

2023-27

POWERLINK QUEENSLAND
REVENUE PROPOSAL

Supporting Document – PUBLIC

Land Asset Methodology Framework

© Copyright Powerlink Queensland 2021





Powerlink – Land Asset Methodology – Framework

Policy stream	Asset Management	
Authored by	Land Strategist	[REDACTED]
Reviewed by	Manager Asset Strategies	[REDACTED]
Approved by	Executive General Manager Strategy and Business Development	[REDACTED]

Version history

Version	Date	Section(s)	Summary of amendment
1.0	25/05/11	New	New document
2.0	27/05/11	2	Updating Figure 1
3.0	14/10/14	Whole document	Minor wordsmithing to align with changes in the organisation
4.0	30/09/15	Whole document	AM-STR-1027. Minor wordsmithing to align with changes in the organisation and adapting to the new document framework
5.0	29/08/17	Whole document	Adapted to organisational changes and associated process changes
6.0	12/06/18	Whole document	Changes to routine maintenance and inclusion of boundary fencing for sites, nominal easement widths, clearing widths and clearing areas.
7.0	1/3/19	Whole document	Complete review of land asset methodology following outcomes from Reliability Centred Maintenance and Value Driven Maintenance. Inclusion of performance indicators and risk factors.
7.1	02/05/2019	Whole document	Non-material change. Quality check before finalising.
7.2	03/11/2020	Whole document	Non-material changes to align with organisational changes.



Table of contents

Version history.....2

1. Introduction5

1.1 *Purpose*5

1.2 *Scope*.....5

1.3 *Objectives*.....5

1.4 *References*.....6

1.5 *Defined terms*6

1.6 *Roles and responsibilities*10

1.7 *Monitoring and compliance*.....10

1.8 *Risk management*.....11

2. Framework12

3. Requirements13

3.1 *Network Corridors*13

3.2 *Network Sites*.....14

3.3 *Network Land for Future Use*14

3.4 *Asset Information & Data*.....14

3.5 *Levels of Service*.....15

3.5.1 *Technical Requirements*15

3.5.2 *Safety & Environment*.....15

3.5.3 *Reliability of Supply*.....16

3.5.4 *Landholder & Community Expectations*.....16

3.6 *Lifecycle Management*16

3.6.1 *Planning, Design and Construction*17

3.6.2 *Operation, Maintenance and Refurbishment*17

3.6.3 *End of Life*20

3.7 *Asset Management Drivers*20

3.7.1 *Condition Assessment Activities*20

3.7.2 *Land Asset Performance Indicators*21

3.7.3 *Land Asset Risk Factors*21

3.7.4 *Fault Statistical Data and Analysis*21

3.7.5 *Data Modelling and Reporting*.....21

3.7.6 *Technical Investigations and Research*21

3.7.7 *Emerging Issues*.....22

Current version: 10/05/2019	INTERNAL USE	Page 3 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland



3.7.7.1 Climate Change Adaptation.....22

3.7.7.2 Fire Management.....22

3.7.7.3 Changes in Compliance Requirements22

3.7.7.4 Changes in Vegetation Management Systems.....22

3.7.7.5 Changes Relating to Access to Assets22

3.8 Emergency Response and Network Security23

3.9 Forward Planning.....23

3.10 Risk Assessment.....23

3.11 Technical Investigations.....25

3.12 Condition Assessments & Asset Performance25

3.13 Reporting, Auditing & Benchmarking26

3.14 Supporting Activities26

 3.14.1 Project Handovers.....26

 3.14.2 Human Resource Training.....26

 3.14.3 Strategic Linkages.....26

 3.14.4 Stakeholder Management.....26

4. Distribution list.....26

Table of Tables

Table 3-1 - Land Asset Maintenance Types and Frequency..... 19

Table 3-2 - Identified Hazards, Risks and Treatments23

Table of Figures

Figure 1-1 - Asset Management Framework.....5

Figure 3-1 - Breakdown of Network Land Assets 13

Current version: 10/05/2019	INTERNAL USE	Page 4 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

1. Introduction

For the purposes of this document, land assets exist to facilitate the safe, reliable, responsible and efficient delivery of electricity transmission services.

1.1 Purpose

In order to implement the organisation’s Asset Management Strategy, specific asset methodologies must be developed for each major asset group within Powerlink.

This document sets out the whole of life management philosophy for Powerlink’s land assets, provides a planning tool for activities throughout the asset life cycle and acts as a reference for the development of asset life, management, maintenance and project plans.

