

## Arboricultural Assessment

Site Address: 88, 130 and 132 Upper Ōrewa Road and 53A,  
53B and 55 Russell Road, Orewa

Prepared for: Vineway Ltd

Purpose of Report: Arboricultural Assessment of Proposed  
Vineway Fast Track Act – Residential Housing  
Proposal – Revised Design

Report Compiled by:		Signed:
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## 1.0 Introduction and Summary of the Proposal

### 1.1 Project Description

Peers Brown Miller Ltd has been commissioned by *VINEWAY LTD* to provide an arboricultural assessment of the proposed master-planned residential development in Wainui (Upper Ōrewa), Delmore (the Project). The application is to be prepared and processed under the fast-track approvals act (2024).

The project involves the subdivision of just over 109ha in 6 contiguous lots (88, 130 and 132 Upper Ōrewa Road and 53A, 53B and 55 Russell Road) and construction of a master-planned urban, residential development of approximately 1213 new lots. The sites are currently utilised for rural uses, with the area occupied by a lifestyle property and stock grazing land, with a number of fenced off vegetated gully areas.



Figure 1 – View of central Project area, taken from Russell Road



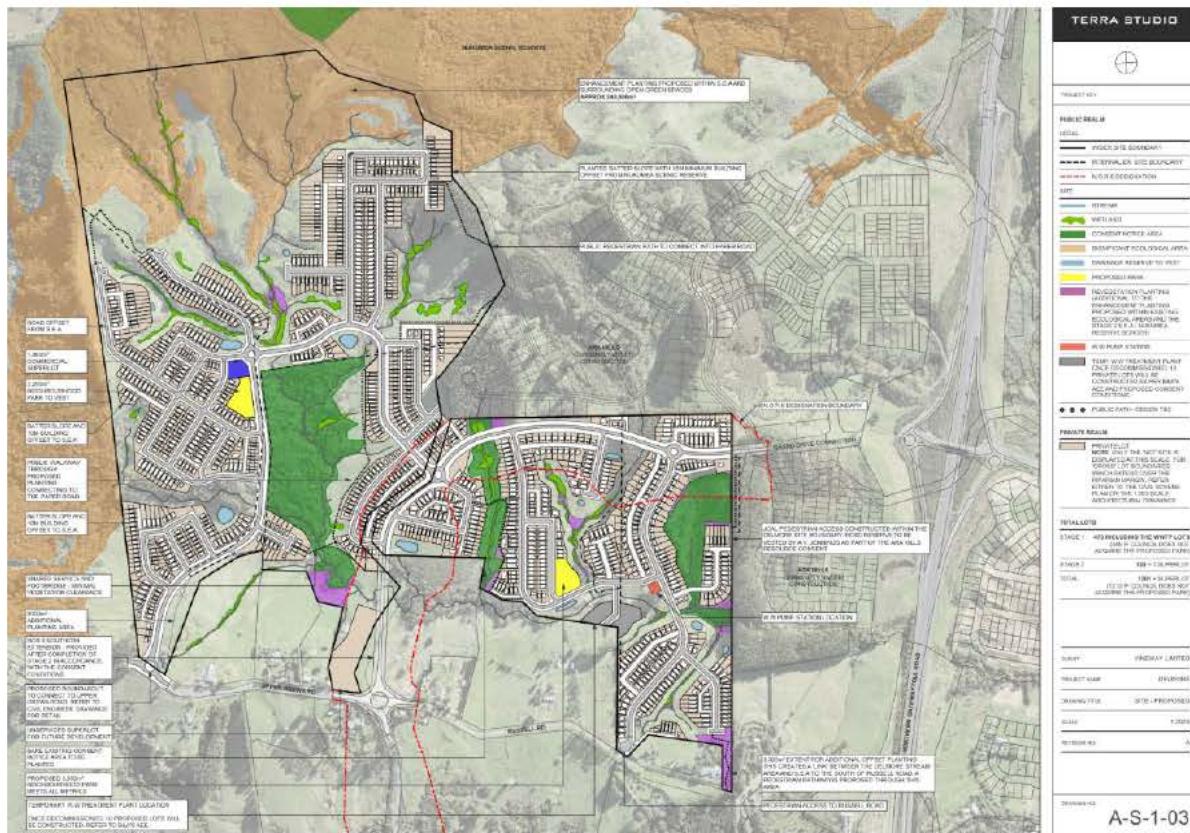
**Figure 2 – Estimated project area, taken from Auckland Council GIS**

## 1.2 General Comments regarding Existing Trees and Vegetation

In general terms, the trees and vegetation within the project area are typical of a rural or semi-rural setting. The more significant vegetation within the project area includes:

- Areas of regenerating indigenous vegetation within the existing gully systems and adjacent to existing stream networks
- Planted farm variety trees in various locations, dominated by Monterey Pine (*Pinus radiata*) and Poplar (*Populus sp.*)
- Isolated trees in planted surrounds, dominated by Puriri (*Vitex lucens*) and Poplar (*Populus sp.*)
- Gully sections dominated by pest plants, predominately gorse (*Ulex europaeus*) and Woolly Nightshade (*Solanum mauritianum*)
- An area of predominately planted indigenous vegetation and a row of Monterey Pine (*Pinus radiata*) growing on the neighbouring property to the southeast (Area 4)
- Planted vegetation adjacent to the existing residential dwelling (Area 5)

The Areas, Trees, and Groups of trees identified within the project area and then discussed in this report as set out in Section 6 and Appendix A. There are twenty-one (21) Areas in total, four (4) Trees in total, and three (3) Groups of trees in total. The Areas, Trees, and Groups of trees addressed in this report have been delineated for the purposes of arboricultural assessment and are different to the Area and Tree delineations used in the ecological report prepared by Viridis Ltd. However, they have been discussed with Viridis Ltd to ensure the assessment of the values of each area are complementary.



## Figure 2 – Concept Scheme Plan

## 2.0 Scope of the Report

The purpose of this report is to identify trees and areas of vegetation affected by the Project, to assess potential arboricultural effects on those areas, and to make recommendations for managing those effects.

Arboricultural effects include the removal of protected trees and vegetation, along with the effects of those trees or vegetated areas where physical works are proposed both within the Protected Root Zone (PRZ) or beneath the canopy of trees, coupled with an assessment of upstream or downstream arboricultural effects where relevant.

In providing this analysis I refer to 'protected trees and vegetation' to describe trees or areas that are subject to legal protection by consent notice, identified as Significant Ecological Area – Terrestrial (SEA-T) in the Auckland Unitary Plan (AUP), or trees/areas captured by the rules in the AUP.

As part of this assessment the following methodology is adopted:

- 2.1 To provide a schedule of trees or areas of vegetation within the boundaries of the project area that are likely to be impacted by the overall Project works, commenting on their general condition.
- 2.2 Review the schedules of the AUP to identify any existing notable trees.
- 2.3 Identify trees and vegetation that are protected via Chapter E15. of the AUP

### 3.0 Relevant Statutory Framework - Tree Protection

There are no Notable trees listed in Schedule 10 of the AUP within the project area.

Areas 1,2, 5, 7, 8, 10, 11, 17, 19, 21, 22, 27 (12 areas) and Trees 3, 4, 12, 13, 14, 15, 16 (7 trees) are adjacent to either permanent or intermittent streams. As such, those rules pertaining to riparian vegetation outlined within Chapter E15. Of the AUP would be relevant when considering future works within those particular areas. Areas 21, 22 and 25 (3 areas) are also subject to an SEA-T overlay and as such are subject to the relevant provisions outlined in Section E15. pertaining to such overlays.

The relevant rules and provisions pertaining to trees and vegetation within Chapter E15. are as follows:

**Table E15.4.1 Activity Table (All riparian areas)**

Rule	Description	Activity Status
(A1)	Biosecurity tree works	P
(A2)	Deadwood Removal	P
(A6)	Pest Plant Removal	P
(A7)	Conservation Planting	P
(A16)	Vegetation alteration or removal within 20m of rural streams, other than those in Rural – Rural Production Zone and Rural – Mixed Rural Zone	
(A18)	Vegetation alteration or removal within 20m of a natural wetland, in the bed of a river or stream (permanent or intermittent), or lake	RD
(A23)	Permitted activities in Table E15.4.1 that do not comply with one or more of the standards in E15.6	RD

**Table E15.4.2 Activity Table (SEAs)**

Rule	Description	Activity Status
(A36)	Pest Plant Removal	P
(A37)	Conservation Planting	P
(A41)	Tree Trimming (in accordance with Standard 15.6.9)	P
(A43)	Any vegetation alteration or removal not otherwise provided for	D

Areas 1, 2, 9, 10, 11, 17 are also subject to consent notices affording these areas additional protections.

## 4.0 Plan References

A number of plans have been produced by the Project team. The most relevant information pertinent to this assessment includes the Clearance Plans, Earthworks Plans and Masterplan and the AUP GIS information. The most relevant plan sets are referenced below:

- Mckenzie & Co – Delmore Stage 1, 2AB, 2CBD – Clearance Plans – 3725 -1, 2AB,2CBD -22000 - 2105
- Mckenzie & Co – Delmore Stage 1, 2AB, 2CBD – Earthworks Plans – 3725 –2A - 2CBD 2000 - 2105
- Delmore Masterplan – Prepared by Terra Studio – A-S1-1-03 – Revision A
- Aerial Location Plans – Prepared by Peers Brown Miller Ltd

The locations of the defined trees/grouping of trees are illustrated on the Aerial Location Plans referenced above. Relevant plans are included at the end of this report as Appendix A.

## 5.0 Trees and Vegetation within the Project Area

As outlined in Section 1.2, the trees and vegetation within the project area are largely typical of a rural or semi-rural area, with existing stands of both established and more recently planted indigenous vegetation observed. The protected vegetation within the project area is discussed in this section, with a general overview of vegetation within the project area provided in the table within Appendix A of this assessment.

### 5.1 Protected trees or vegetation within the project area.

### 5.1.1 Area 1 & 2

Area 1 is identified as an area of mixed exotic and indigenous vegetation growing in a small gully system on the northeast side of the project area (within 55 Russell Road).

The area is dominated by re-generating indigenous species such as Manuka (*Leptospermum scoparium*), Kanuka (*Kunzea ericoides*) and Totara (*Podocarpus totara*), with a mixture of understorey species including Mahoe (*Melicytus ramiflorus*) and Putaputawētā (*Carpodetus serratus*).

Exotic species are also growing on the edge of these areas, with pest plant species such as Gorse (*Ulex europaeus*) and Willow (*Salix sp.*) present.

An existing culvert and farm crossing currently travels between Areas 1 & 2 from east to west, with a new road and associated infrastructure proposed to service new residential lots to the northeast. Vegetation removal is proposed to facilitate the 9.41 metre footprint of the new bridge/culvert, as well as the removal of an existing culvert, with new planting proposed to enhance Areas 1 & 2 to mitigate the loss of vegetation within the road access/ earthworks footprint. An estimated 250m<sup>2</sup> of vegetation is to be removed for the new road connection.

