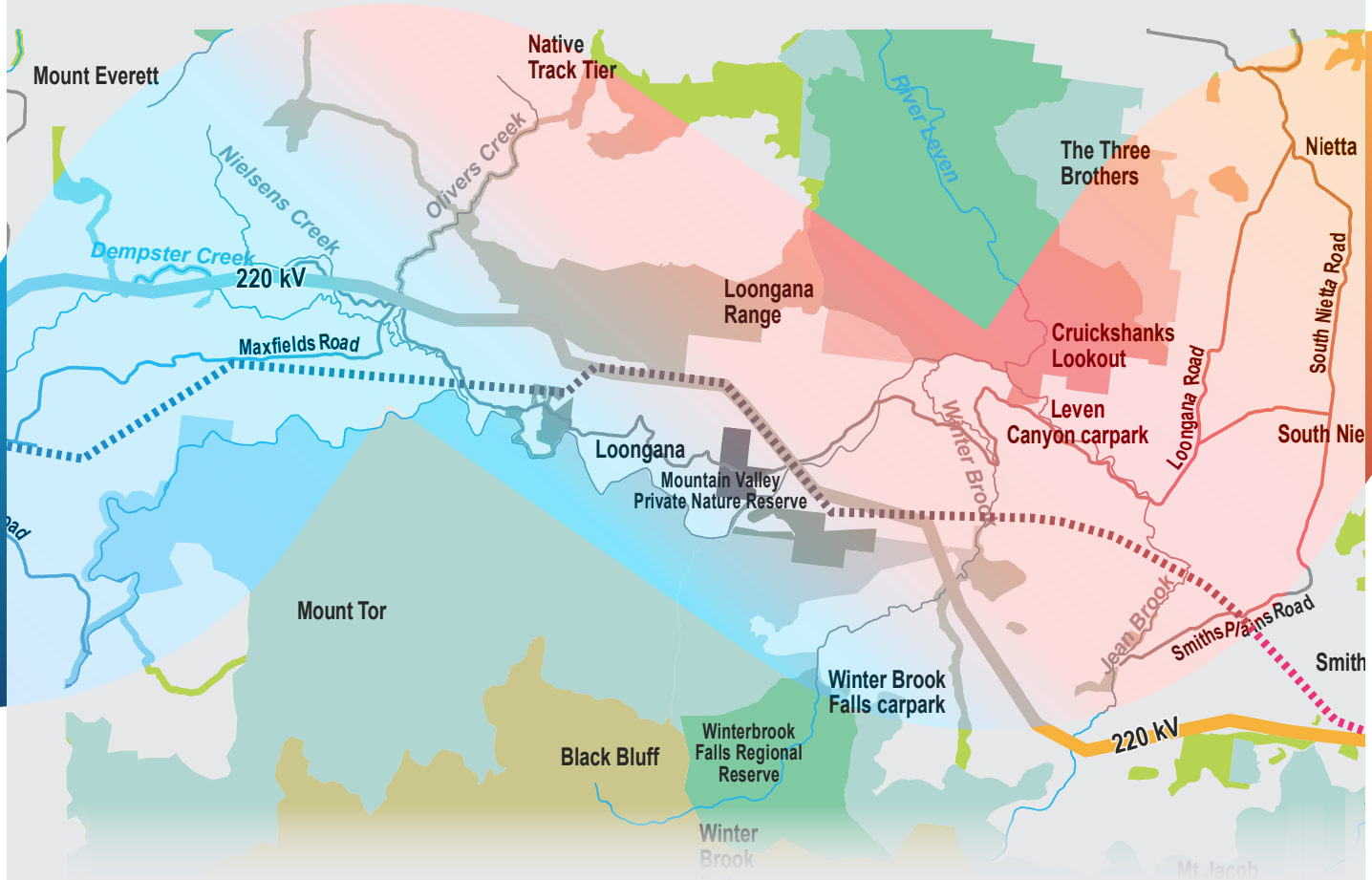
Staverton to Hampshire Hills Route Options Report

overview document - August 2020



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Responsibilities

This document is the responsibility of Tasmanian Networks Pty Ltd, ABN 24 167 357 299 (hereafter referred to as "TasNetworks").

