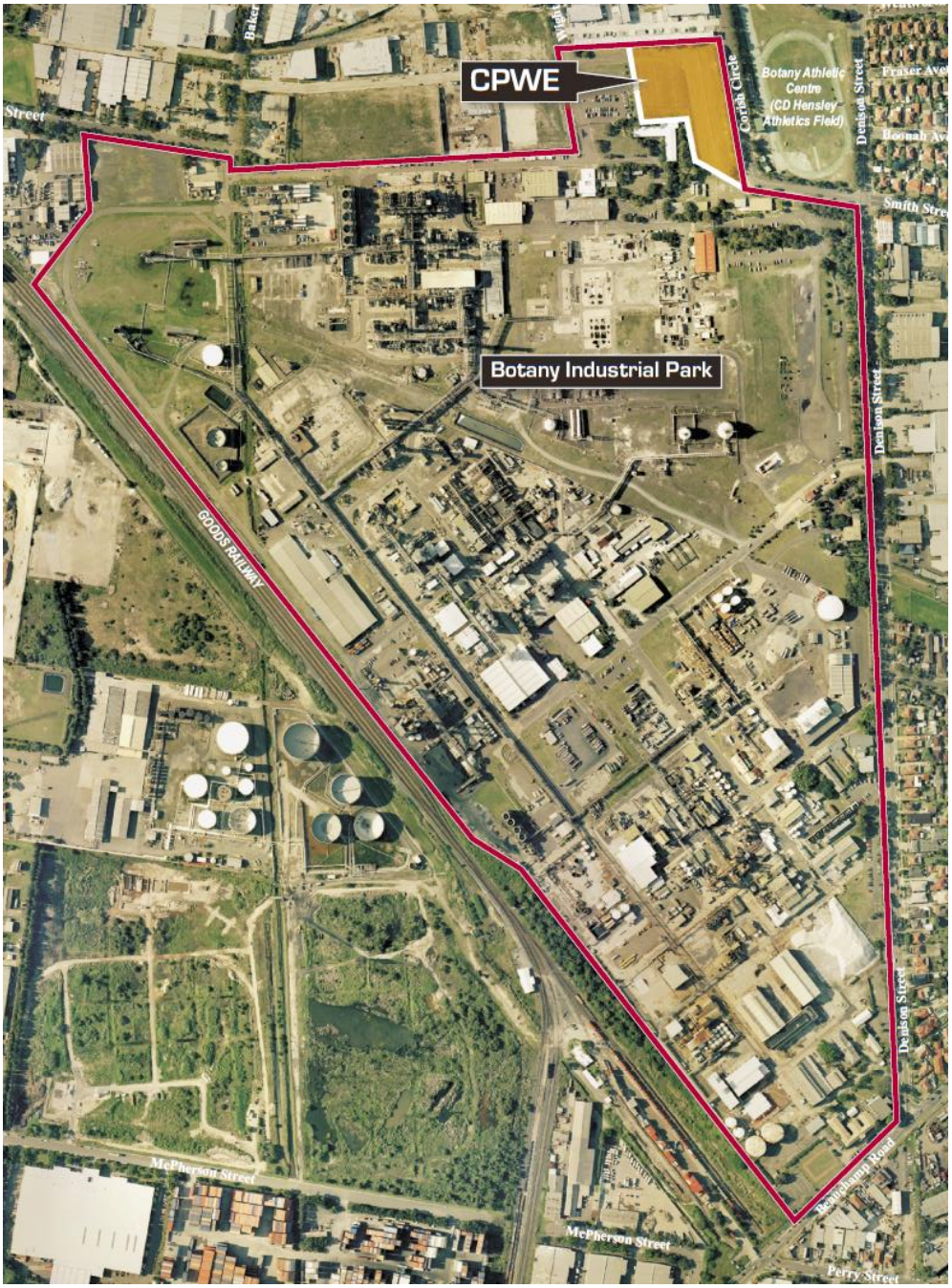

Figure 1: The Car Park Waste Encapsulation and Botany Industrial Park (HLA, 2007).

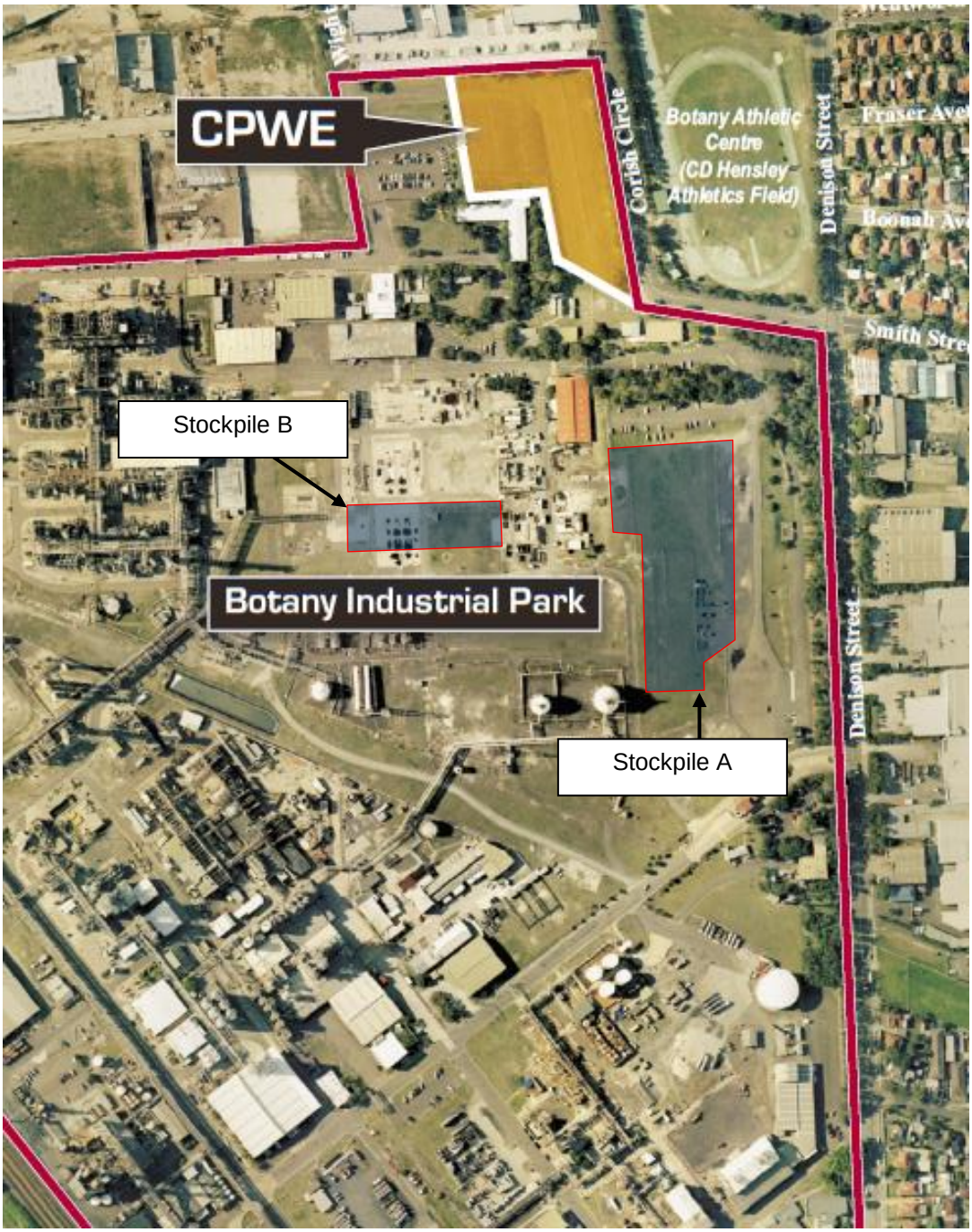

Figure 2: Current approximate location of existing stockpiles of validated material, referred to as Stockpiles A and B (modified from HLA, 2007).

3. LOCATION AND CONTEXT

The Proposal Works are proposed to be carried out on part of the Project Area, located at the BIP, Banksmeadow NSW being:

- Part Lot 103 DP 1192400 (formerly Part Lot 10 DP 1039919);
- Part Lot 104 DP 1192400 (formerly Part Lot 11 DP 1039919);
- Part Lot 9 DP 1016112; and
- Lot 4 DP 1016112,

as shown in Figure 3 (**Proposal Area**).

The land is zoned General Industrial, under *State Environmental Planning Policy (Three Ports) 2013*.

Neighbouring developments are as follows:

- Residential area in Denison Street <100m to the east.
- Banksmeadow Primary School is located approximately 1 km south west, Matraville Primary School is located approximately 800 m south east and Pagewood Primary school is located approximately 1 km north west.
- Hensley Athletic Field <100 m north east.
- Commercial and industrial facilities <100m north and east.
- Industrial facilities within the BIP are directly adjacent the Proposal to the west and south. These include Qenos (Olefines, Alkathene, Alkatuff) Huntsman, Ixom ChlorAlkali and other Orica projects (Hexachlorobenzene repackaging and storage, Former ChlorAlkali Plant Remediation).

Access to the BIP remains via Gates 3 and 4 on Denison Street.

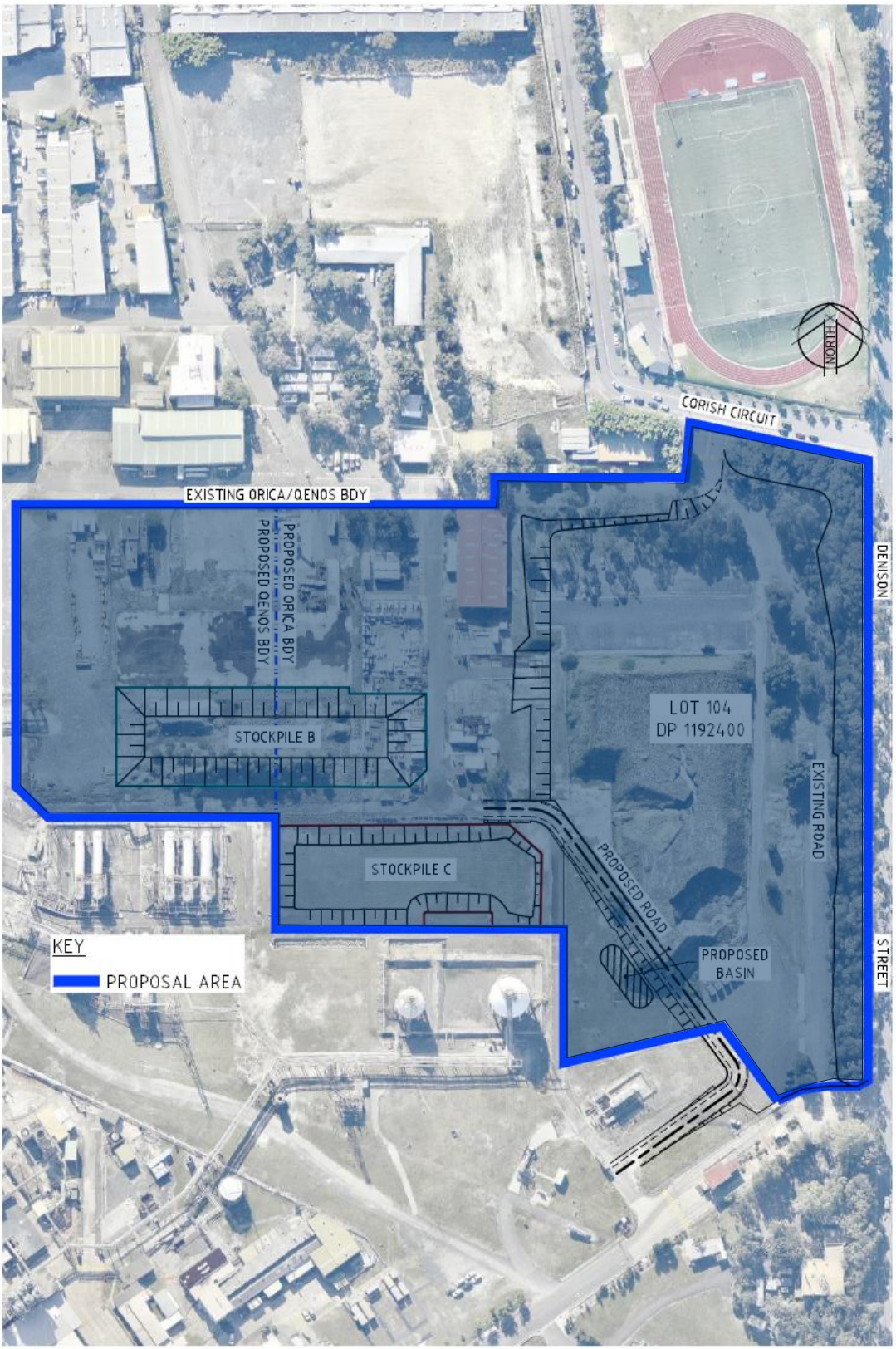

Figure 3: Proposal Area.

4. PROPOSED MODIFICATION

4.1. THE PROPOSAL

The Proposal seeks to modify the Project Approval:

- to clarify that the Project consists of the Proposal Works required for the reuse of this material on the BIP. The Proposal Works include, but are not limited to:
    - the removal of vegetation;
    - the spreading and compaction of treated soil and the capping of that treated soil with virgin excavated natural materials for erosion control;
    - the relocation of an internal private access road;
    - the construction of retaining walls and landscaping; and
    - the resurfacing of existing hard stand areas; and
    - services relocation as required;
- to make minor adjustments to the lot boundaries contained in Appendix D to the Project Approval; and
- to make minor administrative amendments to the Project Approval conditions including:
    - condition 7 of Schedule 2 to allow Orica beneficially reuse validated material on land on the BIP which is not currently owned by Orica, in circumstances where Orica has entered into a contract for sale to purchase that land;
    - condition 14 of Schedule 2 to update the timing of the staged boundary readjustment as shown in Appendix D of the Project Approval; and
    - updating the boundary readjustment plan contained in Appendix D of the Project Approval to incorporate minor adjustments to the lot boundaries.

Figure 4 shows the current indicative layout of the Proposal Works (which remain subject to detailed design).

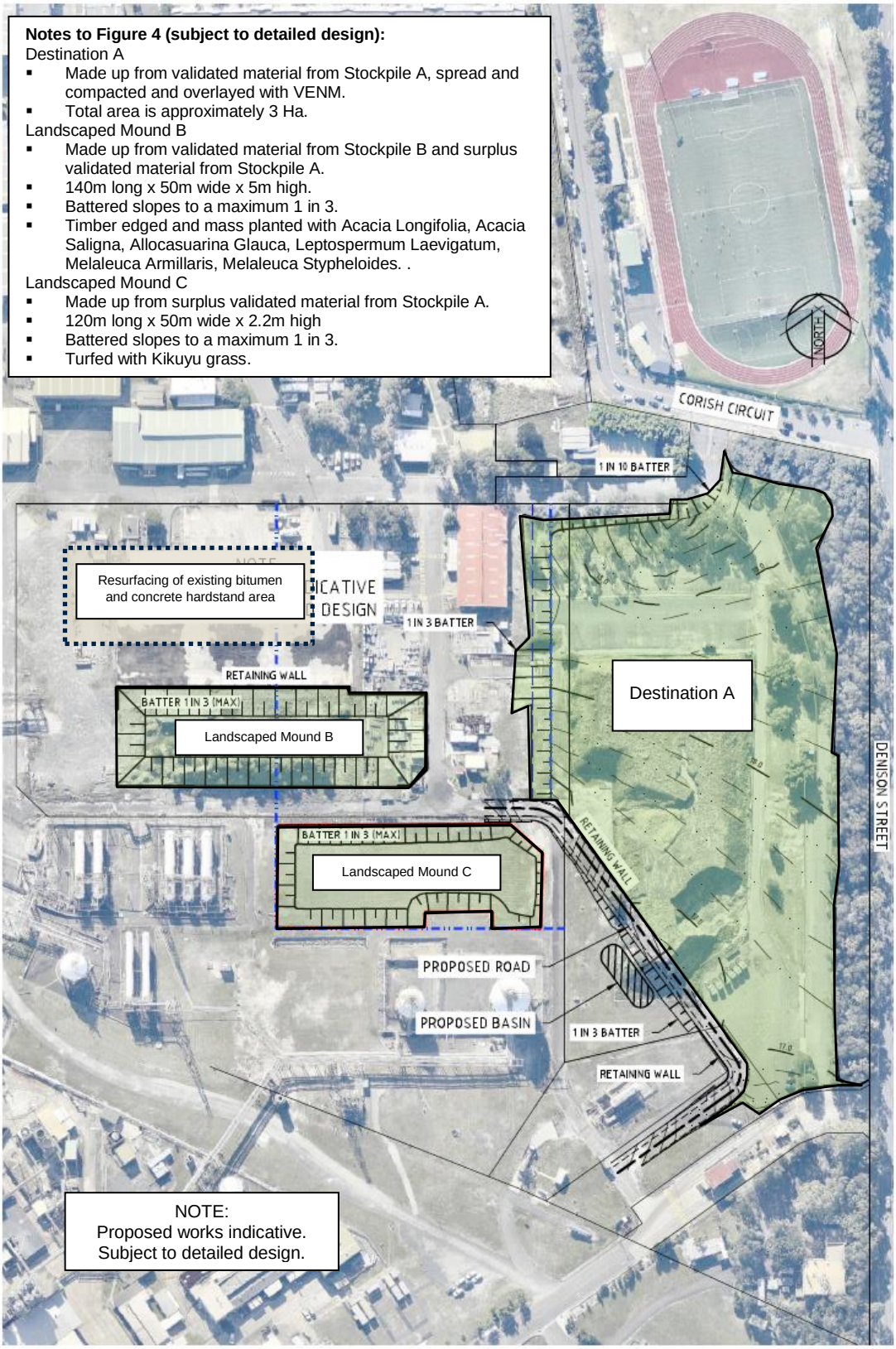

Figure 4: Proposal Works.

4.2. THE PROPOSAL WORKS

4.2.1. OVERVIEW

As outlined in Section 1, the Project Approval currently authorises the beneficial reuse of the treated and validated material on the BIP as it existed as at 12 November 2009. Following treatment at the DTD Plant, the material was validated to verify its suitability for reuse in a commercial / industrial setting and stockpiled (Stockpiles A and B). Orica has identified areas within the BIP suitable for the validated material.

Final grades across the Proposal Area remain subject to detailed design but it is currently anticipated that approximately 35000m^3 of the validated material will be spread and compacted at this location (Destination A). This will require:

- relocation of a privately owned internal access road on the Proposal Area (more information is provided on this below);
- construction of retaining walls up to 3 metres in height to achieve necessary batters and protect the new internal private access road; and
- removal of approximately 132 trees and shrubs, including but not limited to casurinas, eucalyptus, melallucas and lophostemons, so that the validated material can be effectively spread and compacted.

An arborists report is attached as Annexure A which provides an overview and assessment of the trees to be removed.