Further recommendations are provided in Sections 8.0 and within the Draft Tree Management Plan (Draft TMP) in terms of addressing any works within the RPZ of retained vegetation or to address wider arboricultural fringe effects.

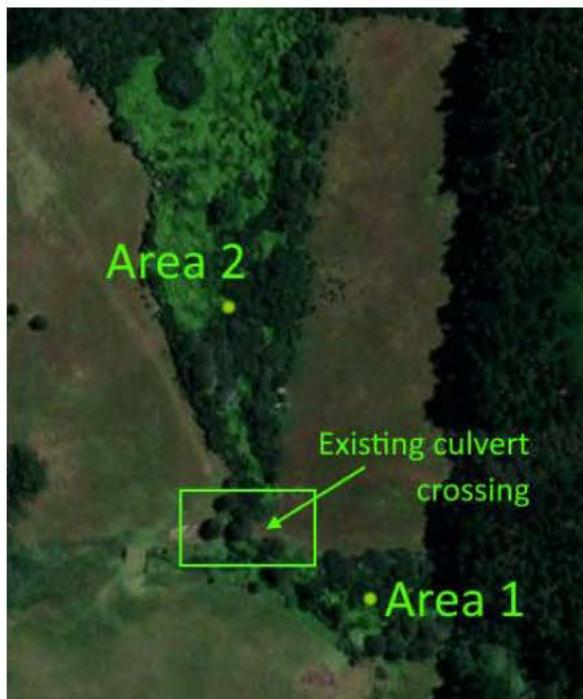


Figure 4 – Aerial image showing Areas 1 & 2



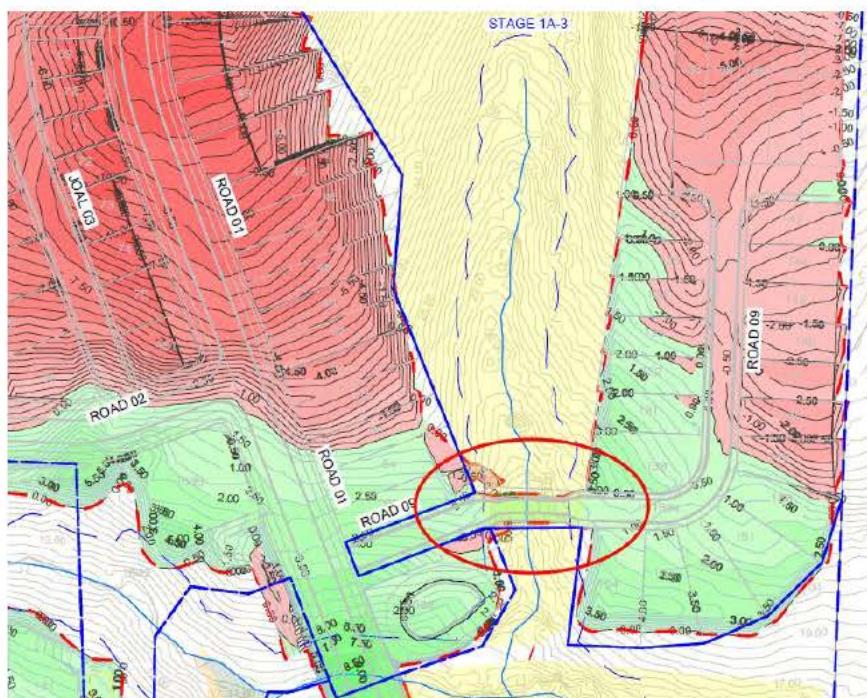
Figure 5 – Snip of proposed bridge/culvert crossing clearance (approximately 250m2)



Figure 6 – Two areas of clearance marked on Council GIS



**Figure 7 – Existing culvert crossing (Area 2)**



**Figure 8 – Snip of earthworks plan showing proposed crossing point**

### 5.1.2 Group 3 & Tree 4

Group 3 is identified as a stand of exotic vegetation, dominated by large Gum trees (*Eucalyptus sp.*), with Tree 4 a Monterey Cypress. It is anticipated that these trees are removed. The trees stand on an embankment to the north of the adjacent stream, with some trees within 20m of the existing stream and some beyond the 10m setback. Those trees within the 20m setback are subject to Rule E15.4.1 (A19).

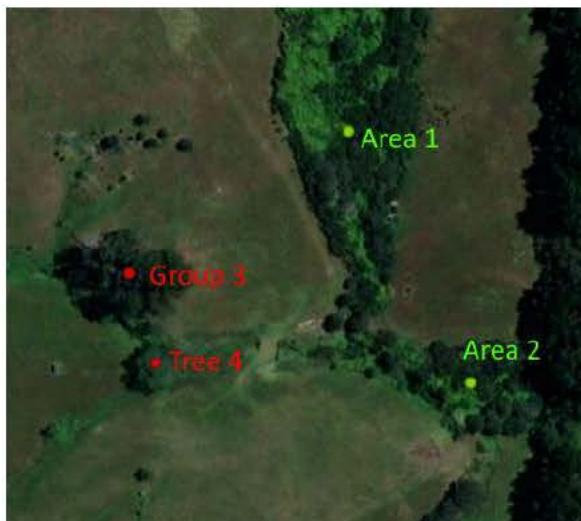


Figure 9 – Aerial showing Group 3 & Tree 4

### 5.1.3 Areas 6 – 8

Areas 6 – 8 are identified as vegetation growing adjacent to the stream network running north to south to the northwest of Group 3. The area is currently partially fenced, with minimal enhancement planning undertaken, with the remaining vegetation dominated by Willow and other exotic species. These areas are subject to Chapter E15. of the AUP and will be enhanced with new plantings. These areas are to be retained and subject to additional planting as part of the Project (see landscape plan prepared by Greenwood Associates). While retained vegetation in this area is minimal, all works within the PRZ of such vegetation should be undertaken in accordance with the recommended measures outlined in the Draft TMP.

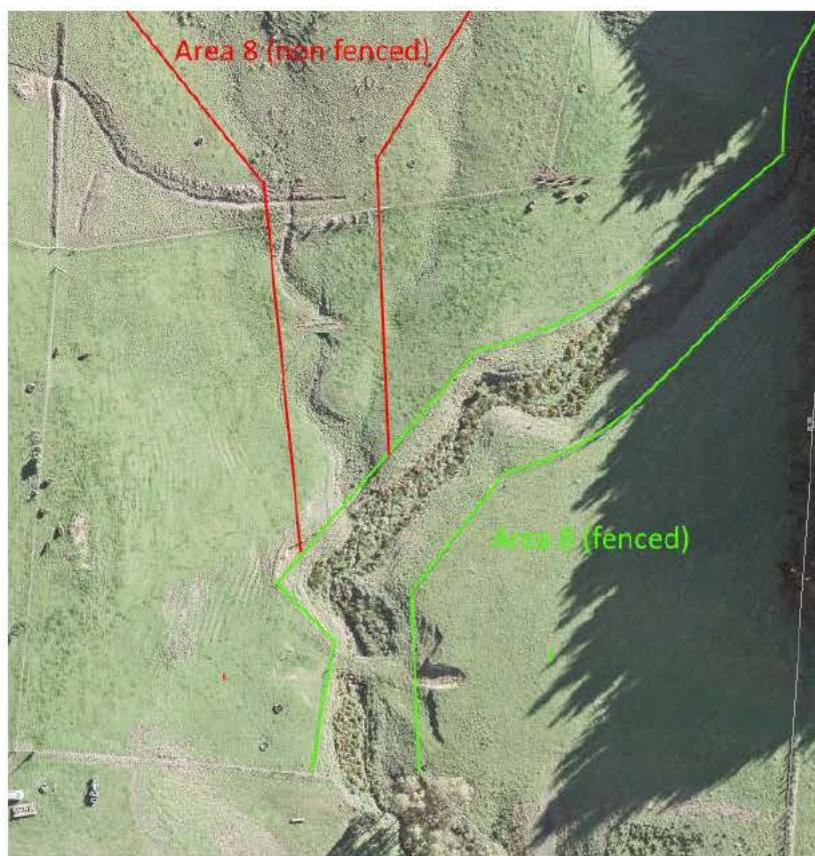


Figure 10 – Image showing fenced and non-fenced portions of Area 8



Figure 11 – View of Area 8 (fenced portion). Area 8a can be seen in the distance to the northeast.

### 5.1.4 Area 8a

Area 8a was previously identified as a large Monterey Pine block with an understorey of both pest plants and emerging pioneer indigenous species. It is understood that Monterey Pine trees in this area have since been removed.



Figure 12 – Stream area within Area 8a

### 5.1.4 Area 9 (3 Russell Road)

Area 9 is identified as an area of bush subject to consent notice growing on the neighbouring property. This bush area is predominantly indigenous, dominated by Totara and Manuka. This area is largely retained under this proposal.

A small portion of vegetation within this area (on the neighbouring property) will require removal to enable the construction of the new NOR 6 road layout, and facilitate the proposed lot layout at the boundary interface, which includes a stormwater pond and north-south facing dwelling lots. It is recommended that an earthworks setback (from the edge of the consent notice boundary) of at least 3.0m is applied where works are required adjacent to the northern boundary of this neighbouring bush area. This recommendation is due to the extent of cut/fill earthworks, coupled with the proposed road stub proposed as part of the NOR 6 alignment, a setback will enable the installation of erosion and sediment control measures to be suitably distanced from the PRZ of this vegetation, to minimise negative arboricultural effects relating to ground level changes and overland flow alterations. Vegetation removal is to be limited as much as practicable, with further protection measures and specific methodologies to be included as part of the TMP where necessary. It is

considered that adequate mitigation for the small area of vegetation that is removed will be provided through the extensive replanting within the wider site.



