2017 to 2018 Electric Line Clearance (Vegetation) Management Plan

Transmission Operations Australia 2 (Ararat)

Transmission Operations Australia 2

November 27, 2017

Administrator: Wayne Evans

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1 PLAN INTRODUCTION

1.1 PLAN APPROVALS

Prepared By

31/ 03 / 17

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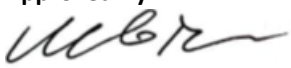
Date

Approved By



31/ 03 / 17

Matt Thorpe
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Date

Endorsed By

31/ 03 / 17

Eric Lindner
CEO Transmission Operations (Australia) 2

Date

Document Revision History			
Version No.	**Revision Summary**	**Reviewer / Approver**	**Date**
1	Submission to ESV	Wayne Evans / Matt Thorpe	**31 March 2017**
1.2	ESV evaluation update#1 ESV evaluation update#2	response to ESV clarifications (Leo Hourigan)	9 June 2017 31 July 2017
1.3	**VP Timeframes** (Policy Attachment C)	**Wayne Evans**	**25 November 2017**

1.2 Plan Alterations

Alterations from the 2015/16 ELCMP

ELCP Clause #	Change/Updated Element	Comments
	Vegetation Management Documents	Updated References ELCMP attachments : •Policy •Procedure •Field Reference Guide
1.3	Definitions	definitions Minimum Clearance Space, Regulated Applicable Distance added

1.3 Plan Definitions

Act: Electricity Safety Act 1998.

Arborist: suitably qualified arborist as defined in Electricity Safety (Electric Line Clearance) Regulations 2015, , who has at least 3 years of field experience in assessing trees

As far as practicable: means an action that which is, or was at a particular time, reasonably capable of being done, effected or put into practice with the available means taking into account and weighing up all relevant matters as determined by TOA2 including:

(i) what we know, or ought reasonably to know, about:
  (i) the nature of any relevant hazard or risk, and
  (ii) ways of eliminating or minimising the risk, and

(ii) the degree of harm that might result from the hazard or the risk

(iii) the availability and suitability of ways to eliminate or minimise the risk

(iv) the impact on amenity, impact on the health of vegetation and cost associated with available ways of eliminating or minimising the risk

(v) whether the impact on amenity, impact on the health of vegetation and cost associated with available ways of eliminating or minimising the risk is disproportionate to the risk.

Code: Code of Practice and related provisions contained in the Schedule of the Electricity Safety (Electric Line Clearance) Regulations 2015.

Consult: Means to provide an adequate opportunity to members of the public, local government and landowners to understand the vegetation works proposed and to seek additional information regarding the proposed works.

ELCMP: Electric Line Clearance Management (Vegetation) Plan relating to compliance with the Code of Practice for Electric Line Clearance for 2017 - 2018.

MCS: Minimum Clearance Space has the same meaning as defined in the Vegetation Management Policy.

Native Vegetation: Native vegetation means plants, trees, shrubs, herbs and grasses that would have been endemic to its current location before European arrival. Native Vegetation excludes plantings, regrowth, vegetation on road reserves, fire breaks and established powerline corridors.

RAD: Regulated Applicable Distance : the distance set out by Part 3 of the Code.

Regulations: Electricity Safety [Electric Line Clearance] Regulations 2015.

Service Provider: a Contractor or Sub-contractor engaged through contractual arrangements with CitiPower and Powercor.

TOA2: Transmission Operations Australia 2 Pty Ltd

TOA2 primary service providers: TOA2 resources and manages the design, construction, operations and maintenance of its network plus manages the provision of its back office services through contractual arrangements with Powercor Network Services and CHED services, part of the Victorian Power Networks

(VPN) Group which also includes CitiPower and Powercor. These contractual arrangements enable TOA2 to utilise the policies, procedures, resourcing and management systems of the VPN Group.

Vegetation Assessor: a person whose qualifications, experience and ongoing training and assessment demonstrate competency in assessing and scoping vegetation near live electrical apparatus. This person determines cutting requirements to confirm compliance for vegetation near live electrical apparatus.

Vegetation Management Documents: the CitiPower and Powercor document hierarchy of Vegetation Management Documents, end-to-end business processes, activities and instructional material for implementation of the ELCMP.

- Policy
- Strategy
- Procedure
- Field Reference Guide

This suite of documents are a reference to this ELCMP and as these are live working documents may be subject to change.

Vegetation Management System (VMS): the CitiPower & Powercor structured set of data to manage vegetation for compliance to the Electricity Safety (Electric Line Clearance) Regulations and corporate strategy.

For other definitions refer to the Act, Regulations and Code.

1.4 Regulation Compliance Information

The purpose of this section in this ELCMP is to provide assistance to quickly cross reference and identify the specific items as required in the Electric Safety (Electric Line Clearance) Regulations 2015, Part 2 Prescribed Code of Practice provisions Section 9.

Item Ref	Regulation Requirement	TOA2 *Plan* Reference
Code of Practice Part 2 Provision 9 clause (3) subclauses (a) – (q) cross reference table		
3(a)	The name, address and telephone number of the responsible person	Responsible Persons, Page 6
3(b)	The name, position, address and telephone number of the individual who was responsible for the preparation of the management *plan*	Responsible Persons, Page 6
3(c)	The name, position, address and telephone number of the persons who are responsible for carrying out the management plan	Responsible Persons, Page 6
3(d)	The telephone number of a person who can be contacted in an emergency that requires clearance of a tree from an electric line that the responsible person is required to keep clear of trees	Responsible Persons, Page 6
3(e)	The objectives of the management plan	Plan Objectives, page7
3(f)	The location to which the management plan applies, by the inclusion of a map	TOA2 Network, page 8
3(g)	The location of areas of containing trees which may need to be cut or removed to ensure compliance with the Code and that are - (i) native; or (ii) listed in a planning scheme to be of ecological, historical or aesthetic significance; or (iii) trees of cultural or environmental significance	3.2 Native Vegetation Coverage, Page 9 Reference B – TOA2 Significant Vegetation Register
3(h)	The means which the responsible person is required to use to identify a tree specified in paragraph (g)(i) (ii) or (iii)	3.4 Important Vegetation Identification Process, page 10

Item Ref	Regulation Requirement	TOA2 *Plan* Reference
Code of Practice Part 2 Provision 9 clause (3) subclauses (a) – (q) cross reference table		
3(i)	The management procedures that the responsible person is required to adopt to ensure compliance with the Code, which must– (i) include details of the methods to be adopted for managing trees and maintaining a Minimum Clearance Space as required by the Code (ii) specify the method for determining an additional distance that allows for cable sag and sway for the purpose of determining a Minimum Clearance Space	3.5 Managing Trees – The Method of Maintaining the Minimum Clearance Space, page 11 3.6 Maintaining the Minimum Clearance Space, page 13
3(j)	The procedure to be adopted if it is not practicable to comply with the requirements of AS 4373 while cutting a tree in accordance with the Code	3.6.1 If practicable to comply with requirements of AS 4373, page 13
3(k)	A description of each alternative compliance mechanism in respect of which the responsible person has applied or proposes to apply, for approval under clause 31 of the Code	nil TOA2 alternative compliance mechanisms
3(l)	The details of each approval for an alternative compliance mechanism that- (i) the responsible person holds (ii) is in effect	nil TOA2 alternative compliance mechanisms
3(m)	A description of the measures that must be used to assess the performance of the responsible person under the management plan	0 Monitoring, page 19
3(n)	Details of the audit process that must be used to determine the responsible person's compliance with the Code	6.2 Auditing, page 19
3(o)	The qualifications and experience that the responsible person must require of the persons who are to carry out the inspection, cutting or removal of trees	4 Training, page 17
3(p)	Notification and consultation procedures, including the form of notice to be given in accordance with the Code	3.8 Notification and Consultation, page 16
3(q)	Dispute resolution procedures	5 Dispute Resolution, page 18
4	A method for determining an additional distance that allows for cable sag and sway may provide for different additional distances to be determined for different parts of a span of an electric line	3.6.2 Process to Establish & Maintain the Minimum Clearance Space, page 13
10(7)	The responsible person must ensure that a copy of the management plan is— (a) published on the Internet site; and (b) available for inspection at the principal office during normal business hours	3.7.2 Available information and Publications, page 166
Code of Practice Schedule 1 Division 1 cross reference table		
2 **3** **7**	Meaning of minimum clearance space Responsible Person must keep minimum clearance space clear of trees Owner or Operator of transmission line must manage trees around minimum clearance space	Primary Service Providers Vegetation Management Policy & Procedure
4 5 6	TOA2 does not intend to apply exceptions & TOA2 does not have any locations under these exceptions	
8	Responsible person may cut or remove hazard tree	3.6.5 Hazard Space, page 14

1.5 Responsible Persons

Primary Service Providers in accordance with contractual obligations provide the ELCMP management services to TOA2.

Responsibility	Name	Title	Address	Contact Details
ELCMP Responsible Person	Eric Lindner	CEO, Transmission Operations Australia2	40 Market Street Melbourne, 3000 **Post to:** Locked Bag	Phone: (03) 9683 2096 Email: elindner@aeoperations.com.au 14090 MCMC Vic 8001
ELCMP preparation	Matt Thorpe	Head of Network Compliance CitiPower /	40 Market Street Melbourne, 3000 **Post to:** Locked Bag Powercor	Phone: (03) 9683 4357 Email: mthorpe@powercor.com.au 14090 MCMC Vic 8001
ELCMP carrying out	Wayne Evans	Vegetation Manager CitiPower /	40 Market Street Melbourne, 3000 Powercor	Phone: 13 22 06 Email: waevans@powercor.com.au
ELCMP reporting	Anwar Qayyum	Project Manager CP/PAL	40 Market Street Melbourne, 3000 **Post to:** Locked Bag	Phone: (03) 9683 4732 Email: aqayyum@powercor.com.au 14090 MCMC Vic 8001
ELCMP Emergency Contact	TOA2/Powercor 24 hour Emergency			Phone: 13 24 12 Refer to "ARTS-ARWF Transmission line near Elmhurst"