4.2.2. INTERNAL ACCESS ROAD WITHIN THE PROPOSAL AREA

An internal private access road currently exists within the Proposal Area. This existing internal road runs directly west of the Denison Street Mound (landscaped setback area), parallel with Denison Street in a north-south direction. This will be covered by the beneficial reuse of the validated material described above (Destination A). To continue to provide internal access within the BIP, an alternative private access road with parking will be developed. This new internal road will connect the main BIP internal access road (10th Avenue) with lower order internal roads to the north of the site. An aerial, of the existing private access road and proposed relocated private access road with parking, is presented in Figure 5.

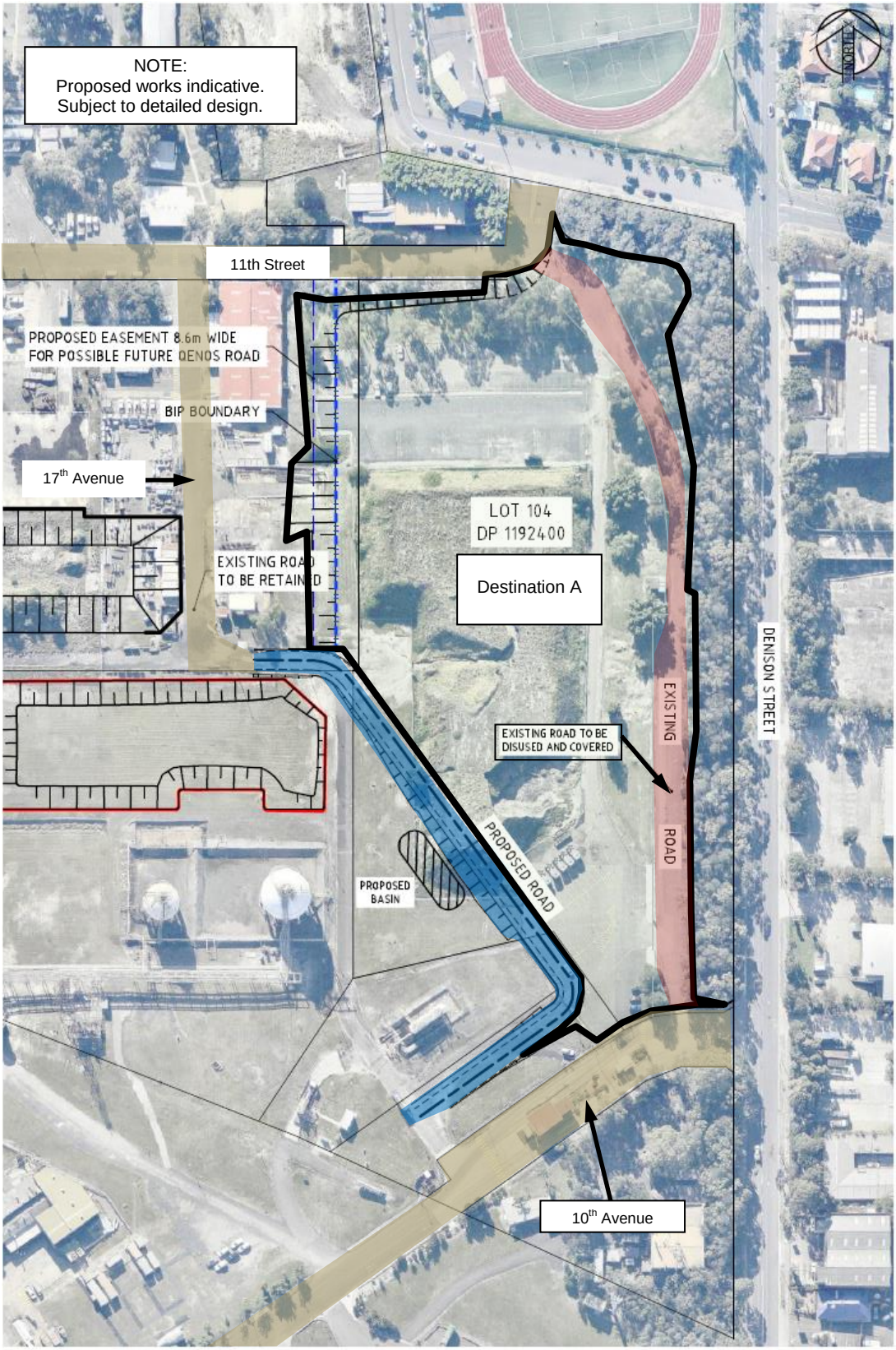

Figure 5: Existing (red shade) and proposed (blue shade) private access roads relevant to this Proposal.

4.2.3. LANDSCAPED MOUNDS

New landscaped mounds (Landscape Mounds A and B) will also be created along the western portion of the Proposal Area. These will be battered, with retaining walls as necessary, landscaped and vegetated.

The indicative locations of Landscape Mounds A and B are presented in Figure 4.

4.2.4. PLANT AND EQUIPMENT

It is anticipated that the associated works will require a variety of plant and equipment, similar to that already required for the currently approved Project. Plant and equipment will include:

- excavators;
- trucks (tippers or truck and dog configurations to deliver and transfer materials);
- bulldozers; and
- vibratory rollers.

4.2.5. PROGRAM OF WORKS

The works the subject of the Proposal are required to facilitate the beneficial reuse of the treated and validated material on the BIP as currently authorised under the Project Approval. Accordingly, the Proposal Works will be carried out in parallel with other works authorised under the Project Approval.

The Proposal Works are currently expected to commence late 2015 and take approximately 6 – 12 months to complete subject to weather and operational requirements of facilities on the BIP.

Construction works will be undertaken during standard hours (7 am – 6 pm Monday to Friday and 8 am – 1 pm Saturdays), with no construction works occurring on Sundays and Public Holidays.

All traffic would enter the BIP via the existing Gate 3 on Denison Street or Gate 4 on Corish Circle. All works are occurring internal to the BIP, with very minor external flows for deliveries and collections. The impact on the local traffic environment is expected to be negligible. Accordingly, the traffic impacts are expected to remain consistent with those assessed for the Project as currently approved.

4.3. REFINEMENT OF LOT BOUNDARIES

The Proposal includes some minor refinements to the lot boundaries on the boundary readjustment plan, contained in Appendix D of the Project Approval.

Consistent with the topography of the area it is proposed to move the northern portion of the western boundary of Lot 104 DP 1192400, 8.6 metres to the west. This is presented in Figure 6.

The revised boundary readjustment plan, showing the proposed refinements to the lot boundaries, is presented in Figure 7.

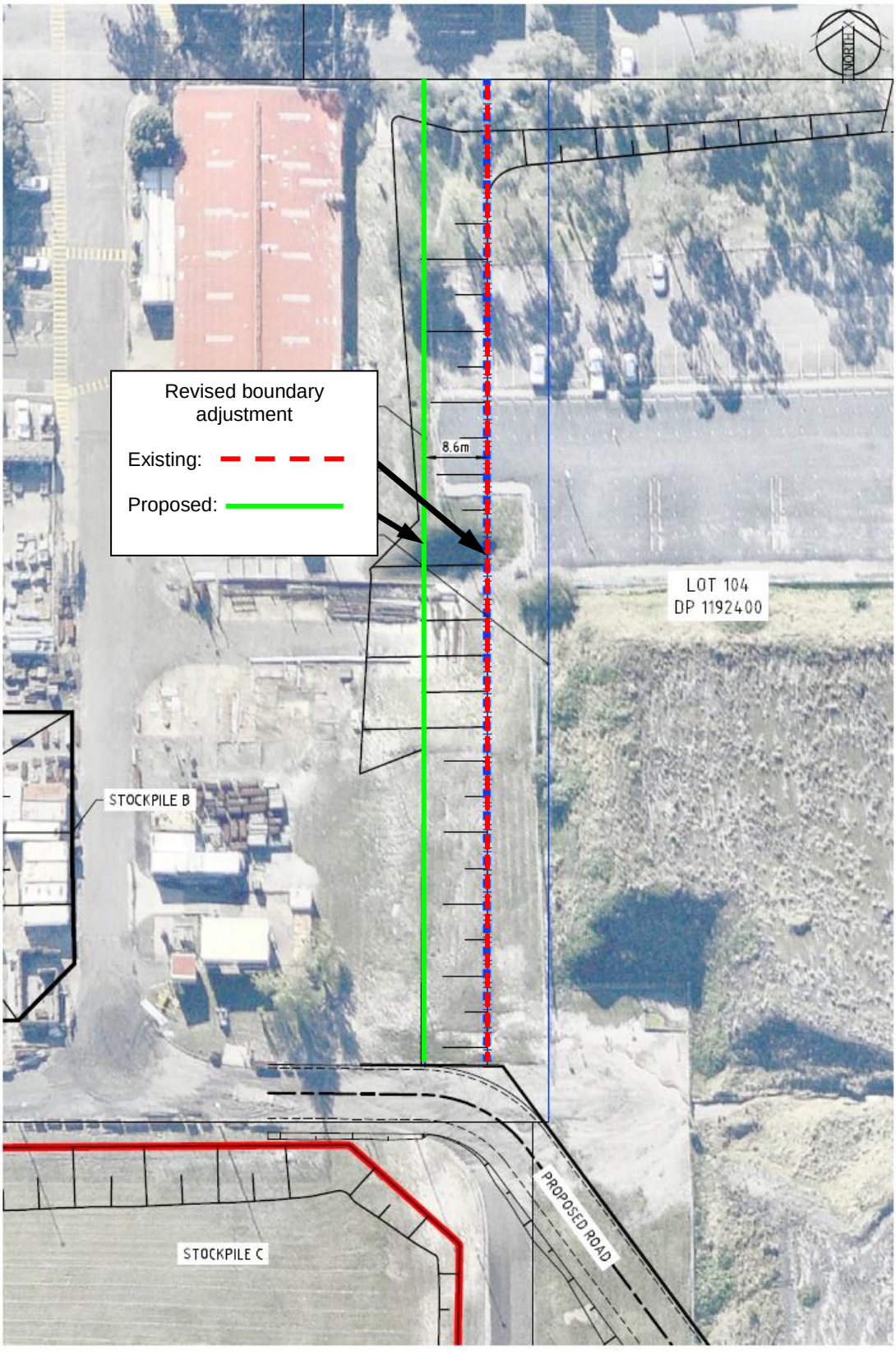

Figure 6: Proposed adjustment of the northern portion of the western boundary of Lot 104 DP 1192400, to cater for topography.

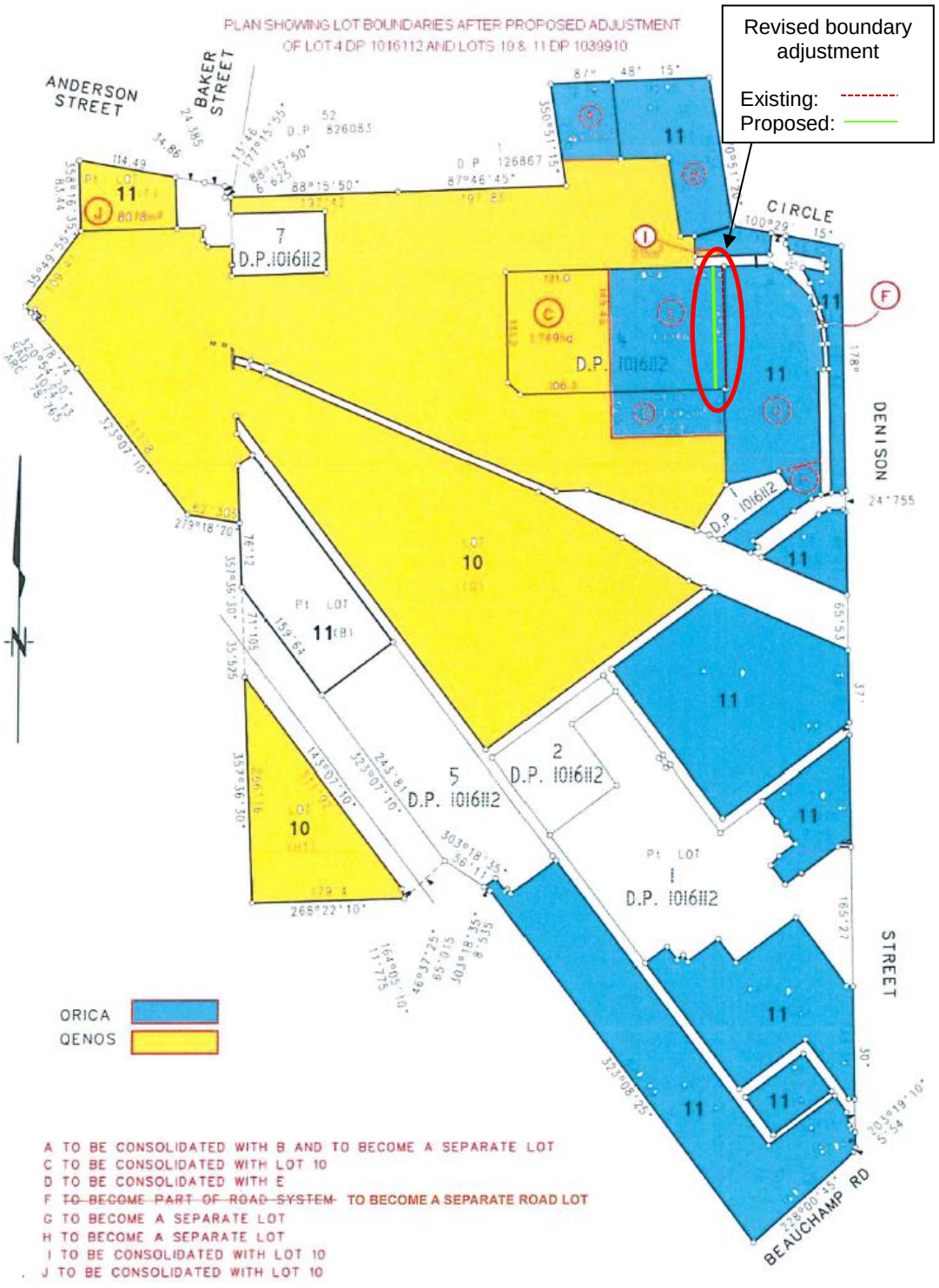

Figure 7: Revised boundary readjustment plan, showing the proposed refinements to the lot boundaries, to be included in Appendix D of the Project Approval.

4.4. MODIFICATION TO THE CONDITIONS OF THE PROJECT APPROVAL

In order to facilitate the Proposal described in Section 4.1 above, minor administrative modifications to the conditions contained in Schedule 2 of the Project Approval would be required as follows:

Insert a new condition 2L, before the existing condition 2L, as follows:

> *Modification application (06_0028 Mod 6) with supporting information entitled Car Park Waste Encapsulation Remediation Project – Project Approval 06_0197 Modification 6, dated 1 October 2015.*

Omit condition 7 and insert a new condition 7 as follows:

Disposal of surplus validated material from the project is only permitted:

- *on land described in Schedule 1; or*
- *on land within the Botany Industrial Park as described in the EA, which is owned by Orica or which written consent has been given by the owner; or*
- *at a licenced landfilling facility that can lawfully receive the surplus validated material.*

Omit condition 14, and insert a new condition 14 as follows:

> *The Proponent shall ensure that the adjustment of boundaries within the Botany Industrial Park is carried out in accordance with the figures contained in Appendix D. The boundary adjustment shall be completed by the date required for completion of the project as specified in condition 6.*

Omit the boundary readjustment plan contained in Appendix D of the Project Approval and insert a new plan, as presented in Figure 7.

5. ENVIRONMENTAL ASSESSMENT

5.1. RELEVANT LEGISLATION

The following environmental legislation and planning instruments are relevant to the Proposal:

- EP&A Act.
- *State Environmental Planning Policy (Three Ports) 2013.*
- *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*.
- *State Environmental Planning Policy No. 55 – Remediation of Land.*
- *Protection of the Environment Operations Act 1997.*

An overview of the application of these to the Proposal is provided below.

5.1.1. ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Despite the repeal of Part 3A of the EP&A Act, section 75W of the EP&A Act continues to apply to transitional Part 3A projects, such as the Project.

Section 75W contains a process for modifications to be made to approvals granted under Part 3A.

5.1.2. STATE ENVIRONMENTAL PLANNING POLICY (THREE PORTS) 2013

The Site is located within zoned 'IN1 — General Industrial' under Part 1 Clause 5 of *State Environmental Planning Policy (Three Ports) 2013* (***Three Ports SEPP***) . The Proposal is considered to comply with the zone objectives as discussed in Table 4.1.

Table 4.1: IN1 — General Industrial: zone objectives

Objective	How the Proposal satisfies the objective
To provide a wide range of industrial and warehouse land uses	The Proposal allows for the completion of the CPWE Remediation Project, facilitating future use of land for industrial and warehouse purposes servicing port related industries. Any such development will be subject to assessment separate to this Proposal.
To encourage employment opportunities	Short term employment will be generated during construction. Temporary and permanent employment opportunities may be realised from the completion of the CPWE Remediation Project through future developments separate to this Proposal.
To minimise any adverse effect of industry on other land uses	The Proposal is limited to the BIP and creates landscaped buffers between BIP facilities.
To facilitate and encourage port related industries that will contribute to the growth and	The Proposal allows for the completion of the CPWE Remediation Project, facilitating future use of land for industrial and warehouse purposes servicing port related industries. Any

diversification of trade through the port	such development will be subject to assessment separate to this Proposal.
To enable development for the purposes of business premises or office premises associated with, and ancillary to, port facilities or industries	The Proposal allows for the completion of the CPWE Remediation Project, facilitating future use of land for industrial and warehouse purposes servicing port related industries. Any such development will be subject to assessment separate to this Proposal.
To encourage ecologically sustainable development	The Proposal will bring to a close the successful remediation of the CPWE, a previous source of contamination in the local area. It embraces ecological sustainable development through the beneficial reuse of validated material on the BIP, thus preventing the need for offsite disposal to landfill.

5.1.3. STATE ENVIRONMENTAL PLANNING POLICY NO. 33 – HAZARDOUS AND OFFENSIVE DEVELOPMENT

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (***SEPP 33***) provides for a system of hazard and risk assessment for potentially hazardous industry. Guidelines, including *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 2011* ('Applying SEPP 33'), have been prepared to provide guidance on when a preliminary hazard analysis (PHA) may be required.

Applying SEPP 33 indicates a PHA may be required for a modification where:

- the modification is considered potentially hazardous or potentially offensive in its own right, or
- the proposed modification is not potentially hazardous in of itself, but interacts with the existing facility in such a way that cumulative hazards (or offence) from the existing facility may be significantly increased.

A PHA has been prepared previously for the CPWE Remediation Project application.

The activities presenting the most significant hazards and risks (handling and treatment of contaminated material) have been completed. The Proposal will facilitate the completion of the CPWE Remediation and does not give rise to any new hazards.

Furthermore, the Proposal does not interact with any existing facilities in a way that alter cumulative hazards. Ongoing use of internal roadways and car park is consistent with use of other internal roads and car parks within the BIP and do not alter the cumulative hazard profile of any facilities on the BIP.

As such, preparation of an updated PHA is not considered to be necessary for this Proposal in accordance with SEPP 33.