**Figure 13 – View of Area 9 located on the adjoining property (3 Russell Road)**



**Figure 14 – View of Area 9 showing existing ground contours**

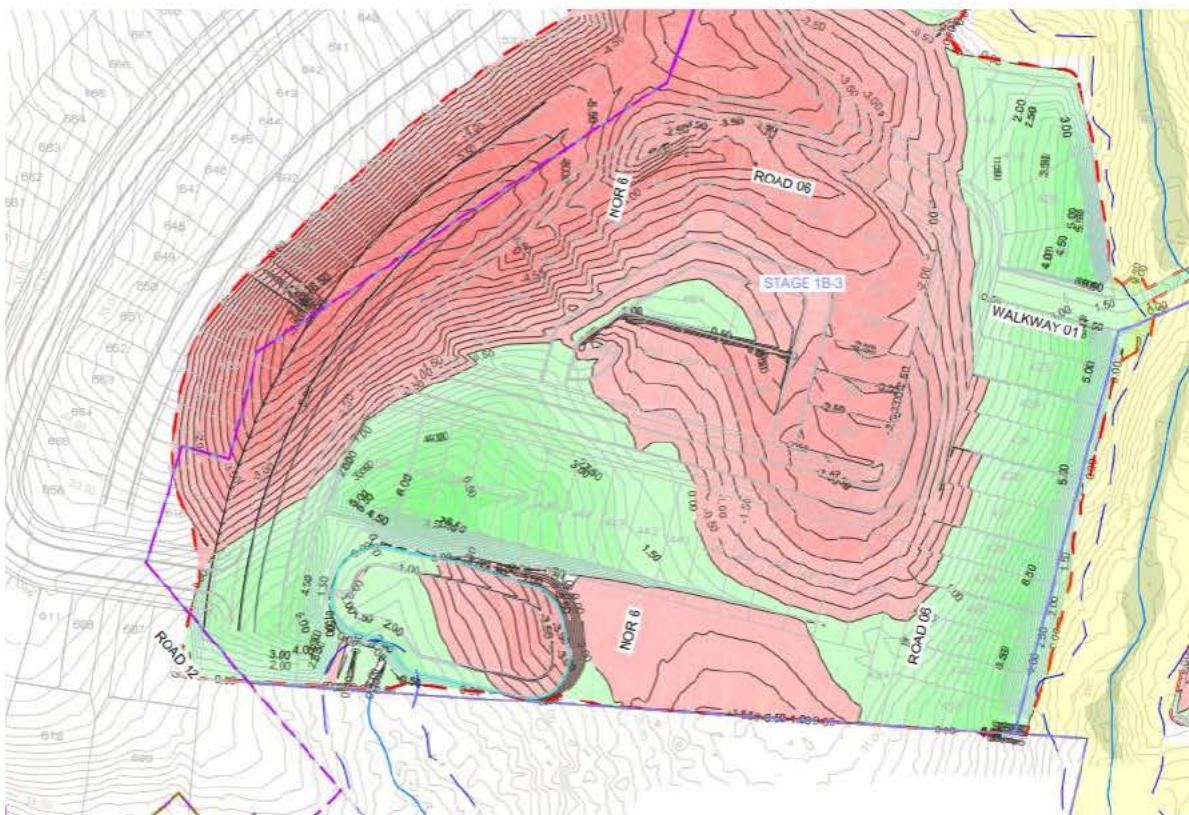


Figure 16 – Earthworks Plan showing proposed cut/fill works adjacent to Area 9

### 5.1.5 Area 10 & 11

Areas 10 & 11 is a formerly degraded stream catchment that travels north to south within 53B Russell Road. The stream has been fenced and re-planted with typical regeneration plant species such as Manuka, Kanuka, Harakeke (*Phormium tenax*), Ti Kouka (*Cordyline australis*) and other indigenous wetland species.

This area is to be largely retained and protected as part of the Project, with an area of vegetation clearance required as part of the creation of the NOR 6 road. The vegetation to be removed stands within Area 11, approximately 21.52m south of the northern boundary with 47 Ara Hills Drive, being adjacent to Area 19a.

The vegetation within this location is dominated by Manuka, Tī Kouka and Karamū (*Coprosma robusta*), having been likely planted within the last 10 years. Approximately 1292m<sup>2</sup> of vegetation is proposed for removal as part of the NOR 6 works. The remaining vegetation within these areas is to be retained and protected, with tree protection measures provided as part of the TMP. Further recommendations are also provided in Section 6.0.



**Figure 17 – Anticipated clearance extent through Area 11 as part of the NOR 6 works**



**Figure 18 – Aerial view of approximate clearance extent for NOR 6 works (Calculations via Auckland Council GIS Maps)**

## NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.
2. REFER TO DRAWING 2100 FOR LEGEND.
3. FINAL EARTHWORKS LEVELS TO BE CONFIRMED DURING DETAILED DESIGN, AND MAY BE AMENDED DURING CONSTRUCTION TO ALLOW FOR UNFORESEEN SITE CONDITIONS. EARTHWORKS TOLERANCE TO BE +/- 200mm

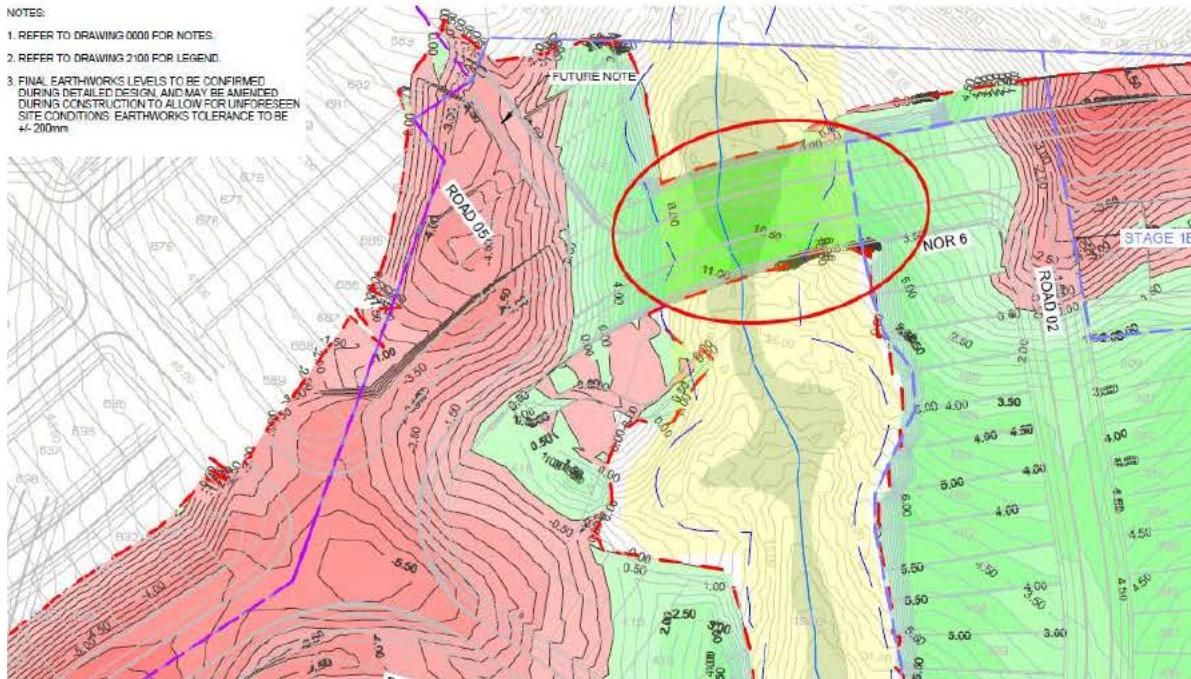


Figure 19 – Snip taken from Earthworks Plan showing NOR 6 road section crossing Area 11



**Figure 20 – Aerial showing Areas 6 – 11**

### 5.1.7 Trees 12- 16

Trees 12 - 16 are located adjacent to the existing stream to the south of the proposed earthworks area. The trees will not be effected as part of the Project layout and as such are proposed for retention.



Figure 21 – Image showing locations of Trees/Groups 12 - 16

### 5.1.8 Area 17

Area 17 is identified as a regenerating indigenous bush area, dominated by Totara, Manuka, Kanuka, Ponga (*Cyathea dealbata*) and Tānekaha (*Phyllocladus trichomanoides*). This area is to be retained, with earthworks required on the western side to form the proposed road network coupled with the removal of an existing culvert and to the north and east as part of the formation of the new residential lots.

An earthworks setback of is recommended to the north and east, with the works to the west largely within the footprint of the existing farm track (bush edge largely defined by a seven-wire fence). This is recommended to ensure works occur beyond the PRZ of existing vegetation, with the consent notice boundaries not a true reflection of the current environment. Further recommendations of works adjacent to and within the PRZ of this Area is to be included in the TMP.



Figure 22 – Main portion of Area 17, as viewed from the east

### 5.1.9 Areas 18 & 21

Areas 18 and 21 are directly north of Area 17 and consist almost entirely of pest plants (including Gorse & Woolly Nightshade (*Solanum mauritianum*)), with the occasional regenerating Mahoe or Ti Kouka. All pest plants are to be removed within the catchment, with indigenous plant species replacement and enhancement planting proposed. Where indigenous trees/vegetation is to be retained, all adjacent earthworks should be undertaken in accordance with the recommended TMP protection measures included in the Draft TMP.



Figure 23 – Area 18 looking north from adjacent to Area 17 (Area 20 seen at top of image)

### 5.1.10 Areas 19-22

Areas 19 - 22 are identified as remnant indigenous bush areas, dominated by Manuka, Kanuka and Ponga, with a mature Rimu (*Dacrydium cupressinum*) growing within Area 19. These bush areas are to be retained and protected. A walking track is proposed along the perimeter of part of this area.

It is recommended that any PRZ works proposed as part of the walking track networks are to be assessed and included as part of the TMP, to ensure any impacts on Area 19,20 & 22 as part of the construction of the proposed walking track areas are minimised. It is noted that Area 22 and a portion of 21 is covered by a SEA-T overlay. Pest plant species will be removed from all areas (mainly Gorse).



Figure 24 – Area 19 to the northeast. Canopy of Rimu tree can be seen in the centre of the remnant.



Figure 25– Area 22 seen from the central portion of the site, pest plant species will be removed adjacent to this grouping (Area 21)



Figure 26 – Area 21 seen to the northwest

### 5.1.11 Group 23

Group 23 is identified as a grouping of three (3) Monterey Pine trees growing along the ridgeline to the northwest of Area 17, a fourth tree, identified as a dead English Oak (*Quercus robur*) is also growing further west. These trees are non-protected specimens and are proposed for removal.



Figure 27 – Group 23 growing on the ridgeline (adjacent to the proposed access road)

### 5.1.12 Group 24

Group 24 is identified as a small cluster of indigenous vegetation growing in a small gully system near the northwest boundary of the project area. The vegetation consists of a mixture of Totara, Manuka,

Kanuka and other pioneer indigenous species. This area will be retained and protected as part of the Project. Pest plant species will be cleared around the grouping.



**Figure 28 – Group 24 to be retained and protected.**

### **5.1.13 Area 25**

Area 25 is identified as an area of dense indigenous vegetation growing on the neighbouring property to the West (955 Weranui Road) and is subject to protection, covered by an SEA-T overlay. It is noted the vegetation making up the wider stand is within the project area and is not subject to the SEA-T overlay. This area as defined as part of Area 26, with a snip of the Area extents provided in Figure 27.

A setback from the boundary of at least 10m for any earthworks is recommended to ensure ongoing protection. This is to ensure edge effects on the neighbouring vegetation is minimised, including ensuring erosion and sediment controls do not impact PRZ.

It is also recommended that all works adjacent to this area are to be undertaken in accordance with the TMP, with management details to be prepared at the detailed design stage, to incorporate best arboricultural practice.



**Figure 24– Group 25 located on neighbouring property to the West (955 Werau Road) (a portion of the vegetation nearest to this area identified as being part of Area 26)**



**Figure 25 – Location of vegetated Areas discussed in Sections 9 - 13**

### 5.1.13 Area 26

Area 26 is defined by two distinct areas, these being:

Part A - the existing semi-mature Monterey Pine forested area, with an understorey of regenerating indigenous species, including Mahoe, Ponga, Putaputaweta, Mapou (*Mysine australis*) and other pioneer species. Typical weed insurgence is also evident, with Privet (*Ligustrum lucidum*) and Gorse the main species.

Part B – an area of regenerating indigenous vegetation growing adjacent to Area 25, consisting of predominately Manuka & Kanuka. An area of Gorse is also located to the northeast, coupled with a row of Monterey Pine trees that a growing within the project area (and are proposed for removal).

