

4 July 2025



# Rehabilitation Management Plan

## Hughenden Workers Accommodation Facility



## Introduction

### Purpose

The purpose of this Rehabilitation Management Plan (this Plan) is to detail management requirements to be implemented to meet Powerlink's (the Principal) rehabilitation objectives. This Plan has been developed for the Hughenden Workers Accommodation Facility (Hughenden WAF) which is part of the CopperString 2032 Project (Project).

### Scope

The scope of this Plan is rehabilitation of the disturbance area associated with the location of the Hughenden WAF. This Plan defines the minimum rehabilitation requirements relating to Hughenden WAF.

### Defined Terms

Terms	Definition
Principal	Queensland Electricity Transmission Corporation Limited t/a Powerlink Queensland.
Project	CopperString 2032 Project

## Project information

The Project will involve the construction of a transmission line and related substation assets from south of Townsville to Mount Isa. The transmission system will connect to the Principal's existing 275kV network, approximately 70km south of Ross, joining into the double circuit line between Ross and Strathmore. The Project includes permanent infrastructure required for the operation of the transmission line as well as temporary infrastructure for construction.

## Relevant legislation and policies

### Commonwealth government

- *Environment Protection and Biodiversity Conservation Act 1999*

### State government

- *Biosecurity Act 2014*
- *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Land Regulation 2020*
- *Nature Conservation Act 1992*
- *State Development and Public Works Organisation Act 1971*
- *Water Act 2000*

## Existing environment

This section describes the existing environment of the location of the Hughenden WAF as determined by desktop and onsite surveys. These are the baseline conditions to assess the success of rehabilitation.

### Land use

Pastural grassland is the dominant land use and habitat type in the Hughenden WAF location. In the northern section, the presence of a permanent water source (trough) has resulted in heavy grazing pressure from the horses kept in the fenced area. This grazing pressure has resulted in sparse ground cover dominated by forbs, leaving heavy clay soils exposed and compacted. The grazing pressure reduces with distance to the water trough, with areas surrounding the mapped drainage feature and the southern end of the Hughenden WAF location having more dense ground cover at the time of the onsite survey.

### Landform

The Hughenden WAF location gently slopes towards the drainage features that run approximately through the centre of the lot.

### Drainage Features

A mapped drainage feature, as defined under the *Water Act 2000*, enters the lot to the west emerging from a culvert under the rail line, crossing the centre of the area, reaching another culvert below the Flinders Highway to the east. This drainage feature is classified as low risk waterway barrier works under the *Fisheries Act 1994*.

Additional drainage features linked to the mapped drainage feature were observed and mapped during the onsite survey.

### Vegetation and Flora

The vegetation within the location of the Hughenden WAF consists of non-remnant grassland dominated by introduced buffel grass (*Cenchrus ciliaris*). Small patches to the south of the drainage feature contained scattered individuals of Acacia tephрина and sandalwood (*Santalum lanceolatum*). Further details are provided in the sections below.

### Threatened Ecological Communities

Desktop assessment determined that no threatened ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* occur within the location of the Hughenden WAF.

### Regional ecosystems

The location of the Hughenden WAF is mapped a non-remnant regional ecosystem. Field surveys confirmed the location consists of non-remnant grassland dominated by buffel grass, which is a non-native perennial species.

### Flora

Onsite surveys identified 58 native flora species. The flora surveys did not detect any threatened and near threatened flora species. Sandalwood (*Santalum lanceolatum*) is listed as a special least concern species under the *Nature Conservation Act 1992*.

## Weeds

Nine introduced flora species were identified within the location of the Hughenden WAF. No species listed as Weeds of National Significance or under *Biosecurity Act 2014* were identified during the onsite survey.

## Fauna and fauna habitat

### Fauna

Onsite surveys detected 29 native fauna species, and three introduced species. Colonial breeding fairy martins (*Petrochelidon ariel*) were recorded flying over the location with nesting colonies established outside of the WAF location beneath the rail line and the Flinders Highway.

One special least concern species under the *Nature Conservation Act 1992*, short-beaked echidna (*Tachyglossus aculeatus*), was confirmed as utilising habitat within the location of the Hughenden WAF through observations of diggings and collection of a skull. Also burrows of varying sizes were recorded within the WAF location.