5.1.4. STATE ENVIRONMENTAL PLANNING POLICY NO. 55 – REMEDIATION OF LAND

State Environmental Planning Policy No. 55 – Remediation of Land (***SEPP 55***) aims to provide a state-wide planning approach to the remediation of contaminated

land, and in particular, promotes the remediation of contaminated land for the purpose of reducing risk of harm to human health or any other aspect of the environment.

SEPP 55 identifies two categories of remediation works – Category 1 works, which require development consent, and Category 2 works, which do not require consent. The CPWE Remediation Project was assessed and approved under Part 3A of the EP&A Act.

The remediation process, that is the excavation, treatment and validation of treated material and source area, has been completed under the Project Approval. No additional remediation works are required or proposed as part of the Proposal. The works forming part of the Proposal are limited to works associated with the (already approved) reuse of the validated material on the BIP and are required to allow for the completion of the approved CPWE Remediation Project.

5.1.5. PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

Orica holds an environment protection licence no. 2148 (EPL) which regulates Orica's activities on the BIP under the *Protection of the Environment Operations Act 1997* (POEO Act).

The works forming part of the Proposal will be required to comply with the conditions in the EPL and the associated obligations, such as management of complaints, pollution incident planning and response and carrying out works in a competent and proper manner.

The premises of the EPL will need to be amended to accurately reflect land owned by Orica during the staged boundary readjustment required by condition 14 of Schedule 2. However, a review of the EPL conditions indicates that no further amendment to the EPL conditions will be required to accommodate the Proposal.

5.2. ENVIRONMENTAL IMPACTS

The Proposal Area is situated within a well-established industrial area, therefore the potential for adverse environmental impact is limited. However, if not suitably managed the Proposal may cause temporal, local impacts.

The conditions of the Project Approval and EPL already provide a robust framework for managing any impacts resulting from the works which form part of the Proposal. In addition, Orica would prepare a specific environmental management plan (**EMP**) to manage any impacts arising from the Proposal Works.

The following subsections outline the potential impacts and particular controls proposed to manage these impacts.

5.2.1. AIR QUALITY

The works which form part of the Proposal have the potential to generate fugitive dust emissions during earthworks and exhaust emissions from plant and machinery. To ensure emissions of dust from the premises are minimised, the following controls will be applied as appropriate.

- Include air quality observations (dust / exhaust emissions) in project induction material, toolbox talks and environmental checklists;
- Conduct ambient dust monitoring during the earthworks phase;
- Erect fencing with shade cloth prior to commencement of works to prevent offsite transport of dust;
- Delineate entrance and exit points at commencement of works to limit ground disturbance;
- Apply a site speed limit of 10 km/h within the construction site;
- Ensure all trucks carrying materials are covered at all times with the exception of loading and unloading;
- Water down exposed surfaces and stockpiles when dust is observed or during dry windy periods;
- Minimise the extent of exposed unconsolidated surfaces at any one time, where possible;
- Stabilise exposed unconsolidated surfaces as soon as practicable after handling;
- Where dust is observed to be moving offsite, stop works which could be causing the issue until corrective action is applied;
- Ensure plant and machinery is suitably maintained so as to control exhaust emissions;
- Where excessive exhaust is observed from a plant or machinery, shut down plant until repairs / replacement is arranged

5.2.2. NOISE AND VIBRATION

The plant and machinery which will be deployed for the Proposal is unlikely to alter the local noise environment, which is already dominated by heavy vehicle movements along Denison Street. However, temporary impacts from Proposal shall be mitigated by applying the controls below:

- All construction work at the premises must only be conducted between 7:00am to 6:00pm Monday to Friday, 8:00am to 1:00pm Saturdays, with no construction activities on Sundays or Public Holidays;
- Prior to noise generating works commencing notification shall be provided to the adjacent residents, so that they are aware of the potential temporary increase in the local noise environment. The letter shall outline the time frame for key noise generating works, work hours, general controls and the complaints / contact number: 1800 025 138;
- Non-tonal beepers shall be fitted to vehicles where possible (known as quackers or woofers);
- Traffic, predicted to very minor flows, is to be directed to and from the site via the main gates, being Gate 3 on Denison Street, and Gate 4 on Corish Circle, other than emergency vehicles that may use the most efficient point of access;
- All plant and machinery shall have their engines turned off when not in use; and
- Fit industrial silencers to exhaust of excessively noisy plant and machinery.

5.2.3. TRAFFIC, TRANSPORT AND ACCESS

The works forming part of the Proposal will generate small volumes of local traffic which are not expected to significantly vary from that generated by the currently approved Project. Local traffic movements will be very minor as works will be occurring within the privately owned BIP boundaries and the earthworks involve material already situated on site.

All plant, materials and contractor vehicle parking will be contained within the BIP.

The relocation of the internal private access road will occur in stages, with the new access road being constructed in advance of the old road being removed to ensure continuity of access. Traffic volumes and flows internal to BIP are predicted to be consistent with those experienced during general operations and maintenance campaigns. Any changes to internal traffic flows will be implemented in consultation with BIP neighbours as per existing arrangements.

The potential traffic impact on the overall traffic volumes in the local area (not related to the Proposal) is negligible.

5.2.4. VEGETATION MANAGEMENT

An arborists report is attached as Annexure A which provides details of the trees to be removed. Approximately 132 trees will ultimately require removal under the Proposal. It is noted that only 6 of the 133 trees were identified as being of high landscape significance and 46 of the trees were identified as being of short or very short safe useful life expectancy (and a further tree is dead).

In addition to this, over 1000 trees in this part of the BIP are proposed to be retained and protected in a landscaped setback area adjacent to Corish Circle and Denison Street. This equates to around 8 trees being retained for every tree removed. In this context the loss of 6 trees of high landscape significance is seen as being relatively minor.

Furthermore, the vegetation on the Proposal Area has been previously assessed by Botany Bay City Council under a previous Development Consent. In particular, DA 10/486 authorised the removal of all the 85 trees impacted by the development consent (unrelated to the Project Approval and this Proposal) granted for future subdivision of the site and use for industrial purposes.

Figures showing the extent of the:

- area where vegetation clearing has already been approved under DA/486; and
- area where further clearing is required under this Proposal (Modification 6)

are presented in Annexure B.

To ensure the potential impacts on trees not subject to removal are minimised, the following controls shall be implemented:

- Trees to be retained are to be clearly identified by signage as protected trees.
- ‘Tree protection zones’ of trees to be retained are to be fenced during the entire construction period except for specific areas directly required to achieve construction works.

- Any excavation within the identified root protection zones of trees to be retained shall be carried out by hand to minimize disturbance to tree roots. Roots greater than 25mm are not to be damaged or severed without prior assessment by an arborist to determine likely level of impact and the restorative actions required to minimise the impacts of root damage.
- Roots of trees to be retained, between 10mm and 25mm diameter, that are severed during excavation, shall be cut cleanly by hand by an experienced Arborist/Horticulturist with a minimum qualification of the Horticulture Certificate or Tree Surgery Certificate.
- Canopy pruning of trees identified for protection which is necessary to accommodate approved building works shall be undertaken in accordance with Australian Standard 4373-2007 'Pruning of Amenity Trees'.

5.2.5. EROSION AND SEDIMENT CONTROL

Site works will involve the handling and placement of significant quantities of validated material. As such, management is necessary to minimise the potential for erosion and sedimentation. Stormwater external to the Proposal Area will be controlled by existing stormwater drainage measures present at the BIP. Within the Proposal Area, diversion measures will be installed to ensure that surface waters are diverted to the existing stormwater system, or retained in a purpose built sedimentation pond.

Consistent with the NSW Department of Housing's Managing Urban Stormwater: Soils and Construction (the 'Blue Book'), a number of erosion and sediment control measures will be applied. These include:

- A stabilised site entrance/exit with appropriate decontamination facilities;
- Sediment control devices on stormwater drains down-gradient of the works area, including a sedimentation pond;
- Sediment fences, will be installed as close as possible to the sediment source (e.g., stockpiles);
- Designated transport routes will be used to avoid unnecessary disturbances in unpaved areas;
- Batter slopes and stockpiles will be controlled to limit erosion in areas external to the active excavation face;
- Stabilisation or covering of stockpiles observed to be in place for a substantial period of time and generating excessive sediment consequent of rainfall events or otherwise; and
- In the event that severe weather conditions are forecast during the works period, consideration should be given to sandbagging or installing silt fences along the down-gradient site boundaries.

5.2.6. CONTAMINATED LAND

The CPWE materials have been treated and validated to meet the Risk Based Soil Criteria (RBSC) and approved by the EPA appointed Site Auditors for reuse in a commercial / industrial setting.

Following treatment at the DTD Plant, the material was subject to extensive validation testing to verify its suitability for reuse. The Site Auditors considered the treatment, validation process and results and confirmed, within a Site Audit Report

that the stockpiled validated material was suitable for reuse (CM Jewell and Associates, 2014 and Ramboll Environ, 2015). This validated material will be used as fill and in landscaped mounds on the BIP in accordance with the works already authorised under the Project Approval.

5.2.7. WASTE MANAGEMENT

The Proposal Works would generate a small volume of general construction waste, for example, surplus material, concrete waste and scrap metal. Waste generated by the Proposal would be managed in accordance with the Orica's existing waste management processes and the conditions of the Project Approval and EPL.

Controls include:

- Waste generated at the premises will be assessed and classified in accordance with the EPA Waste Classification Guidelines (2014);
- Provision of clearly labelled bins or skips for recyclable and non-recyclable waste within the BIP;
- Waste loads will be secured and covered prior to departure in accordance with regulatory requirements;
- Wastes shall be transported by, and disposed of to, operators and facilities lawfully permitted to do so;
- Records will be maintained of incoming and outgoing waste.

5.2.8. HAZARDS AND RISKS

The Proposal involves the handling of validated material within the BIP, with other associated construction works. These types of activities were assessed as part of Project Approval 06_0197. This modification is considered unlikely to pose hazards and risks in excess of those previously assessed.

As discussed above in Section 5.1.3, preparation of a separate PHA is not considered to be necessary for this Proposal.

Hazards and risks that may arise from the Proposal are not dissimilar to those for existing operations on the BIP, such as mobile plant and equipment or work near operational manufacturing facilities. These risks would be managed in accordance with existing BIP and Orica management procedures, and the current conditions of the Project Approval and EPL. These will require all contractors to be appropriately inducted to the BIP, and trained in what to do in cases of emergencies.

5.2.9. VISUAL IMPACT

All works will be occurring internal to the BIP. The BIP is bordered by an extensive vegetated and landscaped mound along Denison Street and Corish Circle. This will be retained by the Proposal (with the exception of minor tree removal as described in Section 5.2.4), preventing any adverse visual impacts to the north and east. All neighbours to the west and south are within the BIP and are industrial facilities. Large separation distances exist to the nearest residential receptors on these aspects.

Small number of vehicles (as discussed in Section 5.2.3) will be entering and exiting the BIP from the main access gates. These flows are well within the numbers required for general operations on the BIP and the surrounding traffic environment.

In short, the potential for visual impact is negligible and temporary only.

5.2.10. SITE OPERATIONS AND MANAGEMENT

The Proposal has been developed in consultation with other BIP operators to ensure the works are consistent with existing operations on site.

Orica will be preparing and implementing an EMP for the Proposal which will include relevant details of construction methodology and key mitigation measures proposed above.

The EMP would designate an environmental officer on Site to monitor implementation of these mitigation measures and ensure that there are not any adverse impacts to the environment during construction.

5.2.11. INCIDENT MANAGEMENT AND EMERGENCY RESPONSE

Orica Botany utilises model procedures, and the Safety, Health & Environment Reporting and Management Information System, for immediate action, classification, reporting, investigation and implementation of corrective actions for incidents.

Incident response plans (Pollution, Emergency and Crisis Plans) have been prepared in consideration of the above and include information relating to the requirements incident management including immediate initiation response, combat and containment, and reporting. Those responsible for the management of the Proposal will be trained on the implementation of these plans.

5.2.12. PUBLIC INTEREST

As discussed, the impacts of the Proposal would be minor or negligible and in most cases be confined to the BIP.

Orica would undertake the Proposal in close consultation with neighbouring facilities on the BIP to ensure the any temporary disruption to site activities prevented or limited.

Community information sessions are regularly held to inform the public, in particular surrounding land users, of operations (existing and proposed) on the BIP and on the Project. Orica has provided a briefing on the Proposal to community at the August 2015 Orica Botany Liaison Committee meeting and will continue to do so as appropriate.

Additionally Orica operates and website and community complaints hotline (1800 025 138), that allows the public to access information or raise concerns. These tools will be maintained throughout the Proposal.

6. CONCLUSION

The Proposal is necessary to enable the completion of the Car Park Waste Encapsulation Remediation Project (**Project**) and is limited to:

- works ancillary to the already approved placement and reuse of the validated material from the Project at the BIP; and
- administrative amendments certain conditions of the Project Approval.

The Proposal is considered consistent with all relevant planning and environmental legislation.

This assessment shows that the impacts of the works forming part of the Proposal are minor or negligible and manageable. Furthermore they are consistent with those assessed as part of the currently approved Project.

Annexure A

Arboricultural Impact Report - Placement and Reuse of Validated Material, Botany Industrial Park (Landscape Matrix, 2015).

ARBORICULTURAL IMPACT REPORT

PLACEMENT AND REUSE OF VALIDATED MATERIAL
BOTANY INDUSTRIAL PARK

CORNER CORISH CIRCLE AND DENISON STREET
BANKSMEADOW

PREPARED FOR ORICA LIMITED

11 AUGUST 2015

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CONTENTS

EXECUTIVE SUMMARY

Landscape Matrix Pty Ltd has been engaged by Orica Limited to prepare an Arboricultural Impact Report in relation to trees located within land known as Botany Industrial Park and potentially impacted by proposed works in part of the site.

The assessment is required to in relation to the placement and reuse of validated material, and ancillary works on part of the site. The works involve the removal of all the trees in the reuse area with the retention of the greater majority of trees along the site's Denison Street frontage to be maintained.

The site is part of the area known as Botany Industrial Park. The area of the site affected by the proposed works is in the vicinity of Corish Circle and Denison Street Banksmeadow. There appears to have been significant past changes in the majority of the site with extensive industrial development and associated infrastructure. The area of the site where the trees are located comprises landscape areas, access roads and carparking areas.

Of the 133 trees that have been assessed for this report the overwhelming majority of the trees are planted Australian species with the most common species present being *Casuarina glauca* (Swamp Oak) and *Casuarina cunninghamiana* (River Oak).

The majority of trees were noted to be mature specimens and the majority of the trees are in good health. However, 33 trees were identified as having a short safe, useful life expectancy (SULE) with a further 13 trees identified as having a very short SULE (< 5 years). 1 of the trees assessed is dead.

Using the nominated assessment methodologies the trees have been categorised according to their retention values with 6 trees identified as being of high landscape significance and medium to long life expectancy. A further 60 trees were identified as being moderate or moderate to high landscape significance and medium to long life expectancy. Tree protection zones are identified in the report for these trees.

16 of the trees were identified as recommended for removal regardless of any future development proposals for the site due to their health, structural condition or because they are weed species (e.g. Golden Wreath Wattle). The remaining 51 trees were identified as not being of specific consideration in the design process.

None of the trees assessed for the report are listed individually as a threatened species under the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

While the majority of the trees assessed will ultimately require removal under the reuse of the validated material, ,it is noted that only 6 of the 133 trees were identified as being of high landscape significance and 46 of the trees were identified as being of short or very short safe useful life expectancy (and a further tree is dead).

In addition to this it is also noted that 1000 plus trees in this part of the overall site are proposed to be retained and protected in a landscaped setback area adjacent to Corish Circle and Denison Street. This equates to around 8 trees being retained for every tree removed. In this context the loss of 6 trees of high landscape significance is seen as being relatively minor. It is also worth noting that the removal of the majority of the trees was considered and assessed as part of a previous industrial subdivision development application, lodged with the City of Botany Bay Council. The consent was issued by the Council, permitting the removal of all the 85 trees impacted by the subdivision.

It is considered the retention of the greater majority of trees in this part of the Botany Industrial Park will retain the landscape character of the site when viewed from Denison Street and Corish Circle. There may also be opportunities to achieve replanting within the site when it is subject to future redevelopment.

1. BACKGROUND

Landscape Matrix Pty Ltd has been engaged by Orica Limited to prepare an Arboricultural Impact Report in relation to trees located within land known as Botany Industrial Park (the site). The trees are located in the area of the site adjacent to the corner of Corish Circle and Denison Street Banksmeadow.

Orica Limited is proposing to place and reuse validated material on part of the site and is seeking a report that addresses the following key requirements in respect to trees potentially impacted by the proposal:

- Undertake an assessment of the current health, vigour and condition of 133 trees at the site;
- Undertake an assessment of the landscape significance of the trees;
- Identify those trees that are of high landscape significance and medium to long life expectancy;
- Identify those trees that are of moderate or moderate to high landscape significance and medium to long life expectancy;
- Identify those trees that are recommended for removal regardless of future planning for the site;
- Identify those trees that are not of specific importance in the planning process for future development of the site; and
- Identify tree protection zones for those trees identified as being worthy of retention.

It is also noted that there are around 1000 trees in the vicinity of the proposed works that are proposed to be retained and protected in the Corish Circle and Denison Street frontage. This equates to around 8 trees being retained for every tree proposed to be removed.

It is considered the retention of the greater majority of trees in this part of the Botany Industrial Park will retain the landscape character of the site when viewed from Denison Street and Corish Circle. There may also be opportunities to achieve replanting within the site when it is subject to future redevelopment.

The area of the site affected by the application site is in the vicinity of Corish Circle and Denison Street Banksmeadow. The location of the Site is illustrated in figure 1 as follows:

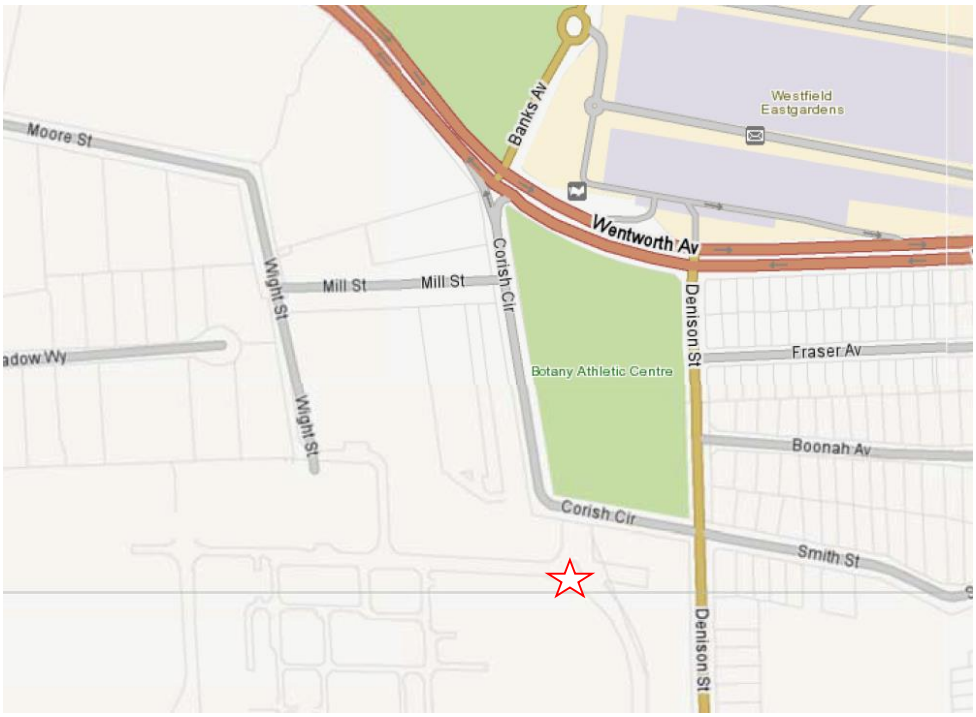


Figure 1: Location Map: Botany Industrial Park (Source: www.whereis.com)

2. METHODOLOGY

Site inspections were undertaken on 15th and 16th August 2011 to collect data for trees identified as 1 to 85 for an earlier application. Further inspections were undertaken on 28th and 30th July 2015 to collect data for tree numbers 86 to 133. The data for the trees was then combined and has been used to assess various aspects of the trees in relation to health, vigour, condition, landscape value and retention value. A number methodologies were used in this process.