With the exception of the pest plants and Monterey Pine row to the north, forested vegetation within Area 26 is to be retained, with works adjacent to Part B as part of the residential lot creation. A new, widened culvert and access roadway is proposed between the southeast portion of Area 26 and the southwest corner of Area 17.

It is recommended that all construction works adjacent to these areas is to be defined and assessed as part of preparing the TMP.



Figure 26 – View of the Monterey Pine forest section of Area 26 (see Figure 18 for an image of the indigenous vegetation adjacent to the western boundary)



Figure 27 – Illustration of Part A & B areas of Area 26. Monterey Pine trees to be removed also shown.

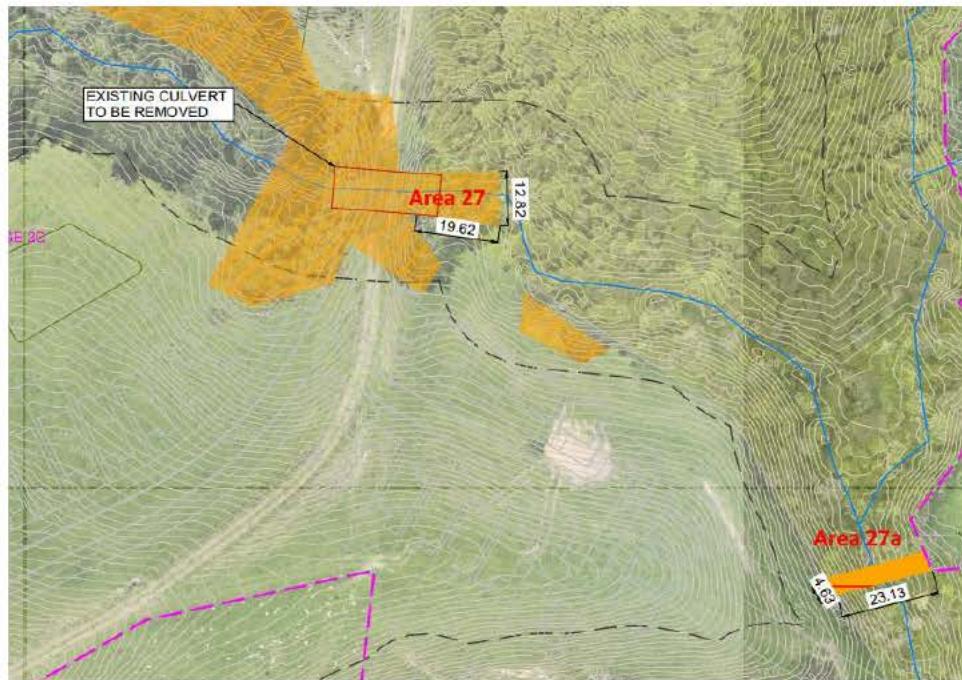
### 5.1.15 Area 27

Area 27 is identified as a mixture of exotic vegetation (Willow) and indigenous vegetation (predominately Totara and Manuka) to be removed to enable the construction of the new road access, removal of the existing culvert, and the removal of an existing pipe bridge between Areas 26 and 17.

Care must be undertaken to minimise the extent of tree removal, and to ensure vegetation overhanging the proposed works footprint and directly adjacent to the PRZ is adequately protected. It is recommended that all works are undertaken in accordance with TMP conditions and set out in the Draft TMP.



**Figure 28 – View of Area 27 to the east of the existing farm track. Portion to be removed for new roadway and associated infrastructure.**



**Figure 29 – Anticipated extent of vegetation clearance proposed to enable the removal of the existing culvert, pipe bridge works (27A) and road infrastructure.**

### 5.1.16 Area 27a

Area 27a is identified as a small area of vegetation to be removed for a proposed pedestrian bridge (see Figure 29 above). The vegetation within this area is typical of the Area 17 vegetation, forming part of the wider forested area.

Care must be undertaken to minimise the extent of tree removal, with care taken to ensure vegetation overhanging the proposed works footprint and directly adjacent to the protected root zone is adequately protected. It is recommended that all works are undertaken in accordance with Draft TMP conditions.

## 6.0 Assessment of Arboricultural Effects

As outlined in Section 3.0, this application will be assessed against those rules pertaining to vegetation within Chapters E15. of the AUP. The specific rules deemed relevant to this proposal are outlined in the table below:

A summary is provided below in terms of tree removal or for the undertaking of works within the PRZ of trees to be retained under the Restricted Discretionary or Discretionary Rules noted above as per the tree numbers referenced in Section 4.0 and Appendix A of this report.

**Table 1 – Activity Status vs Effects**

Activity & Rule	Tree Number as referenced in this report	Total number of Trees/Groups of Trees requiring resource consent under this rule
Rule E15.4.1 (A16) – Restricted Discretionary Activity	Area 1, 2, 6, 7, 8,8a (stream works), 10, 11, 17, 21, 22, 27,27a  Group 3, Tree 4,	Fifteen (15)

### Assessment Against Relevant AUP Criteria

As aforementioned, vegetation growing within the project area ((88, 130 and 132 Upper Ōrewa Road and 53A, 53B and 55 Russell Road)) is subject to those rules outlined in Activity Tables E15.4.1 & E15.4.2 of the AUP.

An assessment is provided below against the relevant Restricted Discretionary criteria outlined in Section E15.8.1 of the AUP for the removal or pruning of trees or works within the PRZ of trees subject to protection under Rules E15.4.1 (A16,). (Table 2)

In the case of the tree removal or alteration within SEA-T overlay areas, no works are proposed within the SEA-T areas (i.e. works within the PRZ), with a 10m setback proposed adjacent to the SEA-T in the northern corner of the Project (the adjacent Nukumea Scenic Reserve) and the western boundary (adjacent to Area 25).

**Table 2 – Removal of trees and works within the PRZ of protected trees**

E15.4.2 Assessment criteria	
<p>The following is my assessment against the criteria for the proposed removal of protected trees contained in E15.4.2 of the AUP (OP). The criteria are given in the left-hand column (red text), with the response in the right hand column (black text). This assessment criteria provides a relevant basis for assessing the proposed activities.</p>	
<p>The Council will consider the relevant assessment criteria for restricted discretionary activities from the list below:</p>	
1(a)	<p><b>the extent to which the vegetation alteration or removal is minimised and adverse effects on the ecological and indigenous biodiversity values of the vegetation are able to be avoided, remedied or mitigated</b></p>
1a (ii)	<p><b>whether vegetation removal will have an adverse effect on threatened species or ecosystems</b></p>

1a (ii)	<b>the extent to which the proposal for vegetation alteration or removal has taken into account relevant objectives and policies in Chapter B7.2 Indigenous biodiversity, B4 Natural heritage, Chapter E18 Natural Character of the coastal environment and E19 Natural Features and natural landscapes in the coastal environment</b>	B7.2 – Indigenous fauna or biodiversity would not be significantly compromised by the proposed works  B4 – Natural heritage values inherent in the relevant natural landscape – in this case the existing natural areas will be ultimately enhanced.  E18 – The project area is not a coastal environment. No vegetation or tree removal will be undertaken within a 'top of cliff' zone, and the proposed works would not compromise the root zones of any vegetation to a degree whereby the health or stability of retained vegetation would be compromised.  E19 – see E18 discussion above.
1b (i)	<b>the extent to which the vegetation serves to avoid or mitigate natural hazards and the amount of vegetation to be retained or enhanced</b>	Significant vegetation removal will be avoided, with vegetation removal and alteration isolated. Where protected tree removal is proposed, this will occur for the purposes of road construction or for the introduction of new engineering elements. Such elements will include design to avoid or mitigate natural hazards, with the Draft TMP conditions intended to minimise arboricultural impacts.
(ii)	<b>the extent to which the vegetation alteration or removal will increase natural hazard risks; and</b>	As above, the vegetation removal is very isolated.
(iii)	<b>whether the vegetation alteration or removal is necessary to mitigate an identified bushfire risk.</b>	Not applicable
c (i)	<b>the extent to which vegetation alteration or removal will adversely affect soil conservation, water quality and the hydrological function of the catchment</b>	The vegetation removal will occur in areas that have existing canopy coverage, with adjacent canopy to be maintained.

	<b>and measures to avoid remedy or mitigate any adverse effects.</b>	
d (i)	<b>the extent to which vegetation alteration or removal will have adverse effects on the values identified for scheduled outstanding natural landscape, outstanding natural features, outstanding natural character and high natural character areas; and</b>	The vegetation does not stand within an area covered by such an overlay.
(ii)	<b>the extent to which vegetation alteration or removal adversely affects landscape, natural features and natural character values particularly on adjacent public space including the coast, reserves and walkways and measures to avoid, remedy or mitigate any adverse effects.</b>	Not applicable
e (i)	<b>the extent to which the vegetation alteration or removal will have adverse effects on the amenity values of any adjacent open space including the coast, parks, reserves and walkways and measures to avoid, remedy or mitigate any adverse effects.</b>	Not applicable
f (i)	<b>whether the vegetation alteration or removal is necessary to enable reasonable use of a site for a building platform and associated access, services and living areas, and existing activities on the site</b>	Not applicable in this instance
(ii)	<b>the extent to which the vegetation alteration removal is necessary taking into account the need for, or purpose of, the proposed building or structure;</b>	Not applicable
(iii)	<b>the extent to which the vegetation alteration or removal is necessary to enable reasonable use of the site for farming purposes</b>	Not applicable
(iv)	<b>whether the vegetation alteration or removal will improve the reliance and</b>	Not applicable

	<b>security of the network utility, or road network;</b>	
(v)	<b>whether the vegetation alteration or removal is necessary for a structure that has a functional or operational need to be in the proposed location;</b>	Not applicable
(vi)	<b>the extent of the benefits derived from infrastructure and the road network</b>	In the case of tree removal to enable the NOR 6 road works, this road network is part of the wider future roading works
(g)(i)	<b>whether there are practicable alternative locations and methods including consideration of an application to infringe development control where this would result in retention and enhancement of vegetation on the site;</b>	The engineering report prepared by Mckenzie & Co illustrates that the proposed pedestrian bridge is located at the narrowest stream crossing point. This will ensure level of vegetation clearance required is minimised as part of construction. Other stream crossings or culvert works have been positioned in locations that are either the narrowest point or are driven by other factors that limit alternative options.
(ii)	<b>whether the effects from the alteration or removal of vegetation and land disturbance can be minimised through works being undertaken on an alternative location on the site, and/or method of undertaking the works</b>	As outlined above, the engineering report determined there were no suitable alternative locations for the proposed culvert or pedestrian bridge works that would have resulted in lesser effects when considering other constraints.  In any case, while reduction in tree removal would be likely in an alternate location if this was possible, the proposed tree removal and impacts on the adjacent vegetation in the outlined locations are minor and can be adequately mitigated by the proposed enhancement plantings within the wider Project
(h)(i)	<b>the extent to which revegetation can remedy or mitigate adverse effects, including eco-sourcing and the ongoing maintenance of revegetation measures.</b>	New tree and vegetation plantings will adequately mitigate the proposed protected tree/vegetation removals.