### Fauna habitat

Three fauna habitat types were identified during the field surveys:

- Pastural grasslands with varied grazing pressure;
- *Acacia* dominated regrowth areas; and
- Drainage features.

As stated above, pastoral grassland with sparse to mid-dense ground cover of buffel grass (*Cenchrus ciliaris*) dominates the Hughenden WAF location. Some native grasses are located in these areas although are rare.

Regrowth areas dominated by *Acacia tephрина* located to the south of the drainage feature provide very sparse canopy cover. Habitat features recorded within the wooded areas include log piles and fallen timber, which are generally small (less than 20 cm in diameter). Hollows are mostly absent from the site with only very rare occurrence of small openings in dead timber. The tree clusters also provide food resources, including mistletoe recorded along the south western boundary of the project area. These may provide foraging opportunity for bird species that utilise fruiting mistletoe.

The areas surrounding the drainage feature and adjacent drainage channels provide the highest available cracking soil habitat. Heavy clay soils across the location tend to provide only very shallow cracking, with some deeper cracks and crevices observed in proximity to and within the drainage channels. Rock habitat and gravel areas are rare and of poor quality. The western end of the drainage feature bed contains minor gravel substrate with some small, scattered boulders.

## Rehabilitation completion criteria

This section provides completion criteria to be implemented for rehabilitation. The primary objective of rehabilitation is to return disturbed areas to as close as practicable to pre-disturbance conditions. This objective incorporates the following:

- Reinstatement of landforms consistent with the surrounding topography;
- Long-term stability of soils and landforms;
- Restore vegetation cover through natural regeneration and if required active revegetation;
- Provide appropriate habitat for local native flora and fauna recruitment; and

- Ensure rehabilitated areas are self-sustainable and resilient.

Rehabilitation completion criteria are provided below. Completion criteria will be measured against baseline data and reference sites as detailed in the following Section.

Item	Interim performance targets	Completion criteria
Landform	Landform contoured to blend in with the surrounding topography.	Landform consistent with the surrounding topography and supports ongoing land use.
Soils and erosion	No major soil loss or erosion observed during monitoring events.	Topsoil is stable with negligible erosion/soil loss relative to reference sites. Disturbed and reinstated soils vegetated to minimise erosion. No additional erosion or sedimentation compared to reference sites.
Weed presence and cover	Density of weeds are no greater than that observed at reference sites. No new weed species within the rehabilitation areas compared to baseline.	Weed cover within 10% of reference sites. No new weeds within rehabilitated areas compared to baseline data.
Regeneration native vegetation	Native vegetation composition (species richness and cover) represents references sites for each fauna habitat type: 1. Pastural grasslands 2. Acacia dominated regrowth areas; and 3. Drainage features.	Native vegetation cover within 10% of reference sites for each fauna habitat type.

## Reference sites

Representative permanent reference sites will be established to compare the rehabilitation success of disturbance areas in present vegetation communities. These sites should be representative of pre-disturbance conditions such as landform, soils and erosion, weeds and vegetation type and cover.

During monitoring, reference sites will be surveyed at the same time as the rehabilitation sites for each monitoring event to determine external factors influencing rehabilitation success such as weather conditions, fire or grazing.

## Rehabilitation Requirements

In accordance with the Coordinator General's change report, disturbance areas within the location of the Hughenden WAF must be rehabilitated progressively throughout construction and operation of the facility. Complete rehabilitation must then be implemented at the end of the temporary occupation period.

## Progressive rehabilitation

As stated above, the location of the Hughenden WAF must be rehabilitated progressively. This progressive rehabilitation may include, but not limited to, stabilisation and revegetation of disturbed areas when no longer required for operation of the facility.

## Removal of construction materials

Prior to the commencement of rehabilitation, all construction materials and supplies must be removed from the temporary disturbance areas. This includes:

- Removal of all infrastructure, buildings, washdown areas and water treatment systems;
- Removal of all waste and excess materials and supplies; and
- Removal of all imported materials including hardstand material such as gravel and road base.

## Soil contamination

Notifiable activities listed under the *Environmental Protection Act 1994*, such as storage of more than 25,000L of petroleum products that are combustible liquids in class C1 or C2, must be listed on the Environmental Management Register (EMR). Following the completion of the notifiable activity, the nature, extent and risks of any contamination on the land must be determined by engaging a suitably qualified person to carry out a site investigation.