During the site inspections on 28th and 30th July 2015 it was noted that 4 trees previously assessed in 2011 had subsequently been removed (tree numbers 5, 7, 11 and 15). These trees were removed due to identified structural issues.

The methodologies used in preparation of this report comprised 4 distinct areas. These are:

- Tree health, vigour and condition;
- Landscape value or significance;
- Tree retention values; and
- Tree protection zones.

2.3 TREE HEALTH AND CONDITION

The tree health and condition assessment was based upon a visual inspection of the trees from ground level using aspects of the Visual Tree Assessment (VTA) method described by

Mattheck & Breloer (1994). The visual inspection included examination of the trees' dimensions, foliage density and foliage health, form, structure, structural condition, overall health and vigour and landscape significance.

The inspection was limited to visual inspection of the trees without dissection, probing or coring. No aerial inspection of the trees was carried out and the assessment did not include any significant woody tissue testing or root investigation.

The tree heights and canopy spreads were estimated and are expressed in metres and the tree diameters at breast height (DBH) were measured with a with standard metal tape at 1.4 metres above ground level and are expressed in millimetres. DBH were rounded up to the nearest 5mm increment.

2.4. LANDSCAPE VALUE OR SIGNIFICANCE

The landscape value or significance of a tree in the landscape is a critical step in the process of determining the importance that a particular tree may have on a site. However, determining tree significance can be a subjective process unless a consistent basis is established to guide the rating.

A number of rating systems have been developed in the past including, for example, the rating system identified in British Standard 5837-2005 (BSI 2005). Typically, these rating systems consider criteria such as size, form, health, heritage, historical and ecological values to assist in determining a rating for the tree.

The Institute of Australian Consulting Arboriculturists (IACA) has developed a rating system for assessing tree significance. This rating system is attached at appendix D and provides the following rating choices based on a selection of criteria:

- High Significance in the Landscape
- Medium Significance in the Landscape
- Low Significance in the Landscape

Trees need to meet 3 criteria to be selected in that rating in the system developed by IACA. (IACA 2010)

The system developed by IACA has been used as a guide to rate the landscape value or significance of trees asses for this report. However, the following modifications have been made:

- A fourth category (after Low landscape significance) of Environmental or Noxious Weed has been added; and
- 'Medium Landscape Significance' has been changed to 'Moderate Landscape Significance'
- Where considered appropriate, a rating between 2 categories has been allowed - e.g. 'Moderate to High Landscape Significance'.

2.5. RETENTION VALUES

Determining the retention value of trees on a development site requires the synthesis of baseline data and subsequent categorisations of individual trees to provide a relative retention value when compared with other trees on the site. The two principal criteria used in determining the retention value of a tree are its sustainability or projected lifespan in the landscape (e.g. SULE) and the tree's landscape value rating.

A number of table or 'matrix' style methods have been successfully used by various authors to assist in consistently determining the retention values of trees on development sites (e.g. Morton 2010, Couston and Howden 2001).

The Institute of Australian Consulting Arboriculturists (IACA) has developed a draft system for assessing tree retention values. This draft system is referred to as 'Tree Retention Value - Priority Matrix and compares life expectancy with landscape significance to identify the following retention values:

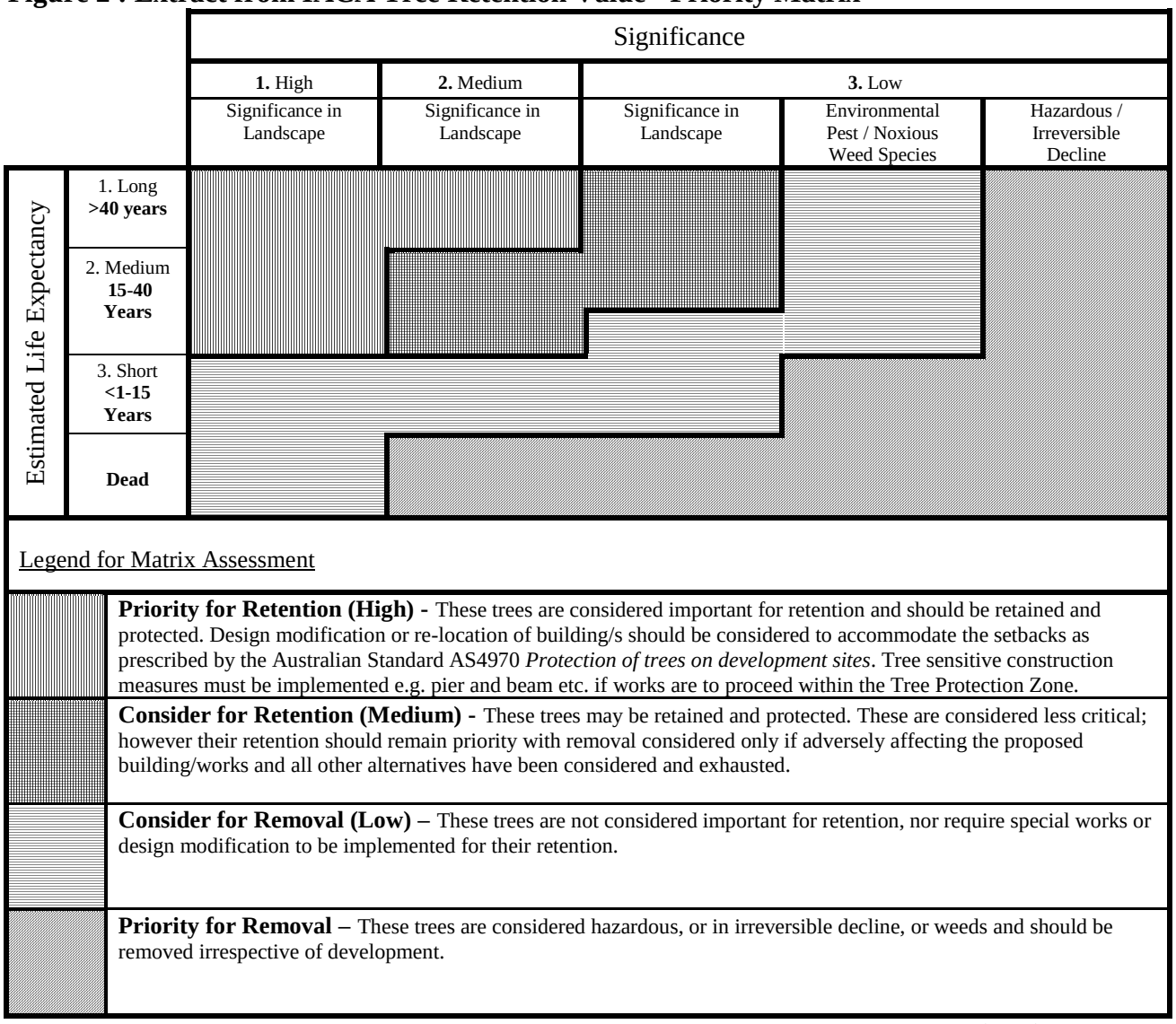
- Priority for retention;
- Consider for retention;
- Consider for removal; and
- Priority for removal

The draft system developed by IACA has been used to guide determination of retention values for this report with the following changes to the methodology:

- An additional category has been added - the additional category is for those trees not identified for retention or removal - this provides for those trees that may be of low or low to moderate landscape significance but could be considered for retention, particularly in the short term, if redevelopment of the site is undertaken and other vegetation is removed.
- Trees of high landscape significance and medium to long SULE identified as the priorities for retention (i.e. trees of moderate landscape significance and long SULE are not identified as a priority for retention due to their moderate significance); and
- Only those trees with a SULE of less than 5 years and those trees identified as structurally unstable are recommended for removal.

The following figure is an extract from the IACA Tree Retention Value - Priority Matrix which illustrates the matrix system.

Figure 2 : Extract from IACA Tree Retention Value - Priority Matrix



Legend for Matrix Assessment

	Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc. if works are to proceed within the Tree Protection Zone.
	Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for Removal (Low) – These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal – These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

Source IACA (2010)

2.6. TREE PROTECTION ZONES

A number of methods to determine the likely extent of root zones and appropriate setbacks for tree root protection zones for trees on development sites have been developed in the past.

The key criteria used in determining setbacks is the tree's trunk diameter at breast height (DBH) in conjunction with other factors including the sensitivity of the species in question to environmental disturbance/change, the age of the tree and the tree's health and vigour at the time.

Harris et al (2004) provide formulae for calculating tree protection zones based on the above criteria and modified from the 1991 British Standard for protection of trees on

construction sites (BS 5837:1991). The 2005 version of the British Standard (BS 5837:2005) recommends a radius of 12 times the tree's DBH. For multi trunked trees BS 5837:2005 recommends a setback of 10 times the basal trunk diameter.

The Australian Standard AS 4970-2009 Protection of Trees on Construction Sites also identifies a 'Tree Protection Zone' (TPZ) of 12 times the tree's DBH. AS 4790-2009 also provides a formula for calculating the "Structural Root Zone' of trees on development sites. This is the area required for stability. In regard to palms, other monocots, cycads and tree ferns the Standard identifies the Tree Protection Zone should not be less than 1 metre outside the crown projection. (Australian Standards Association 2009)

The tree protection zones identified in this report have been calculated using the Australian Standard 'AS 4970 Protection of trees on construction sites' and are the setback from the trees where disturbance (e.g. soil level changes, compaction, excavation etc.) must be minimised to reduce potential impacts on the long term health of the trees. The zones have been rounded to the nearest tenth of a metre.

These zones are illustrated in Appendix E which contains an extract (figure 2) from AS4970-2009.

Preferably, no more than 10% of the tree protection zone should be disturbed with compensation made by extension of other areas of the TPZ to compensate for the area(s) disturbed. Where greater than 10% of the tree protection zone is potentially disturbed the tree's viability needs to be investigated and demonstrated by the project arborist.

AS4970-2009 identifies the structural root zone as the area required for stability and where disturbance of any sort should be avoided.

3. TREE ASSESSMENT RESULTS

3. 1 Brief Summary of trees assessed for the report

During the site inspections undertaken on 15th and 16th August 2011 and 28th and 30th July 2015 a total of 133 trees at the site were assessed with specific data collected for each tree nominated as being over 8 metres in height. This data is summarised in Appendix B – Tree Data Summary.

The 133 trees assessed for the report are summarised in table 1 as follows:

Table 1: Summary of species present, number and height range

SPECIES	COMMON NAME	NUMBER PRESENT	HEIGHT RANGE (metres)
Acacia binervia	Coastal Myall	8	5 to 12
Acacia saligna	Golden Wreath Wattle	2	6 to 7
Agonis flexuosa	Willow Myrtle	1	3.5
Allocasuarina cunninghamiana	River Oak	16	8 to 14
Angophora bakeri	Narrow-leaved Apple	3	6 to 10
Callistemon salignus	White Bottlebrush, Willow Bottlebrush	3	4 to 5.5
Casuarina glauca	Swamp Oak	52	8 to 17
Corymbia gummifera	Red Bloodwood	2	8 to 10
Eucalyptus botryoides	Bangalay	12	9 to 21
Eucalyptus robusta	Swamp Mahogany	4	5 to 12
Eucalyptus sp.	Gum Tree (species not identified)	5	14 to 18
Ficus hillii	Hill's Weeping Fig	2	9
Leptospermum laevigatum	Coast Tea Tree	3	5 to 7
Lophostemon confertus	Brush Box	4	9 to 10
Melaleuca armillaris	Bracelet Honey Myrtle	1	6
Melaleuca quinquenervia	Broad Leaved Paperbark	4	5 to 8
Melia azedarach	White Cedar	1	10
Pinus radiata	Monterey Pine	6	8 to 13
Populus nigra 'Italica'	Lombardy Poplar	3	7 to 10
Schinus areira	Peppercorn Tree	1	7
	Total	**133**	**3.5 to 21 metres**

None of the trees assessed for this report is listed individually as a threatened species under the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

The tree locations for tree numbers 1 to 85 are identified on the Plan prepared by prepared by Cardno (NSW/ACT) Pty Ltd dated 4/8/2011 and identified as drawing number 210058CD-01 Rev. B.

Tree numbers 86 to 133 were not originally located by survey on this plan but their general locations have been identified on the Preliminary Grading Sketch Plan (aerial) prepared by prepared by Cardno (NSW/ACT) Pty Ltd dated august 2015 and identified as drawing number YN210058-SK019 (A) Rev. 07. Each of these trees has been tagged with an aluminum tag identifying their tree number.

A copy of the survey, with tree numbers added is attached to the report.

3. 2 Observations regarding the site

- The following observations are made in regard to the site:
-
- The site is part of the area known as Botany Industrial Park;
- The area of the site affected by the application site is in the vicinity of Corish Circle and Denison Street Banksmeadow
- There appears to have been significant past changes in the majority of the site with extensive industrial development and associated infrastructure;
- The area of the site where the trees are located comprises landscape areas, access roads and carparking areas.
- The trees assessed for the report are a mixture of exotic species and planted Australian species (some of which are representative of species that would have occurred in the locality in the past).
- An illustrative view of the area is shown in Figure 3.

Figure 3: Illustrating the access roads, carparking and landscape plantings in part of the site.

3. 3 Observations regarding the trees assessed for the report

The following general observations are made in regard to the trees assessed for this report:

- 133 trees have been identified as being over 8 metres in height and assessed in this report;
- The overwhelming majority of the trees are planted Australian species;
- The most common species present are:
    - *Casuarina glauca* (Swamp Oak) - 52 specimens
    - *Casuarina cunninghamiana* (River Oak) - 16 specimens
- The majority of trees are mature specimens (117 trees) with 9 trees being semi mature and 6 over-mature specimens. 1 tree was dead;
- The majority of the trees are in good health (92 trees), with 32 trees being of moderate health and 8 identified to be of poor health;
- The majority of trees were identified as being of medium SULE (57 trees) with a further 29 trees of long SULE (29 trees);
- 33 trees were identified as having a short SULE with a further 13 trees identified as having a very short SULE (< 5 years);
- 1 tree was dead;
- 6 trees were identified as being of high landscape value and medium to long life expectancy, 60 trees of moderate or moderate to high landscape and medium to long life expectancy;
- 16 of the trees were identified as recommended for removal regardless of any future development proposals for the site due to their health (dead), structural condition and because they are weed species (e.g. Golden Wreath Wattle)
- None of the trees assessed for the report are listed individually as a threatened species under the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
- 27 of the trees were less than 8 metres in height.

NB: During the site inspections on 28th and 30th July 2015 it was noted that 4 trees previously assessed in 2011 had subsequently been removed (tree numbers 5, 7, 11 and 15). These trees were removed due to identified structural issues.

4. TREE RETENTION VALUES

4.1 Introduction and Summary

Using the methodologies referred to in section 2 of this report the trees can be categorised according to a number of criteria. Of particular interest is the criteria related to:

- Health
- Maturity
- Landscape Significance; and
- Safe Useful Life Expectancy (SULE)

By combining assessment criteria it is possible to identify those trees to which greater consideration should be given in the design process. For example, those trees that are

identified as being of both medium to long SULE and high landscape significance should be the first priority for retention in the design process. In contrast those trees of high landscape significance but short SULE should not be a significant consideration in the design process as they would only be suitable for retention in the short term.

The same principle can be used to identify those trees of moderate or moderate to high landscape significance and medium to long SULE as trees that should be considered for retention if possible in the design process.

In addition, this process can be used to identify trees that should be removed from the site, regardless of any development proposals, due to declining health, structural issues (e.g. risk of failure) or unsuitability to the site (e.g. invasive weed species).

Using this process of categorisation for the tress assessed has identified

- 4 trees are identified as a priority for retention;
- 39 trees were identified for considered for retention;
- 14 trees were identified as recommended for removal regardless of any development proposals; and
- The remaining 32 trees were not identified as being of specific design consideration.

The following tables on pages 13 to 17 provide a summary of the trees identified as a priority for retention (Table 2), those identified for consideration for retention (Table 3).

Once trees have been identified for retention it is important to identify the spatial constraints to development that retention of the trees will require. The spatial constraints relate to protection of a minimum area required for the root zone requirements of the tree and protection of the trees' existing/future canopy growth.

The tree protection zones required to provide for the retention of these trees have been derived using the criteria specified in AS4970-2009 and are identified in tables 2 and 3 below.

Generic tree protection measures are identified in the recommendations to provide guidance on likely measures that will be required prior to and during the construction process to minimise risk of damage to trees identified for retention on the site.

4.2 Trees identified as a priority for retention

Following assessment of the trees it is considered the following 6 trees are of high landscape value and medium to long SULE and warrant consideration as priorities for retention/protection if possible. Further details regarding the trees' health, condition and other factors are provided in the tree data summary (Appendix B).

Table 2: Trees identified as a priority for consideration for retention/protection with identified Tree Protection Zones (TPZ).

TREE NO.	SCIENTIFIC AND COMMON NAME	TPZ	SRZ	COMMENTS
3	*Eucalyptus botryoides* (Bangalay)	5.3 metres	2.6 metres	The tree displays fair branch attachment with multiple leaders from 1.4 metres with some evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure. Birds nest in upper canopy (Australian Raven).
8	*Eucalyptus species*	4.9 metres	2.6 metres	
14	*Eucalyptus species* (Gum)	6.5 metres	2.7 metres	The tree exhibits fair branch attachment with evidence of past branch failure (e.g. At 4 metres on SE)
43	*Eucalyptus botryoides* (Bangalay)	7 metres	2.8 metres	Moderate sized dead wood requires management.
110	*Eucalyptus botryoides* (Bangalay)	5.2 metres	2.6 metres	At the time of inspection the tree was of fair vigour and exhibited low levels of dieback and epicormic growth. Large diameter exposed roots to west. Located adjacent to proposed works and may be impacted.
126	*Casuarina glauca* (Swamp Oak)	5.6 metres	2.6 metres	

4.3 Trees identified for consideration for retention

Following assessment of the trees it is considered the following 60 trees are of moderate or moderate to high landscape significance and medium to long SULE and should be considered for protection. Further details regarding the trees' health, condition and other factors are provided in the tree data summary (Appendix B).