(i)(i)	whether conditions of consent can avoid remedy or mitigate adverse effects including the imposition of bonds, covenants or similar instruments	Not applicable.
(j)(i)	the extent to which any adverse effects on Mana Whenua values can be avoided, remedied or mitigated, and having regard to the objectives and policies in E20 Māori Land whether the proposed works are appropriate to provide for Mana Whenua, mātauranga and tikanga values	While the tree removal is of indigenous vegetation, the works are minor and impact an area heavily modified by farming and stock activities. Mana Whenua have been engaged with as part of the Project.

## 6.2 Summary of Arboricultural Recommendations

In summary, it is concluded that the Project will have less than minor adverse arboricultural effects overall, with any potential and actual adverse effect relating to the removal of protected vegetation adequately mitigated by the proposed replacement and enhancement planting proposed in the wider Project.

Any potential effects on those protected trees and vegetation to be retained as part of the Project can be adequately avoided or mitigated by way of the earthworks and environmental control setbacks that have been discussed throughout Section 5.0 of this report, coupled with the tree protection methodologies proposed as part of the recommended Draft TMP and/or any subsequent version to be prepared as part of the future detailed design and implementation phases and in accordance with the conditions of consent.

The proposed setbacks outlined in Section 5.0 of this report are intended as a baseline and are required to ensure adjacent effects associated with altering adjacent overland flows, existing ground levels and upstream effects on arboricultural elements are minimised. Final setbacks to be determined as part of developing the TMP and subsequently approved and documented by the works arborist. A Draft TMP is outlined in Appendix C of this assessment.

## 7.0 REPLACEMENT AND ENHANCEMENT PLANTING

A high-level ecological restoration plan has been prepared for the main project area by Viridis Consultants and Greenwoods in concert (this plan is referenced as Appendix D in this report).

This plan outlines a proposal for extensive restoration and enhancement planting in forest, riparian and wetland areas within the project area.

From an arboricultural perspective, this planting strategy would adequately mitigate the loss of any protected vegetation proposed for removal as part of the Project, with new plantings in areas not

currently vegetated deemed enhancement from an arboricultural effects perspective. As detailed in the ecological assessment prepared by Viridis Consultants, the total area of earthworks across the site is 1,220,000m<sup>2</sup>, with 26.9 ha of existing natural environment remain across the Site, and 31.81 ha of revegetation and replanting proposed. The level of replacement planting is also deemed adequate from an arboricultural perspective.

## 8.0 Kauri Dieback Management

While no Kauri trees are proposed for removal, a number of Kauri are identified as growing to the north of the site, in Area 22, with smaller planted specimens observed in Areas 1 & 17. Where works are proposed within the vicinity of any Kauri tree, relevant Bio-security measures are required.

The 'Kauri Contamination Zone' is defined as three times the dripline spread radii. Bio-security protocols are required when working within the above-referenced parameter, and for the disposal of cut material and soil. The protocols are intended to control the removal of soil and Kauri tree material so as to minimise and limit the potential spread of the Kauri Dieback Disease.

As such, all works are to be undertaken in accordance with Chapter E11.6.2 – Note 1 (6) of the Unitary Plan, which states the following;

*(6) To prevent the spread of contaminated soil and organic material with kauri dieback disease, vehicle and equipment hygiene procedures must be adopted when working within 3 times the radius of the canopy drip line of a New Zealand kauri tree. Soil and organic material from land disturbance within 3 times the radius of the canopy drip line must not be transported beyond that area unless being transported to landfill for disposal.*

Two documents containing the detailed guidelines pertaining to the above-referenced rule have been issued by the Auckland Council Kauri Dieback Programme team, and are attached to this report as Attachments 1 & 2. They are titled;

Best Practice Guideline – Tree Removal and Pruning of Kauri - Version 2.1 – October 2017

Best Practice Guideline – Vehicle and Heavy Machinery Hygiene – Version 1.1 – October 2017

Further information pertaining to Kauri Dieback protocols, and on any activity proposed to be undertaken in the vicinity of any Kauri tree, can be obtained from PBM or by visiting this website – [www.kauridieback.co.nz](http://www.kauridieback.co.nz).

Provided that all Kauri tree removal and works within the driplines of those Kauri trees to be retained are managed in accordance with the Kauri Dieback Protocols outlined in this report it is considered that any effects on those Kauri tree remaining within the project area as part of the proposed earthworks and residential use would be less than minor.

## 9. Conclusion

An arboricultural assessment has been undertaken in relation to the trees and tree/vegetation groups affected by the proposed works for the Project.

In summary, consent is being sought to carry out the activities outlined in Section 6.0 of this report, with an assessment provided against the relevant Criteria outlined in Chapters E15.4.2.

The trees and tree/vegetation groups affected have been described in general terms - with all tree removal and works within the PRZ of retained vegetation to be undertaken within the project area.

All works are to be overseen by the appointed works supervisory arborist in accordance with a TMP. Kauri dieback management measures are set out in Section 8.0 of this report and a Draft TMP is appended.

This report has been prepared to accompany the resource consent application for the overall proposal. It provides the information that will assist the expert consenting panel to assess activities that affect protected trees under Chapters E15. of the AUP.

The variety of activities that are proposed to take place within the PRZ of the trees to be retained can be managed in such a way that any adverse effect on the health and stability of the protected trees or stand/grouping of vegetation will be less than minor, provided the tree protection methodologies supplied in Appendix C of this report are adopted.

From an arboricultural perspective, the removal of protected vegetation would be adequately mitigated, so that any actual or potential effects would be less than minor, provided that replacement planting was to occur in accordance with the recommendations outlined in both this report and that which is also recommended in the ecological and landscape assessment (prepared by Viridis and Greenwood Associates).

## Appendix A

### Tree Details & Location Plan

Specific details pertaining to each scheduled tree and some more significant trees implicated in the proposal are outlined in the following section:

**Description Key**

- **Tree No**

Refers to the number assigned to each tree

- **Tree Species – Common Name**

The generally accepted common, or Maori, name of the tree is given.

- **Tree Species – Botanical Name**

The genus and species, and cultivar or variety where known, is given. Where the species is unknown the tree is identified as; (Genus) sp.

- **Protective Status**

This refers to the protective status of the tree as defined by the AUP-OIP (where relevant).

**AUP-OIP = Refers to trees protected as part of the AUP rules**

**NP= No Protection.**

Protected trees are indicated by red text to clearly separate these trees from the non-protected trees. AUP relates to their specific protection status.

- **Height (in metres)/ Girth (in metres)**

- **Condition**

This category addresses the physiological condition of the tree as a whole, described as;

**Good** – Full healthy canopy but possibly including some suppressed or damaged branches

**Fair** – Slightly reduced leaf cover, minor dead wood or isolated major dead wood

**Poor** – Overall sparse leafing and/or extensive dieback. Irreversible decline

- **Comments**

Addresses the general location of the trees and/or any specific comments about the trees/areas.

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/ Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
Area 1	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Hange hange ( <i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i> ), Ti Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Woolly Nightshade/ Gorse	Naturalised wetland/stream area adjacent to the eastern boundary (55 Russell Road)	Young – semi mature	Good	<b>Retain</b> – Largely proposed for retention as part of the project, to be vested to new residential lots. Minimum earthworks setback of 10.0m recommended where possible. Approximately 250m <sup>2</sup> of clearance required for new road crossing (R02 – R09)	Yes – Riparian/ Wetland Area
Area 2	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Hange hange ( <i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i> ), Ti Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Woolly Nightshade /Gorse	Naturalised wetland/stream area adjacent to the eastern boundary (55 Russell Road)	Young – semi mature	Good	<b>Retain</b> - Proposed for retention as part of the project, to be vested to new residential lots. Minimum earthworks setback of 10.0m recommended where possible.	Yes – Riparian/ Wetland Area

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
Tree/Group 3	Monterey Pine ( <i>Pinus radiata</i> ) Gum trees (group) <i>Eucalyptus sp.</i>	Bank area above adjacent stream. On edge of 10m setback (55 Russell Road)	Mature	Moderate	<b>Remove</b> – Proposed for removal, new plantings proposed in this area.	Partially – Rural Stream setback - 20m setback protected.
Tree 4	Monterey Pine ( <i>Pinus radiata</i> )	Bank area above adjacent stream. On edge of 10m setback (55 Russell Road)	Mature	Moderate	<b>Remove</b> – Proposed for removal, new plantings proposed in this area.	Partially – Rural Stream setback - 20m setback protected.
Tree 5	Monterey Pine (Group) ( <i>Pinus radiata</i> )	Overhanging Pines from neighbouring property (boundary with 53B Russell Road)	Young – Mature	Moderate – Good	<b>Remove</b> – Proposed for removal, new plantings proposed in this area.	No
Areas 6 - 8	Willow ( <i>Salix sp.</i> ) Carex, sedges Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Akeake ( <i>Dodonaea viscosa</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Woolly Nightshade /Gorse	Existing plantings adjacent to the stream network travelling north/south (55 Russell Road)	Semi-Mature	Moderate	Retain – fenced riparian zone to be planted, retained and protected. Additional riparian zone not fenced to be formalized with fencing and planted out with indigenous species. Willow trees and exotic species removed as required.	Yes – 20m Rural Stream protection setback -.
Area 8a	Monterey Pine (Forest) Emerging pioneer indigenous species including	Northern side of 55 Russell Road	Semi – mature	Moderate	The Pine trees in this area have since been removed. Indigenous vegetation retained where practicable	Partial – riparian area transitioning into Area 8 subject

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
	Ponga, Taupata, Hange hange					to Rural stream setback protection
Area 9	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Akeake ( <i>Dodonaea viscosa</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Woolly Nightshade /Gorse	Growing within 3 Russell Road (neighbouring site) Protected covenanted area – Fringe effects from Project works,	Semi mature – mature	Moderate – Good	Works proposed adjacent to area as part of earthworks (north, east, west) Small area to be removed as part of NoR 6 interface.  To be protected. Tree protection measures. TMP to include measures to protect this neighbouring bush area.	Yes – 20m Rural Stream protection setback - protected by Consent notice
Area 10	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Akeake ( <i>Dodonaea viscosa</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Woolly Nightshade /Gorse	Existing and new plantings adjacent to the stream network travelling north/south (55 Russell Road)	Semi-Mature	Moderate	Retain – fenced riparian zone to be retained and protected. Pest plants removed as required.	Yes - Rural Stream setback - Area 20m setback protected. Protected by Consent notice.
Area 11	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Akeake ( <i>Dodonaea viscosa</i> ), Tī Kōuka ( <i>Cordyline australis</i> ),	Existing and new plantings adjacent to the stream network travelling north/south (55 Russell Road)	Semi-Mature	Moderate	Retain – fenced riparian zone to be retained and protected. Pest plants removed as required.	Yes - Rural Stream setback - 20m setback protected. Protected by Consent notice.