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Route Options Report – overview document

TasNetworks has released a revised route for the Staverton to Hampshire Hills section of the North West Transmission Developments – the preferred route. The preferred route is informed by landowner, community and other stakeholder feedback on the 2019 proposed route and preliminary design. The preferred route will support progress of environmental and social impact assessment, detailed transmission line design, environmental and planning approvals, and land access negotiations.

A Route Options Report has been prepared to document the route selection process TasNetworks has used to identify the preferred route for landowners, the community and other stakeholders.

This document provides an overview the Route Options Report, including information on:

- **Why these developments are proposed for North West Tasmania**
- **How TasNetworks is planning for them**
- **Where the preferred route will go**
- **What the assets on the preferred route will look like**
- **The various stages involved in the route selection process**
- **What it means now that a 'preferred route' has been identified**
- **How you can participate throughout the design and approvals process**

The full Staverton to Hampshire Hills Route Options Report is also available to download from our website. Visit www.tasnetworks.com.au. If you would like a hard copy, please email project.marinus@tasnetworks.com.au, and we'll be in touch.

Why are these developments planned for North West Tasmania?

The electricity transmission network in North West Tasmania is expected to undergo significant changes over the coming years to support the region's role in Australia's transition to a low emissions future. As part of this transition, the Australian Energy Market Operator has developed a blueprint to manage the evolution of Australia's power system. This blueprint is called the Integrated System Plan.

North West Tasmania is identified as a high priority renewable energy zone in the Australian Energy Market Operator's Integrated System Plan. This is because North West Tasmania has excellent potential for developing renewable generation, storage and dispatchable 'on demand' energy projects, including:

- new large-scale wind generation in the order of 2,000 megawatts (MW)
- latent/existing excess hydro power of up to 750 MW, and
- new pumped hydro energy storage developments of at least 750 MW.

The region also hosts the expected connection point for Marinus Link, a proposed 1500 MW capacity undersea and underground electricity corridor that will link North West Tasmania to Gippsland in Victoria. The extra capacity provided by Marinus Link is critical to unlocking the large-scale wind, existing hydro capacity and new pumped hydro energy storage resources planned for development in North West Tasmania.

Did you know?

A megawatt (MW) is approximately equivalent to the energy needed, at a point in time, for powering 1,000 homes. This means that Marinus Link has the capacity to transport low cost, reliable and clean power for approximately 1,500,000 homes.

The work TasNetworks has done to date shows that Marinus Link and the supporting transmission developments in North West Tasmania stack up. **The benefits to customers and local economies will outweigh the costs.**

How is TasNetworks planning for these developments?

Changes to the existing transmission network and potential new transmission routes will be required in North West Tasmania to increase network capacity and ensure the power system can accommodate the future renewable energy and storage developments proposed for the region, including Marinus Link.

TasNetworks' role as a network planner

TasNetworks is the electricity network planner for Tasmania. We work with all parties interested in the future development of the transmission network. We also develop plans to outline how the transmission network will be developed to connect new generation and meet customers' energy needs. This includes the network requirements to efficiently unlock Tasmania's renewable energy zones identified by the Australian Energy Market Operator's Integrated System Plan.