Table 3: Trees identified for consideration for retention/protection with identified Tree Protection Zones (TPZ).

TREE NO.	SCIENTIFIC AND COMMON NAME	TPZ	SRZ	COMMENTS
1	*Allocasuarina cunninghamiana* (River Oak)	4.8 metres	2.4 metres	
6	*Eucalyptus botryoides* (Bangalay)	4.3 metres	2.3 metres	At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density and low levels of dieback.
10	*Eucalyptus botryoides* (Bangalay)	4.3 metres	2.4 metres	Structural roots exposed adjacent to trunk.
17	*Casuarina glauca* (Swamp Oak)	2.4 metres	1.9 metres	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
25	*Allocasuarina cunninghamiana* (River Oak)	4 metres	2.4	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
26	*Allocasuarina cunninghamiana* (River Oak)	4.4 metres	2.4 metres	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
27	*Allocasuarina cunninghamiana* (River Oak)	3.5 metres	2.1 metres	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
28	*Corymbia gummifera* (Red Bloodwood)	4.7 metres	2.2 metres	The tree's past canopy development has been significantly suppressed. The tree exhibits fair branch attachment with multiple leaders and some evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction is a weak point in the tree with increased risk of failure.
29	*Allocasuarina cunninghamiana* (River Oak)	5.5 metres	2.5 metres	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
31	*Allocasuarina cunninghamiana* (River Oak)	3.8 metres	2.3 metres	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of fair vigour as evidenced by low to moderate levels of dieback.
32	*Allocasuarina cunninghamiana* (River Oak)	4.2 metres	2.8 metres	At the time of inspection the tree was of fair vigour as evidenced by low to moderate levels of dieback.

39	*Casuarina glauca* (Swamp Oak)	3.2 metres	2 metres	The tree's past canopy development has been significantly suppressed.
40	*Casuarina glauca* (Swamp Oak)	3.5 metres	2.1 metres	
45	*Casuarina glauca* (Swamp Oak)	5.4 metres	2.6 metres	The tree exhibits fair to poor branch attachment with codominant leaders from 1.4 metres with evidence of poor attachment at the junction - the junction of leaders is a weak point in the tree with increased risk of failure.
46	*Casuarina glauca* (Swamp Oak)	3.6 metres	2.2 metres	The tree's past canopy development has been suppressed. At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density and moderate levels of dieback.
47	*Casuarina glauca* (Swamp Oak)	3 metres	2.1 metres	The tree's past canopy development has been suppressed.
48	*Casuarina glauca* (Swamp Oak)	4.1 metres	2.1 metres	The tree's past canopy development has been suppressed.
49	*Casuarina glauca* (Swamp Oak)	3.1 metres	2.1 metres	
50	*Casuarina glauca* (Swamp Oak)	2.4 metres	1.9 metres	
51	*Casuarina glauca* (Swamp Oak)	2.5 metres	2 metres	
53	*Angophora bakeri* (Narrow-leaved Apple)	2.4 metres	1.7 metres	The tree's past canopy development has been slightly suppressed.
54	*Casuarina glauca* (Swamp Oak)	1.8 metres	1.7 metres	At the time of inspection the tree was of fair vigour and exhibited reduced foliage density.
55	*Casuarina glauca* (Swamp Oak)	3.7 metres	2.2 metres	
61	*Pinus radiata* (Monterey Pine)	3.5 metres	2.2 metres	
71	*Casuarina glauca* (Swamp Oak)	3.4 metres	2.2 metres	
72	*Ficus hillii* (Hill's Weeping Fig)	5.5 metres	2.4 metres	The tree exhibits fair branch attachment with multiple codominant leaders from near ground level with evidence of

				poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure.
73	*Schinus areira* (Peppercorn Tree)	7.2 metres	2.7 metres	At the time of inspection the tree was of moderate health and fair vigour as evidenced by reduced foliage density and low levels of dieback.
75	*Ficus hillii* (Hill's Weeping Fig)	4.6 metres	2.2 metres	The tree exhibits fair branch attachment with codominant leaders from near ground level with evidence of poor attachment at the junction - the junction of leaders is a weak point in the tree with increased risk of failure. Exposed structural roots adjacent to basal trunk - appears to be the result of rabbit burrowing activity.
76	*Melaleuca quinquenervia* (Broad Leaved Paperbark)	5.3 metres	2.3 metres	The tree exhibits fair branch attachment with multiple codominant leaders with some evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density and low levels of dieback.
78	*Lophostemon confertus* (Brush Box)	6.8 metres	2.6 metres	The tree exhibits fair branch attachment with multiple codominant leaders from 0.7 metres with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure. Appears to be rabbit warren under tree's root plate.
80	*Lophostemon confertus* (Brush Box)	6.2 metres	2.5 metres	The tree exhibits fair branch attachment with multiple codominant leaders from 0.6 metres with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure.
82	*Casuarina glauca* (Swamp Oak)	3.7 metres	2.2 metres	The tree's past canopy development has been suppressed. Branch tear at 4 metres on east side as a result of failure of codominant leader in tree number 81.

83	*Lophostemon confertus* (Brush Box)	4.8 metres	2.3 metres	The tree exhibits fair branch attachment with multiple codominant leaders from near ground level with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure.
84	*Melia azedarach* (White Cedar)	2.9 metres	1.9 metres	
85	*Casuarina glauca* (Swamp Oak)	2.3 metres	1.9 metres	Low levels of fasciation in lower foliage.
88	*Eucalyptus botryoides* (Bangalay)	3.8 metres	2.2 metres	The tree displays fair branch attachment with evidence of past branch failures. Low levels of dieback at time of inspection.
89	*Eucalyptus botryoides* (Bangalay)	3.1 metres	2.1 metres	The tree displays fair branch attachment with evidence of a past branch failure at 5 metres.
90	*Populus nigra 'Italica'* (Lombardy Poplar)	4.8 metres	2.6 metres	The tree's past canopy development has been suppressed. Low to moderate dieback at time of inspection.
92	*Casuarina glauca* (Swamp Oak)	2.6 metres	1.8 metres	
93	*Casuarina glauca* (Swamp Oak)	2 metres	1.8 metres	
94	*Casuarina glauca* (Swamp Oak)	2.5 metres	1.8 metres	
95	*Casuarina glauca* (Swamp Oak)	3.7 metres	2.3 metres	The tree displays fair branch attachment with codominant leaders from 0.8 metres - not considered at risk of failure in the short term.
102	*Casuarina glauca* (Swamp Oak)	2.8 metres	2 metres	
105	*Casuarina glauca* (Swamp Oak)	3 metres	2 metres	At the time of inspection the tree was of fair vigour and exhibited reduced foliage density.
106	*Casuarina glauca* (Swamp Oak)	2 metres	1.6 metres	
108	*Casuarina glauca* (Swamp Oak)	2.9 metres	2 metres	

111	*Casuarina glauca* (Swamp Oak)	2.6 metres	1.9 metres	
112	*Casuarina glauca* (Swamp Oak)	2.5 metres	1.9 metres	
113	*Casuarina glauca* (Swamp Oak)	3.1 metres	2 metres	The tree displays fair branch attachment with codominant leaders from 2 metres - not considered at risk of failure in the short term.
118	*Casuarina glauca* (Swamp Oak)	3.8 metres	2.3 metres	
119	*Casuarina glauca* (Swamp Oak)	3.2 metres	2.1 metres	The tree displays poor branch attachment with evidence of recent past branch failures.
123	*Casuarina glauca* (Swamp Oak)	3.8 metres	2.3 metres	
127	*Casuarina glauca* (Swamp Oak)	4.3 metres	2.3 metres	
131	*Casuarina glauca* (Swamp Oak)	4.7 metres	2.4 metres	
132	*Casuarina glauca* (Swamp Oak)	3 metres	1.8 metres	
133	*Casuarina glauca* (Swamp Oak)	7.3 metres	2.7 metres	

TPZ = Tree Protection Zone under AS4970-209; SRZ = Structural Root Zone under AS4970-2009

4.4 Trees identified for removal regardless of any development proposals

Following assessment of the trees on the site it is considered that 16 of the trees assessed for this report should be considered either for immediate removal and replacement due to declining health, structural issues and/or removal in the longer term due to unsuitability to the site (e.g. weed species).

These trees are identified in table 4 as follows:

Table 4: Trees recommended for consideration for removal.

TREE NO.	SCIENTIFIC AND COMMON NAME	REASON
5	*Eucalyptus species*	The tree is considered to be structurally suspect - there is extensive wounding in the lower trunk with decay present as evidenced by fruiting bodies (*Phellinus sp.*) at 1 metre on north side and 3 metres on east side. Urgent testing required if tree is retained to confirm extent of decay and impacts on structural integrity. Birds nest in upper canopy (Australian Raven).
13	*Eucalyptus botryoides* (Bangalay)	At the time of inspection the tree was of poor health and vigour as evidenced by reduced foliage density and high levels of dieback.
18	*Eucalyptus robusta* (Swamp Mahogany)	At the time of inspection the tree was of poor health and vigour as evidenced by significant levels of dieback. Large diameter dead wood requires management.
22	*Allocasuarina cunninghamiana* (River Oak)	At the time of inspection the tree was of poor health and vigour as evidenced by significantly reduced foliage density, high levels of dieback and epicormic growth.
36	*Corymbia gummifera* (Red Bloodwood)	At the time of inspection the tree was of moderate health and poor vigour as evidenced by very high levels of dieback and epicormic growth.
56	*Pinus radiata* (Monterey Pine)	At the time of inspection the tree was of poor health and vigour and exhibited reduced foliage density and very high levels of dieback. Originally 3 main leaders with 2 removed in past.
58	*Acacia binervia* (Coastal Myall)	The tree exhibits poor branch attachment with one of the 2 remaining live leaders partially broken in the past and resting on the ground for support. At the time of inspection the tree was of moderate health and poor vigour as evidenced by high levels of dieback.
62	*Acacia binervia* (Coastal Myall)	At the time of inspection the tree was of poor health and poor vigour as evidenced by significantly reduced foliage density and very high levels of dieback.
65	*Acacia binervia* (Coastal Myall)	The tree exhibits poor branch attachment with codominant leaders from near ground level with evidence of poor attachment and partial past failure at the junction - the junction of leaders is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of moderate health and poor vigour as evidenced by reduced foliage density and high levels of dieback.
66	*Acacia binervia* (Coastal Myall)	The tree exhibits poor branch attachment with evidence of past failure of a codominant leader at the junction at 1.7 metres. At the time of inspection the tree was of poor health and poor vigour as evidenced by very high levels of dieback.
67	*Eucalyptus robusta* (Swamp Mahogany)	The tree exhibits fair branch attachment with codominant leaders from 0.6 metres with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak

		point in the tree with increased risk of failure. At the time of inspection the tree was of moderate health and poor vigour as evidenced by significantly reduced foliage density and high levels of dieback.
68	*Acacia binervia* (Coastal Myall)	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of poor health and poor vigour as evidenced by significantly reduced foliage size and density and moderate to high levels of dieback.
69	*Acacia binervia* (Coastal Myall)	
77	*Acacia saligna* (Golden Wreath Wattle)	Short lived species, environmental pest species.
91	*Acacia saligna* (Golden Wreath Wattle)	The tree displays poor branch attachment with multiple leaders form ground level with evidence of poor attachment and past failure of a main junction at ground level (large slit in junction).
100	*Melaleuca armillaris* (Bracelet Honey Myrtle)	The tree is considered to be unstable - it has failed in the past and is leaning against, and supported by, T98. Moderate dieback at the time of inspection.

4.5 Trees not identified for retention or removal

The following 51 trees have not been identified as being of moderate to high landscape value, medium to long SULE and worthy of retention/protection, or as priority for removal due to low landscape value and condition:

- Tree numbers 4, 7, 9, 11, 12, 15, 20, 21, 23, 24, 30, 33, 34, 35, 37, 38, 42, 44, 52, 57, 59, 60, 63, 64, 70, 74, 79, 81, 86, 87, 96, 97, 98, 99, 101, 103, 104, 107, 109, 114, 115, 116, 117, 120, 121, 122, 124, 125, 128, 129 and 130.

These trees are currently in moderate health and condition and do perform some landscape function of low to moderate significance. Their retention on the site would be desirable, particularly in the short term, if redevelopment of the site is undertaken. However these trees are not considered significant enough to warrant specific design consideration.

5. IMPACT ANALYSIS OF PROPOSED WORKS

The potential impacts of the proposal have been assessed using the following plan: Preliminary Grading Sketch Plan (aerial) prepared by prepared by Cardno (NSW/ACT) Pty Ltd dated august 2015 and identified as drawing number YN210058-SK019 (A) Rev. 07.

5.1 Trees requiring removal or proposed to be removed to facilitate the proposed works

All of the trees with the exception of tree number 110 (*Eucalyptus botryoides* - Bangalay) will be within the areas to be regraded and filled and require removal.

5.2 Trees potentially impacted by the proposed works

Tree number 110 (*Eucalyptus botryoides* - Bangalay) will be in the vicinity of the works and will have a portion of its TPZ increased by proposed filling. Protection measures are identified in the recommendations of this report to minimise potential impacts to this tree and other trees to be retained in the vicinity.

6. CONCUSIONS

6.1 The site

The site is part of the area known as Botany Industrial Park. The area of the site affected by the proposed subdivision is in the vicinity of Corish Circle and Denison Street Banksmeadow.

There appears to have been significant past changes in the majority of the site with extensive industrial development and associated infrastructure. The area of the site where the trees are located comprises landscape areas, access roads and carparking areas.

6.2 The trees

A total of 133 trees have been assessed for this report with the overwhelming majority of the trees being planted Australian species;
The most common species present are:

- *Casuarina glauca* (Swamp Oak) - 52 specimens
- *Casuarina cunninghamiana* (River Oak) - 16 specimens

The following observations were noted regarding the trees:

- The majority of trees are mature specimens (117 trees) with 9 trees being semi mature and 6 over-mature specimens. 1 tree was dead;
- The majority of the trees are in good health (92 trees), with 32 trees being of moderate health and 8 identified to be of poor health;
- The majority of trees were identified as being of medium SULE (57 trees) with a further 29 trees of long SULE (29 trees);
- 33 trees were identified as having a short SULE with a further 13 trees identified

as having a very short SULE (< 5 years);
- 1 tree was dead;

NB: During the site inspections on 28th and 30th July 2015 it was noted that 4 trees previously assessed in 2011 had subsequently been removed (tree numbers 5, 7, 11 and 15). These trees were removed due to identified structural issues.

Using the assessment methodologies referred to in this report the trees have been categorised according to their retention values as follows:

- 6 trees were identified as being of significant or high landscape value and medium to long life expectancy - priorities for retention,
- 6 trees of moderate or moderate to high landscape and medium to long life expectancy - consider for retention;
- 16 of the trees were identified as recommended for removal regardless of any future development proposals for the site due to their health (dead), structural condition and because they are weed species (e.g. Large Leaved Privet); and
- The remaining 51 trees were identified as not being of specific consideration in the design process.

None of the trees assessed for the report are listed individually as a threatened species under the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Tree protection zones are identified in the report for those trees identified as either a priority for retention or for consideration for retention. (Tables 2 and 3)

6.3 Impacts of the proposed works

All of the trees with the exception of tree number 110 (*Eucalyptus botryoides* - Bangalay) will be within the areas subject to material reuse and require removal.

While all of the trees except one will require removal it is noted that only 6 of the 133 trees were identified as being of high landscape significance and 46 of the trees were identified as being of short or very short safe useful life expectancy (and a further tree is dead).

In addition to this it is also noted that 1000 plus trees in this part of the overall site are proposed to be retained and protected in a landscape setback area adjacent to Corish Circle and Denison Street. This equates to around 8 trees being retained for every tree removed. In this context the loss of 6 trees of high landscape significance is seen as being relatively minor. It is also worth noting that the removal of the majority of the trees was considered and assessed as part of a previous industrial subdivision development application, lodged with the City of Botany bay Council. The consent was issued by the Council, permitting the removal of all the 85 trees impacted by the subdivision.

It is considered the retention of the greater majority of trees in this part of the Industrial Park will retain the landscape character of the site when viewed from Denison Street and Corish Circle. There may also be opportunities to achieve replanting within the site when it is subject to future redevelopment.

3. RECOMMENDATIONS

7.1 Tree Protection Zones

It is recommended the tree protection zones identified in tables 2 and 3 be used as the minimum offsets required for protection of trees not subject to removal.

7.4 Generic Tree Protection Measures

The following generic tree protection measures are recommended to assist in minimising potential impacts that may arise during construction phase (including the implementation of landscape works on the site).

A. Measures to be implemented prior to the commencement of any works on the site.

1. Tree to be retained are to be clearly identified by signage as protected trees.

2. The tree protection zones of trees to be retained are to be protected by fencing during the entire construction period except for specific areas directly required to achieve construction works.

3. The tree protection fence shall be constructed of galvanised pipe at 2.4 metre spacing and connected by securely attached chain mesh fencing to a minimum height of 1.8 metres and shall be installed prior to work commencing.

4. The tree protection fencing shall be installed as closely as possible to the alignment of the identified tree protection zone and shall be approved and certified by the site arborist prior to commencement of any construction or demolition works on the site.

B. Measures to be implemented and maintained during the life of construction works on the site.

5. Any excavation within the identified root protection zones of trees to be retained shall be carried out by hand to minimize disturbance to tree roots. Roots greater than 25mm are not to be damaged or severed without prior assessment by an arborist to determine likely level of impact and the restorative actions required to minimise the impacts of root damage.

6. Tree roots between 10mm and 25mm diameter, severed during excavation, shall be cut cleanly by hand by an experienced Arborist/Horticulturist with a minimum qualification of the Horticulture Certificate or Tree Surgery Certificate.

7. The following activities/actions are prohibited from the tree protection zones:

- Soil cut or fill including excavation and trenching
- Soil cultivation, disturbance or compaction
- Stockpiling storage or mixing of materials
- The parking, storing, washing and repairing of tools, equipment and machinery
- The disposal of liquids and refueling
- The disposal of building materials
- The sitting of offices or sheds
- Any action leading to the impact on tree health or structure

8. Canopy pruning of trees identified for protection which is necessary to accommodate approved building works shall be undertaken in accordance with Australian Standard 4373-2007 'Pruning of Amenity Trees'.

Guy Paroissien, MAIH, MIACA, MISA
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11 August 2015

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APPENDIX A: PHOTOGRAPHS

Photograph 1 - Tree # 5 - illustrating the past wounding and evidence of decay (fruiting bodies - *Phellinus sp*.)

Photograph 2 - Tree # 11 - illustrating the evidence of partial, past failure (wind throw) with exposed structural roots and distinct trunk lean

Photograph 3 - Tree # 58 - illustrating the past failure (fracture) of a main leader.