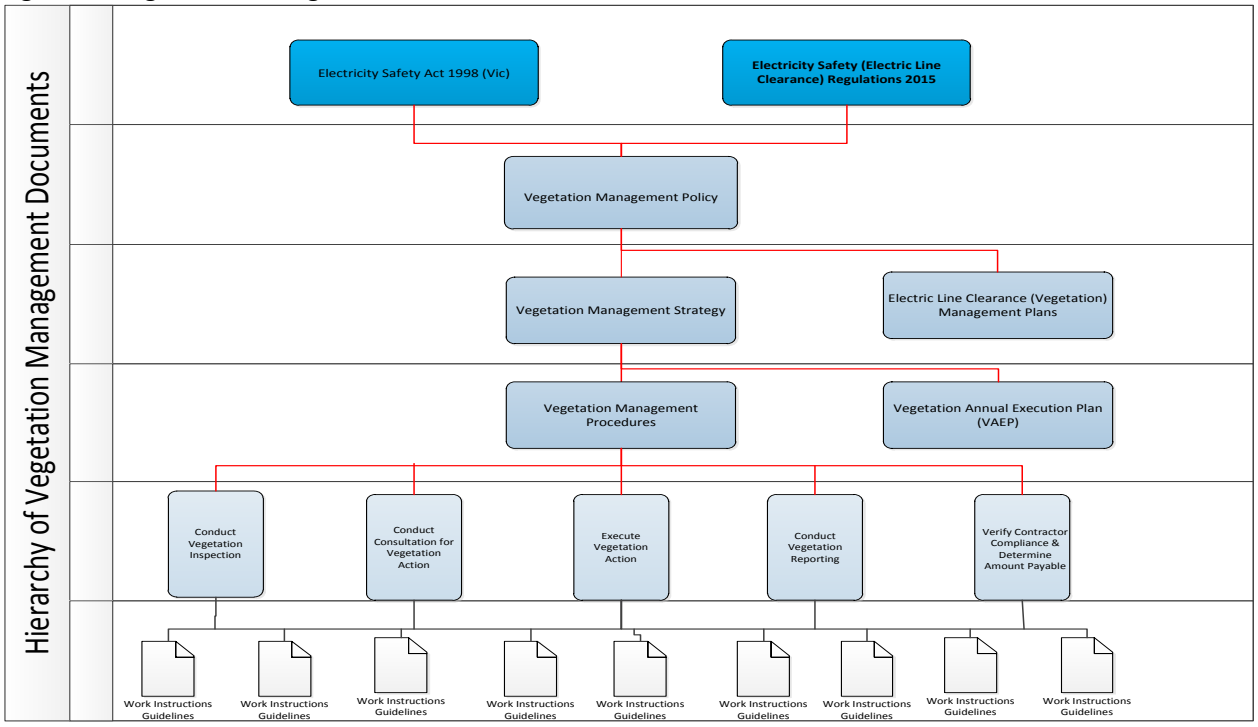
A copy of the current TOA2 Vegetation Management Plan can be viewed at the Transmissions Operations Australia2 offices located at 40 Market Street, Melbourne during normal business hours (9.00 a.m. to 5.00 p.m.).

1.6 Plan References

- Electricity Safety Act 1998 (Vic) (The Act)
- Electricity Safety (Electric Line Clearance) Regulations 2015 (Vic)
- Industry Guidelines
- CitiPower and Powercor Customer Action and Response System (CARE)
- Environment Protection and Biodiversity Conservation Act 1999 (Cth)
- Flora and Fauna Guarantee Act 1988 (Vic)
- Victorian Planning Provisions and Planning Schemes
- Pruning of Amenity Trees AS4373(current version)
- Powercor Bushfire Mitigation Strategy Plan
- CitiPower and Powercor Vegetation Management Documents
  - Policy
  - Strategy
  - Procedure
  - Field Reference Guide

Figure '1' describes the hierarchical structure of the Powercor and CitiPower Vegetation Management Documents for key processes, end-to-end business procedures, activities and instructional material for implementation of the ELCMP.

Figure 1 – Vegetation Management Documents



The vegetation management plan shall be updated annually to ensure the plan is consistent with all relevant regulations, is relevant to the needs of the community and considers all business drivers.

The business compliance tracking tool ensures regulatory obligations including the ELCMP is completed. The TOA2 ESMS 2016 (Section 02 Management Structure) provides currency of regulations.

2 PLAN OBJECTIVE

This Plan has been prepared to comply with the requirements of the Electricity Safety (Electric Line Clearance) Regulations 2015. The objective of this Plan is to describe management procedures to comply with the regulations and to achieve the vision. An annual review of all regulation changes will be conducted prior to submission of the plan each year.

2.1 VISION

To minimise the risks to the community and the environment caused through the interaction of trees and powerlines.

We will support this vision by attention to our mission and instilling the following values:

- Live safely
- Drive and embrace change
- Be community minded
- Make it easy for our customers
- Be the best we can be
- Succeeding together

2.2 MISSION

To ensure that the Minimum Clearance Space is maintained in accordance with the Code for the period of the pruning cycle detailed in 3.6.3.

At all times these activities will be carried out with attention to:

- Minimising the risk of fire starts
- Ensuring public safety
- Ensuring electrical safety
- Ensuring private property security
- Ensuring continuity of supply
- Delivery of quality service
- Responsible Environmental Management
- Commitment to work place safety
- Minimising of community cost
- Consultation/Notification
- Reduction in number of inappropriate species of vegetation near powerlines

Monitoring critical performance outcomes for these activities is by established Key Performance Indicators.

The outworking of the Vision and Mission are explained in more detail in this Plan.

3 MANAGEMENT PROCEDURES

3.1 TOA2 ELECTRICAL OVERHEAD NETWORK

The TOA2 electrical overhead 132kV transmission line covers approximately 21 kilometres from the Ararat Windfarm collector station to the Ararat Terminal Station (ARTS) and the line to the 220kV connection at ARTS for the incoming 220kV lines from Horsham Terminal Station (HOTS) and Waubra Terminal Station (WBTS). All assets are located in a Hazardous Bushfire Risk Area. Fire & Non Fire Area is recorded against each pole asset in the vegetation database and available to all personnel in the field. TOA2 manages vegetation in the vicinity of transmission lines as required under Section 84 of the Act.

Figure 2a – the location of TOA2 Ararat Terminal Station ARTS (near the town of Elmhurst, Victoria)

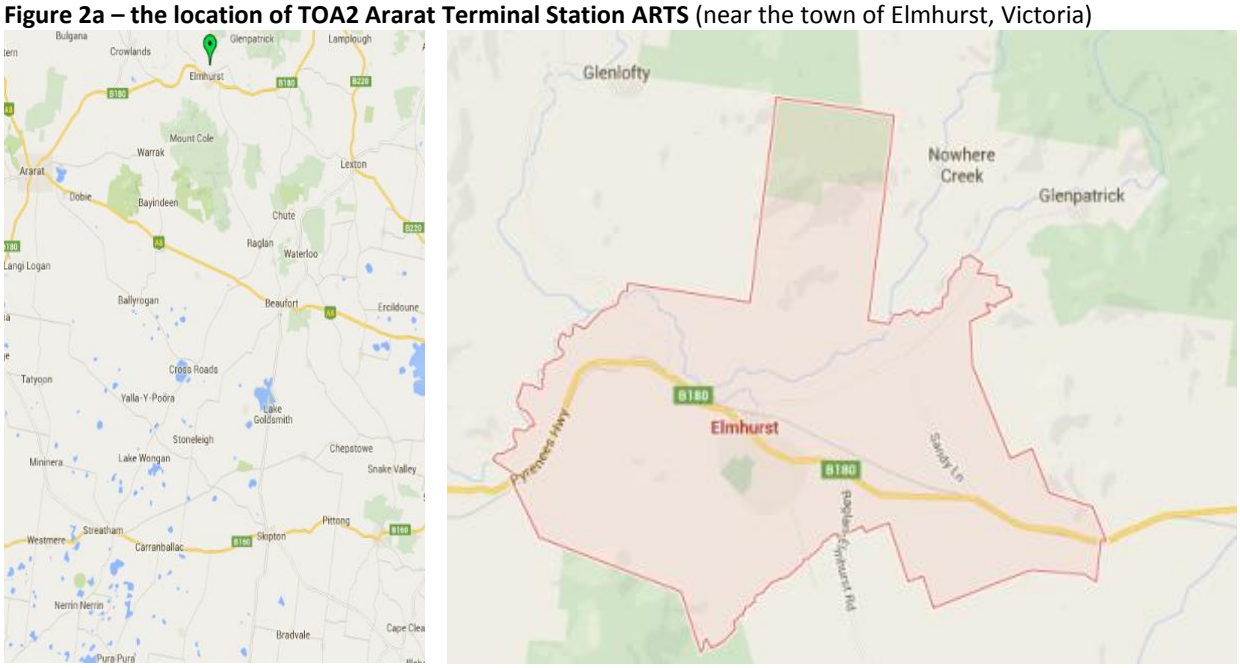
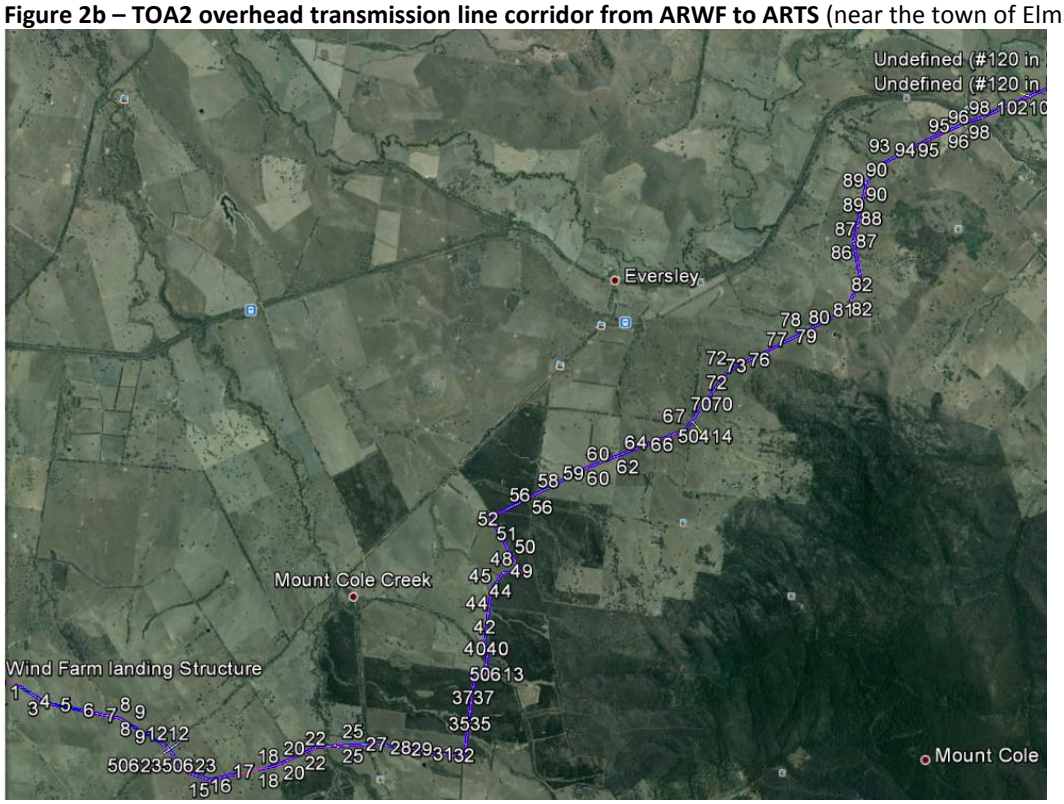


Figure 2b – TOA2 overhead transmission line corridor from ARWF to ARTS (near the town of Elmhurst, Victoria)