In addition, areas identified as being at risk of contamination as a result of activities at the WAF, such as refuelling or mechanical maintenance areas, must be tested then treated or removed for disposal at an offsite licensed waste disposal facility prior to the commencement of rehabilitation.

## Site contouring

Once construction materials and any soil contamination are removed, disturbed areas will be reshaped to reflect pre-disturbance landforms to the extent practical including natural drainage patterns.

## Ripping

Soil compaction from construction and operational activities inhibits rainfall infiltration and increases the risk of erosion to rehabilitation areas. Ripping of compacted areas will be undertaken after site contouring and prior to the placement of topsoil.

Ripping of all disturbance areas will be undertaken across the natural slope (i.e. parallel to contours) to reduce overland flow velocity and mitigate erosion to a depth of approximately 300 mm. Highly compacted areas such as hardstands, laydowns and temporary tracks may need to be ripped to depth of 500 mm.

## Topsoil dispersal

Following contouring and ripping, topsoil will be redistributed as per the following steps:

- Topsoil spread to a depth of approximately 100 mm or the natural soil profile depth across the disturbed area;
- Topsoil to be spread from the far edge of the disturbed area progressively moving inwards to reduce the risk of compaction and destruction of seed bank; and
- Habitat features, such as woody debris, will be placed over the rehabilitated areas for fauna habitat.



Topsoil will be spread over disturbed areas will assist in soil nutrient levels. If soil nutrient levels are determined through testing to be insufficient to support rehabilitation, then the application of fertilisers to rehabilitation areas may be required.

Rehabilitation should be timed when soil moisture content is optimum to assist in vegetation growth. If there is insufficient soil moisture content to allow for effective seed germination for rehabilitation, then watering may be required.

### **Reseeding**

If required, disturbed areas will be reseeded with flora species compatible with local vegetation types as listed in the Existing Environment section.

## **Rehabilitation success factors**

Planning and timely implementation of rehabilitation measures should be undertaken in a manner consistent with best practice to ensure success.

### **Management of onsite resources**

Topsoil and vegetated mulch must be removed and stockpiled in separately. Stockpiles must be located within the disturbance area. The location of stockpiles should be planned such that the stockpile will not need to be moved until required for rehabilitation. The location of topsoil and vegetation stockpiles must be documented prior to disturbance.

#### **Topsoil**

Topsoil when correctly stripped, stockpiled and managed can provide significant seed bank for native vegetation species when respread. Also topsoil when correctly managed can retain sufficient nutrients for natural regeneration when respread.

The following must be implemented for topsoil management:

- Topsoil must be stripped to a minimum of 100 mm and stockpiled for rehabilitation;
- Topsoil stockpiles must be no greater than 2 m in height;
- Topsoil stockpiles must be protected from water and wind erosion, such as seeding with sterile cover species;
- Topsoil stockpiles must be protected from disturbance during operation of the WAF; and
- To avoid hard setting, water will not be used for dust suppression during topsoil stripping or on topsoil stockpiles.

#### **Stockpile management**

Stockpiles must be stabilised and where necessary have suitable erosion and sediment control measures installed. Stockpiles will not be located within 50 m of drainage features or areas where eroded material could be transported into other sensitive areas.

The following must be implemented for stockpile management:

- Separate topsoil and subsoil stockpiles;
- No stockpiling or storage within the dripline of any mature trees to be retained to prevent damage to the root system; and

- Location as close as practicable to the final use area while avoiding potential for disturbance from operations.

## Weed management

The following weeds will be targeted for monitoring and management during rehabilitation:

- Weeds of National Significance; and
- Weeds listed as a Prohibited Matter' or Restricted Matter under the *Biosecurity Act 2014* (Qld).

This will include the control of these targeted weeds within disturbed areas and on stockpiles prior to commencement of rehabilitation.

Fast germinating weed species may colonise rehabilitation areas if the necessary conditions for native species are not met such as soil moisture. Following rehabilitation, weed control must be undertaken before they set seed to which will further increase the weed regeneration.

## Inspections and monitoring

### Post rehabilitation inspection

Following the completion of rehabilitation works, rehabilitated areas must be inspected by Principal Environment and Sustainability Manager or delegate. The purpose of this inspection will be to record and sign off that works have been completed generally in accordance with this Plan.