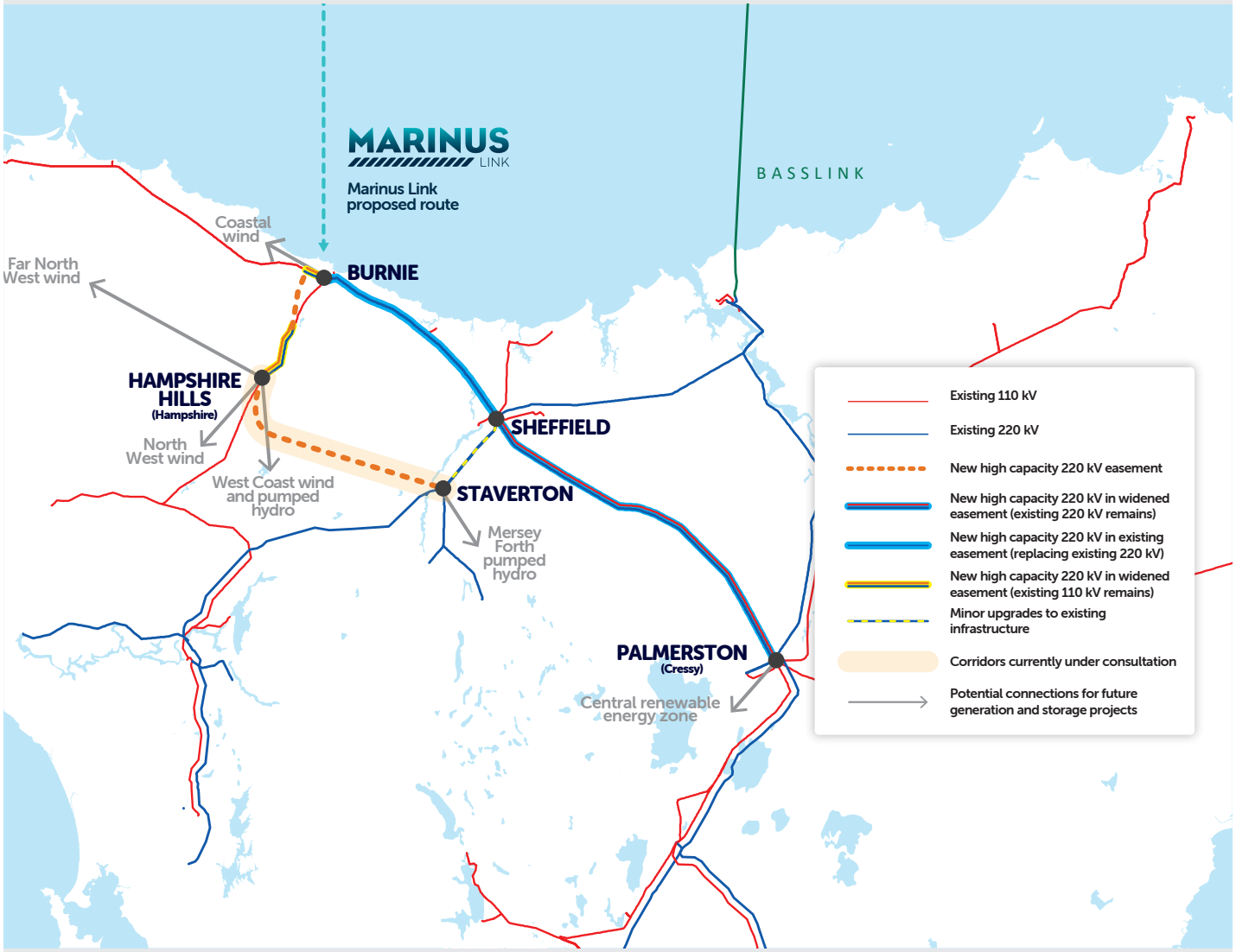
Strategic planning

TasNetworks has undertaken strategic planning for the North West Tasmanian transmission network, which considers planned developments required to support the energy market in the long term. As part of progressing plans, TasNetworks is now assessing the transmission upgrades and potential new transmission developments that may be required. This strategic planning aims to minimise adverse impacts on landowners, community, environment and areas of cultural significance by using existing transmission routes where viable and cost-efficient. However, our assessment is that in order to support efficient development of renewable energy zones in Tasmania, some new transmission routes will be needed.

TasNetworks' strategic planning recommends strengthening the transmission network in North West Tasmania by creating a 220 kilovolt (kV) 'rectangle' that connects the existing Sheffield and Burnie substations with two new switching stations in Hampshire Hills and Staverton. This 220 kV rectangle provides significant system benefits. These benefits include:

- transmission route diversity and redundancy
- reduced transmission losses
- maximising power transfer capability
- system resilience

This means that the 'rectangle' will allow Tasmania's power system to remain strong and stable while passing more energy efficiently through the network.