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
	Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Woolly Nightshade /Gorse					Approximately 1292.09m <sup>2</sup> of clearance proposed to construct new Road 05 to 02 connection. <b>Removal of vegetation in this area also subject to Rule E15.4.1 (A10)</b>
Tree 12	Totara ( <i>Podocarpus totara</i> )	Single tree growing adjacent to the existing stream. Footprint of proposed major road. (88 Upper Orewa Road)	Semi mature	Moderate	Retain – Outside Project earthworks extent.	Yes - Rural Stream setback - 20m setback protected
Group 13	Gorse ( <i>Ulex europeaus</i> ) (Group)	Northern side of the existing stream. (88 Upper Orewa Road)			Retain – Outside Project earthworks extent.	Pest Plant
Tree 14	Totara ( <i>Podocarpus totara</i> )	Single tree growing adjacent to the existing stream. Footprint of proposed major road. (88 Upper Orewa Road)	Semi mature	Moderate	Retain – Outside Project earthworks extent.	Yes - Rural Stream setback - 20m setback protected
Tree 15	Weeping Willow ( <i>Salix babylonica</i> )	Edge of the existing stream. (88 Upper Orewa Road)	Mature	Good	Retain – Outside Project earthworks extent.	Yes - Rural Stream setback - 20m setback protected
Tree 16	Weeping Willow ( <i>Salix babylonica</i> )	Edge of the existing stream. (88 Upper Orewa Road)	Mature	Good	Retain – Outside Project earthworks extent.	Yes - Rural Stream setback - 20m setback protected
Area 17	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoidies</i> ) Akeake ( <i>Dodonaea viscosa</i> ), Tī Kōuka ( <i>Cordyline australis</i> ),	Planted and regenerating area of native bush adjacent to the existing stream	Young – semi mature	Good	Retain – works within the PRZ of trees at edge of fenced area. TMP conditions to be implemented.	Yes - Rural Stream setback - 20m setback protected. <b>Consent notice.</b>

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
	Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) Woolly Nightshade /Gorse	network. (88 Upper Orewa Road)				Clearance proposed for culvert removal and new road related works. Removal of vegetation in this area also subject to Rule E15.4.1 (A10)
Area 18	Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Woolly Nightshade /Gorse	Mixed area of predominantly pest plants and some emerging pioneer indigenous species	Young – semi-mature	Poor – Moderate	Remove Pest Plants  Retain indigenous trees  Area to be cleared of pest plants and replaced with indigenous plantings and enhancements	Yes - Rural Stream setback - 20m setback protected
Area 19a	Monterey Pine ( <i>Pinus radiata</i> ) (Forest)	47 Ara Hills Drive. Neighbouring property.	Mature	Moderate	Retain – Tree protection methodologies as required to ensure ongoing stability	No
Area 19	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Akeake ( <i>Dodonaea viscosa</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea</i>	Northeast corner of project area. 130 Upper Orewa Road	Semi-mature to mature	Moderate – Good	Retain – Indigenous vegetation to be retained and protected. Works in accordance with TMP conditions.  Remove Pest Plant species	Yes – Rural Stream protection – 20m protected setback.

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/</u> <u>Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
	<i>sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) Rimu ( <i>Dacrydium cupressinum</i> ) Woolly Nightshade /Gorse					
Area 20	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Akeake ( <i>Dodonaea viscosa</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) Rimu ( <i>Dacrydium cupressinum</i> ) Woolly Nightshade /Gorse	Northeast corner of project area. 130 Upper Orewa Road	Semi-mature to mature	Moderate – Good	<b>Retain – Indigenous vegetation to be retained and protected. Works in accordance with TMP conditions.</b>  <b>Remove Pest Plant species</b>	Yes – Rural Stream protection – 20m protected setback
Area 21	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ) Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> )	Northeast corner of project area. 130 Upper Orewa Road	Semi-mature to mature	Moderate – Good	<b>Retain – Indigenous vegetation to be retained and protected. Works in accordance with TMP conditions.</b>  <b>Remove Pest Plant species</b>	Indigenous vegetation protected by SEA-T overlay.

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
	and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) Rimu ( <i>Dacrydium cupressinum</i> ) Woolly Nightshade /Gorse					
Area 22	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) Rimu ( <i>Dacrydium cupressinum</i> ) Woolly Nightshade /Gorse	Northeast corner of project area. 130 Upper Orewa Road	Semi-mature to mature	Moderate – Good	<b>Retain – Indigenous vegetation to be retained and protected. Works in accordance with TMP conditions.</b>  <b>Remove Pest Plant species</b>	Yes - Indigenous vegetation protected by SEA-T overlay.

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/</u> <u>Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
Group 23	Monterey Cypress x 4 ( <i>Pinus radiata</i> ) English Oak (dead)	Ridgeline to the northwest of Area 17 132 Upper Orewa Road	Mature	Moderate	Remove – earthworks proposed in this location.	No
Area 24	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> )	Small gully system near western boundary with 955 Weranu Road	Semi - mature	Moderate – Good	Retain – Indigenous vegetation to be retained and protected. Works in accordance with TMP conditions.  Remove Pest Plant species	Yes – Rural Stream protection – 20m protected setback
Area 25	Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) Rimu ( <i>Dacrydium cupressinum</i> ) Woolly Nightshade /Gorse	Area of mature bush growing within neighbouring property 955 Weranu Road and 180 Upper Orewa Road	Semi-mature - Mature	Good	Retain – 10m earthworks setback recommended. Works in accordance with TMP conditions where near PRZ.	Yes - Indigenous vegetation protected by SEA-T overlay.

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
Area 26	<b>Part A</b> – Monterey Pine (Forest), understorey species such as Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Woolly Nightshade /Gorse/Privet <b>Part B</b> - Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) Rimu ( <i>Dacrydium cupressinum</i> ) Woolly Nightshade /Gorse	Area of planted Pine forest with understorey of weed species and indigenous pioneer species. Central portion to the west of Area 17 and bordering 180 Upper Orewa Road. (vegetation within 132 Upper Orewa Road)	Young – mature	Poor – Good	Retain – 10.0m earthworks setback recommended. Works in accordance with TMP conditions where near PRZ.  <b>Pest plant removal as required.</b>	Partially - Yes – Rural Stream protection – 20m protected setback

<u>Tree No.</u>	<u>Common Name</u> <u>Botanical Name</u>	<u>Location</u>	<u>Age Class/Size</u>	<u>Condition</u>	<u>Proposed Activity &amp; Comments</u>	<u>AUP</u> <u>Protected</u>
Area 27 & 27A	<u>Western side</u> – Willow sp. <u>Eastern side</u> – Part of Area 17, Manuka ( <i>Leptospermum scoparium</i> ), Kanuka ( <i>Kunzea ericoides</i> ), Tī Kōuka ( <i>Cordyline australis</i> ), Karamu ( <i>Coprosma repens</i> ) and Totara ( <i>Podocarpus totara</i> ), Mapou ( <i>Myrsine australis</i> ) Ponga ( <i>Cyathea sp.</i> ), Tarata ( <i>Pittosporum eugenioides</i> ) Mahoe ( <i>Melicytus ramiflorus</i> ) Putaputaweta ( <i>Carpodetus serratus</i> ) Tanekaha ( <i>Phyllocladus trichomanoides</i> ) <u>27A - Pipe Bridge extent</u> – Same vegetation types as above.	Portion of vegetation adjacent to the existing farm track/culvert. Between Areas 26 and 17., with 27A also part of Area 17. 132 Upper Orewa Road.	Semi-mature	Moderate – Good	<b>Remove as required</b> – Portion of vegetation requiring removal to enable construction of new road layout/ pedestrian bridge works	Partially - Rural Stream setback - Area 20m setback protected <b>Area 17 Covenant.</b> <b>Removal of vegetation in this area also subject to Rule E15.4.1 (A10)</b>



Figure 1 – Tree Location Plan (blue lines show Project extent)

## APPENDIX C - DRAFT TREE MANAGEMENT PLAN (TMP)



## APPENDIX C – DRAFT TREE MANAGEMENT PLAN (TMP)

The purpose of the Tree Management Plan is to manage arboricultural effects on protected trees and vegetation growing within the Project area directly adjacent to areas proposed for clearance as part of physical works, coupled with those trees or vegetation of which works are proposed within their respective protected root zones, or are likely to be affected by adjacent land changes (such as overland flow path alterations, cut/fill works or temporary environmental controls or enabling works).

The trees or areas to which it relates are Areas 1, 2, 8a, 9, 10, 11, 17, 19, 20, 25, 26, 27 & 27a

### Pre-works Tree Management Plan

1. Prior to any works commencing on the site in the vicinity of any of the subject trees, a designated Pre-commencement Meeting should be held to discuss all issues pertaining to the protection of the trees to be retained and to gain a common understanding of the protection measures and construction methods in that regard. This meeting would take the form of a site induction to present the standards and expectations of the tree protection within the site. Present at the meeting should be;
  - The Project Manager
  - All site managers & foremen
  - All the site workers
  - The site works arborist
  - Auckland Council Compliance Monitoring Officer(s)
2. All tree removal and pruning works are to be undertaken by a qualified arborist prior to or during the earthworks phase. The pruning shall be undertaken in accordance with best arboricultural practice, with the extent of pruning to be limited to the removal of no more than 20% of the trees canopy or branches no larger than 100mm in diameter unless specified otherwise in Section 5.0 of this report.
3. All removal of existing structures (power poles, buildings, pipes, culverts.) is to be supervised and managed according to this TMP when within 2 metres of the Protected Root Zone (PRZ) extent of any retained tree. The PRZ is defined as the dripline, or canopy radius, with the PRZ of more conical species such as Kahikatea defined as half the tree's height.
4. Temporary protective fencing should be erected around every tree/group of trees to be retained, and any stands of trees where there is no existing solid fence to serve as a protective fence. The fence should be located to completely enclose the open ground area of open ground out to the PRZ (dripline extent) of the tree, while leaving existing accessways clear.
5. The fence shall not be moved by any contractor or site worker at any stage of the construction activities. Any exception would be where the Site Arborist determines that the fence may be moved to execute consented construction activities.

6. The fencing is to be constructed of, as a minimum, orange mesh tightly supported by a steel wire and waratah standards. The Site arborist may also determine that 1.8m diamond mesh fencing panels shall be used to afford greater protection for vulnerable trees.
7. The protective fence shall remain in place until the completion of the project in the vicinity of the tree (some sections of the project may finish well before the overall completion date).
8. The exact bridge/culvert/road and associated works locations as discussed in Section 5.0 in this report (and within the indicative bridge plans prepared by Mckenzie & Co) are indicative at this point of the proposal. As such, some flexibility is recommended to ensure adequate space is afforded for these structures. Some additional tree removal may be required in these areas. However, all tree removal will be documented and recorded, with appropriate mitigation provided. If this occurs, updated clearance plans will be provided to the Auckland Council Arborist specialist with a confirmation that any tree removal will be limited and that proposed mitigation will be appropriate and adequate on a case by case basis. The replacement planting will be undertaken in accordance with the planting species and size agreed in consultation with the project's ecologist. This new planting would then be maintained by the client for a period of 24 months, in accordance with best practice.
9. In addition to those trees noted above, it is possible that the same scenario may apply in cases not specifically identified. In some cases, tree removal may be required where works will exceed acceptable thresholds. In that case, the same protocols would apply. The largest replacement tree (like for like or a similar species), available as a nursery specimen, will be sourced and planted in replacement, subject to the suitability of ground conditions. This tree would then be maintained by the client for a period of 24 months, in accordance with best landscape practice.