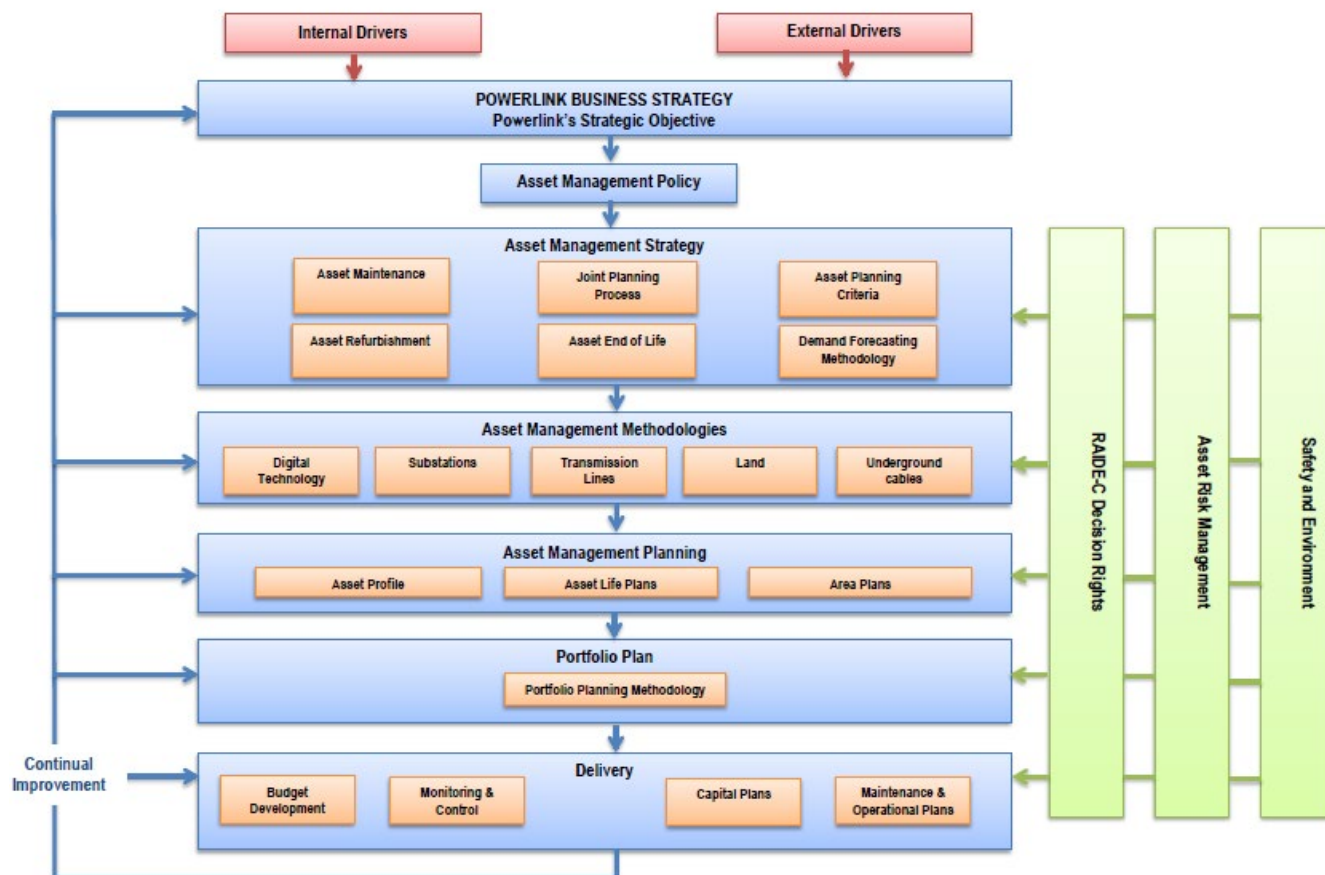
1.2 Scope

This document covers the asset management methodologies applied to the life cycle of land assets linked to electrical infrastructure. The document also considers associated network land assets for future use.

1.3 Objectives

Land assets form part of Powerlink’s asset management system with the following key elements:

Figure 1-1 - Asset Management Framework



Powerlink's asset management strategy ensures the organisation's assets are managed in a manner consistent with its overall corporate vision objectives to responsibly deliver electricity transmission services that are valued by shareholders, consumers, customers and the market in a safe, commercial and performance focused way.

The Land Asset Methodology sets out how the following key performance areas are to be addressed:

1. Levels of Service
2. Lifecycle Management
3. Asset Management Drivers
4. Asset Management Activities
5. Environmental and Safety Compliance

1.4 References

Reference	Document title
A969433	Asset Management Strategy
A2300019	Asset Management Framework
A2417558	Asset Risk Management Framework
A462955	Vegetation Management Specification
Acquisition of Land Act	Acquisition of Land Act 1967 (Qld)
Biosecurity Act	Biosecurity Act 2014 (Qld)
Maintenance of Electricity Corridors in Parks and Forests	Code of Practice for Maintenance of Electricity Corridors in Queensland's Parks and Forests 2007 (Qld)
Electricity Works on Protected Areas	Deed of Agreement for Electricity Works on Protected Areas 2010 (Qld)
Electrical Safety Act	Electrical Safety Act 2002 (Qld)
ESR2013	Electrical Safety Regulations 2013 (Qld)
ENA DOC 038-2018	Vegetation Risk Management for Overhead Electricity Networks – Guideline
Fisheries Act	Fisheries Act 1994 (Qld)
Nature Conservation Act	Nature Conservation Act 1992 (Qld)
Line Asset Methodology	Powerlink Line Asset Methodology Framework
Substation Asset Methodology	Powerlink Substation Asset Methodology Framework
Sustainable Planning Act	Sustainable Planning Act 2009 (Qld)
Work Health and Safety Act	Work Health and Safety Act 2011 (Qld)

1.5 Defined terms

Terms	Definition
Clearing Areas	Clearing areas that are established at the time of construction, considering permits, approvals and landholder requirements. Within these areas, there may be constraints that are documented in geographical information systems (e.g. PQMaps).

Current version: 10/05/2019	INTERNAL USE	Page 6 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

Terms	Definition
Clearing Widths	Clearing widths that are established at the time of construction and may not extend to the edge of the easements.
Constraints	Restrictions that can impact on the ability to achieve desired outcomes in an efficient manner.
Co-use	Activities on easements are defined as “co-use”. Some activities are permitted, while other activities may require specific assessment. Powerlink has a public process for determining if co-use may be permitted, primarily based on safety, access, future works and operational considerations.
Hazardous Marginal Trees	Trees that are outside of the cleared easement or land parcels that Powerlink actively maintains, have a risk of falling on network assets and have been assessed as being unhealthy.
INDJI	A system that assesses natural hazards, including fires.
ITOMS	International Transmission Operations & Maintenance Study that performs voluntary benchmarking, including information on land assets associated with networks.
LiDAR	Light Detection and Ranging, used for measuring vegetation distances from conductors, density and height above ground.
Nominal Easement Widths	<p>Easements widths that are recommended for associated built assets:</p> <ul style="list-style-type: none"> • Fibre cables buried: 3m either side (6m total) • Fibre cables overhead: 5m either side of structures (10m total) • <132kV overhead: 15m either side of centre line (30m total) • <132kV underground: 5m either side (10m total) • 132kV overhead: 20m either side of centre line (40m total) • 132kV underground: 6m either side (12m total) • 275kV overhead: 30m either side of the centre line (60m total) • 275kV underground: 10m either side (20m total) • 330kV overhead: 35m either side of the centre line (70m total) • 330kV underground: 12m either side (24m total) <p>Actual easement widths may vary depending on specific circumstances.</p>

Terms	Definition
Performance Indicators (regional)	<p>Completing the annual vegetation management plan (plan is submitted 6 months prior to commencement of FY, including contractor prices)</p> <ul style="list-style-type: none"> • Good = all work completed under budget • Moderate = all work completed at budget • Poor = some work is not completed and/or over budget <p>Corrective action (ME/MA) expenditure for land maintenance</p> <ul style="list-style-type: none"> • Good = <1% • Moderate = 1-3% • Poor = >3% <p>Fire risk management associated with land maintenance</p> <ul style="list-style-type: none"> • Good = 100% of spans have fuel loads <Very High (<4) within "AER High Bushfire Prone Areas" • Moderate = <100-95% of spans have fuel loads <Very High (<4) within "AER High Bushfire Prone Areas" • Poor = <95% of spans have fuel loads <Very High (<4) within "AER High Bushfire Prone Areas" <p>Landholder complaints and significant issues are recorded in PQConnect - relevant to land maintenance activities</p> <ul style="list-style-type: none"> • Good = All complaints and significant issues are recorded into PQConnect • Moderate = 1 complaint or significant issue not recorded in PQConnect • Poor = >1 complaint or significant issue not recorded in PQConnect <p>Safety and Environment incidents and near hits are reported - relevant to land maintenance activities</p> <ul style="list-style-type: none"> • Good = All incidents and near hits are recorded in PQSwitch • Moderate = 1 incident or near hit not recorded in PQSwitch • Poor = >1 incident or near hit not recorded in PQSwitch <p>Spans with vegetation >6m from conductors (12 month rolling average)</p> <ul style="list-style-type: none"> • Good = >99% • Moderate = 99-95% • Poor = <95% <p>Spans with vegetation within untrained distances (12 month rolling average) as per QLD Electrical Safety Regulations 2013, Schedule 2, Part 2</p> <ul style="list-style-type: none"> • Good = <1% • Moderate = 1-3% • Poor = >3% <p>Spans with vegetation within electrical exclusion zones (12 month rolling average) as per QLD Electrical Safety Regulations 2013, Schedule 2, Part 2</p> <ul style="list-style-type: none"> • Good = 0 • Moderate = 1 • Poor = >1 <p><i>No electrical events caused by vegetation are considered acceptable</i></p> <p>Work has a warrantee period (construction and maintenance)</p> <ul style="list-style-type: none"> • Good = >12 months • Moderate = 12-6 months • Poor = <6 months