3.2 Native Vegetation Coverage

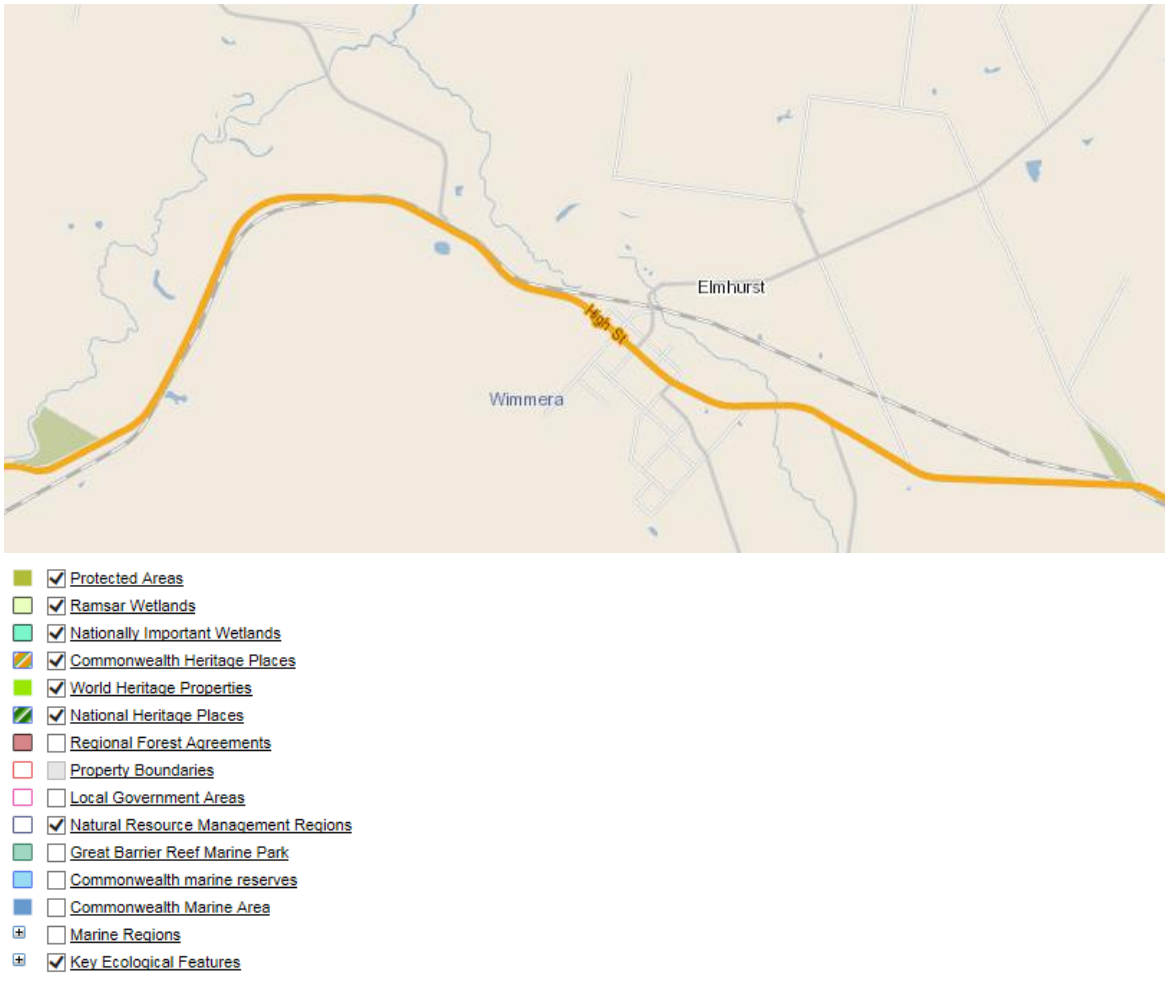
TOA2 is contained in a relative confined area so only has restricted areas of native vegetation, locations and categories shown in Figure 3.

More detailed information relating to local coverage can be found at the DSE Biodiversity Interactive website at the following link: http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim which has been overlayed onto the Powercor Google Earth Enterprise application.

Local coverage of nationally significant vegetation can be found using the Protected Matters Search tool at the Australian Government Department of the Environment website at the following link: http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/protected

TOA2 will as far as practicable restrict cutting or removal of native vegetation to the extent necessary for continuous compliance with Part 2 and 3 of the Code and in accordance with the outlined vegetation clearance cycles shown in Clause 3.6.3.

Figure 3 –Vegetation Coverage Categories



3.3 Important Vegetation Coverage

Important Vegetation is defined in this Plan as trees and vegetation (in locations) which may need to be cut or removed to ensure compliance with the Code and that are:

(i) listed in a planning scheme to be of ecological, historical or aesthetic significance; or
(ii) trees of cultural or environmental significance

The location of important vegetation that is identified as a result of **3.4 – Important Vegetation Identification Process** is registered in the Significant Vegetation Register which is individually linked at span level in the Vegetation Management Database.

Where provided, this database is made available directly to the Vegetation Assessors to ensure that all important vegetation is identified at the inspection stage prior to any cutting or removal works. The current Significant Vegetation Register is listed in REFERENCE B – TOA2 SIGNIFICANT VEGETATION REGISTER. This information in Reference B is correct at the issue date of this Plan and subject to change following the continued outworking of **3.4 - Important Vegetation Identification Process.**

3.4 Important Vegetation Identification Process

The Primary Service Provider's Vegetation Management Procedure –Manage Vegetation Action Sec.4.1 Compile Work Package Process Outline Step 2 environmental due diligence will be used to identify important vegetation.

Purpose
This procedure outlines the process to be employed to ensure important vegetation located within the vicinity of powerlines is identified and given special consideration when pruning or clearing of vegetation is proposed to ensure compliance with the Code.

Scope
This procedure applies to all persons associated with the vegetation management program.

Procedure
TOA2 shall determine the location of important vegetation by consulting:

- Government records, including –
  - The Victorian Heritage Register
  - The Victorian Aboriginal Heritage Register
  - Department of the Environment and Primary Industries, Flora and Fauna Guarantee Act 1988, Threatened Species List
  - The DEPI Biodiversity Interactive Mapping Website
  - Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), List of threatened flora, List of threatened ecological communities, List of threatened fauna and the Protected Matters Search Tool website, and
- Council records, including the relevant zoning and overlay controls in the planning scheme.

Municipal Councils and Public Land Managers are contacted to obtain specific locations of vegetation that may require pruning or clearing under the Regulations, that is;

(a) specified in a relevant planning scheme to be of ecological, historical or aesthetic significance; or
(b) of cultural or environmental significance as defined in the Regulations;
(c) nationally environmentally significant and listed under the Environment Protection Biodiversity and Conservation Act 1999 **(Nationally significant vegetation)**; or
(d) the habitat or rare or endangered species

Pruning/clearing of these trees will only be completed after consultation with the Tree Owner in relation to the regrowth of that vegetation to avoid and minimise any impacts on this vegetation. Consultation with local government authorities of TOA2 vegetation work programs is detailed in 3.8.

Nationally significant vegetation will not be cleared, pruned or otherwise impacted without first deciding whether the activity requires referral and approval from the Department of the Environment, and obtaining any requisite approvals.

Where pruning/clearing of a tree that has been identified as habitat for fauna listed as either;

a) threatened in accordance with section 10 of the Flora and Fauna Guarantee Act 1988 or
b) listed in the Threatened Invertebrate Fauna List with a conservation status in Victoria of vulnerable", "endangered" or "critically endangered" or
c) listed in the Threatened Vertebrate Fauna List with a conservation status in Victoria of “venerable”, “endangered” or “critically endangered”;

then pruning or clearing of the tree will be undertaken outside of the breeding season for that species. Where it is not practicable to undertake cutting or removal of the tree outside of the breeding season for that species, translocation of the fauna will be undertaken wherever practicable.

If there is proposed pruning/clearing of a tree or vegetation that has been identified as habitat for fauna listed in the EPBC Act List of Threatened Fauna as "vulnerable", "endangered", "critically endangered" or "extinct in the wild" **(Nationally significant habitat)**, then that nationally significant habitat will not be cleared, pruned or otherwise impacted without deciding whether the activity requires referral and approval from the Department of the Environment, and obtaining any requisite approvals.

All details of these outcomes will be electronically recorded in the vegetation management’s spatially referenced database to ensure appropriate consideration is made to manage the MCS. TOA2 only records species or categories for vegetation identified in this process.

The database which holds this information is made available directly to the Vegetation Assessors to ensure that important vegetation is identified at the inspection stage prior to any clearing works. The information is recorded the Significant Vegetation Register (refer REFERENCE B – TOA2 SIGNIFICANT VEGETATION REGISTER which is based on source information from the project proponents original planning permit and website links listed in Reference B).

TOA2 shall consult with those responsible for the important vegetation prior to commencement of works to determine the most effective way of protecting affected vegetation, while maintaining public safety. Alternatives to tree clearing and pruning shall be determined in accordance with the procedure outlined in 3.5 Managing Trees – The Selection of the Method of Maintaining the MCS.

3.5 Managing Trees – The Selection of the Method of Maintaining the Minimum Clearance Space

The Primary Service Providers Vegetation Management Procedure – 2. Vegetation Inspection will be used to conduct inspections in a timely and financially sustainable manner to select the method of maintaining the MCS.

Purpose

To outline the procedure to be employed when identifying:

- locations where vegetation is likely to encroach into the MCS prior to the next nominated pruning period, and
- the selection of the method to maintain vegetation clearances between transmission lines and trees.

This is expected to achieve the most appropriate solution to avoid and or minimise the adverse effects of electric lines on surrounding vegetation.

Scope

This procedure applies to all persons associated with the vegetation management program.

Procedure

As part of the cyclic program, an inspection of each site is conducted by the Vegetation Service Provider to determine the most effective method of maintaining the MCS between vegetation and transmission lines. Figure 4 Selection of the Method of maintaining the MCS outlines the evaluation and decision making process to be undertaken.