This map shows the existing transmission network. It also indicates the proposed transmission upgrades to existing lines and proposed new transmission developments that we are presently investigating.

These developments form the proposed 220 kV 'rectangle' that connects Burnie, Sheffield, Staverton and Hampshire Hills.

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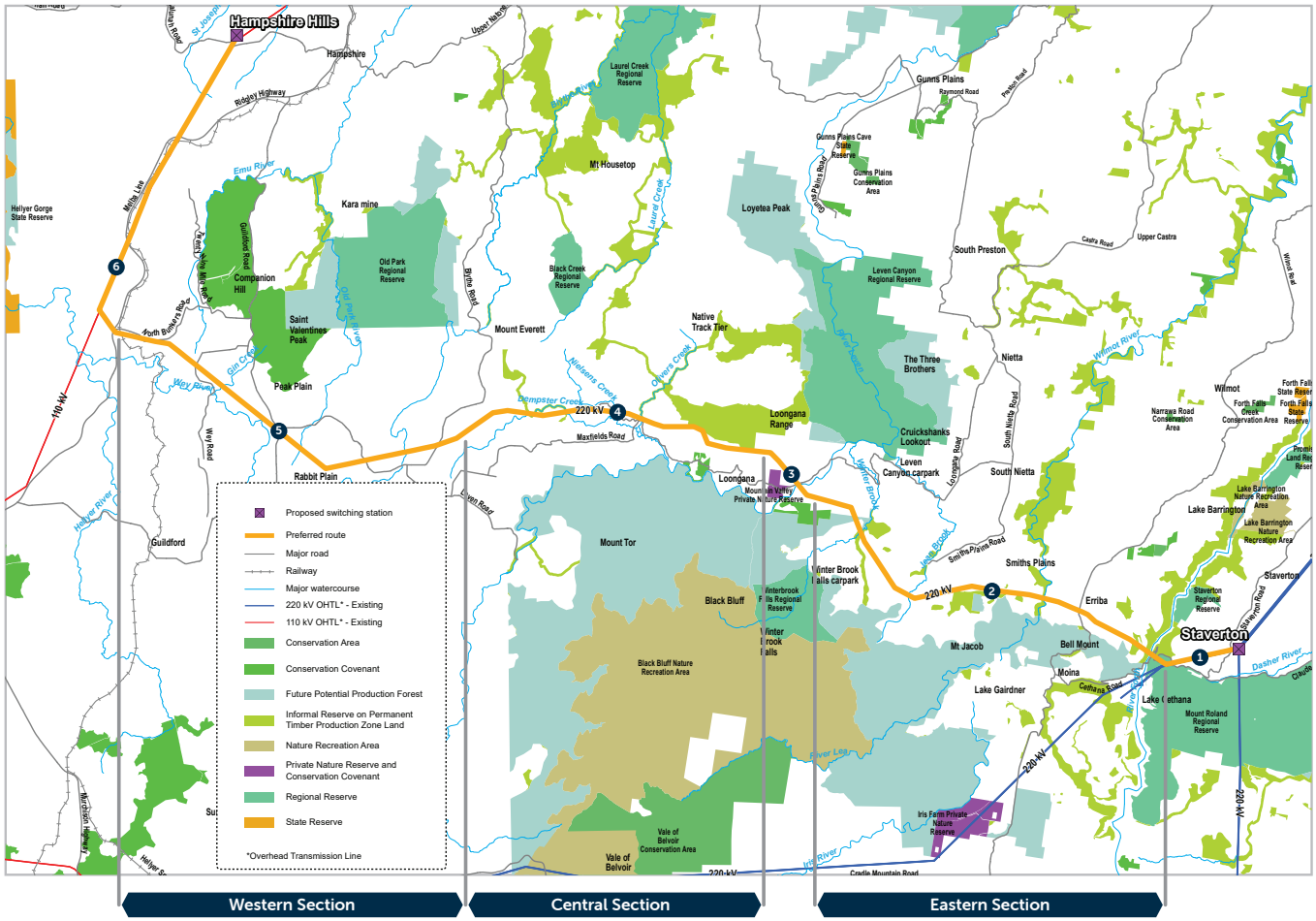
Where will the preferred Staverton to Hampshire Hills route go?