Terms	Definition
PQConnect	A database used by Powerlink to record interactions with stakeholders.
PQMaps	An in-house spatial solution that provides visual renditions of assets, including land assets in a geo-spatial context.
PQSwitch	A database used by Powerlink to record safety and environmental incidents and near hits
Risk Factors (spans)	<p>AER Bushfire Prone Area Risk (measuring point)</p> <ul style="list-style-type: none"> • High = High-Very High Potential • Moderate = Medium Potential • Low = Potential Buffer Impact <p>Annual Rainfall Risk (measuring point)</p> <ul style="list-style-type: none"> • High = >1600mm • Moderate = 1200-1600 • Low = <1200 <p>Change in Elevation Risk (span characteristic)</p> <ul style="list-style-type: none"> • High = >40m • Moderate = 20-40m • Low = <20m <p>Ground Clearance Risk (span characteristic)</p> <ul style="list-style-type: none"> • High = <7m • Moderate = 7-10m • Low = >10m <p>Maximum Slope Risk (span characteristic)</p> <ul style="list-style-type: none"> • High = >25% • Moderate = 5-25% • Low = <5% <p>Regional Ecosystem Type Risk (span characteristic)</p> <ul style="list-style-type: none"> • High = Wet Tropics and Southeast Queensland • Moderate = Einasleigh Uplands and Central Queensland Coast • Low = Brigalow Belt and New England Tableland <p>Soil Type Risk (span characteristic)</p> <ul style="list-style-type: none"> • High = Sodosols • Moderate = Chromosols, Kurosols, Rudosols, Tenosols, Podosols, Hydrosols, Organosols and Calcarosols • Low = Ferrosols, Dermosols and Kandosols <p>Span Length Risk (span characteristic)</p> <ul style="list-style-type: none"> • High = Spans >700m must be assessed by an Engineer • Moderate = Spans 600-700m should have input from Engineer and/or consult design drawings + use LiDAR • Low = Spans <600m should be visually assessed to consider sag + use LiDAR <p>Vegetation Span Risk (measuring point)</p> <ul style="list-style-type: none"> • High = > or = 4 • Moderate = 2-3 • Low = 1

Terms	Definition
RINs	Regulatory Information Notices that can be requested by the Australian Energy Regulator, including information on land assets associated with networks.
SAP	An enterprise software solution used for asset management and financial purposes at Powerlink, including the management of land assets.
Spatial Analysis	Annual analysis of spatial datasets relevant to land maintenance to assist in better understanding risk and performance.
Vegetation Infringement	Any instance where vegetation has entered electrical exclusion zones (12 month rolling average) as per QLD Electrical Safety Regulations 2013, Schedule 2, Part 2. Using Powerlink's vegetation risk rating system, this equates to any risk 5 or above.
Washdown	A facility used to wash or clean vehicles as a partially effective control measure to mitigate the spread of biosecurity threats.

1.6 Roles and responsibilities

Who	What
General Manager Community and Delivery Services, DTS	Aligning approvals, route selection, acquisition, land and rights protection, management and sale of network land and landholder commitments in accordance with the land asset methodology.
General Manager Design Solutions, DTS	Aligning design and other technical services with land asset methodology.
General Manager Infrastructure Delivery, DTS	Implementing land asset methodology as part of Infrastructure Delivery.
General Manager Asset Strategies & Planning, SBD	Setting standards for land assets associated with network assets.
Land Strategist, DTS	Principal author and coordinator.
General Manager Network Operations, OSD	Provision of fault data and analysis relating to land assets.
General Manager Service and Supply Partners, OSD	Auditing land assets in the maintenance phase, including Ergon Energy's delivery of services.
General Manager Field Services, OSD	Implementing land asset methodology as part of field services.
General Manager Health Safety and Environment, PCS	Aligning health, safety and environmental strategies with land asset methodology.

1.7 Monitoring and compliance

Annual audits will be performed to determine compliance with the requirements outlined in this document. Annual reporting is also required for stakeholders, which relies on the implementation of these requirements (e.g. RINs and Annual Report).

Current version: 10/05/2019	INTERNAL USE	Page 10 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland



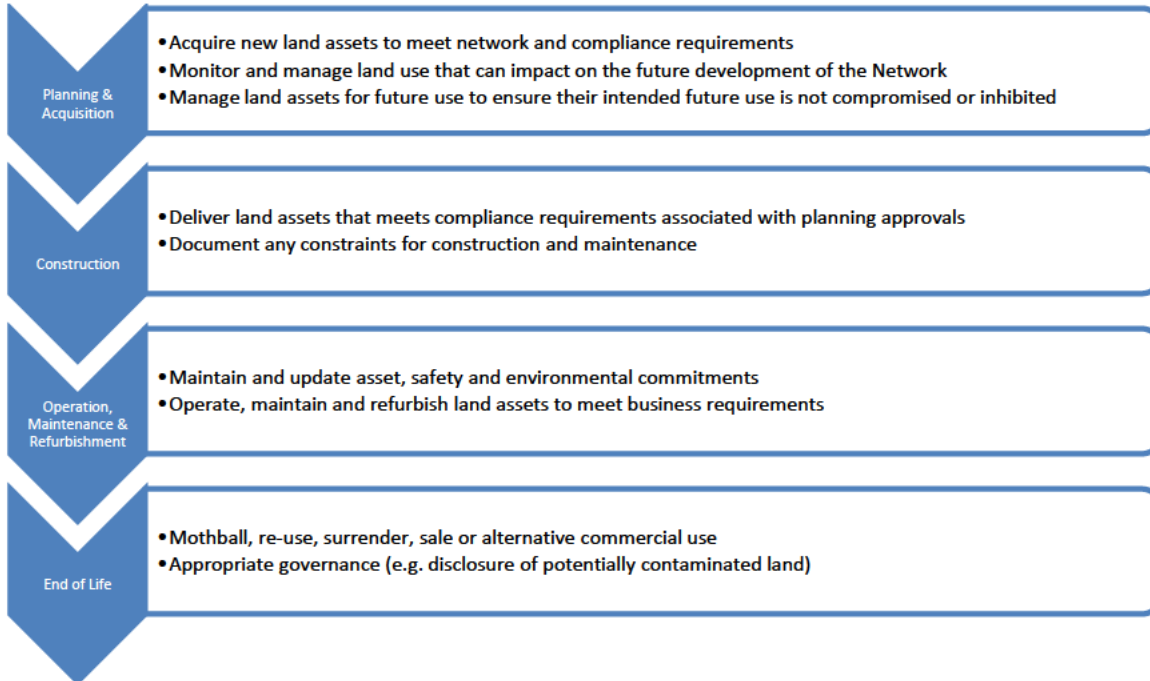
1.8 Risk management

Land assets should be managed in a manner consistent with asset management principles and compliance requirements. A risk management approach is taken to prioritise work where constraints or conflicts arise. Risk management must be documented and recorded in corporate systems so that others understand the rationale behind the approach. SAP is the primary source for asset condition and risk management should be recorded.