In making these long term evaluations and before deciding on the most appropriate method, due consideration is given to the site's specifics, including the following:

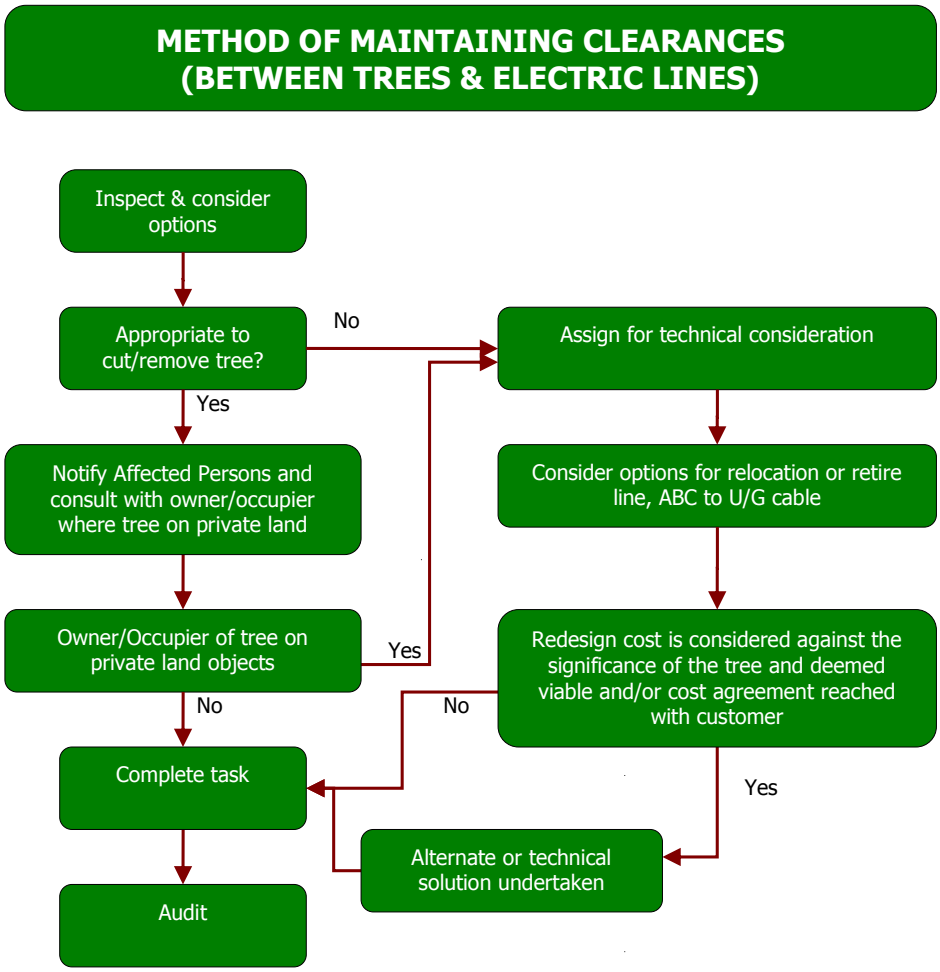
- the significance as obtained in procedure 3.4 – Important Vegetation Identification Process.
- the significance and public value of the site's aesthetics
- the impact on the tree's amenity and utility value if subjected to pruning versus removal
- the sites suitability to accept more appropriate species as replacements
- opportunity to replace with a more suitable species over time
- the environmental impact of proposed works
- determining the most appropriate method of actioning the offending vegetation concerned

The information gathered during these inspections, forms the basis of the TOA2 plan of action and allows:

- appropriate planning and scheduling
- identification and quantification of equipment and accredited personnel required
- funding arrangements
- notification under the Code.

When considering alternate methods of maintaining vegetation clearances, the costs are calculated using actual costs of constructing the alternative with an allowance for saving in present day dollars of future tree clearing costs avoided.

Figure 4 - Selection of the Method of Maintaining the Minimum Clearance Space



3.6 Maintaining the Minimum Clearance Space

3.6.1 If practicable to comply with requirements of AS 4373

This process applies to determine the most appropriate method of actioning the vegetation. As far as practicable TOA2 will prune in accordance with the current version of AS4373 (Pruning of Amenity Trees). Consultation based on the evaluation and decision making process outlined in Figure 4 and the Primary Service Providers Vegetation Management Procedure 5. Affected Persons – 5.1 Consultation and Negotiation Work Instruction Process Outline flowchart will be carried out where the Standards principles cannot be utilised, for example, in some instances, pruning in accordance with AS4373 may limit the ability to achieve MCS requirements or could lead to excessive pruning. Personnel are made aware of the organisations definition of "as far as practicable" and how this would apply via the Primary Service Providers Field Reference Guide.

3.6.2 Process to Establish and Maintain the Minimum Clearance Space

The Primary Service Provider's Vegetation Management Procedure - 4. Manage Vegetation Action will be used to establish and maintain the vegetation Minimum Clearance Space.

The Primary Service Provider's Vegetation Management Procedure – 2. Vegetation Inspection Process Outlines: Lidar vegetation inspections & Ground-based vegetation inspections will be used to select the method of maintaining the Minimum Clearance Space. As part of the cyclic program, an inspection of each site is conducted by the Primary Service Provider to gather information to determine the most effective method of maintaining the vegetation Minimum Clearance Space.

The Primary Service Providers Vegetation Management Documents – the Policy (Reference C) specifies the MCS definition that will be used for determining an additional distance that allows for cable sag and sway for the purpose of determining a Minimum Clearance Space using the Primary Service Provider's Vegetation Management Procedure – 9.3 Vegetation Clearance Charts, including TOA2 transmission clearances to maintain transmission line MCS compliance to the requirements of this Plan and Electric Line Clearance Regulations. The method for determining the additional distance for sag and sway is based on the characteristics of the conductor such as the voltage, stranding, conductor material, design temperature and the maximum side swing of the conductor.

Purpose

The purpose of this procedure is to define the process and levels of compliance to be employed to create and maintain the required MCS (surrounding electric lines) free of vegetation in accordance with Part 2 of the Code. The maintenance of the MCS is managed in accordance with the Electricity Safety (Electric Line Clearance) Regulations 2015 and this plan.

Scope

This procedure applies to all persons associated with the vegetation management program.

Procedure

The TOA2 process for maintaining the Minimum Clearance Space is structured into segments covering; inspection, non-compliance rectification pruning, database coding and performance monitoring.

The process is designed to achieve and maintain defined compliance at all times.

- In determining the location where work will be required to maintain the MCS, the Vegetation Service Provider makes use of the inspection program, including the Primary Service Provider's HBRA program of annual inspections utilised to verify HBRA summer preparedness, a cyclic program targeted to address specific locations to maximize the long term vegetation clearance opportunities to maintain compliance at all times.
- Associated program of audits by the Primary Service Provider, and
- Reports from the public on areas of concern.

At each location the Vegetation Service Provider will determine the most appropriate method of maintaining the vegetation clearance between transmission lines and vegetation in accordance with Figure 4: Selection of the Method of Maintaining the MCS.

Required clearance space measurements are determined having regard to the minimum clearances space distances in the Powercor Vegetation Procedure, include an allowance for the sag and sway of the particular conductor, span length under maximum wind loading (where not specified in the Code), and vegetation regrowth.

Technical calculations may be undertaken on individual spans and/or trees to determine specific requirements for unique situations. If pruning and clearing is deemed to be the most appropriate method then tree trimming and clearing will be scheduled in the Powercor vegetation work program.

3.6.3 Pruning Cycle

TOA2 shall determine the Pruning Cycle at each locality based on growth rates of individual species, vegetation clearances achieved and consultation with owners/occupiers under clause 17 of the Code. The achievement of the targeted pruning cycles may be varied depending on the outcome of these factors.

TOA2 aims to achieve the Minimum Clearance Space requirements. The targeted pruning cycle is 3 years.

3.6.4 Re-Growth Space

The Vegetation Service Provider in consideration of the MCS dimensions determines the Re-growth Space at each specific location by:

- The Pruning Cycle
- The vegetation's species and likely vigor e.g.
  - Fast Growing Species – Eucalyptus and Acacia
  - Medium Growing Species – Casuarinas and Lophostermon
  - Slow Growing Species – Melaleuca and Leptospermum

The application of appropriate pruning standards may over-ride simplistic calculated re-growth measurements. In practice, vegetation clearance distances are a combined total of the Minimum Clearance Space, including individually calculated sag & sway based on actual conductor type and span length with a regrowth allowance then trimming to growth points.

3.6.5 Hazard Space

The Hazard Space is inspected as part of the cyclic inspections of the network. Vegetation that can contact the line if it fails (Hazard Tree), or provides potential high fire fuel loads is assessed. Hazardous vegetation typically could be;

- Dead and dangerous limbs
- Physical defects in trees
- Other trees or limbs that may be unstable and could fall on the powerline under the range of weather conditions that can be reasonably expected to prevail in the locality.
- Dense shrub/tree growth present, long thick grass, weed infestation

When required, using the Primary Service Providers Vegetation Reference Guide for reference, hazardous vegetation is evaluated by an Arborist appropriately qualified to National Certificate Level IV in Horticulture & Arboriculture who has at least 3 years field experience in assessing trees.

Hazardous vegetation is recorded in the database for evaluation by an Arborist and if the Arborist assessment under Schedule 1 clause 8 confirms the imminent likelihood of contact with an electric line having regard to foreseeable local conditions the database is updated using the Primary Service Providers Vegetation Management Procedure – 2. Manage Vegetation Inspection.

While every attempt will be made to identify hazardous vegetation, all vegetation within the vicinity of powerlines has the potential to be hazardous and it is not practical or environmentally acceptable to remove all potential hazardous vegetation. During the routine clearance and pruning works, or under emergency situations, hazardous vegetation will be addressed to ensure that the clearance, re-growth and hazard spaces remain clear of foreseeable hazards.

Hazard Trees will be managed in accordance with clause 8 of the Code. Hazardous vegetation will be referred to Energy Safe Victoria, for direction, where agreement to remove cannot be reached with the Affected Person.

3.6.6 Urgent Cutting/Removal

Urgent cutting or removal can be undertaken in the following circumstances –

- As a result of encroachment or growth that was not anticipated in the management plan
- As a result of a tree falling or becoming damaged and entering the MCS
- If an arborist's assessment confirms the imminent likelihood of contact with electrical assets
- During the fire danger period declared under the Country Fire Authority Act 1958
- Cutting will be in accordance with clause 13.2 of the Code

Affected person/s shall be notified as soon as practical after urgent pruning has been undertaken using the Notification Letter – Reference A, records of pruning are maintained in the vegetation management database. This will be carried out in accordance with section 18 of Schedule 1 of the Code. The MCS in accordance with clause 13.2 of the code for urgent cutting is communicated in the Work Package issued to cutting crews.

Urgent cutting is actioned in accordance with the Powercor Vegetation Management Policy - Reference C which provides for timely rectification. The Primary Service Providers Vegetation Management Procedure Affected Persons –6.1 Consultation and Negotiation Work Instruction Process Outline Step 2 will be used to ensure notification occurs as soon as practical following urgent cutting or removal.

3.7 Assistance to Responsible Persons and the General Public

Purpose

This procedure outlines the process to be employed to ensure that TOA2 is able to provide advice to the general public about vegetation near transmission lines.

Scope

This procedure applies to all persons associated with the vegetation management program.

Procedure

TOA2 shall inspect its own transmission lines in accordance with the procedures set out in this Plan and other TOA2 documents. TOA2's vegetation work programs are communicated to Local Government Authorities and other Affected Persons, to ensure that tree clearing activities are coordinated and rationalised.

3.7.1 General Assistance

TOA2 is able to assist the general public with any queries regarding the management of vegetation clearances in close proximity to TOA2 transmission lines. In conjunction with the established TOA2 vegetation management programs, other long term strategies to minimise the risk to the safe operation of electric lines due to vegetation that is likely to grow into or encroach on the MCS include;

- **Communications and Direct Assistance** - The outworking of a communication program with Councils by letter or face to face meetings to discuss local or specific issues relating to compliance with the Code.
- **Unsuitable Species Identification** – TOA2 can provide information to the public on the planting and the maintenance of vegetation near transmission lines. Planting of inappropriate species near transmission lines significantly adds to the cost of complying with the Code and increases the exposure of future contact between vegetation and transmission lines. Where inappropriate species are planted near or under transmission lines, negotiations will be carried out with the Affected Person to remove any vegetation which may at some time in the future enter the MCS.