#### **Pathways through SEA or Protected Bush Areas**

10. Detailed design of proposed pathways within sensitive areas must be discussed with the TMP author prior to implementation. The consulting arborist must provide written confirmation of the proposed alignments, methodologies and materials as part of the design process, which must also be certified by Council, where such pathways will form part of a public network or asset. Boardwalk sections and on-grade solutions such as hoggin, organic-loc or similar products must be utilised in all instances where works occur within the protected root zone (PRZ) of retained vegetation.

### **Construction Activities Tree Management Plan**

- 11.** All equipment/vehicles shall be manoeuvred to/ within the site in a manner that avoids any damage to the root zone and canopy of any retained/protected trees.
- 12.** No machinery or equipment or materials shall be stored or deposited within the protected root zone of any tree within the site (i.e. no products, fluids, machinery, or tools, etc). Special attention shall be paid to any petrol/diesel operated machinery to avoid contaminating the soil in the root zone of the trees.
- 13.** No tracking or movement of equipment, trucks or machinery is to be undertaken within the rootzone of protected trees. A mulch accessway or track-mats are to be utilised for the directional drilling machine in order to avoid damage to tree roots if movement is required within any protected rootzone or on the berm.
- 14.** The areas to be excavated adjacent to trees to be retained shall be clearly indicated with spray paint by the Site Manager.
- 15.** The Site Arborist shall indicate, with a different colour spray paint, those areas where direct supervision of the excavation is required by the site arborist.
- 16.** Prior to approaching the zones which require supervision, the site manager shall engage the site works arborist to assist and direct activities.
- 17.** Once the upper vegetated layer has been removed, the initial cut to define the outside edge of the excavation closest to the street tree should be made by hand (spade) by the Site Arborist prior to full excavation by machine. Utmost care must be taken to minimise root strike.
- 18.** If significant roots are encountered within the first 100mm, the level must be altered to accommodate that root and any subsequent roots discovered.
- 19.** If any significant roots are encountered during excavation in the dripline of any retained/protected trees, that root should be accommodated; unless the arborist is satisfied that severance of such a root would not cause a deterioration of the health of the tree. No roots beyond the approved thresholds are to be removed. (Roots up to 80mm for protected trees under the supervision of a suitably qualified arborist).
- 20.** Any retained roots shall be wrapped in hessian and immediately re-covered if possible. Any roots to be exposed for more than 4 hours must be kept wet until recovering occurs.
- 21.** Any roots less than permitted diameter may be severed cleanly to the excavated face. All root severance shall be undertaken by the Site Arborist.
- 22.** A layer of hessian shall be securely pinned to the excavated face against retained trees to shade the root ends and minimise desiccation.
- 23.** Any service installations should be made via directional drilling or outside the PRZ of any retained trees. If this is not practical, the works arborist must be consulted and an acceptable method agreed upon.

**Post -works Tree Management Plan**

24. Compliance with all conditions of consent relating to tree protection shall be monitored by the appointed Site Arborist - with the detail of communication and works activities being logged. The completed log will be provided to the consent holder at the completion of the project to serve as a compliance report.

**ATTACHMENTS 1&2: KAURI DIEBACK PROTOCOLS AND  
RECOMMENDATIONS**





## Vehicle and Heavy Machinery Hygiene

**Prepared By:** [REDACTED]  
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### Document Information

#### Version History

Date	Version	Author	Description of changes
September 2017	1.0	T. Ashcroft	Original version
October 2017	1.1	T. Ashcroft	Changes to Figure 1. Definition of 3x the radius of the canopy dripline.

#### Consultation and peer review

Role	Name	Date submitted
Planning & Intelligence Workstream	[REDACTED]	August 2017
Operations Workstream	[REDACTED]	May 2017
	[REDACTED]	April 2017

### Approval

Name	Role	Signature/ Date	Endorsement
██ Programme Manager	Approve / Note the contents of this document	██ 17/10/17 11	<input checked="" type="radio"/> Yes <input type="radio"/> No

## Associated documents

Document name	Link
Hygiene Procedures for Kauri Dieback	<a href="https://www.kauridieback.co.nz/more/documents-and-resources/">https://www.kauridieback.co.nz/more/documents-and-resources/</a>
Land disturbance activities (incl. earthworks) around kauri	
Tree Removal and Pruning of Kauri	
Landfill disposal of contaminated material	

## Glossary

Terminology	Meaning
Dripline	The outer extent of the branch spread from the trunk.
Kauri area	The ground area around kauri, defined as 3 times the radius of the canopy dripline. Considered contaminated with PA, until proven otherwise.
Kauri dieback	Name of the disease that causes dieback on kauri caused by the pathogen <i>Phytophthora agathidicida</i>
KDP	Kauri Dieback Programme
Outermost dripline	The furthest (maximum) extend of the branch spread from the trunk.
PA	<i>Phytophthora agathidicida</i>
Propagule	Microscopic life stage (like seeds) whose role is to progress the propagation of an organism to the next stage in their life cycle.
Root Zone	The ground area around kauri, defined as 3 times the radius of the outermost canopy dripline.
SOP	Standard Operating Procedures
Sterigene	2% solution of detergent Sterigene®
Wash-down	Removal of soil and organic material using pressurised water and brushes.
Wastewater	Water generated from washing down vehicles and heavy equipment.

## Disclaimer

*The information in this guideline is intended to be general information. It is not intended to take the place of, or to represent, the written law of New Zealand or other official guidelines or requirements. While every effort has been made to ensure the information in this document is accurate, the Kauri Dieback Programme (and any of their representatives involved in the drafting of these guidelines) does not accept any responsibility or liability for error of fact, omission, interpretation or opinion that may be present nor for the consequences of any decisions based on this information.*

## 1.0 Purpose

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To provide hygiene guidelines to mitigate the spread of kauri dieback on vehicles and heavy machinery when operating near kauri (*Agathis australis*).

A precautionary approach is taken to manage the level of scientific uncertainty around ascertaining whether kauri and the surrounding soil is infected or not.

## 2.0 Background

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Kauri dieback is a soil-borne disease that spreads primarily through the movement of contaminated soil. Just a pinhead of soil is all that is needed to spread the pathogen (that causes kauri dieback), *Phytophthora agathidicida* (PA), to other areas.

Humans and their activities are the primary cause of spread through soil contaminated conveyances. Vehicles (e.g. cars, trucks, four-wheel drives, tractors) and heavy machinery (e.g. dozers, excavators, graders) are often used in and around kauri forests where earthworks, maintenance and construction operations are involved. It is therefore important that vehicle and heavy equipment hygiene practices are followed before, during and after an operation to reduce soil contamination and hence reduce the likelihood of spread of the disease on these pathways.

These guidelines outline best practice hygiene measures when using vehicles and heavy machinery and the use of such vehicles when transporting potentially contaminated soil or other loads from an infected or potentially infected area.

## 3.0 Assumptions & Constraints

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**Due to a number of uncertainties ascertaining whether an area is infected with kauri dieback or not, a number of assumptions have been made which has informed these guidelines:**

- 3.1 Since we do not know the time from infection to when disease symptoms first occur on the tree, healthy trees may be infected. As a result all kauri and their root zone (i.e. 3 x the radius of the outermost tree canopy dripline) are potentially infected with the disease.
- 3.2 Movement of contaminated root, trunk, bark materials and associated by-products such as sawdust, could spread PA.

3.3 Vehicles and other similar conveyances such as heavy equipment are vectors for disease dispersal.

Soil samples were taken from soil-contaminated vehicles during an Auckland Council study (unpublished) to link the movement of vehicles to the spread of PA. Even though a small sample size was taken, *Phytophthora* species were detected in 4 out of 6 samples which indicates that vehicle movements can facilitate the spread of pathogens (Lee Hill, pers. comm.).

3.4 Disease spread outside the kauri root zone can occur by movement of infected material via human and animal vectoring. Although yet to be proven (Bellgard et.al, unpub), there is anecdotal evidence that spread via wastewater run-off and water catchment discharge is possible.

3.5 Long-lived spores (oospores) of kauri dieback can survive and remain viable in the soil, long after a tree dies (at least 6 years and potentially a lot longer)(Horner, 2015).

## 4.0 Before you begin

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4.1 These guidelines has been developed to provide written advice on the management of kauri dieback during vehicle and heavy machinery use in a kauri forest and within the root zone of kauri.

4.2 The guidelines are not policy but should be considered by planners, land managers and contractors when planning any operations.

4.3 Please contact your local council or land management agency if there are local policy or regulatory constraints.

4.4 The guide provides what is considered best practice based on the current information and uses risk management principles to reduce the likelihood of spread of PA during operations.

## 5.0 Planning Considerations

5.1 Prior to using a vehicle or heavy machinery near kauri, proper planning is required to ensure that you have considered the following factors in reducing the likelihood of contamination onto vehicles and heavy machinery.

- Consider using vehicles or heavy machinery that will do the job but are also easy to clean, such as machines with rubber tyres rather than tracks.
- Undertake operations in dry weather wherever possible to reduce contamination of vehicles and equipment and to make decontamination operations easier. If necessary postpone operations and reschedule when there are drier conditions. Wet soil tends to cling to vehicles and heavy equipment making it easier for PA to be transported.
- Where possible, consider leaving heavy machinery and vehicles onsite for the duration of the job to minimise the risk of introducing kauri dieback each time the vehicles or heavy machinery is brought to the site.

5.2 The following Best Practice Guidelines should be read in conjunction with these guidelines, prior to undertaking any on-site operations.

Best Practice Guideline	Link
Hygiene Procedures for Kauri Dieback	<a href="https://www.kauridieback.co.nz/more/documents-and-resources/">https://www.kauridieback.co.nz/more/documents-and-resources/</a>
Land disturbance activities (incl. earthworks) around kauri	
Tree Removal and Pruning of Kauri	
Landfill disposal of contaminated material	

## 6.0 General Considerations

6.1 All heavy machinery and vehicles should be **free of soil or organic material** when (1) entering and exiting a kauri forest; and (2) entering, moving between and exiting a kauri root zone (Figure 1).

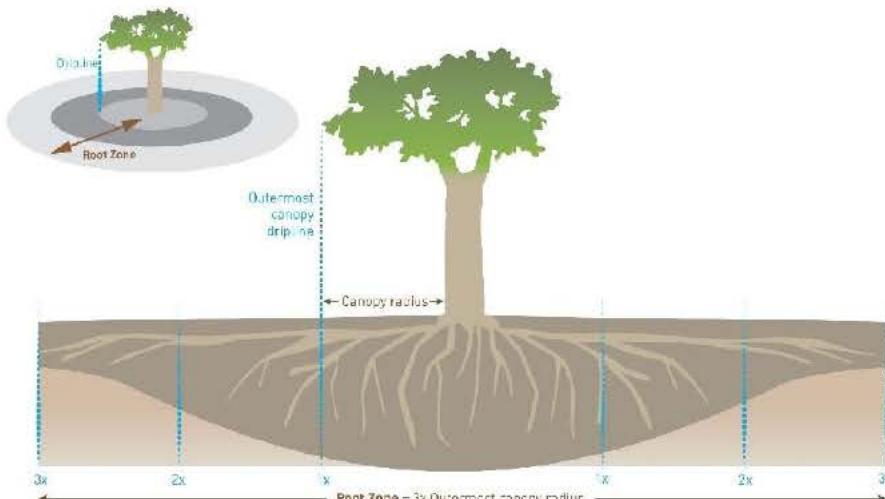
6.2 Upon exiting a root zone, a full wash-down of soil and debris should occur on site prior to movement, thereby containing any problems at the source.