Current version: 10/05/2019	INTERNAL USE	Page 11 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

2. Framework

The following framework outlines the key elements of Powerlink's Land Asset Methodology. The GM Technology & Planning is accountable for setting, monitoring and reviewing the framework.



The following accountabilities align with the framework:

- Planning and Acquisition – GM Community & Delivery Services
- Construction – GM Infrastructure Delivery
- Maintenance & Refurbishment – GM Service & Supply Partners
- Operation – GM Network Operations
- End of Life – GM Community & Delivery Services

Overall accountability for ensuring that Powerlink’s framework for land assets is fit for purpose rests with the Executive General Manager Strategy & Business Development.

Current version: 10/05/2019	INTERNAL USE	Page 12 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

3. Requirements

Land assets can be associated with Transmission lines (Easements), Sites (Substations, Communications and Washdowns) or can be network land for future use such as vacant easements and future substation sites. Asset lifecycle management practices differ, depending largely on the type of land asset and the surrounding land use.

Land assets associated with Powerlink’s commercial buildings (e.g. Virginia complex, Narangba complex and Construction Site Offices) are not covered by this strategy. These assets are managed by other parts of the business, applying different methodologies.

The management of land assets is fundamentally linked to network assets and adopts the familiar nomenclature of the associated network asset.

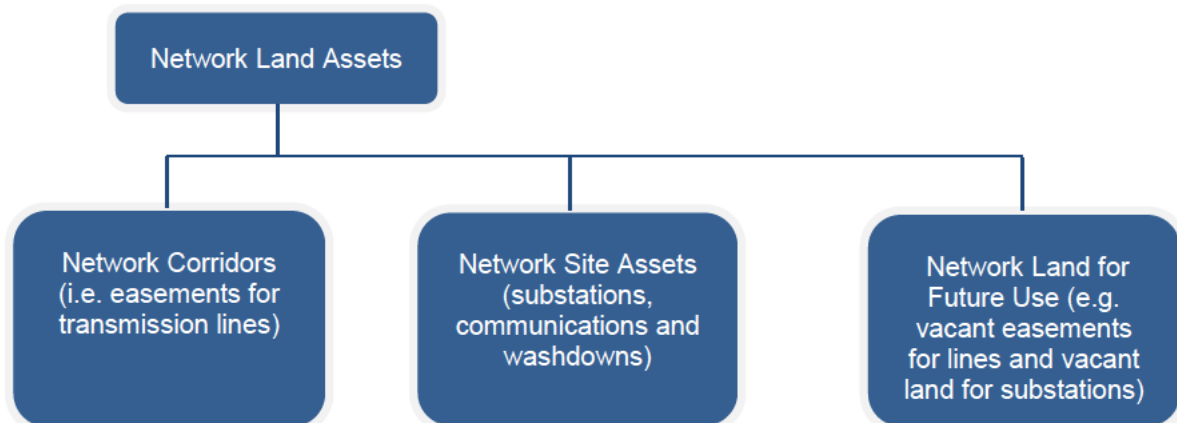
- For a transmission line corridor, the basic management units used are Built Sections and Ground Spans;
- For a substation the network site name; and
- For a communications site, the site name.

There are other land management considerations relating to the land parcel. For example, land within a substation is managed as part of the substation plant methodology and only land outside the substation fence is classified as the land asset for the purposes of this methodology. This recognises the need for different management within the network site and the different skill set required to maintain the land surrounding or adjacent to the electrical asset. Management of vacant land that has been allocated for future network development also needs to be considered.

Network land assets for future use will be managed on a case by case basis and will be dependent on lease arrangements, managed by GM Community & Delivery Services. Guidelines on Site Selection for Easements and Sites are available with delivery also managed by GM Community & Delivery Services.

The land assets managed under this methodology are summarised in Figure 3-1 below:

Figure 3-1 - Breakdown of Network Land Assets



3.1 Network Corridors

Network corridors support transmission lines. As for the management of transmission lines, the corridors are broken into Built Sections to align with the life cycle approach to planning, investment, operations, maintenance, refurbishment and end of life. Each Built Section represents an asset and has the asset value attached to it. Multiple Built sections can exist within a network corridor. At the most fundamental level, a Built Section will

Current version: 10/05/2019	INTERNAL USE	Page 13 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland



represent a homogenous asset with management practices applied to the whole. The length of Built Sections varies from 10 metres to over 300 kilometres.

Built Sections are further broken into spans. A ground span is the land between two adjacent towers/poles and there are more than 25,000 ground spans in Powerlink's network, with lengths varying from a few meters to over one kilometre and widths between 20 and 80 metres per span. Ground spans and towers are often reached by access tracks jointly maintained by Powerlink, which are positioned on and off easement and sometimes on land parcels with no physical assets.

3.2 Network Sites

Sites in this category are parcels of land containing network infrastructure such as substations, communications facilities, washdowns and helipads. Washdowns standard drawings are available and should be applied for any new washdowns established by Powerlink.

Land associated with substations within the security fence and to a distance of up to five metres outside the fence, will be managed as part of the Substation Asset Methodology Framework. Consequently, there is no consideration of land strategy in this document where infrastructure covers the entire land parcel it occupies.

Partially occupied substation sites contain additional land, not directly associated with the network asset. Different management techniques to those within the facility fence are required to protect HV assets, including access and vegetation management. This includes the buffer zone areas. A preference will be to allow other compatible land use to occur with written agreements (e.g. agistment licenses) in consultation with the Property Team. However, if no licence or written agreement exists with a third party over the buffer zone areas, the Property Team has no involvement in the management of the land assets. Maintenance Service providers will ensure the land assets associated with network sites remain fit for purpose at all times, including safety and environmental compliance matters. Refer to the Substation Civil Inspection Checklist Part A for details.

The installation of an appropriate property boundary fence, considering the surrounding land use, is recommended.

3.3 Network Land for Future Use

Planning for future development of network assets can require the strategic acquisition of land some time before the construction of the network. There are two separate issues associated with this land that requires managing:

- Land use over time can change, which can impact on the future development of the network; and
- Land assets can also exist adjacent to existing network infrastructure (e.g. land purchased as part of the easement acquisition process).

These assets are managed by the Property Team who ensure that their intended future use is not compromised or inhibited, while realising commercial opportunities where appropriate.

3.4 Asset Information & Data

Powerlink's holistic approach to land assets is predicated on the interaction of complimentary systems (e.g. SAP and PQMaps).

SAP is used as an asset register and financial control system with PQMaps providing positioning and mapping functions. SAP is responsible for providing as-built asset and Built Section configuration information and is considered the master system in the SAP/PQMaps relationship where "as-built" data is concerned. SAP is subordinate in all matters pertaining to geo-spatial data and information. PQMaps is subordinate in all other matters, including spatial presentation of stakeholder details.

PQMaps data includes the spatial rendition of land assets, such as boundary data, land area, easements condition reporting, access tracks and constraints.

The leveraging of these systems as a unified management tool provides a detailed view of land assets.

Current version: 10/05/2019	INTERNAL USE	Page 14 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland



3.5 Levels of Service

Powerlink has a large number of stakeholders. Requirements and expectations for dealing with them are defined through various documents, including state and federal laws and regulations, electricity market rules, connection agreements, procurement agreements, service level agreements, landholder agreements and broader community expectations. This document now includes performance indicators and risk factors to provide clearer picture for the business on the levels of service and risk management.