3.7.2 Available Information and Publications

TOA2 provides information and advice regarding tree owner's rights and responsibilities and a dispute resolution process as well as answer general enquiries. Customers can call the free call number below.
A copy of the current TOA2 Vegetation Management Plan, other publications and brochures containing information relating to vegetation and industry regulations are also made available. These include;

- Planting Trees near Power Lines - a guide for Home gardens and Rural Properties,
- Private Overhead Electric Lines (Understanding your responsibilities)
- Powerlines and Your Property and "No Go Zone" brochures

The ELCMP and general advice is publicly available on the Transmission Operations Australia website.
http://www.toaust.com.au/aboutus/corporatedocuments

Transmission Operations Australia	**General Enquires 1300 543 949 (24 hours)Ask for Anwar Qayyum or Wayne Evans during business hours (8:30am to 5:00pm). Alternatively log a call for a return phone call within 24 hours.**

3.8 Notification and Consultation

Purpose
This procedure outlines the process to be employed by TOA2 to notify persons affected by pruning or clearing activities.

Scope
This procedure applies to all persons associated with the vegetation management program.

Procedure
TOA2 must decide how to maintain clearance between transmission lines and trees so that the MCS remains free of vegetation in accordance with procedure: **Managing Trees – The Selection of the method of Maintaining the Minimum Clearance Space**. However, this does not preclude Affected Persons from negotiating conditions under which other solutions may be used. The Affected Persons at each location shall be determined by TOA2 by the Primary Service Providers Vegetation Management Procedure – Conduct Affected Persons Consultation.

Consultation shall be carried out for the cutting or removal of all trees, consultation will be conducted in accordance with clause 17 of the Code of practice as follows:

A minimum of 14 days and not more than 60 days' notice, in writing or by publication in a newspaper circulating generally in the area, will be given to all Affected Persons prior to works commencing in accordance with Schedule 1 clause 15 and clause 16 of the Code of Practice. Should cutting not occur within the requested notification period renotification will occur.

Where the tree intended for pruning/clearing is a tree of cultural significance or national, state or local environmental significance TOA2's Primary Service Provider will notify the affected person/s of details of the impact of the cutting or removal of the tree and actions taken to minimise the impact. Each of these situations will be subject to specific negotiation and notice following negotiation will be in writing and will be tailored to suit the individual situation and meet the regulatory requirements.

Each of these situations will be subject to specific negotiation and notice following negotiation will be in writing and will be tailored to suit the individual situation and meet the regulatory requirements.

If emergency clearing is undertaken, the responsible person or landowner shall be notified as soon as practicable after the event in accordance with Schedule 1 clause 18 of the Code. Copy of a typical notification notice is shown in REFERENCE A – EXAMPLE NOTIFICATION LETTER.

4 TRAINING

The qualifications, training and experience of all TOA2 employees and contractors undertaking vegetation management activities shall be appropriate for the task they are to perform.

Training requirements are agreed in the joint VESI™ and are documented in the VESI Vegetation Management Guideline published at www.vesi.com.au. Vegetation Workers are "authorised persons" as referred to in the Electricity Safety (Installation) Regulations 2009 r.318 & r.319.

In addition to the VESI requirements TOA2 require Vegetation Workers who will be classified as Ground Crew will require a Certificate II in ESI–Powerline Vegetation Control. The following table outlines the Units of Competency required to be undertaken for the Vegetation Ground Crew role. All Mandatory (M) units of competency shall be completed to undertake the role. Other units of Competence may be required to fulfil the role and the task being undertaken.

Legend

M - Mandatory

A - Additional - If worker requires this training for the works being performed

	Qualification / Competency Standard Unit (CSU) number	**Ground Crew**
Qualification		
Certificate II in ESI - Powerline Vegetation Control	UET20312	M
Certificate II Powerline Vegetation Control – Core Competency Standard Units		
Apply Occupational Health Safety regulations, codes and practices in the workplace	UEENEEE101A	M
Comply with sustainability, environmental and response policies & procedures	UETTDREL13A	M
Working safely near live electrical apparatus as a non-electrical worker	UETTDREL14A	M
Operate and maintain chainsaws	AHCARB205A	M
Plan the removal of vegetation up to vegetation exclusion zone near live electrical apparatus	UETTDRVC23A	M
Monitor safety compliance of vegetation control work in an ESI environment	UETTDRVC27A	M
Certificate II Powerline Vegetation Control – Elective Competency Standard Units		
Operate specialist equipment at ground level near live electrical apparatus	UETTDRVC31A	M
Fell small trees	AHCARB202A	M
Apply chemicals under supervision	AHCCHM201A	M
Operate machinery and equipment	AHCMOM304A	M
Operate a mobile chipper/mulcher	FPIHAR2206B	A
• Workers classified as Ground Crew to be trained annually in Safe Approach Distances – Vegetation Work. • All Vegetation workers to be trained in Maintain safety at an incident scene (PUAOHS0002B)		

Training requirements are confirmed as meeting the agreed industry and TOA2 standards prior to a Vegetation worker commencing work on the Network and in system audits.

Annual training includes refresher training for the Vegetation Reference Guide for compliance with the Regulations and this Plan as far as reasonably practical.

Prior to a Vegetation worker commencing work the employer submits evidence of all training requirements and this is verified. System Audits are undertaken to verify that Vegetation workers training records are being maintained and are current. TOA2 will engage individuals as "under supervision" to enable them to be assessed as competent to perform a given task or while training is being completed. Individuals will attend all training applicable for the role and be deemed competent by a Training Provider. Evidence to demonstrate

competence, including Statement of Attainment, Certificate of Completion, will be provided to Powercor and when all valid evidence is provided the “under supervision” will be removed.

Any person without appropriate training will be removed from site by as detailed in TOA2 ESMS 2016 (Part 3 Section 09 Incident Reporting).

5 DISPUTE RESOLUTION

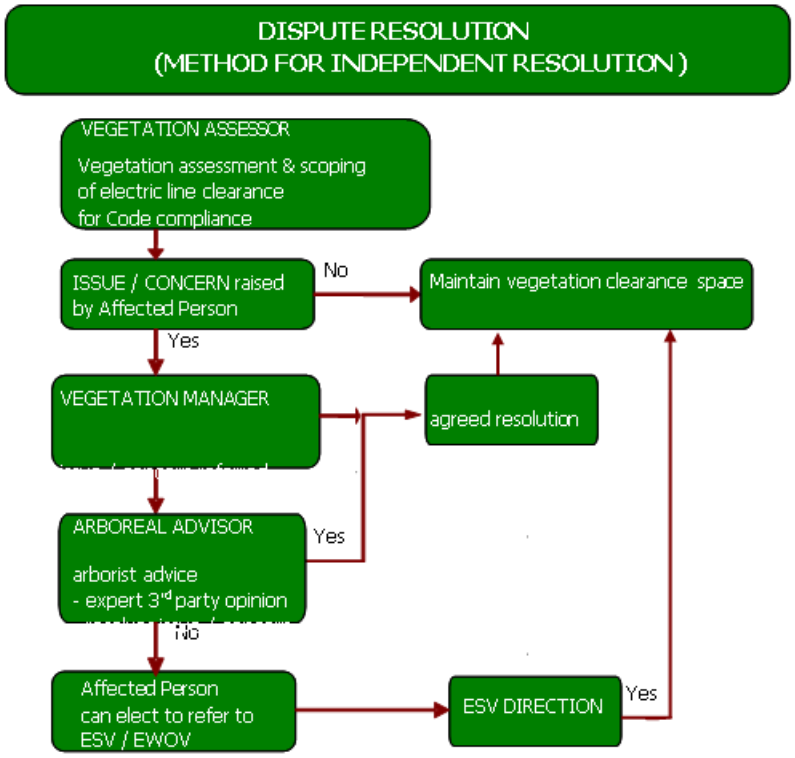
TOA2 will provide suitable contact details including; name, position and telephone number on individual notices provided to all Affected Persons. This is expected to be the first point of reference if the Affected Person feels the need to follow up on an issue or concern. If the Affected Person does not have these contact details or is unable to contact the person nominated, they may contact TOA2 as nominated in 1.5 - Responsible Persons to obtain the appropriate first level of contact to address their concern and/or resolve the dispute.

Where a dispute cannot be settled by the Vegetation Assessor (VA) the matter shall be referred to the Vegetation Manager.

Reference to Arboreal Advisers - While all Vegetation Assessors have had training in tree identification, pruning techniques and tree physiology some special situations may require greater expertise. Advice may be sought from an arborist where the dispute requires an expert third party opinion on a matter relating to the tree or trees in question. TOA2 refers to a number of expert arborists who are widely respected in academia and industry.

If intervention by the Vegetation Manager does not resolve the dispute, the land owner or occupier may choose to refer the case to Energy Safe Victoria or The Energy and Water Ombudsman, as appropriate, to assist resolve the matter. If the non-completion of the disputed work presents an immediate fire or safety risk, TOA2 may be obliged under Clause 14 of the Code, in accordance with Clause 13.2, to enter the property and complete the work.

Figure 5 – Dispute Resolution flowchart



If the landowner or occupier has any concerns with TOA2 vegetation management issues can be escalated by this dispute resolution process.

6 MONITORING AND AUDITING

The Primary Service Provider's Vegetation Management Strategy confirms;

- Details of audit sample sizes
- The auditing process to verify completion of inspection and rectification pruning to the requirements of the plan
- The use of corrective actions in the event inadequate performance is identified

6.1 MONITORING

TOA2 undertakes regular performance and compliance monitoring of the Vegetation Service Provider. This is structured around monthly Operational Meetings and quarterly Strategic Management Meetings. A set of specific contract Key Performance Indicators (KPIs) and reportables have been established to monitor various critical performance outcomes and business deliverables. These measures are identified in the table below.

Key TOA2 performance measures include:

Performance Measures			
Transmission Line Compliance	**Line**	All spans will be inspected prior to the fire season declaration date	100%
Transmission Line Compliance	**Line**	All non-compliant and current year Vegetation Codes action within current calendar year or as agreed.	>100%

6.2 AUDITING

TOA2 CEO has the overall responsibility of the Electric Line Clearance Plan implementation and auditing and the Head of Network Compliance is responsible for comprehensive auditing of the vegetation management process including compliance to the requirements of this Plan, the Code & Electric Line Clearance Regulations and has identified the key risks associated with the delivery of the Vegetation Management service and their associated control measures. Using this information an annual audit schedule has been created; Vegetation Management Procedure 9.2 & Vegetation Quality Review Schedule.

Audits associated with, but not limited to, OH&S Systems, Environmental Management Systems, Quality Control and Traffic Management Procedures, are conducted. These are further supported by field verification and compliance monitoring audits.

Audits are conducted by personnel who have suitable audit training and background. External specialist resources, which are experienced and have appropriate expertise in the relevant field, may be engaged to assist. An annual review involving the service provider, Powercor and TOA2 senior management is also conducted.