Photograph 4 - Tree # 65 - illustrating the codominant leaders from ground level with evidence of poor attachment at the junction.

Photograph 5 - Tree # 81 - illustrating the past failure of a codominant leader t 2 metres.

Photograph 6 - Illustrating the layout of carparking and landscape areas.

APPENDIX B - TREE DATA SUMMARY - BOTANY INDUSTRIAL PARK - 2015

Tree No.	*Genus, Species (Common Name)*	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	SULE	Landscape Significance	Retention Value*	Comments
1	*Allocasuarina cunninghamiana* (River Oak)	10	8	400	400	480	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the North	Lower limbs pruned to 2 metres in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	
2	*Allocasuarina cunninghamiana* (River Oak)	10	8	110, 250, 330	520	560	Good foliage condition	Mature	Multi trunked	Upright trunk	Majority of canopy to the North	Lower limbs pruned to 1.5 metres in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
3	*Eucalyptus botryoides* (Bangalay)	18	12	440	440	540	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the North	Lower limbs pruned to 3 metres in past	Appears stable	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	High landscape significance	1	The tree displays fair branch attachment with multiple leaders from 1.4 metres with some evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction o leaders is a weak point in the tree with increased risk of failure. Birds nest in upper canopy (Australian Raven).
4	*Acacia binervia* (Coastal Myall)	5	11	Ca 500	500	550	Good foliage condition	Mature	Single trunk	Slight trunk lean to SE	Balanced canopy area	Lower limbs pruned to 3 metres in past	Stability is suspect	Fair branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate to high landscape significance	3	The tree is considered to be structurally suspect - appears to have partially failed in the past with the main leader to the south resting on the ground following past failure.
5	*Eucalyptus species*	17	11	560	560	660	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Stability is suspect	Fair branch attachment	Good health	Fair vigour	5%	Decay in main trunk at 1 and 3 metres (*Phellinus sp*.)	4 (<5 years)	High landscape significance	4	The tree is considered to be structurally suspect - there is extensive wounding in the lower trunk with decay present as evidenced by fruiting bodies (Phellinus sp.) at 1 metre on north side and 3 metres on east side. Urgent testing required if tree is retained to confirm extent of decay and impacts on structural integrity. Birds nest in upper canopy (Australian Raven).
6	*Eucalyptus botryoides* (Bangalay)	14	6 x 10	360	360	440	Fair foliage condition	Mature	Single trunk	Slight trunk lean to NE	Majority of canopy to the East	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density and low levels of dieback.
7	*Eucalyptus botryoides* (Bangalay)	12	6 x 8	370	370	420	Fair foliage condition	Mature	Single trunk	Slight trunk lean to NE	All of canopy to the NE	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density, moderate levels of dieback and epicormic growth on the trunk.
8	*Eucalyptus species*	17	8	410	410	560	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	1 Long (> 40 years)	High landscape significance	1	
9	*Eucalyptus species*	14	5	300	300	380	Fair foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 3.5 metres in past	Appears stable	Fair branch attachment	Moderate health	Poor vigour	20%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	Structural roots exposed adjacent to trunk. At the time of inspection the tree was of moderate health and fair vigour as evidenced by moderate to high levels of dieback and epicormic growth.
10	*Eucalyptus botryoides* (Bangalay)	11	6	360	360	460	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 2.5 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate to high landscape significance	2	Structural roots exposed adjacent to trunk.
11	*Eucalyptus botryoides* (Bangalay)	15	10 x 12	480	480	570	Good foliage condition	Mature	Single trunk	Distinct trunk lean to NE	Majority of canopy to the NE	No evidence of significant past pruning	Stability is suspect	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	High landscape significance	3	The tree is considered to be structurally suspect - there is evidence the tree has partially failed in the past to the NE (wind throw) with a distinct trunk lean to the NE and lifted, exposed structure roots to the SW. A large diameter codominant leader has failed in the past at 3 metres on the SW with exposed heartwood susceptible to future decay infection.
12	*Eucalyptus botryoides* (Bangalay)	12	6	360	360	380	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the North	No evidence of significant past pruning	Displays signs of instability	Fair branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	Reaction wood (swelling) in lower trunk possibly indicative of internal decay - further investigation recommended if tree is retained. At the time of inspection the tree was of fair vigour as evidenced by low levels of dieback and high levels of epicormic growth.
13	*Eucalyptus botryoides* (Bangalay)	12	4	300	300	320	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy on an NE x SW axis	No evidence of significant past pruning	Appears stable	Fair branch attachment	Poor health	Poor vigour	25%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	At the time of inspection the tree was of poor health and vigour as evidenced by reduced foliage density and high levels of dieback.

Tree No.	*Genus, Species (Common Name)*	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	SULE	Landscape Significance	Retention Value*	Comments
14	*Eucalyptus species* (Gum)	18	10	540	540	630	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the North	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	High landscape significance	1	The tree exhibits fair branch attachment with evidence of past branch failure (e.g. At 4 metres on SE)
15	*Eucalyptus species* (Gum)	10	6	340	340	380	Fair foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Poor branch attachment	Moderate health	Poor vigour	20%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low to moderate landscape significance	3	At the time of inspection the tree was of moderate health and poor vigour as evidenced by high levels of dieback. Large diameter dead wood present and requires management.
16	*Casuarina glauca* (Swamp Oak)	10	3	250	250	340	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
17	*Casuarina glauca* (Swamp Oak)	10	2 x 3	200	200	280	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy on an NE x SW axis	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
18	*Eucalyptus robusta* (Swamp Mahogany)	12	6	270	270	330	Poor foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limb pruned at ground	Appears stable	Poor branch attachment	Poor health	Poor vigour	45%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	At the time of inspection the tree was of poor health and vigour as evidenced by significant levels of dieback. Large diameter dead wood requires management.
19	*Casuarina glauca* (Swamp Oak)	8	3	210	210	300	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
20	*Allocasuarina cunninghamiana* (River Oak)	12	7 x 9	180, 320	380	460	Fair foliage condition	Mature	Twin trunked	Upright trunk	Majority of canopy on an NW x SE axis	No evidence of significant past pruning	Appears stable	Fair branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	At the time of inspection the tree was of moderate health and fair vigour as evidenced by reduced foliage density and moderate levels of dieback.
21	*Leptospermum laevigatum* (Coast Tea Tree)	5	3	200	200	220	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to East	Majority of canopy to the South	Lower limb pruned at 0.6 metres in past	Appears stable	Sound branch attachment	Moderate health	Fair vigour	5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	The tree's past canopy development has been significantly suppressed.
22	*Allocasuarina cunninghamiana* (River Oak)	8	2	180	180	250	Poor foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Poor health	Poor vigour	10%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	At the time of inspection the tree was of poor health and vigour as evidenced by significantly reduced foliage density, high levels of dieback and epicormic growth.
23	*Allocasuarina cunninghamiana* (River Oak)	8	4	110, 160, 210	480	370	Fair foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Moderate health	Poor vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low to moderate landscape significance	3	At the time of inspection the tree was of moderate health and poor vigour as evidenced by reduced foliage density and low to moderate levels of dieback.
24	*Allocasuarina cunninghamiana* (River Oak)	9	2 x 3	200	200	290	Fair foliage condition	Mature	Single trunk	Upright trunk	All of canopy to the North	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	At the time of inspection the tree was of moderate health and fair vigour as evidenced by moderate to high levels of dieback.
25	*Allocasuarina cunninghamiana* (River Oak)	9	8	330	330	460	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	15%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
26	*Allocasuarina cunninghamiana* (River Oak)	10	9	370	370	480	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.7 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
27	*Allocasuarina cunninghamiana* (River Oak)	10	6	290	290	350	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
28	*Corymbia gummifera* (Red Bloodwood)	10	8	90, 190, 230	390	360	Good foliage condition	Mature	Multi trunked	Distinct trunk lean to NW	All of canopy to the NW	Lower limbs pruned to 2.5 metres in past	Appears stable	Fair branch attachment	Moderate health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been significantly suppressed. The tree exhibits fair branch attachment with multiple leaders and some evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction is a weak point in the tree with increased risk of failure.
29	*Allocasuarina cunninghamiana* (River Oak)	13	6 x 8	290, 320	460	520	Good foliage condition	Mature	Twin trunked	Slight trunk lean to North	Majority of canopy to the North	Lower limbs pruned to 3 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate to high landscape significance	2	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
30	*Allocasuarina cunninghamiana* (River Oak)	8	2	230	230	270	Poor foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the North	No evidence of significant past pruning	Appears stable	Sound branch attachment	Poor health	Poor vigour	15%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	The tree's past canopy development has been suppressed. At the time of inspection the tree was of poor health and vigour as evidenced by significantly reduced foliage density and moderate to high levels of dieback.
31	*Allocasuarina cunninghamiana* (River Oak)	10	7	320	320	410	Fair foliage condition	Mature	Single trunk	Upright trunk	All of canopy to the North	Lower limbs pruned to 3 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of fair vigour as evidenced by low to moderate levels of dieback.

Tree No.	Genus, Species (Common Name)	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	SULE	Landscape Significance	Retention Value*	Comments
32	*Allocasuarina cunninghamiana* (River Oak)	14	12	230 + 470	350	670	Good foliage condition	Mature	Twin trunked	Slight trunk lean to NE	All of canopy to the NE	Lower limbs pruned to 3 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of fair vigour as evidenced by low to moderate levels of dieback.
33	*Allocasuarina cunninghamiana* (River Oak)	8.5	7	400	400	490	Fair foliage condition	Mature	Single trunk	Slight trunk lean to NE	Majority of canopy to the NE	Lower limbs pruned to 2.5 metres in past	Appears stable	Sound branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of moderate health and fair vigour as evidenced by moderate to high levels of dieback.
34	*Leptospermum laevigatum* (Coast Tea Tree)	6.5	3 x 4	330	330	380	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to SE	All of canopy to the South	Lower limbs pruned to 2.5 metres in past including large diameter branches	Appears stable	Sound branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback.
35	*Casuarina glauca* (Swamp Oak)	9	4 x 8	190, 200	300	330	Fair foliage condition	Mature	Twin trunked	Slight trunk lean to South	All of canopy to the South	No evidence of significant past pruning	Appears stable	Fair branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low to moderate landscape significance	3	The tree's past canopy development has been significantly suppressed. The tree exhibits fair branch attachment with codominant leaders from 0.8 metres with evidence of poor attachment at the junction - the junction of leaders is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of moderate health and fair vigour as evidenced by reduced foliage density and moderate levels of dieback.
36	*Corymbia gummifera* (Red Bloodwood)	8	4 x 7	230	230	340	Poor foliage condition	Mature	Single trunk	Slight trunk lean to North	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Poor vigour	30%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	At the time of inspection the tree was of moderate health and poor vigour as evidenced by very high levels of dieback and epicormic growth.
37	*Allocasuarina cunninghamiana* (River Oak)	8	2 x 4	200	200	290	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to North	Majority of canopy on an North x South axis	Lower limbs pruned to 1 metre in past	Appears stable	Sound branch attachment	Moderate health	Poor vigour	15%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	At the time of inspection the tree was of moderate health and poor vigour as evidenced by reduced foliage density and high levels of dieback.
38	*Allocasuarina cunninghamiana* (River Oak)	8	1.5 x 3	160	160	240	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy on an NE x SW axis	Lower limbs pruned to 1.6 metres in past	Appears stable	Sound branch attachment	Moderate health	Poor vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	At the time of inspection the tree was of moderate health and poor vigour as evidenced by reduced foliage density and high levels of dieback.
39	*Casuarina glauca* (Swamp Oak)	8	5	270	270	310	Good foliage condition	Mature	Single trunk	Distinct trunk lean to North	All of canopy to the North	Lower limbs pruned to 3 metres on North in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been significantly suppressed.
40	*Casuarina glauca* (Swamp Oak)	12	6	290	290	320	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the North	Lower limbs pruned to 2.5 metres in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	
41	*Casuarina glauca* (Swamp Oak)	9	4	270	270	340	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the NW	Lower limbs pruned to 2 metres in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	The tree's past canopy development has been suppressed.
42	*Eucalyptus botryoides* (Bangalay)	9	4	210	210	290	Good foliage condition	Semi Mature	Single trunk	Slight trunk lean to West	All of canopy to the West	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	The tree's past canopy development has been significantly suppressed.
43	*Eucalyptus botryoides* (Bangalay)	21	15	580	580	650	Good foliage condition	Mature	Single trunk	Slight trunk lean to NE	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	1 Long (> 40 years)	High landscape significance	1	Moderate sized dead wood requires management.
44	*Lophostemon confertus* (Brush Box)	9	4	230	230	280	Good foliage condition	Semi Mature	Single trunk	Slight trunk lean to South	Balanced canopy area	Lower limbs pruned at ground	Appears stable	Sound branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	At the time of inspection the tree was of fair vigour as evidenced by moderate levels of dieback. Past tissue damage at 1 metre on the north side.
45	*Casuarina glauca* (Swamp Oak)	14	9	450 at 1 metre	450	540	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.5 metres in past	Appears stable	Poor to fair branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate to high landscape significance	2	The tree exhibits fair to poor branch attachment with codominant leaders from 1.4 metres with evidence of poor attachment at the junction - the junction of leaders is a weak point in the tree with increased risk of failure.
46	*Casuarina glauca* (Swamp Oak)	12	5	300	300	360	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to North	Majority of canopy to the North	Lower limbs pruned to 3 metres on North in past	Appears stable	Fair branch attachment	Good health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been suppressed. At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density and moderate levels of dieback.

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47	*Casuarina glauca* (Swamp Oak)	14	5	250	250	320	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to North	Majority of canopy to the north	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been suppressed.
48	*Casuarina glauca* (Swamp Oak)	12	5	Up to 210	340	340	Good foliage condition	Mature	Multi trunked	Upright trunk	Majority of canopy to the NE	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been suppressed.
49	*Casuarina glauca* (Swamp Oak)	13	4	260	260	320	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
50	*Casuarina glauca* (Swamp Oak)	11	4	200	200	270	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
51	*Casuarina glauca* (Swamp Oak)	12	4	210	210	300	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the SW	Lower limbs pruned to 1 metre in past	Appears stable	Sound branch attachment	Good health	Fair vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
52	*Angophora bakeri* (Narrow-leaved Apple)	10	3	170	170	190	Good foliage condition	Semi Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Poor branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low to moderate landscape significance	3	The tree exhibits poor branch attachment with 3 codominant leaders from 4 metres with evidence of poor attachment at the junction - the junction of leaders is a weak point in the tree with increased risk of failure.
53	*Angophora bakeri* (Narrow-leaved Apple)	9	4	200	200	210	Good foliage condition	Semi Mature	Single trunk	Slight trunk lean to West	Majority of canopy to the West	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	The tree's past canopy development has been slightly suppressed.
54	*Casuarina glauca* (Swamp Oak)	10	2	150	150	200	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of fair vigour and exhibited reduced foliage density.
55	*Casuarina glauca* (Swamp Oak)	17	8	310	310	390	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	
56	*Pinus radiata* (Monterey Pine)	9	4	210, 280, 300	600	530	Poor foliage condition	Over Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 4 metres, 2 x Central leader removed at 1 metre in past	Appears stable	Fair branch attachment	Poor health	Poor vigour	40%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	At the time of inspection the tree was of poor health and vigour and exhibited reduced foliage density and very high levels of dieback. Originally 3 main leaders with 2 removed in past.
57	*Angophora bakeri* (Narrow-leaved Apple)	6	3	160	160	190	Good foliage condition	Semi Mature	Single trunk	Slight trunk lean to North	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Low to moderate landscape significance	3	
58	*Acacia binervia* (Coastal Myall)	10	7	260	260	320	Fair foliage condition	Over Mature	Single trunk	Upright trunk	Majority of canopy on an NE x SW axis	No evidence of significant pruning	Appears stable	Poor branch attachment	Moderate health	Poor vigour	15%	No evidence of significant pest nor disease	4 (<5 years)	Moderate landscape significance	4	The tree exhibits poor branch attachment with one of the 2 remaining live leaders partially broken in the past and resting on the ground for support. At the time of inspection the tree was of moderate health and poor vigour as evidenced by high levels of dieback.
59	*Pinus radiata* (Monterey Pine)	10	5	400	400	450	Fair foliage condition	Mature	Single trunk	Slight trunk lean to West	Balanced canopy area	Lower limbs pruned to 5 metres in past	Appears stable	Sound branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	At the time of inspection the tree was of moderate health and fair vigour as evidenced by moderate to high levels of dieback.
60	*Pinus radiata* (Monterey Pine)	9	2 x 4	330	330	370	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the West	Lower limbs pruned to 2 metres in past	Appears stable	Sound branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low to moderate landscape significance	3	At the time of inspection the tree was of moderate health and fair vigour as evidenced by moderate to high levels of dieback.
61	*Pinus radiata* (Monterey Pine)	8	4 x 6	290	290	370	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the West	Lower limbs pruned to 3 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
62	*Acacia binervia* (Coastal Myall)	12	6	320	320	410	Poor foliage condition	Over Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 5 metres in past	Appears stable	Sound branch attachment	Poor health	Poor vigour	25%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	At the time of inspection the tree was of poor health and poor vigour as evidenced by significantly reduced foliage density and very high levels of dieback.
63	*Pinus radiata* (Monterey Pine)	13	8	420, 460	660	580	Fair foliage condition	Mature	Twin trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 3 metres in past	Appears stable	Poor branch attachment	Good health	Fair vigour	15%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate to high landscape significance	3	The tree exhibits fair to poor branch attachment with codominant leaders from 1.2 metres with evidence of poor attachment at the junction - the junction of leaders is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density and moderate levels of dieback.