3.5.1 Technical Requirements

In response to stakeholder requirements, Powerlink has established service levels for land assets, including:

- Vegetation Management;
- Physical Access to Assets;
- Land Management;
- Land Asset Condition Assessment;
- Site Selection of Easements and Sites;
- Vegetation Management General Arrangement; and
- Washdown Drawings.

3.5.2 Safety & Environment

To ensure the network is operated in a way that is electrically safe, Powerlink has considered electrical and workplace safety requirements associated with land assets, including Powerlink's Electrical Safety Management System.

Maintenance measures include:

- Routine and condition based preventative maintenance programs;
- Corrective maintenance as required;
- Land inspections and other asset condition monitoring;
- Monitoring of the forced outage data that could be linked to vegetation or fire; and
- Audits, including safety.

Notifications of electrical safety incidents are investigated and where necessary reported as part of normal safety management system requirements.

Powerlink's internal standards and contract conditions ensure that high levels of safety compliance are met and consider all aspects of work including safe ground access where this is required. Service providers maintain documented safe systems of work, demonstrating a coordinated and systematic approach to managing health and safety risks. The systems used need to demonstrate the integration of Work Health and Safety (WHS) and Electrical Safety requirements within the normal procedures and practices, including the preparation of Safety Management Plans and Pre-work Risk Assessments.

All routine maintenance work on land assets is conducted outside the untrained exclusion zone and qualifications and training requirements are commensurate with this working environment. Other work is performed based on asset condition and recorded in SAP with various codes and characteristics to identify risk and priority. Notifications of electrical safety incidents are investigated and hazards reported as part of normal contract requirements. Safety audits of work associated with the land assets are carried out as part of broader annual auditing programs.

Powerlink Queensland is committed to responsible environmental management as an integral part of our business activities. Powerlink aims to meet all of its environmental obligations while working efficiently and safely. Powerlink maintains an Environmental Management System (EMS), which includes compliance with Environmental Management Plans (EMP) and Environmental Work Plans (EWP).

Current version: 10/05/2019	INTERNAL USE	Page 15 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

These systems of work meet the “general duty of care” and include items such as:

- A documented policy or statement of commitment;
- Responsibility and authority of individuals;
- Emergency preparedness, incident investigation and reporting;
- Audit provisions and environmental risk assessment; and
- Training requirements.

The Manager HSE Services (PCS) or their representative will be contacted for support and advice relating to safety and environmental matters relevant to land maintenance activities.

3.5.3 Reliability of Supply

Powerlink has reliability of supply obligations that are supported by the management of land assets under this methodology. Control of vegetation around transmission lines is a key to reliability with standards documented in the Vegetation Management Specification.

Powerlink is focused on proactively managing risks associated with vegetation. Investigations into any vegetation infringements are conducted to support the continual improvement of vegetation monitoring and maintenance practices. Where contractors or service providers are involved, a joint investigation will be performed with the Land Strategist.

There is also a requirement to ensure levels of access are maintained for maintenance and emergency access for efficient restoration of the system in the event of network outages or loss of supply events.

3.5.4 Landholder & Community Expectations

Powerlink has a strong principle of working closely and co-operatively with landholders, particularly where we have joint interests in managing easements and other aspects. This approach aims to achieve a level of joint management of land assets and to maximise the understanding of all parties to ensure compliance with access protocols, safety and co-use requirements.

Joint management of matters is essential for successful management of land assets, particularly when it comes to biosecurity matters. Powerlink recognises that in managing its linear infrastructure, reasonable and practicable steps need to be taken to ensure vehicle movements do not facilitate the spread of biosecurity threats. Powerlink has established systems for managing biosecurity risks and works closely with stakeholders to develop effective and efficient risk management strategies.

Community expectations over large geographical areas differ greatly with different levels of interaction, which also depend on the life cycle stage of the assets. This is sometimes challenging and Powerlink:

- Monitors media coverage as an indicator of issues being raised;
- Thoroughly investigates and records complaints; and
- Centrally records and maintains constraints on land use, access and other matters raised by landholders/stakeholders.

The Land Strategist should be advised of joint management issues that are not aligned with Powerlink’s land asset requirements.

3.6 Lifecycle Management

To achieve the best outcome for its stakeholders, Powerlink takes a whole of life cycle approach to managing its assets. Optimising the costs and benefits while being cognisant of the risks is the basis of this approach and includes 3 main stages:

1. Planning, Design and Construction
 - Optimisation of the concept and the design process, including consideration of the asset’s construction and likely operating life.

Current version: 10/05/2019	INTERNAL USE	Page 16 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland



2. Operation, Maintenance and Refurbishment

- The effective management of the asset's lifecycle through targeted maintenance, refurbishment and life extension.

3. End of Life

- The mothballing, reuse, replacement, rehabilitation or disposal activities.

3.6.1 Planning, Design and Construction

During Planning and Design, the characteristics and constraints of the land asset are considered as part of the route or site selection processes and need to take into account:

- for the suitability of the land to meet business standards, including construction;
- Optimisation of total lifecycle costs, including impacts on construction and maintenance; and
- Compliance with statutory and other planning requirements.

The need for land associated with corridors or sites is identified as part of the network investment planning processes and can involve members from Technology & Planning, Business Development, Community & Delivery Services and other groups.

Approval of Powerlink's site and corridor acquisition is predominantly governed by the Acquisition of Land Act 1967 and the Sustainable Planning Act 2009. Powerlink has guidelines outlines considerations when choosing sites and corridors that balance costs, social and environmental considerations. Balancing these constraints should provide the best available site or corridor for acquisition.

In most cases, substation sites are owned by Powerlink but communication sites are a mixture of owned and leased sites, depending on the land availability and site criticality. For corridors, internal processes linked with the designation guidelines determine the route selection, site selection and acquisition of new corridors. Typically, easements are secured for transmission line assets.

The construction of built assets needs to consider planning, design and community requirements. The aim should be to achieve vegetation clearing in accordance with relevant guidelines for easements and sites. Removal of species that are incompatible should be the aim, selectively applying registered herbicides with landholder consent. Constraints to construction and maintenance need to be recorded in corporate systems (e.g. vehicle washdown requirements).

Construction needs to comply with planning and design requirements, noting constraints for construction and future maintenance activities.

Subsequent to construction, the following elements need to be provided prior to the operational and maintenance phases of the land asset lifecycle:

- Shape files of assets (e.g. landholder contact details, towers, clearing areas, constraints, access tracks and gates);
- Areas cleared for ground spans (hectares);
- Route length (Built Section);
- Length of access tracks maintained or shared; and
- Land asset SAP measuring point values (e.g. fuel loads, vegetation risk, vegetation height, vegetation density and tower leg condition).

3.6.2 Operation, Maintenance and Refurbishment

During the Operation, Maintenance and Refurbishment stage, asset standards are implemented to ensure land assets are maintained and operated within technical parameters and perform as per business requirements.

Current version: 10/05/2019	INTERNAL USE	Page 17 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

Condition and performance must be monitored and relevant activities undertaken to ensure optimum performance. Activities may include:

- routine preventative maintenance;
- condition based preventative maintenance;
- corrective maintenance;
- maintenance support; and
- refurbishment.