The audit schedule is reviewed annually to address any changes in business requirements, concerns from previous years, and the Vegetation Service Provider's performance history.

There are broadly four different types of audits within the schedule, relating to;

- Health and Safety – Safe work methods (e.g. General work methods, working near powerlines and tree clearing methods), equipment vehicles and plant, inductions, training and authorisation, traffic management.
- Compliance – General inspection and cutting compliance with programs, hazardous trees, stakeholder and defect management.
- Procedure/Work Instruction – Policies, work instructions, procedures, customer notification, data management and accuracy, reporting and documentation.

- Environmental – Important or significant vegetation, chemicals, weeds, noise, pruning technique and quality.
- System Audit – Conducted by Audit Services.

The audit process considers actual performance and outputs and then compares them against planned performance and expected outputs. Where a variation occurs the item is noted and followed through to ensure corrective actions are taken and improvement opportunities are factored into plans to enhance future performance.

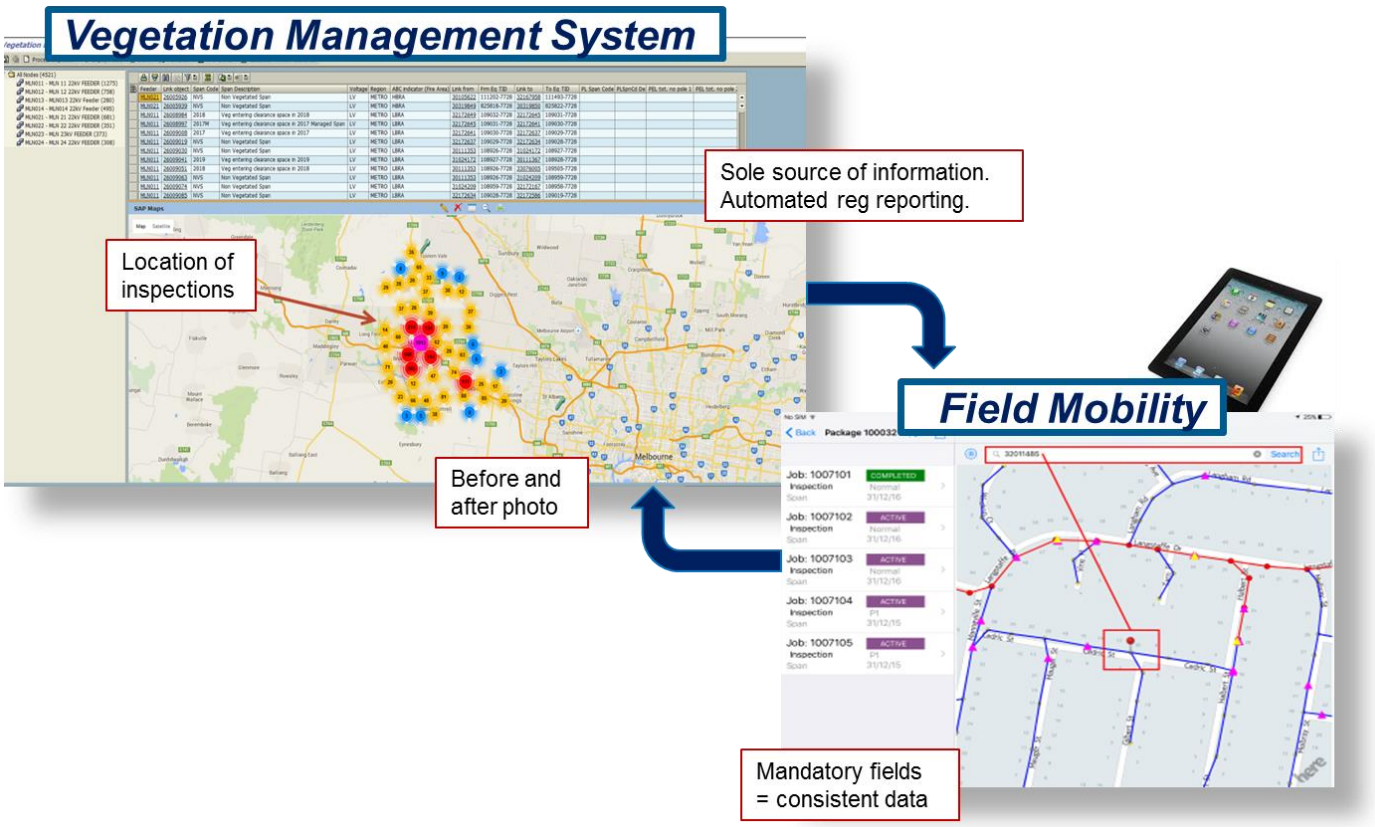
Service Providers' operate their own internal audit program which targets the following key areas –

- Felling Techniques
- Tree Climbing
- Herbicide
- Tipper/Chipper Use
- Tree Clearing from EWP
- Vehicles (Pre-summer)
- PPE
- Hearing Conservation
- Limits of Approach
- Worksite Traffic Management
- Hazard Assessment Controls (HAC Sheet)
- Manual Handling

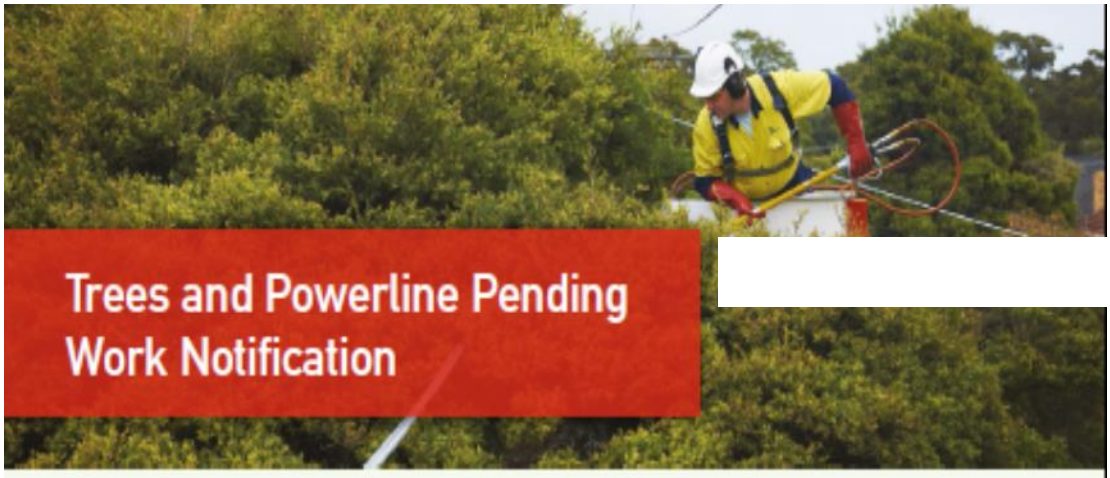
The results of these audits are provided to TOA2.

7 Vegetation Management System overview

The Vegetation management system ('VMS') is an IT mobility solution based on the overall network SAP database providing a sole source of information.



REFERENCE A
Example of current Service Providers Notification Letter



Trees and Powerline Pending Work Notification

Work location .....

.....

My name is .....

Phone .....

I am a CitiPower and Powercor representative contracted to carry out Vegetation Maintenance Inspections.

My inspection of the trees on and/or adjacent to your property on ...../...../..... at ..... has shown that:

- ◯ No tree clearing works need to be undertaken from this inspection
- ◯ Trees on/or adjacent to your property have grown so that they now require pruning to maintain compliance with the Victorian Government's Electricity Safety (Electric Line Clearance) Regulations 2015.

  These works may commence between 14 and 60 days from the date on this notice.
- ◯ Urgent Cutting - Urgent tree clearing/pruning is required. Trees on your property have grown too closely to or within the Clearance Space required around powerlines, as noted in the Electricity Safety (Electric Line Clearance) Regulations 2015 Part 2- Section 18 (Page 33), and as such the required 14 day notification period does not apply.

  Previous inspection date: ...../...../.....

  There will be no charge to you for tree clearing works required around CitiPower and Powercor's powerlines.

Please contact me as soon as possible so we can discuss the required works/if you have queries about the proposed works.

The works required at your property include:

.....

.....

.....

If you are not the owner of the property we request your assistance in forwarding this notice to the landowner, or contact me.

This is a representation of how your tree/s will be cleared when viewed along the line from pole .....

CitiPower and Powercor aims to remove all debris on the day of pruning, however in rural areas clean up can take up to five days. If you experience extended delays in clean up please contact me.

CITIPOWER Powercor AUSTRALIA

Works may be carried out using the following specialist equipment:

Elevated Work Platform

Ground Crew / Tipper Chipper

Climbing Crew

Hedger

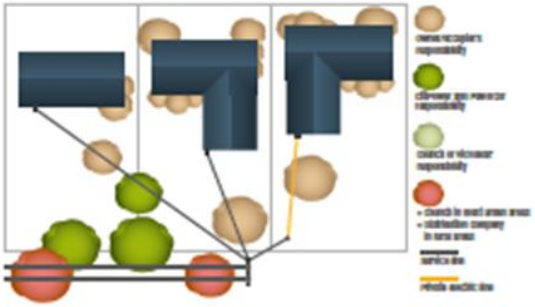
Mechanical Trimmer

Mulcher

Who is responsible for maintaining vegetation?

Trees on your Property

CitiPower and Powercor or your local council are responsible for maintaining trees affecting the main distribution powerline. Any privately owned electric lines on your property – and the service line to your property are your responsibility. It is important for your safety that you hire a professional to carry out any tree clearing work near your powerlines. If you are unsure of your responsibility please contact CitiPower and Powercor for clarification.



As your electricity distributor, CitiPower and Powercor owns and operates the largest electricity distribution network in Victoria. We deliver to you the power you buy from your electricity retailer. Our role is to develop and maintain the poles, wires and equipment on our electricity network to reduce the likelihood of fires or supply interruptions caused by trees and vegetation.

Each year, CitiPower and Powercor invests millions of dollars in bushfire mitigation and vegetation management programs to keep the power on and the community safe. CitiPower and Powercor employs expert vegetation management resources, to keep trees and vegetation a safe distance from our network assets.

For all enquiries regarding vegetation and powerlines contact:

CitiPower
Call **1300 301 101** or visit **www.citipower.com.au**

Powercor
Call **13 22 06** or visit **www.powercor.com.au**

To monitor the level of your satisfaction with our vegetation service, CitiPower and Powercor or our agents may contact you after these works are completed. If you object to this, please contact me to advise.

If you have any concerns with our vegetation management, issues can be escalated via the dispute resolution process found in our Vegetation Management Plan. A copy of the plan can be obtained by visiting **www.citipower.com.au** or **www.powercor.com.au**.