The Staverton to Hampshire Hills preferred route augments the existing 220 kV transmission network by completing the first of two new 'sides' of the proposed 220 kV 'rectangle'. A new double circuit 220 kV overhead transmission line is proposed, with a new switching station at Staverton and plans for a future switching station at Hampshire Hills. **Switching stations control where energy flows within the transmission network by 'switching' the energy flow between transmission circuits within the network.**

The Staverton to Hampshire Hills preferred route is illustrated below. The route includes the following areas, including three route sections where viable route change requests were adopted:

1. Staverton to Cethana
2. Cethana to River Leven (the 'eastern' section)
3. River Leven crossing
4. River Leven to Blythe Road ('central' section)
5. Blythe Road to Wey River ('western' section)
6. Wey River to Hampshire Hills

A map of the preferred transmission route from Staverton to Hampshire Hills August 2020

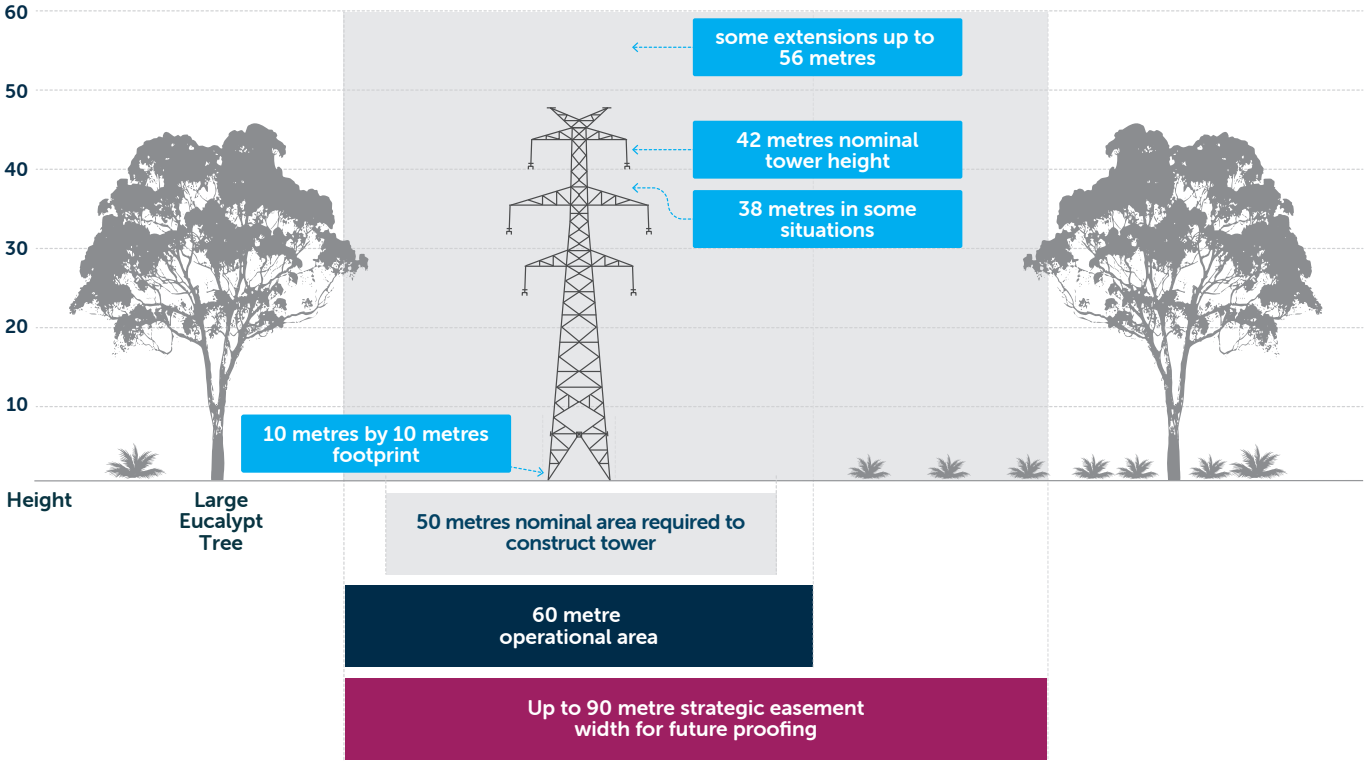