Lag indicators in the operational phase is through monitoring of faults on and threats to the network as a result of vegetation. Network Operations engages with other parts of the business to assist them with managing these aspects, including data gathering, investigations, analysis and reporting.

Maintenance is performed based on condition, in line with reliability centred maintenance and value based maintenance principles.

Refurbishment work is typically undertaken when the asset condition indicates the land asset is in a state that is not consistent with normal functional requirements and requires a level of work that exceeds the scope of normal maintenance activities. Examples of refurbishment work include:

- Rectification of major access track erosion;
- Reduction of fire risk;
- Removal of large tracts of hazardous marginal trees; and
- The installation of a washdown facility.

To meet stakeholder's expectations and comply with the Electricity Safety Act and other applicable regulations and standards, the land needs to be inspected and maintained at regular intervals as part of Powerlink's maintenance activities. The network is divided into zones relating to broad climate and vegetation characteristics assigned to an indicative zone. The zones drive the frequency of asset condition assessment to monitor the effectiveness of maintenance delivery. The objective for vegetation is to always maintain >6m clearance from the high voltage electrical network, selectively removing incompatible species and by applying selective herbicides where possible. This should result in the lowest overall cost, while also being safe. Maintenance is also broken into regions for the purposes of efficient delivery (Northern, Central and Southern).

Land asset parameters will be maintained, including the following elements:

- Shape files of assets (e.g. landholder contact details, clearing areas, ground span and towers conditions, constraints, access tracks and gates);
- Areas cleared for ground spans;
- Length of access tracks maintained or shared; and
- Land asset measuring points (e.g. fuel loads, vegetation risk, vegetation height, vegetation density and tower leg condition).

Current version: 10/05/2019	INTERNAL USE	Page 18 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

Table 3-1 - Land Asset Maintenance Types and Frequency

Maintenance Type		Activity	Frequency
Preventative Maintenance	Routine Preventative Maintenance (MR)	Land Inspections (audit outcomes from contractors) – INSP and routine treatments aligned to occur prior to inspections (CHEM and TPRN)	Aligned with vegetation management cycles for zones and supplemented by other land asset condition assessments (e.g. Lidar, Spatial Analysis, Civil Inspections, Aerial Inspections and Ground Inspections).
	Condition Based Preventative Maintenance (MB)	Vegetation Management	As required, based on risk
		Land Management	As required, based on risk
		Access to Assets	As required, based on risk
		Fuel Load Reduction	As required, based on risk
Corrective Maintenance	Emergency Corrective (ME)	Immediate work that must be performed to prevent danger to personnel, equipment or system performance.	As required, based on risk
	Deferred Corrective (MA)	All work, including subsequent investigations and report, associated with rectifying an unacceptable plant condition to an acceptable state that is not an emergency in nature.	As required, based on risk

In addition to the activities outlined in Table 3-1, maintenance support tasks are undertaken, which are those not directly related to the maintenance of the land asset, including:

- Land Maintenance Audits that are carried out annually to determine alignment with land asset requirements;
- Attending Land Maintenance Forums; and
- Attending public meetings (Powerlink may be required to attend public meetings to ensure its maintenance programs coordinate with broader activities e.g. biosecurity and fire management).



3.6.3 End of Life

End of Life may involve mothballing assets during periods of uncertainty. Alternatively, the land assets may facilitate the replacement of network assets. If the land is no longer required, the timing for rehabilitation of land and for the surrender of easements or sale of land assets will be considered, depending on a review of future network requirements and other commercial opportunities.

Disposal of land assets should occur only after extensive investigation of future needs. In particular, easements may have future uses outside the current asset’s requirements. Communication across the organisation in this regard is vital. The same would apply to decisions for disposal of land used or intended for use as future substation and communications sites.

Once the decision to dispose of land assets has been made, Powerlink will review its routine maintenance programs to align with appropriate investment strategies. Cost savings may be realised, but must always maintain compliance with Powerlink’s Electrical Safety Management System.

Powerlink will also consider constraints on future use and manage potential liabilities, approvals and agreements that may be in place. These constraints may place restrictions on the future use of the land (e.g. contamination may not allow residential development to occur), which should be disclosed to potential buyers.

If the land assets are easements, then the easement may simply be surrendered in consultation with the landholder.

3.7 Asset Management Drivers

Land assets represent an integral component of Powerlink’s network. It is critical to manage these assets in such a way as to achieve not only the optimum operating life (depending on environmental and other conditions), but to do so while achieving optimal lifecycle costs. This can only be achieved by setting the asset management strategy correctly at the beginning of the asset lifecycle and incorporating timely responses to the range of internal and external factors, including:

Internal

- Condition Assessment Activities;
- Fault Statistical Data and Analysis;
- Data Modelling and Reporting; and
- Technical Investigations and Research.

External

- Innovation and Technology; and
- Emerging Issues (including environmental, legislative and technical).

The Land Strategist is accountable for monitoring these drivers and putting forward strategies that enable Powerlink to adapt, while minimising impacts on available resources.

3.7.1 Condition Assessment Activities

Condition assessment provides an indication of the level of compliance to the established standards. Data is captured by various means, including Land Inspections, Spatial Analysis and LiDAR Surveys.

The condition data will provide information relating to the known land condition. This currently includes the following measuring points in SAP:

- Span vegetation risk;
- Span bushfire risk;
- Vegetation height;
- Vegetation density;

Current version: 10/05/2019	INTERNAL USE	Page 20 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland



- Tower leg condition;
- Access track condition;
- Herbicide application; and
- Washdown condition.

Additional asset condition data is recorded as span characteristics and notifications, including actions associated with vegetation, access tracks and land management risks.

3.7.2 Land Asset Performance Indicators

Land asset performance indicators have been developed to provide the business with clarity about measures that require monitoring and reporting. Those defined in section 1.5 will be monitored and reported through the Network Maintenance Forum on a monthly basis with end of financial year results reported more broadly to the business.

3.7.3 Land Asset Risk Factors

Land asset risk factors have been developed to provide the business with greater transparency and depth of understanding of asset conditions that can contribute towards realising risks. Those defined in section 1.5 will be reviewed annually and considered in preparing and reviewing annual programs of work.

3.7.4 Fault Statistical Data and Analysis

Powerlink maintains a database of all network events (faults). Faults that are attributed to Land Assets (e.g. vegetation and fire) are reviewed and analysed at land maintenance forums. Longer term trends are analysed by the Land Strategist to assist in determining the effectiveness of control measures and processes. These trends are communicated to maintenance service providers to assist them with understanding the reasons for any changes in processes or investments.

3.7.5 Data Modelling and Reporting

The SAP maintenance system model for land assets forms a part of the condition reporting process between maintenance service providers and the Land Strategist. This data is audited on an annual basis, focussing on a review of maintenance costs, alignment with standards, value for money and identification of the root causes of land asset defects. Maintenance service provider’s supply updates on land maintenance activities to the Land Strategist, which include:

- Annual Program of Works 6 months prior to the commencement of the financial year;
- Monthly progress of the works program, including any delays and budget v actuals;
- Potential refurbishment projects;
- Training and competencies;
- Progress on implementing improvements identified from audits;
- Data entry into SAP (measuring points entered within 1 month of inspections being completed);
- Land management activities;
- Stakeholder engagement (including attending public meetings on behalf of Powerlink) and landholder complaints; and
- Faults that are attributed to land assets (e.g. vegetation and fire).