Tree No.	Genus, Species (Common Name)	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	SULE	Landscape Significance	Retention Value*	Comments
64	*Pinus radiata* (Monterey Pine)	9	8	420 at 1 metre	470	470	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to NW	All of canopy to the NW	Lower limbs pruned to 2.5 metres in past	Appears stable	Sound branch attachment	Moderate health	Poor vigour	30%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of moderate health and poor vigour as evidenced by high levels of dieback.
65	*Acacia binervia* (Coastal Myall)	8	6	230, 280	390	420	Fair foliage condition	Over Mature	Twin trunked	Distinct trunk lean to West	All of canopy to the West	Lower limbs pruned to 3 metres in past	Appears stable	Poor branch attachment	Moderate health	Poor vigour	30%	No evidence of significant pest nor disease	4 (<5 years)	Low to moderate landscape significance	4	The tree exhibits poor branch attachment with codominant leaders from near ground level with evidence of poor attachment and partial past failure at the junction - the junction of leaders is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of moderate health and poor vigour as evidenced by reduced foliage density and high levels of dieback.
66	*Acacia binervia* (Coastal Myall)	9	9	390	390	440	Poor foliage condition	Over Mature	Single trunk	Upright trunk	Majority of canopy to the North	Lower limbs pruned to 4 metres in past	Appears stable	Poor branch attachment	Poor health	Poor vigour	85%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	The tree exhibits poor branch attachment with evidence of past failure of a codominant leader at the junction at 1.7 metres. At the time of inspection the tree was of poor health and poor vigour as evidenced by very high levels of dieback.
67	*Eucalyptus robusta* (Swamp Mahogany)	11	6	230, 250	360	420	Poor foliage condition	Mature	Twin trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Moderate health	Poor vigour	20%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	The tree exhibits fair branch attachment with codominant leaders from 0.6 metres with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of moderate health and poor vigour as evidenced by significantly reduced foliage density and high levels of dieback.
68	*Acacia binervia* (Coastal Myall)	8	4	220	220	250	Poor foliage condition	Over Mature	Single trunk	Distinct trunk lean to SW	All of canopy to the SW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Poor health	Poor vigour	20%	No evidence of significant pest nor disease	4 (<5 years)	Low landscape significance	4	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of poor health and poor vigour as evidenced by significantly reduced foliage size and density and moderate to high levels of dieback.
69	*Acacia binervia* (Coastal Myall)	8	2	240	240	300		Dead													4	
70	*Acacia binervia* (Coastal Myall)	7.5	4	250	250	290	Fair foliage condition	Mature	Single trunk	Slight trunk lean to West	Majority of canopy to the SW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Poor vigour	30%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	The tree's past canopy development has been significantly suppressed. At the time of inspection the tree was of moderate health and poor vigour as evidenced by reduced foliage size and density and moderate to high levels of dieback.
71	*Casuarina glauca* (Swamp Oak)	12	5	280	280	370	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 3 metres	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	
72	*Ficus hillii* (Hill's Weeping Fig)	9	12	Up to 260	460	460	Good foliage condition	Semi Mature	Multi trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	The tree exhibits fair branch attachment with multiple codominant leaders from near ground level with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure.
73	*Schinus areira* (Peppercorn Tree)	7	11	Up to 300	600	600	Fair foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of moderate health and fair vigour as evidenced by reduced foliage density and low levels of dieback.
74	*Agonis flexuosa* (Willow Myrtle)	3.5	6	Up to 180	340	340	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Low landscape significance	3	
75	*Ficus hillii* (Hill's Weeping Fig)	9	14	Up to 220	380	380	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Poor branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate to high landscape significance	2	The tree exhibits fair branch attachment with codominant leaders from near ground level with evidence of poor attachment at the junction - the junction of leaders is a weak point in the tree with increased risk of failure. Exposed structural roots adjacent to basal trunk - appears to be the result of rabbit burrowing activity.

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76	*Melaleuca quinquenervia* (Broad Leaved Paperbark)	8	6	180, 200, 200	440	420	Fair foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.3 metres in past	Appears stable	Fair branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree exhibits fair branch attachment with multiple codominant leaders with some evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of fair vigour as evidenced by reduced foliage density and low levels of dieback.
77	*Acacia saligna* (Golden Wreath Wattle)	7	9	320	320	430	Good foliage condition	Mature	Single trunk	Slight trunk lean to North	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Environmental pest species	4	Short lived species, environmental pest species.
78	*Lophostemon confertus* (Brush Box)	9	8	Up to 310	570	570	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 3 metres for vehicle access on East in past	Appears stable	Poor branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate to high landscape significance	2	The tree exhibits fair branch attachment with multiple codominant leaders from 0.7 metres with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure. Appears to be rabbit warren under tree's root plate.
79	*Eucalyptus robusta* (Swamp Mahogany)	5	6	230	230	310	Good foliage condition	Mature	Single trunk	Distinct trunk lean to South	All of canopy to the SW	Lower limbs pruned to 1.2 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	The tree's past canopy development has been significantly suppressed.
80	*Lophostemon confertus* (Brush Box)	10	10	Up to 270	520	520	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 2 metres in past	Appears stable	Poor branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate to high landscape significance	2	The tree exhibits fair branch attachment with multiple codominant leaders from 0.6 metres with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure.
81	*Casuarina glauca* (Swamp Oak)	13	8	460	460	540	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Poor branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate to high landscape significance	3	Large diameter codominant leader has failed in the past at 2 metres on west side - exposed heartwood at failed junction susceptible to future decay infection.
82	*Casuarina glauca* (Swamp Oak)	13	7	310	310	390	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the North	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	The tree's past canopy development has been suppressed. Branch tear at 4 metres on east side as a result of failure of codominant leader in tree number 81.
83	*Lophostemon confertus* (Brush Box)	10	6	140, 170, 220	400	400	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.6 metres in past	Appears stable	Poor branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree exhibits fair branch attachment with multiple codominant leaders from near ground level with evidence of poor attachment at the junction - while not considered at immediate risk of failure the junction of leaders is a weak point in the tree with increased risk of failure.
84	*Melia azedarach* (White Cedar)	10	8	240	240	270	Deciduous - None	Mature	Single trunk	Distinct trunk lean to North	Majority of canopy to the North	Lower limbs pruned to 3 metres on North in past	Appears stable	Sound branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
85	*Casuarina glauca* (Swamp Oak)	11	5	190	190	270	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the NE	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	Low levels of faciation in lower foliage	1 Long (> 40 years)	Moderate landscape significance	2	Low levels of faciation in lower foliage.
86	*Populus nigra 'Italica'* (Lombardy Poplar)	9	2	260	260	330	Deciduous - None	Mature	Single trunk	Slight trunk lean to North	Majority of canopy to the north	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Poor vigour	15%	Poplar Rust present	3 Short (5 to 15 years)	Low landscape significance	3	At the time of inspection the tree was of moderate health and poor vigour and exhibited moderate to high levels of dieback.
87	*Populus nigra 'Italica'* (Lombardy Poplar)	7	2	Up to 110 (210 above root flare)	210	210	Deciduous - None	Semi Mature	Multi trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	Poplar Rust present	2 Medium (15 to 40 years)	Low landscape significance	3	
88	*Eucalyptus botryoides* (Bangalay)	16	6	320	320	360	Fair foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Fair vigour	5 to 10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree displays fair branch attachment with evidence of past branch failures. Low levels of dieback at time of inspection.
89	*Eucalyptus botryoides* (Bangalay)	9	8	260	260	330	Good foliage condition	Semi Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 2 metres in past	Appears stable	Fair branch attachment	Good health	Good vigour	5%	Moderate levels of Psyllid damage to foliage	1 Long (> 40 years)	Moderate landscape significance	2	The tree displays fair branch attachment with evidence of a past branch failure at 5 metres.
90	*Populus nigra 'Italica'* (Lombardy Poplar)	10	8	400	400	540	Fair foliage condition	Mature	Single trunk	Slight trunk lean to NW	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree's past canopy development has been suppressed. Low to moderate dieback at time of inspection.

Tree No.	*Genus, Species (Common Name)*	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	SULE	Landscape Significance	Retention Value*	Comments
91	*Acacia saligna* (Golden Wreath Wattle)	6	8	Up to 260 (ca. 620 above root flare)	620	620	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.8 metres in past	Appears stable	Poor branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Environmental pest species	4	The tree displays poor branch attachment with multiple leaders form ground level with evidence of poor attachment and past failure of a main junction at ground level (large slit in junction).
92	*Casuarina glauca* (Swamp Oak)	9	4	220	220	240	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the west	Lower limbs pruned to 1.8 metres in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
93	*Casuarina glauca* (Swamp Oak)	9	3	170	170	230	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the east	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
94	*Casuarina glauca* (Swamp Oak)	8	3	210	210	240	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
95	*Casuarina glauca* (Swamp Oak)	10	3 x 4	210, 200	310	410	Good foliage condition	Mature	Twin trunked	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree displays fair branch attachment with codominant leaders from 0.8 metres - not considered at risk of failure in the short term.
96	*Leptospermum laevigatum* (Coast Tea Tree)	7	6	300	300	320	Good foliage condition	Mature	Single trunk	Distinct trunk lean to the SW	All canopy to the SW	No evidence of significant past pruning	Appears stable	Poor branch attachment	Good health	Fair vigour	10 to 15%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	The tree's past canopy development has been significantly suppressed. The tree displays poor branch attachment with evidence of a large diameter branch failure at 1.6 metres on the NW side. Moderate levels of dieback at time of inspection.
97	*Casuarina glauca* (Swamp Oak)	8	2	160	160	210	Fair foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low to moderate landscape significance	3	
98	*Casuarina glauca* (Swamp Oak)	6	2 x 3	140	140	210	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the west	Lower limbs pruned to 1.5 metres in past	Appears stable	Sound branch attachment	Good health	Fair vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	
99	*Eucalyptus robusta* (Swamp Mahogany)	12	8	220, 230, 340	595	420	Fair foliage condition	Mature	Multi trunked	Slight trunk lean to west	Majority of canopy to the west	Lower limbs pruned to 1.2 metres in past	Appears stable	Sound branch attachment	Moderate health	Poor vigour	15 to 20%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate to high landscape significance	3	At the time of inspection the tree was of moderate health and poor vigour and exhibited high levels of dieback and epicormic growth.
100	*Melaleuca armillaris* (Bracelet Honey Myrtle)	6	5	190	190	210	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to the north	Majority of canopy to the north	No evidence of significant past pruning	Stability is suspect	Sound branch attachment	Moderate health	Fair vigour	20%	No evidence of significant pest nor disease	4 (< 5 years)	Low landscape significance	4	The tree is considered to be unstable - it has failed in the pasty and is leaning against, and supported by, T98. Moderate dieback at the time of inspection.
101	*Casuarina glauca* (Swamp Oak)	8	2	140	140	180	Good foliage condition	Mature		Slight trunk lean to west	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	
102	*Casuarina glauca* (Swamp Oak)	12	4	230	230	310	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
103	*Casuarina glauca* (Swamp Oak)	5	2 x 3	140	140	180	Good foliage condition	Mature	Single trunk	Slight trunk lean to SW	Majority of canopy to the SW	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	The tree displays fair branch attachment with codominant leaders from 2.5 metres - not considered at risk of failure in the short term.
104	*Casuarina glauca* (Swamp Oak)	5	2	120	120	140	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Fair vigour	15%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	At the time of inspection the tree was of moderate health and fair vigour and exhibited reduced foliage density and moderate levels of dieback.
105	*Casuarina glauca* (Swamp Oak)	14	4	250	250	290	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the SW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	At the time of inspection the tree was of fair vigour and exhibited reduced foliage density.
106	*Casuarina glauca* (Swamp Oak)	8	3	170	170	190	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
107	*Casuarina glauca* (Swamp Oak)	5	2	90	90	120	Good foliage condition	Semi Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	
108	*Casuarina glauca* (Swamp Oak)	8	5	240	240	290	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the west	Lower limbs pruned to 3.5 metres in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	

Tree No.	*Genus, Species* (*Common Name*)	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	SULE	Landscape Significance	Retention Value*	Comments
109	*Callistemon salignus* (White Bottlebrush, Willow Bottlebrush)	5.5	4	Up to 140 (240 above root flare)	240	240	Good foliage condition	Mature	Multi trunked	Upright trunk	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low to moderate landscape significance	3	The tree displays fair branch attachment with multiple leaders from near ground level - not considered at risk of failure in the short term.
110	*Eucalyptus botryoides* (Bangalay)	19	11	430	430	560	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	High landscape significance	1	At the time of inspection the tree was of fair vigour and exhibited low levels of dieback and epicormic growth. Large diameter exposed roots to west. Located adjacent to proposed works and may be impacted.
111	*Casuarina glauca* (Swamp Oak)	9	4.5	220	220	270	Good foliage condition	Mature	Single trunk	Slight trunk lean to west	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
112	*Casuarina glauca* (Swamp Oak)	9	4	210	210	270	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	
113	*Casuarina glauca* (Swamp Oak)	8	6	260	260	290	Good foliage condition	Mature	Single trunk	Slight trunk lean to NW	Majority of canopy to the NW	Lower limbs pruned to 2 metres in past	Appears stable	Fair branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate landscape significance	2	The tree displays fair branch attachment with codominant leaders from 2 metres - not considered at risk of failure in the short term.
114	*Casuarina glauca* (Swamp Oak)	14	6	170, 240	310	410	Fair foliage condition	Mature	Twin trunked	Slight trunk lean to west	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Fair branch attachment	Moderate health	Fair vigour	10%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	The tree displays fair branch attachment with codominant leaders from 0.3 metres - not considered at risk of failure in the short term. At the time of inspection the tree was of moderate health and fair vigour and exhibited reduced foliage density and moderate levels of dieback.
115	*Casuarina glauca* (Swamp Oak)	13	4 x 5	150, 170	240	270	Fair foliage condition	Mature	Twin trunked	Upright trunk	Majority of canopy to the SW	No evidence of significant past pruning	Appears stable	Fair branch attachment	Moderate health	Fair vigour	5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Moderate landscape significance	3	The tree displays fair branch attachment with codominant leaders from 0.3 metres - not considered at risk of failure in the short term. At the time of inspection the tree was of moderate health and fair vigour and exhibited reduced foliage density and moderate levels of dieback.
116	*Casuarina glauca* (Swamp Oak)	8	3	160	160	240	Fair foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low to moderate landscape significance	3	
117	*Casuarina glauca* (Swamp Oak)	6	3	Up to 90 (240 above root flare)	240	240	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Removed to ground level in past	Appears stable	Poor branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low to moderate landscape significance	3	The tree displays poor branch attachment with multiple leaders from ground level following severe past pruning (cut to ground level in past).
118	*Casuarina glauca* (Swamp Oak)	14	5	320	320	420	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	
119	*Casuarina glauca* (Swamp Oak)	12	5	270	270	320	Good foliage condition	Mature	Single trunk	Slight trunk lean to NW	Majority of canopy to the NW	No evidence of significant past pruning	Appears stable	Poor branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree displays poor branch attachment with evidence of recent past branch failures.
120	*Casuarina glauca* (Swamp Oak)	5	2	110	110	140	Fair foliage condition	Mature	Single trunk	Slight trunk lean to west	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Moderate health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	
121	*Casuarina glauca* (Swamp Oak)	3	3	160	160	190	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Poor branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	3 Short (5 to 15 years)	Low landscape significance	3	The tree displays poor branch attachment with multiple regrowth following past failure of the main leader at 1.7 metres (broken off).
122	*Callistemon salignus* (White Bottlebrush, Willow Bottlebrush)	4	3	Up to 140 (240 above root flare)	240	240	Fair foliage condition	Mature	Multi trunked	Upright trunk	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Fair branch attachment	Good health	Fair vigour	5 to 10%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	At the time of inspection the tree was of fair vigour and exhibited low to moderate levels of dieback.
123	*Casuarina glauca* (Swamp Oak)	14	6	320	320	420	Good foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	
124	*Casuarina glauca* (Swamp Oak)	11	3	160	160	210	Good foliage condition	Mature	Single trunk	Slight trunk lean to SW	Majority of canopy to the SW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Low to moderate landscape significance	3	

Tree No.	*Genus, Species (Common Name)*	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	SULE	Landscape Significance	Retention Value*	Comments
125	*Callistemon salignus* (White Bottlebrush, Willow Bottlebrush)	5	4	Up to 110 (210 above root flare)	210	210	Good foliage condition	Mature	Multi trunked	Upright trunk	Majority of canopy to the SW	No evidence of significant past pruning	Appears stable	Fair to poor branch attachment	Good health	Good vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	
126	*Casuarina glauca* (Swamp Oak)	18	11	470	470	540	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	1 Long (> 40 years)	High landscape significance	1	
127	*Casuarina glauca* (Swamp Oak)	11	6	360	360	410	Good foliage condition	Mature	Single trunk	Slight trunk lean to SW	Majority of canopy to the SW	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate to high landscape significance	2	
128	*Melaleuca quinquenervia* (Broad Leaved Paperbark)	5	4	Up to 180 (220 x 340 above root flare)	280	280	Fair foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.6 metres in past	Appears stable	Fair to poor branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low to moderate landscape significance	3	
129	*Melaleuca quinquenervia* (Broad Leaved Paperbark)	6	6	Up to 210 (460 above root flare)	460	460	Fair foliage condition	Mature	Multi trunked	Slight trunk lean to south	Majority of canopy to the south	Lower limbs pruned to 1.2 metres in past	Appears stable	Fair to poor branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low to moderate landscape significance	3	
130	*Melaleuca quinquenervia* (Broad Leaved Paperbark)	4	3	Up to 90 (240 above root flare)	240	240	Fair foliage condition	Mature	Multi trunked	Slight trunk lean to SE	Majority of canopy to the SE	No evidence of significant pruning	Appears stable	Fair branch attachment	Moderate health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Low landscape significance	3	The tree's past canopy development has been significantly suppressed.
131	*Casuarina glauca* (Swamp Oak)	9	9	390	390	480	Good foliage condition	Mature	Single trunk	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.7 metres in past	Appears stable	Sound branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	1 Long (> 40 years)	Moderate to high landscape significance	2	
132	*Casuarina glauca* (Swamp Oak)	5	3	Up to130 (130 and 210 above root flare)	250	250	Fair foliage condition	Mature	Multi trunked	Upright trunk	Majority of canopy to the west	No evidence of significant past pruning	Appears stable	Sound branch attachment	Good health	Fair vigour	5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
133	*Casuarina glauca* (Swamp Oak)	8	7	Up to280 (460 x 760 above root flare)	610	610	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned to 1.6 metres in past	Appears stable	Fair to poor branch attachment	Good health	Good vigour	<5%	No evidence of significant pest nor disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	
ca = approximate diameter at breast height (DBH) estimated from nearest property boundary or fence where trees were located on adjoining properties																						
* Retention Values: 1 - High (Priority for retention); 2 - Moderate (Consider for retention); 3 - Low or short Sule (Not warranting specific design consideration) and 4 - Remove (very short SULE, structurally unsound, weed species etc.)																						

APPENDIX C: SULE CATEGORIES

SULE CATEGORIES AND SUB-CATEGORIES

	1	2	3	4	5
	Long SULE:	**Medium SULE:**	**Short SULE:**	**Remove:**	**Small, Young or regularly clipped:**
	Trees that appeared to be retainable at the time of assessment for more than 40 years with and acceptable level of risk	Trees that appeared to be retainable at the time of assessment for 15 to 40 years with and acceptable level of risk	Trees that appeared to be retainable at the time of assessment for 5 to 15 years with and acceptable level of risk	Trees that should be removed within the next 5 years	Trees that can be reliably transplanted or replaced
A	Structurally sound trees located in positions that can accommodate future growth	Trees that may only live for between 15 and 40 more years	Trees that may only live for between 5 and 15 more years	Dead, dying, supressed or declining trees through disease or inhospitable conditions	Small trees less than 5 metres in height
B	Trees that could be made suitable for retention in the long term by remedial Care	Trees that may live for more than 40 years, but would need to be removed for safety or nuisance reasons	Trees that may live for more than 15 years, but would need to be removed for safety or nuisance reasons	Dangerous trees through instability or recent losss of adjacent trees	Young trees less than 15 years old but over 5 metres in height
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention	Trees that may live for more than 40 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	Trees that may live for more than 15 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form	Trees that have been regularly pruned to arteficially control growth
D		Trees that could be made suitable for retention in the medium term by remedial Care	Trees that require substantial remedial care and are only suitable for retention in the short term	Damaged trees that are clearly not safe to retain	
E				Trees that may live for more than 5 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	
F				Trees that may cause damage to existing structures within 5 years	
G				Trees that will become dangerous after removal of other trees for reasons given in 1A-1F	

Ref: Barrell, Jeremy (1996)
Pre-development Tree Assessment
Proceedings of the International Conference on Trees and Building Sites (Chicago)
International Society of arboriculture, Illinois, USA

APPENDIX D: IACA RATING SYSTEM FOR TREE SIGNIFICANCE

Rating System for Tree Significance

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating tree significance becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site.