What are you proposing to build?

The Staverton to Hampshire Hills transmission line is proposed to be an overhead 220 kV transmission line with an operational area of up to 60 metres wide. TasNetworks proposes to negotiate strategic easements up to 90 metres wide to enable design flexibility and future proofing of the network.

The proposed transmission towers have a nominal ground level footprint of 10 metres by 10 metres and require up to 50 metres by 50 metres for construction activity. The towers have a nominal height of 42 metres with a small number up to 56 metres tall and other towers as low as 38 metres.

220 kV - Double circuit steel lattice towers twin phosphorous phase conductors and dual optical ground wires



Access tracks with a nominal width of six metres will be required for each of the towers along the preferred route. Where possible, the required tracks will make use of existing tracks and roads.

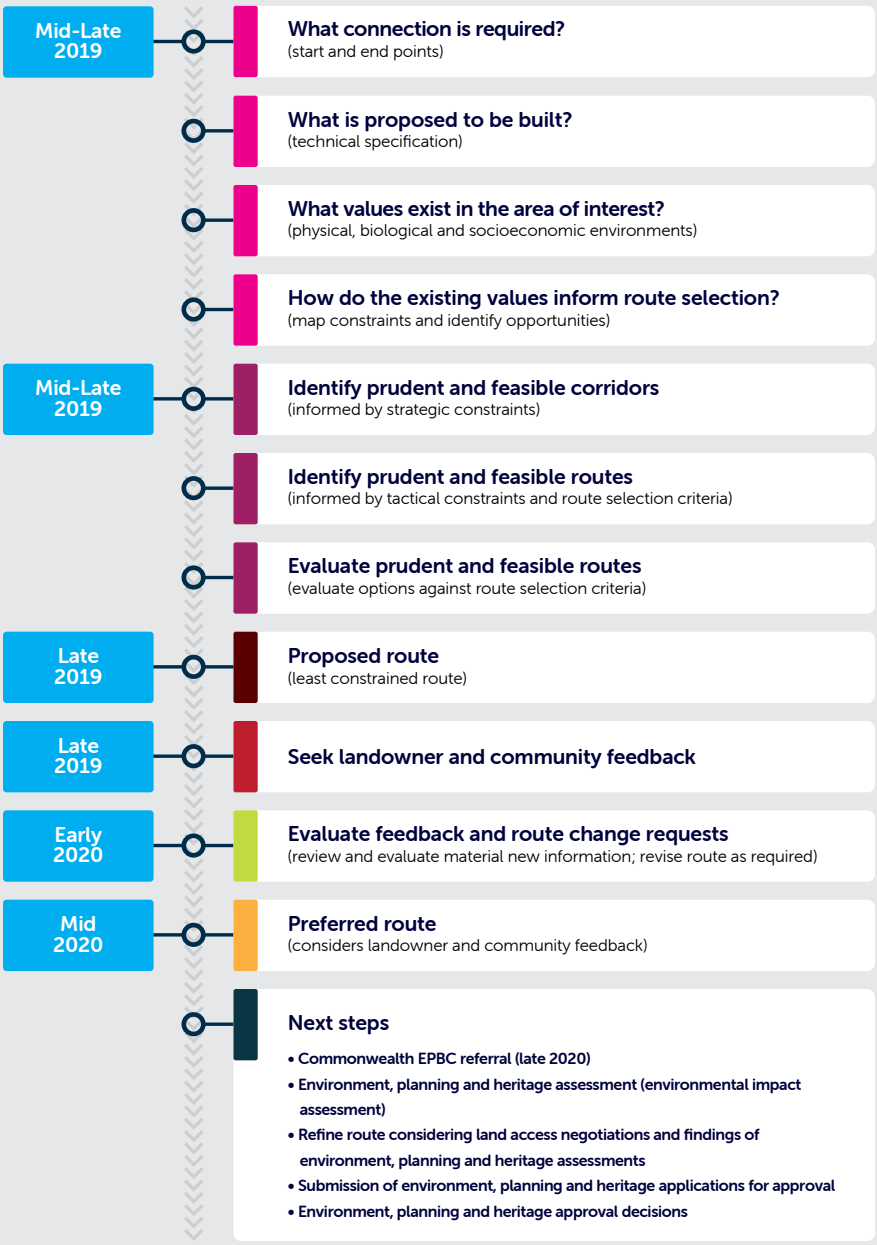
The proposed **Staverton Switching Station** would have a plot size of approximately 260 metres by 120 metres.