Based on these and other inputs, the overall land maintenance strategy is delivered.

3.7.6 Technical Investigations and Research

To support the land asset strategies, technical specialists are engaged from time to time to assist with the investigation and resolution of site, technical and asset performance issues. Investigations can be initiated by a task request for internal specialists or commercial arrangement with a subcontractor or industry specialist. These activities include research into erosion, fire management, weed management and innovative ways of using new technology.

Current version: 10/05/2019	INTERNAL USE	Page 21 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

The Land Strategist will initiate technical investigations and research projects as required.

3.7.7 Emerging Issues

The Land Strategist will scan the external environment to determine if there are any emerging issues that may need to be considered as part of prudent long term management of land assets.

3.7.7.1 Climate Change Adaptation

Since the middle of the 20th century, Australian temperatures have on average, risen by about 1°C with an increase in the frequency of heatwaves and a decrease in the numbers of frosts and cold days. Rainfall patterns have also changed with the northwest experiencing increases in rainfall over the last 50 years, while much of eastern Australia and the far southwest have experienced a decline. Changes in temperature and rainfall patterns will directly impact vegetation growth rates, curing of fuel loads, erosion of access and subsequent management. The current strategy is to monitor and investigate changes on the land assets and to develop systems that will allow adaption to the changing climate, including potential issues associated with the increasing frequency and intensity of extreme weather events.

3.7.7.2 Fire Management

While Powerlink already considers fire management as part of its management of land assets, significant fire events in southern Australia and internationally, indicate that fire management may increase in importance over time depending on land use and climatic conditions. The Land Strategist will review and develop strategies to ensure credible hazards associated with land assets are managed appropriately. This includes monitoring industry and research developments.

3.7.7.3 Changes in Compliance Requirements

Powerlink is continually monitoring changes in compliance requirements. This includes an environmental reference register, which the General Manager Health, Safety and Environment, maintains.

Changes associated with the Biosecurity Act 2014 and associated regulations continue to be reviewed and strategies developed to meet any changes to Powerlink’s requirements for land assets, including risk mitigation measures and investment strategies to cost effectively meet Powerlink’s general biosecurity obligations.

Powerlink is also changing its approach to safety, which is resulting in a sharper focus on community, staff and contractor safety. Some matters that may be legacy issues (e.g. incompatible co-use or cane burning near transmission lines) are being reviewed and managed by applying risk-based approaches.

3.7.7.4 Changes in Vegetation Management Systems

Energy network providers have increasingly made investments to improve their confidence in vegetation management outcomes associated with maintenance. Throughout Australia, the majority of vegetation management work is performed by external contractors who are engaged through various arrangements.

Energy network providers have increased their sophistication in vegetation management systems, particularly in distribution networks, in an attempt to drive greater accountability and performance of their contractors. Increasingly this includes the use of Lidar (light detection and ranging) and spatial analysis. Data primarily is collected through aerial surveys to determine the presence of vegetation and the distance from conductors, but spatial analysis has potential to provide some forecasting of vegetation health and growth.

The Energy Networks Association has published a guideline on Vegetation Risk Management for Overhead Electricity Networks (ENA DOC 038-2018). Powerlink is considering these guidelines and changes where improvements in its vegetation management systems are identified and business benefits are proven, including increasing its use of Lidar surveys and spatial analysis.

3.7.7.5 Changes Relating to Access to Assets

The introduction of self-assessable codes in September 2010 under the Sustainable Planning Act 2009 (SPA) and Fisheries Act 1994 relating to fish passage required changes to standard practices.

Under this code, normal “bed level crossings” on access tracks are classed as “operational works” and assessable under the code as they are deemed to impact on fish passage. Changes to standard designs in these areas are continuing on a risk based approach to ensure that the crossings comply.

Current version: 10/05/2019	INTERNAL USE	Page 22 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

Related to this issue is the need to classify crossings associated with network assets to ensure the right areas are applied to the existing laws. Reports from field staff outline the difficulties of identifying water courses under the Fisheries Act, Water Act and Marine Acts. Associated constraints are to be recorded in appropriate corporate systems.

Changes to transmission line maintenance practices are making use of larger equipment to improve safety for personnel working at height and lifting loads to heights. These changes are driving requirements for improving the standard dry weather 4WD access tracks and ground platforms for transmission line towers leading to a higher standard in construction and maintenance of access tracks and gully crossings. This is being offset in some instances by using helicopters to transport lines maintenance staff.

Landholder access requirements are also changing, highlighted through network expansion in the Surat Basin in association with coal seam gas projects. Powerlink is proactively working to improve engagement with landholders to ensure that business impacts are minimised, including the management of land assets.

3.8 Emergency Response and Network Security

Vegetation that encroaches within exclusion zones for untrained persons for the HV assets will be treated as deferred corrective maintenance. Vegetation within exclusion zones for authorised or instructed persons will be removed as soon as is practical by suitably qualified personnel using appropriate control measures and treated as emergency corrective work.

Fires near HV assets have the potential to reduce the insulating properties of air sufficiently to cause an outage. Fire behaviour is a combination of the physical aspects of the site and the weather conditions at the time of the fire. Among other things, prevailing weather conditions can mean the difference between a low intensity fire burning quietly across an easement (for instance on a cool night with no wind) or a crown fire engulfing a line (for instance on a 30°C afternoon, with 30% relative humidity and a 30 km/hr wind).

Spatial analysis is performed to identify fires close to the HV assets (e.g. INDJI) and procedures for notification of internal and external parties in the event of a fire are managed by Network Operations. Powerlink also provides an information sheet (Fire and High Voltage Transmission Line Safety) on its website as a means of communication with stakeholders.

Emergency response work associated with land assets may be performed in response to natural disasters (e.g. cyclones and floods). This needs to be identifiable in related SAP notifications to allow for separate reporting.

The most appropriate way to access HV assets in an emergency event also needs to be considered. If access to HV assets needs to be restored or upgraded as part of an emergency event consider if the Manager HSE Services needs to be contacted for advice and support.

3.9 Forward Planning

Maintenance Service Providers will maintain a 5 year forward plan that is updated on a regular basis for each region (southern, central and northern), confirming alignment with land asset strategies. Contractors performing land maintenance will submit annual work plans 6 months prior to the commencement of a financial year. All plans should be reviewed by the Land Strategist to confirm alignment with the land asset strategies.

3.10 Risk Assessment

To successfully manage Powerlink’s land assets, it is necessary to identify and manage a range of hazards and risks, including those not directly related to the performance of the asset. Land asset risks are often managed as part of the associated built asset risks as part of asset management plans.

The following table summarises the identified hazards (and indicative ratings) associated with land assets. It also includes risk controls that are currently in place to mitigate the risk.