18-65-F0009 May 2015

CITIPOWER

Powercor AUSTRALIA

REFERENCE B
TOA2 Significant Tree Register

TOA2 Significant Native Vegetation Register			
Region Location	**ARWF-ARTS 132kV line Pole Number**	**Native Vegetation**	**Remarks**
Big Hill Road Warrak	Pole No.'s 11 - 12	EVC 20 - Healthy Dry Forest	Off-sets obtained - minimise disturbance (barricade area)
Allenders Road Warrak	Pole No.'s 23 - 24	EVC 68 - Creekline Grassy Woodland	Off-set obtained - no vehicle access required (no disturbance)
Buangor Ben Nevis Road Warrak	Pole No.'s 25 - 26	EVX 67 - Alluvial Terraces Herb-Rich Woodland	Off-set obtained - no vehicle access required (no disturbance)
Iron Pot Creek Road Warrak	Pole No.'s 40 - 41	EVX 67 - Alluvial Terraces Herb-Rich Woodland	Off-sets obtained - minimise disturbance (barricade area)
Iron Pot Creek Road Warrak	Pole No.'s 40 - 41	EVC 68 - Creekline Grassy Woodland	Off-set obtained - no vehicle access required (no disturbance)
Red Rocks Road Eversly	Pole No.'s 55 - 56	EVC 68 - Creekline Grassy Woodland	Off-set obtained - no vehicle access required (no disturbance)
Colliers Gap Road Eversly	Pole No.'s 67 - 68	EVC 68 - Creekline Grassy Woodland	Off-set obtained - no vehicle access required (no disturbance)
Pyrenees Highway Eversly	Pole No.'s 91 - 92	EVC 68 - Creekline Grassy Woodland	Off-set obtained - no vehicle access required (no disturbance)
Pyrenees Highway Elmhurst	Pole No.'s 100 - 101	EVC 68 - Creekline Grassy Woodland	Off-set obtained - no vehicle access required (no disturbance)
Pyrenees Highway Elmhurst	Pole No.'s 99 - 99	EVC 68 - Creekline Grassy Woodland	Off-set obtained - no vehicle access required (no disturbance)

references: source information from Planning Permit issued to ARWF developer Renewable Energy Systems Holdings Limited 'RES' Planning Permit

More detailed information relating to local coverage can be found at the DSE Biodiversity Interactive website at the link: http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim which has been overlayed onto the Powercor Google Earth Enterprise application.

Local coverage of nationally significant vegetation can be found using the Protected Matters Search tool at the Australian Government Department of the Environment website at the link: http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/protected

Vegetation Management Policy

Policy Statement

This Policy applies to the following entities:

- Powercor PAL)
- CitiPower (CP)
- Transmission Operations Australia Elaine (TOA)
- Transmission Operations Australia 2 Ararat TOA2)

To minimise the risk to the community and the environment caused through the interaction of trees and powerlines, CP, PAL, TOA and TOA2 are obligated and committed to comply with the requirements of the current Electricity Safety (Electric Line Clearance) Regulations 2015.

The Electric Line Clearance (Vegetation) Management Plan, Vegetation Management Procedure and Vegetation Annual Execution Plan define the detailed programs to achieve our commitment to compliance, whilst allowing flexibility within the business to encourage innovation, continuous improvement and the efficient use of resources.

The Electric Line Clearance Management Plan and strategies are focussed on maintaining a network where **no tree is inside the Minimum Clearance Space** within the CP, PAL, TOA and TOA2 networks. It is acknowledged however that from time to time trees may be discovered inside the MCS and therefore CP, PAL, TOA and TOA2 has processes in place to action these trees. CP PAL has set out VP codes and timeframes to manage vegetation that may unexpectedly grow inside the MCS.

Abbreviations

Abbreviation	Description
HBRA	Hazardous Bushfire Risk Area
LBRA	Low Risk Bushfire Area
ACSR	Aluminium Core Steel Reinforced
MEC	Major Electricity Company
PAL	Powercor Australia Ltd
CP	CitiPower
TOA	Transmission Operations Australia Elaine
TOA2	Transmission Operations Australia 2 Ararat
CPPAL	CitiPower and Powercor, and for the purposes of this ELCMP, also includes UE, TOA and TOA2
Regulations 2015	Electricity Safety (Electric Line Clearance) Regulations 2015
MCS	Minimum Clearance Space in accordance with the Regulations 2015
RAD	Regulated Applicable Distance
SAS	Sag And Sway

Abbreviation	Description
DSw	Design Sway
DSg	Design Sag
VBS	Vegetation Buffer Space
HV/HV Asset	High Voltage nominal voltage exceeds 1000 volts AC for the purposes of this policy includes distribution, sub-transmission, TOA and TOA2 transmission lines

Vegetation Priority

Code definitions

Code	2017 Vegetation Priority Code definitions
VP1	Vegetation in the first 10% of the Minimum Clearance Space (MCS)* Applies to only energised** LV & HV assets.
VP2	Vegetation in the middle 70% of the MCS. Applies only to energised LV & HV assets.
VP3	Vegetation in the last 20% of the MCS for energised HV and LV assets. (Excluding telecommunication cable and assets)
Current Year Code 2017	A span where vegetation is in the CPPAL Vegetation Buffer Space (VBS) or is likely to grow into the VBS within the calendar year. The VBS is within 1 years growth from the MCS (Nominally gauged at 1 meter of MCS)
Inspected year	Means the year that the data from the LiDAR acquisition is uploaded into SAP
M	(Managed Span) –M spans have a reduced MCS requirement applied, this is due to community importance of a tree in the span and can only be applied to LV in LBRA with CP/PAL approval as applicable also any HV spans will require approval from ESV.
NCR	(No Code Required) – A pole and asset which has no exposed overhead powerline connections and therefore no requirement for vegetation clearance. For example a street light pole.
NVS	(Non Vegetated Span) - Means there is no potential for any vegetation to enter into the MCS due to tree growth (Carried out by Visual Assessment Only) and will remain so for at least 10 years.
Year Codes: 18, 19,20,21,22,23, 24	Means the year the vegetation is anticipated to grow within the VBS. For example a code 18 means vegetation will likely to enter the VBS within the year 2018 (Nominally within 1 meter of VBS) For telecommunication cable and assets the one year code represents the year that the vegetation will contact the asset.

Notes:

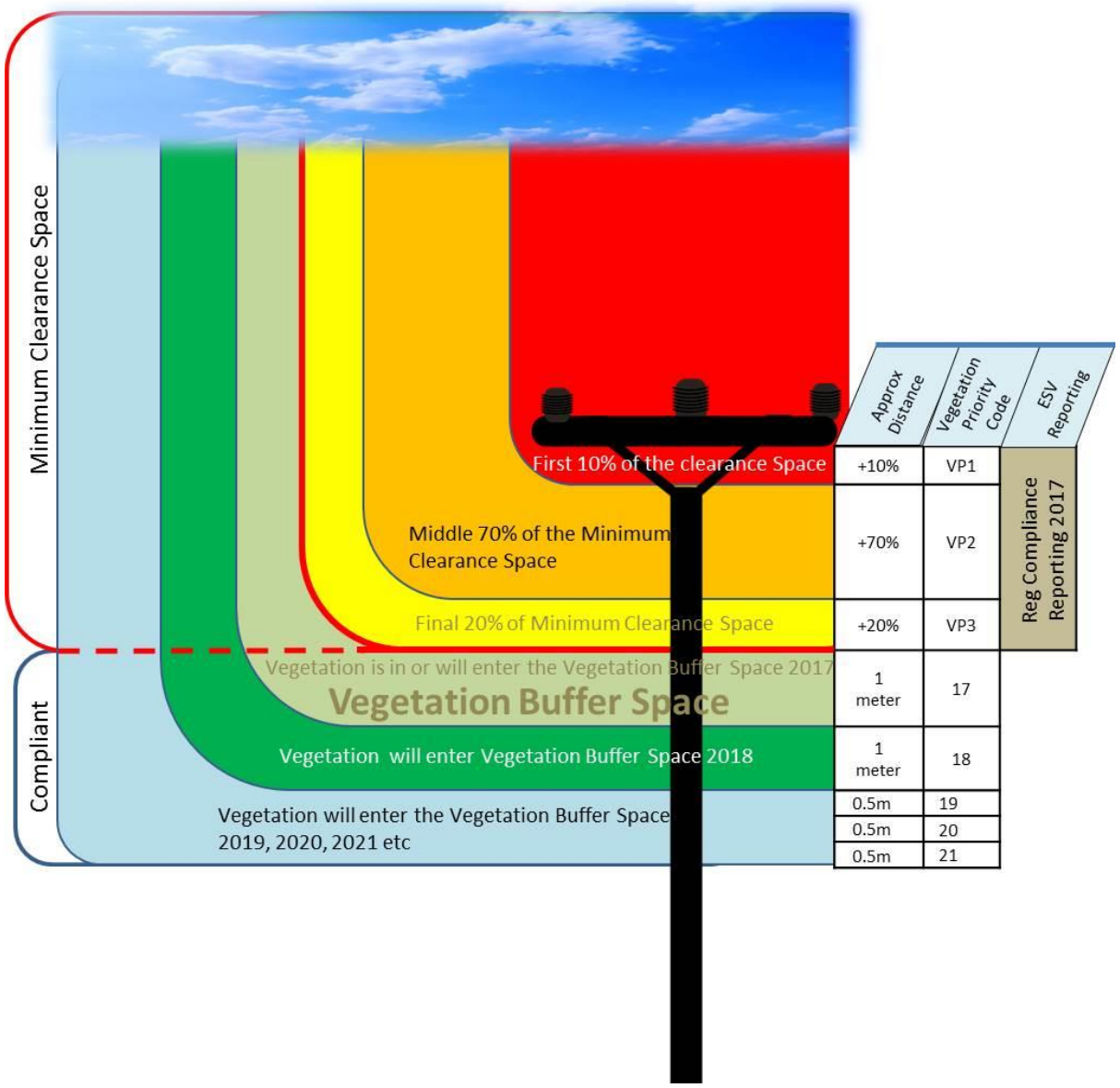
- *: Minimum Clearance Space (MCS) is defined in this CitiPower Powercor Vegetation Management Policy in the following section Determining the Minimum Clearance Space.
- **: Energised assets include Conductors, Fuses, Switches, Hybrid U/G structures, Cable Head structures, and overhead transformers. Excludes Guy Wires, Aerial Earth, Light Pole without conductor, Ground Kiosks, Poles.

Vegetation Minimum Clearance Space

Determining and maintaining the Minimum Clearance Space (MCS) through risk based prioritization is key to CPPAL & UE achieving its commitment to the requirements of the Regulations 2015.The relationship between the MCS and the risk based Vegetation Priority Codes is illustrated in Figure 1 below. This figure also shows the CPPAL Vegetation Buffer Space (VBS) which is designed to further reduce the potential risk of vegetation entering the MCS.

All VP codes are recognised as non-compliances with the Regulations 2015. The CP PAL program is designed to **maintain vegetation outside the MCS at all times,** however CP PAL has set out VP codes and timeframes to manage vegetation that may unexpectedly grow inside the MCS.

Figure 1 Minimum Clearance Space and Vegetation Priority Codes for High Voltage & Low Voltage



Determining the Minimum Clearance Space In accordance with the Regulations 2015, the CPPAL method for determining an additional distance that allows for sag and sway for the purposes of determining the MCS is described below.