Once the landscape significance of an individual tree has been defined, the retention value can then be determined.

The terms used in the Assessment Criteria and Tree Retention Value - Priority Matrix, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

Tree Significance - Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of significant age;
- The tree is listed as a Heritage Item, Threatened Species or part an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The growing environment supports the tree to its full dimensions above and below ground without conflict or constraint.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the area,
- The tree is moderately constrained by above or below ground influences of the built environment to reach full dimensions.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree is severely constrained by above or below ground influences of the built or natural environment and therefore will not reach full dimensions - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

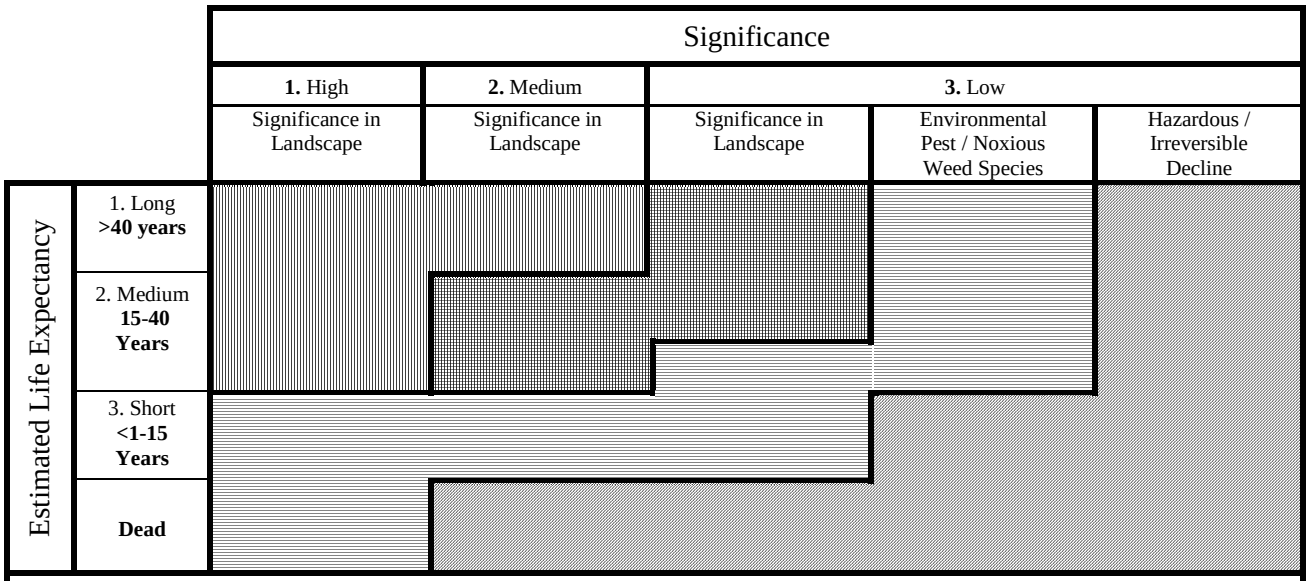
Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however it can be applied to a monocultural stand in its entirety e.g. hedge.

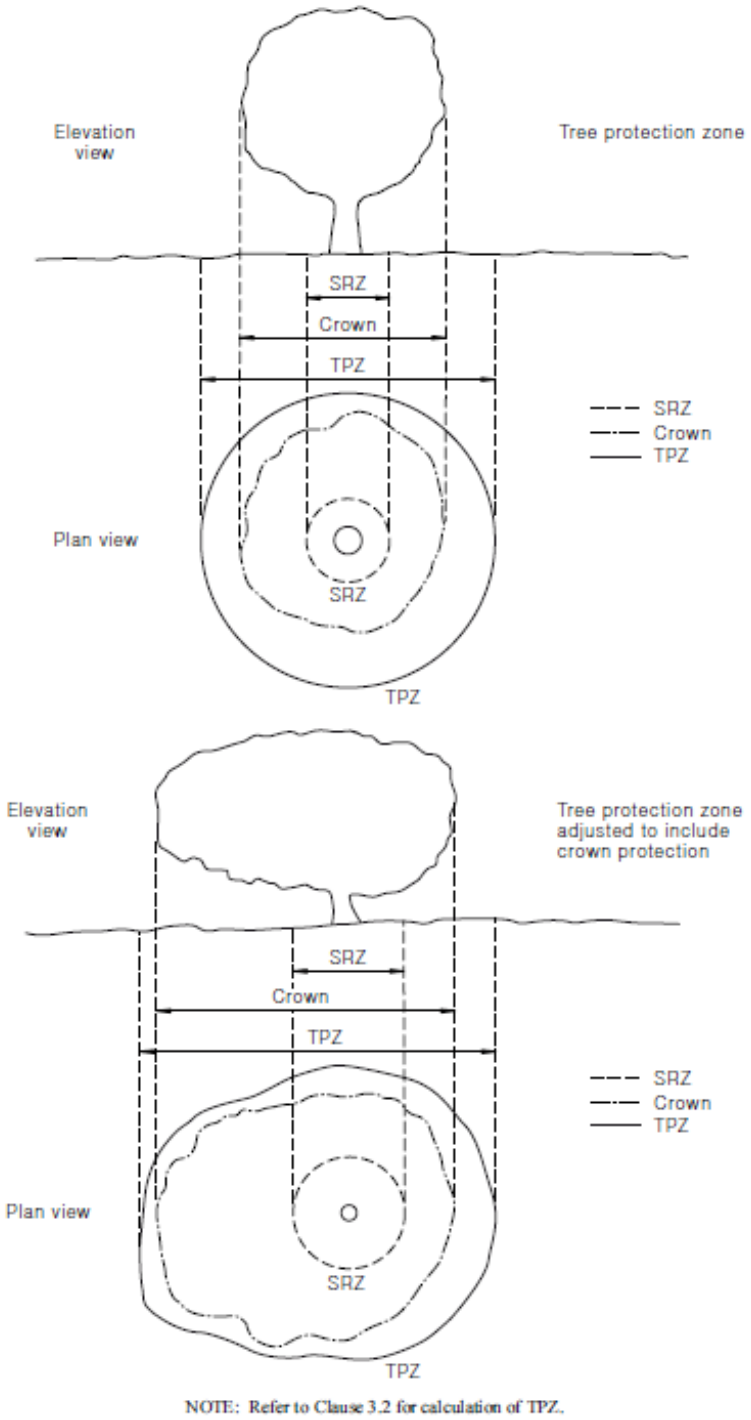
Table 1.0 Tree Retention Value - Priority Matrix.



Legend for Matrix Assessment

	Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc. if works are to proceed within the Tree Protection Zone.
	Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for Removal (Low) – These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal – These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

APPENDIX E: TREE PROTECTION ZONE ILLUSTRATION AS PER AS4970-2009

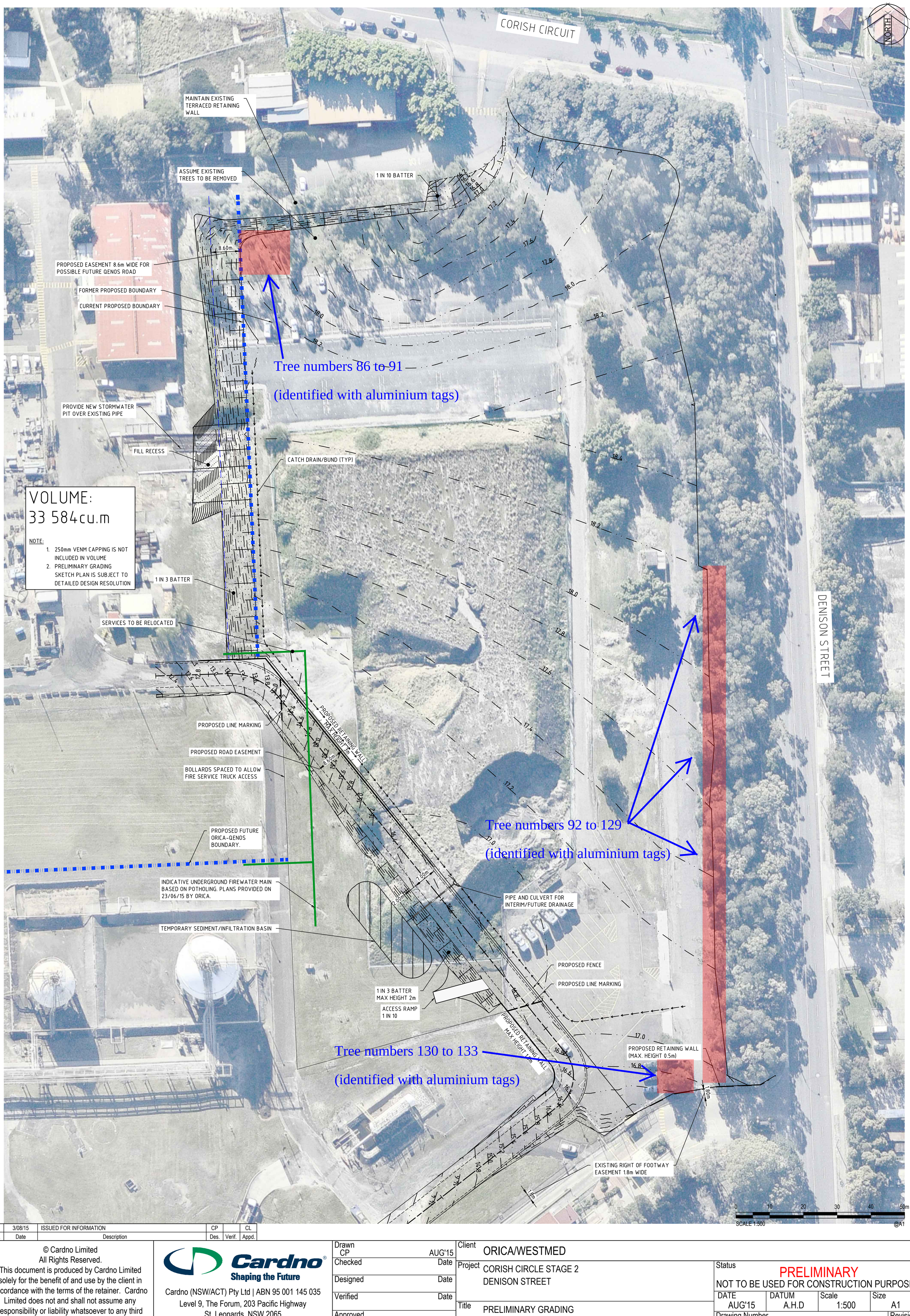


NOTE: Refer to Clause 3.2 for calculation of TPZ.

FIGURE 2 INDICATIVE TREE PROTECTION ZONE

Source: Australian Standards (2009)

DATE PLOTTED: 3 August 2015 3:36 PM BY : CARMELA PELAEZ



Rev.	Date	Description	Des.	Verif.	Appd.
07	3/08/15	ISSUED FOR INFORMATION	CP		CL

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Drawn	CP	AUG'15
Checked		Date
Designed		Date
Verified		Date
Approved		

Client: ORICA/WESTMED

Project: CORISH CIRCLE STAGE 2
DENISON STREET

Title: PRELIMINARY GRADING
SKETCH PLAN (AERIAL)

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DATE	DATUM	Scale	Size
AUG'15	A.H.D	1:500	A1

Drawing Number: YN210058-SK019 (A)

Revision: 07

XREFs: X-SITEWORKS; X-CONT-DESN-500; X-SURVEY (150612); X-SERVICES; X-CONT-EXST-500
CAD File: \\AUSYDCFS02\CID-Data\210058 - Orica Denison Street Subdivision\Drawings\Civil\Sketches\YN210058-SK019-Rev7.dwg

Rev	DATE	REVISIONS	Drn	Chk

DRAWN: G.MURRAY
CHECKED: T.BARTLETT
DATUM: N/A
ORIGIN OF LEVELS: PM 29559
CONTOUR INTERVAL: N/A
SCALE: 1:500
A2

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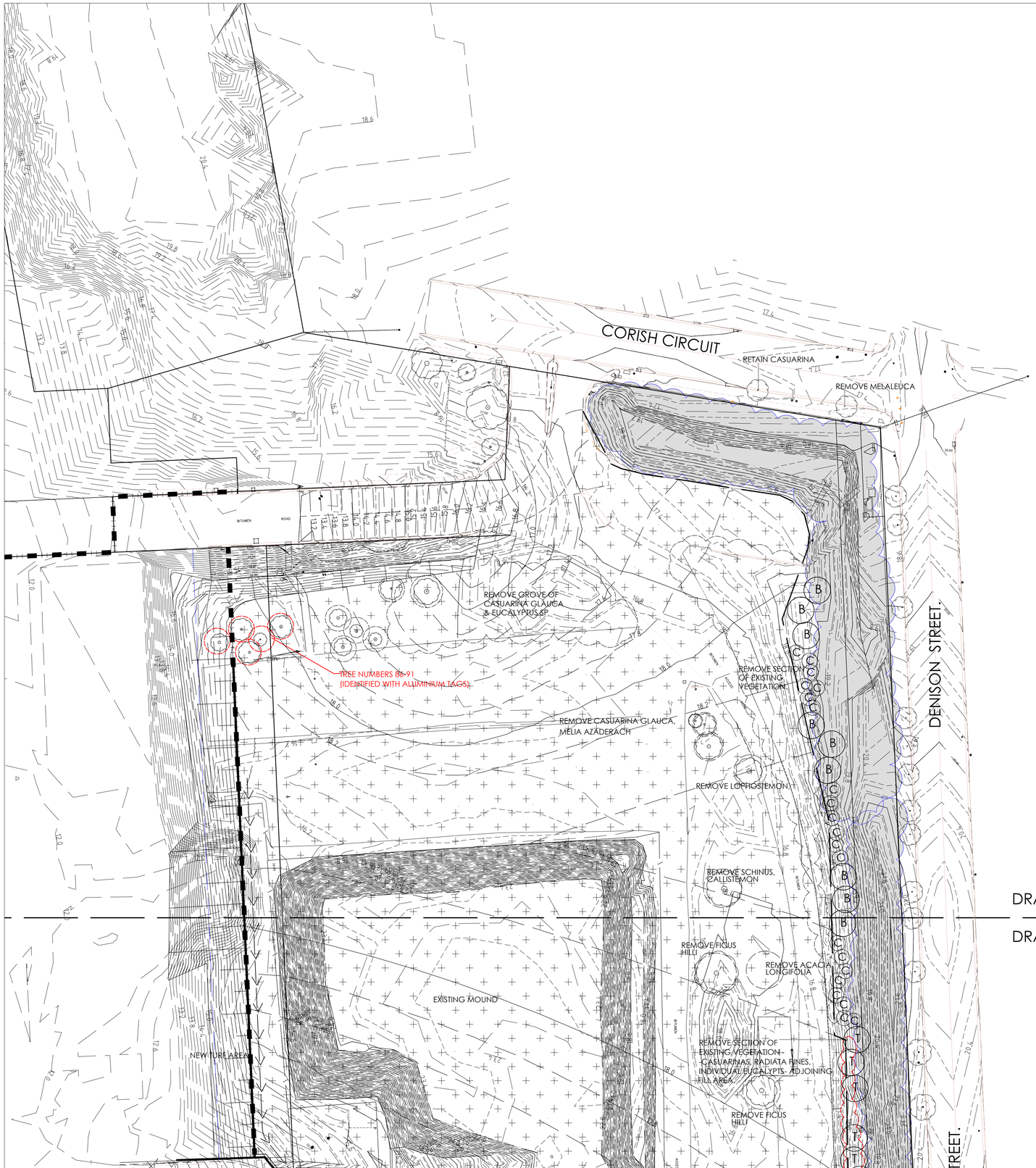
ORICA
DETAIL SURVEY
BOTANY INDUSTRIAL PARK
DENISON STREET, MATRAVILLE
L.G.A. BOTANY BAY CITY

DATE: 4-8-2011
DRAWING No: 210058CD-01
Rev: A

Annexure B

Tree removal figures (Jocelyn Ramsey and Associates, 2015).



PLANT SCHEDULE.

NAME	KEY	QTY	SIZE
ALLOCASUARINA GLAUCA	C	13	150 dia pot
EUCALYPTUS BOTRYOIDES	B	8	"

LEGEND

EXISTING CONTOURS
PROPOSED CONTOURS
REFER TO ENGINEER'S DRAWINGS FOR FULL DETAILS.

EXISTING TREES/ GROUPS OF TREES REMOVED APPROVED IN ORIGINAL APPLICATION DA/486/2010.

EXISTING TREES/ GROUPS OF TREES REMOVED ADDITIONAL TO ORIGINAL APPLICATION. REFER TO ARBORICULTURAL IMPACT REPORT DATED 11.08.15: PREPARED BY LANDSCAPE MATRIX.

EXTENT OF FILL

EXISTING TREES TO BE RETAINED & PROTECTED.

ISSUE	AMENDMENTS	DATE
C	APPROVAL, REVISED SCHEME	29.09.15
B	APPROVAL, REVISED SCHEME	27.07.15
A	APPROVAL	12.03.15

CLIENT.
ORICA.

PROJECT.
CARPARK NO 3.
WASTE ENCAPSULATION PROJECT.

DATE.
JULY 2015
DWG. NO.
15-007/L02

SCALE
1:500 @ A1
NO. IN SET
3

DRAWING.
LANDSCAPE PLAN

JOCELYN RAMSAY & ASSOC. PTY. LTD
A.B.N. 38 087 566 999
LANDSCAPE ARCHITECTS.
SUITE K 680 PACIFIC HWY.,
KILLARA NSW 2071.
ph. 02 9499 4220
fax. 02 9499 4221
email:jrla@bigpond.net.au

PLANT SCHEDULE.

NAME	KEY	QTY	SIZE
ALLOCASUARINA GLAUCA	C	24	150 dia pot
EUCALYPTUS BOTRYOIDES	B	5	"
EUCALYPTUS TERETICORNIS	T	16	"

LEGEND

EXISTING CONTOURS
PROPOSED CONTOURS
REFER TO ENGINEER'S DRAWINGS FOR FULL DETAILS.

EXISTING TREES/ GROUPS OF TREES REMOVED

EXISTING TREES/ GROUPS OF TREES REMOVED ADDITIONAL TO ORIGINAL APPLICATION. REFER TO ARBORICULTURAL IMPACT REPORT DATED 11.08.15: PREPARED BY LANDSCAPE MATRIX.

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