How did you select this route?

TasNetworks' has followed a rigorous route selection process to identify the preferred Staverton to Hampshire Hills route. This process began in early 2019. Over 18 months we have considered a range of factors and constraints relevant to the development of transmission infrastructure. The diagram below sets out each of the steps involved in this route selection process.

The preferred route will support the progress of the environmental and social impact assessment, detailed transmission line design, environmental and planning approvals, and land access negotiations. These will be the next steps in the route selection process.

Route Selection Process



The route selection process explained

The first steps in the route selection process involve understanding the renewable energy connection requirements and opportunities in the context of the existing network system and the environment.

What connection is required?

Route selection starts by considering strategic transmission network planning requirements to identify what augmentation or new transmission infrastructure is required, and where it is to be located, i.e. the start and end points for route selection.

TasNetworks identified that changes will be required for the Tasmanian electricity transmission network to increase network capacity and ensure the power system can accommodate the future renewable energy and storage developments proposed for the region, including Marinus Link. These changes include a new transmission route between Staverton and Hampshire Hills.

The Staverton to Hampshire Hills transmission route is proposed to connect Marinus link, pumped hydro and other future renewable energy projects, including the Robbins Island and Jim's Plain Renewable Energy Parks currently being planned by a private energy developer called UPC Renewables. The UPC Renewables connection has prompted TasNetworks to bring forward the timing of development between Staverton and Hampshire Hills. TasNetworks' goal is to work with UPC Renewables and other generation and storage developers to achieve a coordinated and optimised transmission network that efficiently unlocks the renewable energy zone. The proposed transmission line between Staverton and Hampshire Hills is to be built, owned and operated by TasNetworks. Under this arrangement, UPC Renewables will pay for the right to use the line.

What is proposed to be built?

The next step of the process was to understand what needs to be built i.e., the technical specifications for the transmission infrastructure. In this instance, a 220 kV transmission line with a 60 metre wide operational area and requisite access tracks, along with a switching station in Staverton and a future one proposed at Hampshire Hills.

What values exist in the area of interest?

Understanding the physical, biological and socioeconomic environment of the area potentially affected by the proposed transmission line is another key early stage in the route selection process. Landscape and scenic values were also considered.

The identified 'area of interest' extends from Staverton to Hampshire and Cradle Mountain to Gunns Plains. The route selection process involved collating all publicly available geospatial data (such as vegetation cover and types, land forms, water courses, roads, land uses, etc.) and existing literature to identify constraints for the proposed overhead transmission route.

What do we mean by constraints?

Constraints to route selection are considered in both strategic and tactical contexts.

Strategic constraints inform corridor identification and tactical constraints inform identification of prudent and feasible routes within those corridors. For example, strategic constraints informing corridor selection in the area of interest include Black Bluff Range, Cradle Mountain-Lake St Clair National Park, Leven Canyon, Loongana Range, Mt Everett, Mt Housetop, Native Track Tier and St Valentines Peak.