Table 3-2 - Identified Hazards, Risks and Treatments

Technical Issues Related Hazards	Risk	Risk Controls (minimum requirements)
Current version: 10/05/2019	INTERNAL USE	
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	

Vegetation related outage (Regrowth, Marginal Tree)	Significant	<ul style="list-style-type: none"> • Documented processes; • Land inspections; • Condition assessments (e.g. Lidar); • Notifications raised in SAP; • Condition based maintenance; and • Land asset audits.
A catastrophic fire event is caused by arcing from HV assets to vegetation	Significant	<ul style="list-style-type: none"> • Network Operations processes; • Monitoring fire weather conditions; • Engaging and communicating with stakeholders; and • Condition based maintenance.
Ground access not available to transmission line or site	Moderate	<ul style="list-style-type: none"> • Documented processes; • Land asset audits; • Land inspections; • Exception reporting; and • Condition based maintenance.
Spread of biosecurity threats through Powerlink's activities	Significant	<ul style="list-style-type: none"> • Documented processes; • Investments in joint control measures and washdown facilities; • Land asset audits; • Actively engaged with biosecurity management stakeholders; • Land inspections; • Condition based maintenance; • Vehicle hygiene practices; and • Exception reporting.
High fire fuel load accumulation on corridor, resulting in a network event (e.g. double circuit outage caused by fire)	Moderate	<ul style="list-style-type: none"> • Documented processes; • Investments in joint control measures; • Actively engaged with fire risk management stakeholders; • Monitoring active fires; • Land inspections; and • Mapping of known risk areas.
Erosion effecting electrical infrastructure or access	Moderate	<ul style="list-style-type: none"> • Documented processes; • Land asset audits; • Land inspections; • Condition based maintenance; and • Exception reporting.
Performance Related Hazard	Risk	Risk Controls (minimum requirements)
Property owner withholds access to land asset	Moderate	<ul style="list-style-type: none"> • Documented processes, including land access protocols; and • Exception reporting
Maintenance service provider does not correctly complete maintenance	Significant	<ul style="list-style-type: none"> • Documented processes; • Land asset audits; • Condition assessments (e.g. Lidar); • Monitoring network events relating to fire and vegetation; and • Investigations.

Maintenance service provider does not comply with relevant legislation or direction of statutory authority	Moderate	<ul style="list-style-type: none"> • Documented processes; • Compliance week; • Maintenance forums; and • Audit programs
Constraints are not documented into corporate systems, resulting in non-conformance or lock out	Moderate	<ul style="list-style-type: none"> • Documented processes, including land access protocols; and • Exception reporting
Associated Hazards	Risk	Risk Controls (minimum requirements)
Bushfire started by operational works associated with land maintenance	Moderate	<ul style="list-style-type: none"> • Documented processes; • Monitor fire weather conditions; • Control measures placed in contracts; and • Assess risks associated with activities and site conditions (pre-work risk assessments).
Damage to Electrical infrastructure from machinery owned by a landholder or contractor	Moderate	<ul style="list-style-type: none"> • Documented processes; • Easement agreements; and • Contract terms and conditions.
Illegal access to corridors by third party	Moderate	<ul style="list-style-type: none"> • Documented processes; • Easement agreements; and • Contract terms and conditions.

3.11 Technical Investigations

Technical investigations may be warranted or triggered based on the performance of land assets and service providers. These may be initiated by various parts of the business, but in all cases involving land assets, the Land Strategist should take a lead role in overseeing these investigations.

3.12 Condition Assessments & Asset Performance

Land assets need to align with asset strategies and serve their intended purpose (i.e. safe, cost effective, reliable and responsible delivery of transmission services). Condition assessments should evaluate land assets against established performance criteria as outlined in relevant processes. Land asset performance will be monitored and reported on a regular basis on the following:

- The number of network events resulting from vegetation and fire;
- The number of fire starts associated with land assets;
- The level of entry of measuring point data sets into SAP within 1 month of scheduled land inspections, including:
 - Span vegetation risk;
 - Span bushfire risk;
 - Vegetation height;
 - Vegetation density;
 - Tower leg condition;
 - Access track condition;
 - Herbicide application; and
 - Washdown condition.
- The number of notifications raised to indicate defects in the condition of the assets;

Current version: 10/05/2019	INTERNAL USE	Page 25 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland

- Management of assets based on risk/priority;
- Provision of services within budget, including delivery of refurbishment projects;
- The number of instances of inappropriate access to assets, (exception reporting of what access doesn't meet required standards); and
- The absence of any significant stakeholder interactions recorded in corporate systems.

3.13 Reporting, Auditing & Benchmarking

Land maintenance service providers should provide the Land Strategist with regular feedback about performance issues associated with land assets. Significant issues, future challenges and trends will be discussed at maintenance forums.

Land assets will be audited annually with a sample of assets from each region included in the scope of the audits. These should form part of broader asset auditing programs with results linked to service provider and contractor bonus schemes where appropriate. Service providers will be accountable for managing improvements identified and for reporting progress.

Internal and external benchmarking of land asset performance will be coordinated by the Land Strategist. An internal review of land assets generally occurs annually and external benchmarking should be aligned with other business requirements (e.g. ITOMS and RINS).

3.14 Supporting Activities

A number of additional supporting activities are required as part of managing land assets, including the following activities.

3.14.1 Project Handovers

Project handover processes provide the conduit for transferring design and construction information between the Designers, Construction Contractors and the Maintenance Service Providers. Handovers provide an opportunity for the project team and stakeholders to document and communicate challenges in meeting land asset standards, which can contribute towards identifying opportunities for improvements in process.

3.14.2 Human Resource Training

The Land Strategist provides input to training requirements for staff and contractors involved in managing land assets. The Land Strategist also provides communications to reinforce key concepts and strategies with service providers. It is important to communicate changes that have been implemented based on audits, condition assessments, investigations and condition assessments.

Training will be the decision of line managers with input and support from the Land Strategist.

3.14.3 Strategic Linkages

The Land Strategist will identify and manage key stakeholders as a member of the Asset Strategies team. The position forms part of the Assets Strategies team due to its links with asset management and to ensure land assets remain fit for purpose.

3.14.4 Stakeholder Management

As part of managing land assets, Powerlink recognises the most effective and efficient manner to achieve positive outcomes is often by engaging and coordinating with stakeholders. Where appropriate, Powerlink will proactively engage with stakeholders to achieve mutually positive outcomes.

4. Distribution list

Divisional Distribution	Contact details
Chief Executive	N/A

Current version: 10/05/2019	INTERNAL USE	Page 26 of 27
Next revision due: 10/05/2022	HARDCOPY IS UNCONTROLLED	© Powerlink Queensland



Divisional Distribution	Contact details
Delivery and Technical Solutions	Executive General Manager Delivery & Technical Solutions General Manager Community & Delivery Services General Manager Infrastructure Delivery General Manager Design Solutions
Finance and Governance	General Manager Governance & Business Services
Operations and Service Delivery	Executive General Operations and Service Delivery General Manager Field Services General Manager Service & Supply Partners General Manager Network Operations General Manager Technical & Network Solutions
People and Corporate Services	General Manager Health Safety & Environment Manager HSE Services
Strategy & Business Development	Executive General Strategy and Business Development General Manager Network Portfolio General Manager Business Development General Manager Asset Strategies & Planning Manager Asset Strategies