MCS is the Regulated Applicable Distance (RAD) and an additional distance that allows for sag and sway (SAS). MCS distances are determined as follows:

- **Insulated conductor in LBRA & HBRA:**
  - the MCS is equal to the RAD, as prescribed in the Regulations 2015.
- **Uninsulated Conductor in LBRA up to 100m in span length:**
  - the MCS is equal to the RAD, as prescribed in the Regulations 2015 for spans of up to 100 meters in length.
- **Uninsulated Conductor in LBRA greater than 100m in span length:**
  - the MCS is calculated horizontally for sway as:
    - equal to the RAD, as prescribed in the Regulations 2015 for spans greater than 100 meters in length; or
    - where the RAD is less than Design Sway (DSw), an additional distance is added to the RAD to make the MCS equal the DSw plus an additional buffer** of 300 millimetres (measured horizontally from the swayed conductor);
    - where DSw* is the Design Sag (DSg*) at a temperature of 50^{o} for 6.6kv/11kv/12.7kv/22kV and at 100° for 66kV; and with an assumed sway angle of the max designed angle of sway.
  - the MCS is calculated vertically for sag as:
    - equal to the RAD, as prescribed in the Regulations 2015 for spans greater than 100 meters in length; or
    - where the RAD is less than DSg, an additional distance is added to the RAD to make the MCS equal the DSg;
    - where DSg* is calculated at a temperature of 50^{o} for 6.6kv/11kv/12.7kv/22kV and at 100° for 66kV.
- **Uninsulated Conductor in HBRA:**
  - the MCS is calculated horizontally for sway as:
    - equal to the RAD, as prescribed in the Regulations 2015; or
    - where the RAD is less than DSw, an additional distance is added to the RAD to make the MCS equal the DSw plus an additional buffer*** of 500 millimetres (measured horizontally from the swayed conductor);
    - where DSw* is the DSg* at a temperature of 50^{o} for 6.6kv/11kv/12.7kv/22kV and at 100° for 66kV; and with an assumed sway angle of the max designed angle of sway.
  - the MCS is calculated vertically for sag as:
    - equal to the RAD, as prescribed in the Regulations 2015; or
    - where the RAD is less than DSg, an additional distance is added to the RAD to make the MCS equal the DSg;
    - where DSg* is calculated at a temperature of 50^{o} for 6.6kv/11kv/12.7kv/22kV and at 100° for 66kV.

Notes:

- *: The DSw and DSg calculations are based on the principles of AS 7000. Overhead Line Design.
- **: 300mm is added to LBRA sway allowances to cater for the potential variability of operating temperature, construction, asset/pole movement and site conditions. This allowance in LBRA is less than HBRA given the lower relative fire risk.
- ***: 500mm is added to HBRA sway allowances to cater for the potential variability of operating temperature, construction, asset/pole movement and site conditions.
- The VM procedure Vegetation Clearance Charts – TOA & TOA2 vegetation clearances list transmission line DSw and DSg

Sample Minimum Clearance Space

The following table provides a sample of horizontal MCS distances for some of the most common conductor types and span lengths. These are examples only and specific individual MCS distances must be calculated for each span on the CPPAL & UE networks and recorded in the vegetation asset data records.

Conductor Description	Span Length	MCS (horizontal in mm)
66kv HBRA	170m	5030
66kv HBRA	200m	5860
22kv HBRA Steel	175m	4300
22kv HBRA Steel	275m	5130
22kv HBRA Steel	500m	6450
22kv HBRA ACSR	125m	2730
22kv HBRA ACSR	200m	4150
22kv HBRA ACSR	275m	6690

Rectification timeframes in HBRA in the Fire Danger Period

Where spans and locations are identified in HBRA as having vegetation inside the MCS during the declared Fire Danger Period, CP PAL will take reasonable steps to clear the vegetation within timeframes set out below:

Vegetation Priority Code	Action required
	LV & HV energized asset
VP1	24 hours of reporting date. If not cleared an observer is require to be posted on a Total Fire Ban day whilst FDI above 30
VP2	Cleared within 7 days No inspection required on a Total Fire Ban day.
VP3	Cleared or re-inspected within 14 days confirmed to priority code No inspection required on a Total Fire Ban day

Rectification timeframes in HBRA outside the Fire Danger Period

Where spans and locations are identified in HBRA as having vegetation inside the clearance space at times outside the declared Fire Danger Period, CP PAL will take reasonable steps to clear the vegetation within timeframes set out below:

Vegetation Priority Code	Action required
	LV & HV energized asset
VP1	Cleared within 28 days measured from inspection date.
VP2	Cleared within 6 months or prior to fire season declaration date, measured from inspection date.
VP3	Cleared within 6 months or fire season declaration date if prior, measured from inspection date or any subsequent re-inspection confirming vegetation remains code VP3

*For Transmission lines VP1 codes will be actioned within 24 hours

Rectification timeframes in LBRA at all times

Where spans and locations are identified in LBRA as having vegetation inside the clearance space, CPPAL will take reasonable steps to clear the vegetation within timeframes set out below:

Vegetation Priority Code	Action required
	LV & HV energized asset
VP1	Cleared within 28 days measured from inspection date.
VP2	Cleared within 6 months measured from inspection date.
VP3	Cleared within 6 or any subsequent re-inspection confirming vegetation remains code VP3 measured from inspection date.

Rectification timeframe notes

- All rectification timeframes commence from LidDAR inspection date flown.
- Spans are coded to the highest VP priority defect within the span.
- Where a span or asset is inaccessible due to wet or inundated ground conditions the rectification timeframes do not apply and reassessment is to occur within 14 days.

Issue Number and Date

The Issue Number of this Policy is:

- Issue 8

The Issue Date of this Policy is:

- 1 November 2017

Effective Date

This Policy is effective from:

- 1 November 2017

Related Documents

- Electric Line Clearance (Vegetation) Management Plans
- Vegetation Management Procedure
- Vegetation Annual Execution Plan (VAEP)

Date Last Reviewed

This Policy was last reviewed by the Business Process Owner on the following date:

- 1 November 2017

Document Owners

This document has the following Business Process Owner (BPO) and Business Process Analyst (BPA):

- Business Process Owner (BPO) title: Head of Network Compliance
- Business Process Analyst (BPA) title: Technical Officer, Vegetation Management

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Change Log Details

Year	Previous	New
2016	• 55 = P1	• 55 does not need to be rated as all 55s will be treated the same.
2016	• P28 Removed	• Insulated cable – HV becomes a 55 and LV are manage as 56s.
2016	• 55 and 56s applied to all assets	• 55 and 56 codes no longer apply to “non hazard items” eg telecommunication cables, and pillars.
2016	• Code 55 - A span where vegetation is touching or likely to touch a conductor	• Code 55 - A span where vegetation is touching or likely to touch a HV conductor. Change has been made to ensure compliant insulated LV is not prioritized for cutting. Focus’s resource on clearing higher risk 55s and 5601s on HV rather than LV 55s
2016	• 5601 - Applies to all conductors where, under extreme weather conditions, inspection confirms vegetation is likely to touch	Applies to HV conductors , substation, fuse or crossarm where inspection confirms vegetation has a high risk of touching conductors under conditions marginally in excess of standard design conditions

Year	Previous	New
2016	• 5602 - Applies to all conductors where, under extreme weather conditions, inspection confirms vegetation is likely to touch conductors.	• Applies to HV conductors where, under extreme weather conditions, inspection confirms vegetation is likely to touch conductors. Foliage contact with LV conductors is a 5603.
2016	• 5603- Applies to all conductors where inspection/re-inspection confirms vegetation is unlikely or cannot contact the conductor under any conditions.	• Applies to all conductors where inspection/re-inspection confirms vegetation is unlikely or cannot contact the conductor under any conditions. Foliage contact with LV conductors is a 5603.
2016	• 2010 Regulation	• 2015 Regulation
2016	• 55 cleared within 28 days LBRA	• 55 cleared within 90 days LBRA
2016	• 56 cleared within 6 months LBRA	• 55 cleared within 1 year LBRA
2016	• Inspection date	• Cutting notification creation.
2016	• TFB requirements added to risk rating.	• TFB requirements added
2016	• Vegetation Codes	• Definitions added
2017	• 56 codes	• Further defining of 56
2017	• Codes redefined	• Removal of code 55 and 56s, and inclusion on more descriptive non-compliance codes
2017	• Vegetation span codes 55 and 56	• New Vegetation Priority Codes (VP codes) VP1, VP2, and VP3
2017	• Review of VP2 and VP3 timeframes	• Additional phrase “of the inspected year” added to codes and Inspected year added as a definition
2017	• N/A	• Ammended to include United Energy Network
2017	• Review of all VP rectification timeframes	• Rectification timeframes reduced for VP1s to 28 days and a 6 month maximum rectification timeframe for VP2 and VP3 in HBRA outside the Fire danger period and for LBRA at all times.
2017	• Transmission line VP1 timeframe	• Transmission line VP1 codes will be actioned within 24 hours
2017	• Vegetation Priority Code Definitions	• low voltage VP Code definitions updated

REFERENCE D
Vegetation Management Procedure

Vegetation Management Procedure

1. Purpose

The purpose of the CitiPower and Powercor (CP-PAL) Vegetation Management Procedure is to provide clear and concise guidance in how to mitigate the risks to the community and the environment for the interaction of trees and powerlines. The Management Policy and Vegetation Management Strategy also elaborates in detail how best this can be achieved.

2. Objectives

Is To manage the specific risks associated with vegetation interacting with CP-PAL's overhead supply network, CP-PAL's has categorised its Vegetation Management Procedures into the following key objectives:

1. **Bushfire Risk** – mitigate the risk of bushfires caused by vegetation interacting with live electricity assets;
2. **Electrical Safety** – mitigate the risk of public and worker safety incidents caused by vegetation interacting with live electricity assets;
3. **Compliance** – achieve compliance to all relevant legislative and statutory requirements Electricity Safety (Electric Line Clearance) Regulations 2015, and to work collaboratively with councils to assist them to achieve compliance;
4. **Network performance** – mitigate the risk of supply interruptions as a result of vegetation coming into contact with live electricity assets;
5. **Network damage** – minimise the risk of damage to CP-PAL electricity assets caused by vegetation.

CP-PAL aims to work towards and meet these objectives in a safe, timely, environmentally responsible and cost effective manner.
CP-PAL seeks to become an innovative industry leader in the area of vegetation management.

Vegetation Management is a broad term that includes inspection by ground staff and aerial assessment by *Light Imaging, Detection, And Ranging* (LIDAR), tree pruning; brush removal through the use of power saws and mowers; the judicious use of herbicides and tree growth regulators; hazard tree identification and removal; the implementation of strategies to minimise the establishment of incompatible species under and near power lines; and the general control of weeds.

Document Control						
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Date	**Rev No**	**Revision Details**	**Typist**	**Author**	**Verifier**	**Approver**
10/2016		Process rewrite			GHD	
2/2017		Vegetation Code and clearance review			Wayne Evans	
31/3/2017		Final			Matt Thorpe	