If rehabilitation works are considered not to meet the requirements outlined in this Plan, corrective actions must be agreed and recorded. Corrective actions will then be implemented with a follow up inspection completed to certify the rectification works were completed to the required standard.

### Monitoring sites

#### Rehabilitation sites

Permanent monitoring sites, consisting of a 50 m transect, will be established to monitor the progress and success of rehabilitation of disturbance areas. The transect must be situated entirely within the rehabilitation area and representative of the species composition of the area.

The coordinates of the start and end point of the 50 m transects will be recorded to be surveyed over consecutive monitoring events.

#### Reference sites

Due to seasonal variations and other external factors, reference sites will be established and surveyed during each monitoring event to be used as 'benchmark' conditions. Permanent reference sites, consisting of a 50 m transect, will be established to compare the rehabilitation success of disturbance areas.

The coordinates of the start and end point of the 50 m transects will be recorded to be surveyed over consecutive monitoring events.



## Monitoring implementation

### Photo monitoring

Photo point monitoring will be undertaken at the start point (0 m) of each monitoring site. Photos will be taken in each cardinal direction (north, east, south, west) and in landscape.

### General visual inspections

General visual inspections will be undertaken for each monitoring site. This will include:

- Landform stability;
- Signs of erosion and sedimentation; and
- Signs of disturbance such as bushfire or vehicle access.

### Ground cover monitoring

Ground cover will be measured along each monitoring site transect using a 1 x 1 m quadrat. A total of five quadrats will be measured along each transects on alternating sides of the transect at the following distances:

- 5 – 6 m;
- 15 – 16 m;
- 25 – 26 m;
- 35 – 36 m; and
- 45 – 46 m.

The attributes to be measured within the quadrats will be:

- Individual vegetation species cover of both native and introduced flora species;
- Organic litter;
- Bare ground caused by ecological factors (i.e. ant/termite mounds, native rodent/marsupial diggings); and
- Bare ground not caused by ecological factors (i.e. erosion and sedimentation).

### Monitoring timing

Monitoring the success of the rehabilitation of disturbed areas will be undertaken at the following intervals:

- Initial monitoring undertaken within 12 months of the completion of rehabilitation works with preference of late wet season or early dry season; and
- Annually from initial monitoring event for five consecutive years or until rehabilitation completion criteria has been met.

In the event that a major disturbance (e.g. flood or drought) occurs prior to the planned monitoring event, monitoring should be postponed six months or the subsequent year.

### Reporting

Following the completion of any specific rehabilitation monitoring program, a rehabilitation monitoring report must be developed by a suitably qualified person. Reports must include information on achieving the performance targets and completion criteria as detailed in this Plan.

## Adaptive management

Adaptive management practices may be implemented where monitoring indicates rehabilitated areas will not achieve rehabilitation objectives and completion criteria. The triggers for adaptive rehabilitation management are provided below.

Item	Trigger for further action	Corrective action
Landform	Monitoring indicates landform does not support ongoing land use.	Investigate alternative revegetation methods.
Soils and erosion	Monitoring indicates additional erosion and sedimentation relative to reference sites.	Implement additional erosion and sediment controls as determined appropriate by a Certified Practicing Erosion and Sediment Control Professional (CPESC).
Weed presence and cover	Monitoring indicates an increase in weed cover relative to reference sites.  An outbreak of weed species not previously recorded in the area.	Review timing and frequency of weed management measures.  Investigate alternative or additional weed management control actions and implement.
Regeneration native vegetation	Decrease in species richness and cover observed from preceding years values.  Noting that a decrease in values in line with decreases in values observed from the reference sites does not constitute a trigger action.	Undertake adaptive rehabilitation management of areas where vegetation species composition and cover is less than 20% of reference sites.

## Specific adaptive rehabilitation plans






Where adaptive management practices are required to be implemented to meet rehabilitation objectives and completion criteria, specific adaptive rehabilitation plans should be developed in consultation with specialist personnel as required.

These plans should include a range of adaptive management strategies such as:

- Manual watering;
- Direct seeding, hydromulching or planting of tube stock;
- Soil testing and application of fertilisers or other soil treatments based on chemical and physical soil test results; and
- Extending the rehabilitation monitoring and reporting period.

These plans should include rehabilitation objectives, performance indicators and measurable targets relevant to the vegetation communities and flora species being planted.

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