6.3 Alternatively, if this cannot occur then vehicles and heavy machinery may be taken off site and cleaned in a wash-down facility, but all loose soil and debris must be

removed at the kauri site prior to moving and care should be taken to ensure that risk of spread during transport to that facility is minimised.

- 6.4 Soil and organic material cleaned from vehicles and heavy equipment should, where possible, be collected and disposed of appropriately at an approved landfill (see Best Practice Guidelines - Landfill disposal of contaminated material). Alternatively the material can be left in situ at the source.
- 6.5 **Extreme care** should be taken as to not damage the kauri roots when using vehicle or heavy machinery near kauri.

**Figure 1: Root zone of kauri (3 times the radius of the outermost canopy dripline).**



## 7.0 Wash-Down Sites

### 7.1 Site Selection in a kauri forest

- Wash down of vehicles and/or heavy machinery that was used within a kauri root zone should occur within that area where possible.
- If vehicles and/or heavy machinery have been operating outside a root zone, then wash-down should occur prior to exiting a kauri forest.
- The following considerations should be taken into account when selecting a suitable wash-down site:

- Hard-stand area and well-drained surface e.g. a road near the edge, firm grass or gravel.
  - At least 30m away from a water course or water body.
  - An area within the root zone, if use of equipment and vehicles has occurred in this area.
  - Is of gentle slope to drain wastewater away from (1) the wash-down area and into a kauri root zone; (2) water catchment; (3) areas outside the kauri root zone and; (4) vehicles and heavy machinery being washed to prevent potential re-contamination.
  - Enable cleaned objects to exit without being re-contaminated.
  - Undertaking a risk assessment of the site to inform a health & safety risk management plan e.g. working around powerlines.
- Where run-off cannot be managed to an acceptable standard (e.g. large quantity of wastewater and/or an extensive run-off) construction of a bund and sump may be required to safely dispose of the wastewater.
- Commercially available bunds or containment berms are available as temporary wash-down solutions. This will allow the decontamination of heavy equipment and vehicles on site where the wastewater is contained, collected and removed for safe disposal. An example of a portable containment berm in use is in the below link.  
<https://www.nzta.govt.nz/innovations-and-ideas/innovations/decontamination-wash-down-bay-for-geotechnical-investigation-equipment/>
- If wash down cannot occur in the forest then the vehicles and/or heavy machinery should be taken to a suitable facility off site for decontamination.

## 7.2 Off-site facilities

- **Commercial Operators - Vehicle wash facilities (e.g. Petrol stations).**
  - Different commercial operators have different wastewater discharge consents which is dependent on the council by-laws of that area. The commercial operator environmental policy may also place voluntary conditions on the discharge of wastewater from the site. Regardless, a large percentage of the wastewater generated from urban vehicle wash facilities is likely to end up in the reticulated storm water system and then onto waterways.
  - If the wastewater is infected with PA, the discharge consents (ranging from the use of on-site detergents to sediment separators) is unlikely to reduce PA oospore viability. As a result, commercial operators of wash-down facilities can be used, as long as the wastewater from the facility does not drain into catchments running into or near a kauri forest or an area with kauri.
  - A purpose built vehicle wash-down facility instead of an automated washing facility (as seen in petrol stations) is preferred due to the availability of the

facilities equipment to remove contaminants in difficult to reach places such as the undercarriage of vehicles and heavy machinery. An automated wash facility (such as a car wash at a petrol station) may be suitable if soil contamination is in areas of the vehicle where the automated system can effectively remove the soil during the washing process.

- **Truck wash facilities**

- There are a number of truck wash facilities operated by private trucking companies that are used to wash-down cattle or livestock trucks. Some of these companies may be accessible to the public.
- These facilities are **not recommended** where the effluent generated from the wash-down is used to irrigate farmland, hence if the effluent is contaminated with PA, then spread of PA directly onto rural farmland is likely to occur. This applies only to irrigation of farmland close to kauri forests or in catchment areas leading into kauri forests or surrounding areas.

- **Landfills disposal**

- Disposal of soil and organic material at a landfill, requires the truck/trailer unit to be washed down after unloading.
- The majority of landfills recommended in the ‘Best Practice Guideline: Landfill disposal of contaminated material’, have dedicated on-site wash down facilities that can be used for this purpose.

- **Council Depots**

Council depots have wash down facilities however you will need to contact the relevant local government authority to seek permission to use them. As long as the wastewater discharge is away from catchments leading too or near kauri forests, these facilities can be used.

## **8.0 Wash-Down Procedural Guidelines**

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### **8.1 Field - On site**

- If the vehicle or heavy machinery cannot be washed down effectively on site, all loose soil and vegetation should be removed where possible, before it is transported off-site to a wash down facility.
- Attempt to remove as much soil and mud (preferably when it is dry) by first physically removing it using a hard brush or broom or by using compressed air.

- Pay attention to the underside, between dual wheels, sump guards, mud flaps, hollow sections, foot wells, bumper bars. Minimise the amount of water to be used.
- Remove any soil/debris inside the vehicle, particularly on the vehicle floor and workers footwear as well as any tools used to remove the soil/debris at completion of the job.
- If possible, minimise the use of pressurised water in situations where the wastewater is not sufficiently contained and/or the runoff is not controlled.
- If possible, it is advised that vehicles and heavy machinery are washed using a pressurised spray unit (to reduce run-off) and then sprayed with a solution containing 2% Sterigene solution before the vehicle or heavy machinery leaves the area.
- Do not drive through wash-down wastewater as this may re-contaminate the vehicle and/or machinery.
- No dirt or loose soil should be present after wash-down.

#### 8.2 Public & Commercial Facilities - Off site

- A purpose built vehicle wash-down facility is preferred due to the availability of the facilities hand-held equipment to remove contaminants in difficult to access places such as the undercarriage of vehicles.
- Decontaminating off site mainly involves washing down the vehicle and heavy machinery with high pressure water at a wash-down facility and then spraying with a solution containing 2% Sterigene solution.
- Pay attention to the body underside, crevices and ledges, sump guards, mud flaps, hollow sections, foot wells, bumper bars, chassis. Between dual wheels, inside and out, spare wheel.
- Clean interior (floors, mats, under seats).
- Wash wastewater away from vehicle, do not drive through wastewater.
- An automated wash facility at a petrol station won't be effective if undersides and concealed areas are likely to be contaminated with soil but may be suitable if soil contamination is restricted to areas where the automated system can effectively remove the soil.

### 9.0 Loading and transport of material out of an area

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- 9.1 The movement of potentially contaminated loads via vehicle transportation out of an area containing kauri, may result in the spread of the disease if part of the load falls off during transit. A load can be (1) soil resulting from earthworks, (2) wood debris from road maintenance or (3) soil contaminated heavy machinery that are transported on a trailer (that cannot be washed down on site).
- 9.2 Certain practices should therefore be taken into consideration during the loading and transportation of such loads to reduce the risk of accidental exposure of the disease during transit.

- 9.3 Transport vehicle trailers should have sealed sides (or liners installed) to ensure all loads being transported is appropriately contained and leakage from soil or debris is reduced during transit. There may be situations where this is not practical, however every care should be taken to reduce the risk of soil or debris from falling off the transport vehicle.
- 9.4 Liners should be of a suitable thickness and durability to prevent rupture during transport and contain the material sufficiently to prevent any leakage.
- 9.5 Water can be mist sprayed onto soil loads to reduce dust and spillage during transportation.
- 9.6 The liners can be folded over to encompass the entire load and then appropriately secured.
- 9.7 Loads carrying potential contaminated material i.e. soil and/or wood debris shall be transported to one of the recommended landfills listed in the Best Practice Guideline 'Landfill disposal of contaminated material'.

The vehicle (including trailer) should be cleaned after unloading, using the wash-down facilities at the landfill (if available) and the liners subsequently disposed of.

The trailer unit should be sprayed with a solution containing 2% Sterigene solution either at the landfill (if available) or back at the depot prior to re-use.

## References

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## **Kauri Dieback Disease - Tree Removal and Earthworks Procedures**

### **Overview**

Kauri Dieback is a fungus-like disease called *Phytophthora agathidicida*. The disease is specific to Kauri and kills trees of all ages and sizes. It can spread through both water and soil, with soil movement on equipment such as footwear and machinery.

Controls have been implemented at a regional level to attempt to restrict the spread and infection of this disease, including a tree removal and earthworks procedure for both the removal of trees and works in the vicinity of both healthy and infected trees.

### **Tree Removal**

The removal of both healthy and diseased Kauri should be undertaken in accordance with the following procedure:

- Any foliage removed as part of the felling process should remain intact on the site or removed to a Council-approved landfill (Council's biosecurity division has a list of these sites). Where possible, logs should be left whole on site. However, if it is impractical to leave the logs on site, they must be disposed of at an approved landfill.
- Tree stumps should be left in place where possible, or extracted intact and removed to an approved landfill.

- All associated machinery including chainsaws and/or climbing equipment should be inspected for any evidence of soil, and sprayed with Sterigene (Biosecurity approved disinfectant) on arrival at the site, and again before it is removed from site. If it can remain at the site for the duration of the works, that would reduce the number of times such action would be required.

#### **Earthworks and Soil Removal**

- There are strict rules, detailed in the Unitary Plan, pertaining to the prevention of the spread of the Kauri Dieback Disease (*Phytophthora agathidicida*).
- The rule states that the removal of soils within 3 x the particular dripline radius of a New Zealand Kauri tree is restricted. No soil within this zone can be removed from a site, unless it is taken to an approved landfill.
- The Unitary Plan rule: PART 3 - REGIONAL AND DISTRICT RULES» Chapter H: Auckland-wide rules»4 Natural resources»4.2 Earthworks»2. Controls»2.1 Permitted activities»2: states: *To prevent the spread of Kauri Dieback disease, vehicle and equipment hygiene techniques must be adopted so that no soil from earthworks within 3 x the particular dripline radius of a New Zealand kauri tree is transported offsite.*
- When transporting this material from site, the soil should be covered. Once the load has been dumped at the approved site, Sterigene should be applied to the deck surface to prevent any further contamination of future loads or new sites.
- All associated equipment including trucks, diggers and associated equipment in direct contact with soil material should be washed or brushed before leaving site.

If you require any further information relating to Kauri Dieback please contact a Peers Brown Miller Ltd staff member on 09 631 7610 or phone the Kauri Dieback Hotline on 0800 NZ Kauri 0800 6952874