Tactical constraints relate to statutory requirements, technical considerations and societal expectations and are reflected in route selection criteria. For example, legislation and land use planning controls indicate what land uses are permissible in reserves and planning zones. Australian and Tasmanian Government legislation lists and protects threatened ecological communities and species and cultural heritage sites.

What do we mean by "prudent and feasible"?

The National Electricity Rules require identification of a route that is a prudent and efficient. Environmental, planning and cultural heritage legislation and guidelines require **prudent and feasible** alternatives to be identified and assessed that factor in additional values and constraints. This process is used to identify a preferred transmission route.

The route selection process involves trade-offs between a variety of factors. **Prudent and feasible** routes balance societal expectations with environmental impacts, cultural heritage considerations, constructability, current and future land use, project costs (construction, operation and maintenance) and technical and operational requirements.

How do the existing values inform route selection?

The existing physical, biological and socioeconomic values limit route options but also provide opportunities, particularly those created by existing linear infrastructure (i.e., existing transmission lines and road corridors). These values provide context and assist in identifying constraints and opportunities for prudent and feasible routes.

Environmental, planning and heritage legislation and guidelines are used to define constraints to route selection. Some existing linear infrastructure provides opportunities for co-location.

This information helps to map and identify prudent and feasible corridors and routes.

Constraints, opportunities, and prudent and feasible corridors and routes are mapped and identified by:

- Collating all relevant publicly available information including spatial data, reports and previous investigations into transmission line projects.
- Building a project geographic information system (GIS) to store and facilitate analysis of publicly available spatial data.
- Using the project GIS to understand constraints to route selection and to support the identification and evaluation of prudent and feasible alternatives.

The next steps of the route selection process involve identifying prudent and feasible corridors, prudent and feasible routes within those corridors, and then evaluating these route options against route selection criteria to identify a proposed route.

Identify prudent and feasible corridors

Strategic constraints, such as mountain ranges in the area of interest, are used to identify prudent and feasible corridors.

Significant strategic constraints within the area of interest include: Black Bluff Range, Cradle Mountain-Lake St Clair National Park, Leven Canyon, Loongana Range, Mt Everett, Mt Housetop, Native Track Tier and St Valentines Peak. These constraints led to three prudent and feasible corridors being identified:

- northern corridor through South Nietta, South Preston, Gunns Plains, South Riana and Upper Natone to the north of Leven Canyon and Mt Housetop;
- central corridor through the River Leven valley and Surrey Hills; and
- southern corridor along the existing Sheffield to Farrell 220 kV overhead transmission line and the Burnie to Waratah 110 kV overhead transmission line.

Identify prudent and feasible routes within corridors

The next step involved identifying prudent and feasible routes within in each corridor including consideration of tactical constraints and using route selection criteria.

The tactical constraints and route selection criteria included consideration of:

- cost
- constructibility
- transmission system integrity and performance
- environmental and social aspects including occupation, land use, native vegetation, threatened ecological communities and species, planning controls and geomorphology.

Landscape and visual amenity were also key considerations in route selection.

Evaluate prudent and feasible routes within corridors

The route selection criteria enable prudent and feasible route options to be compared and then evaluated to identify the route with the least limitations – the 'least constrained' option.

The evaluation process is relatively complex and is a progressive process. Potential route options are evaluated against criteria with options progressively discounted as more detailed information becomes available and is analysed. The evaluation is undertaken by a team of experts in the fields of land use planning, power system engineering, economics, environment and cultural heritage.

At this stage in the overall route selection process, desktop information was used to identify all prudent and feasible routes, with preliminary baseline studies and 'ground-truthing' used to evaluate shortlisted options to determine a proposed route. By baseline studies we mean collating and examining lots of public and online data as it applies to the routes, and by ground-truthing we mean getting out into the field to the extent possible to observe conditions in real life and comparing this information against the desktop data.

Routes in the '**northern corridor**' were found to be highly constrained by geology (granite formations), rural settlements and intensive agriculture, particularly in Gunns Plains.

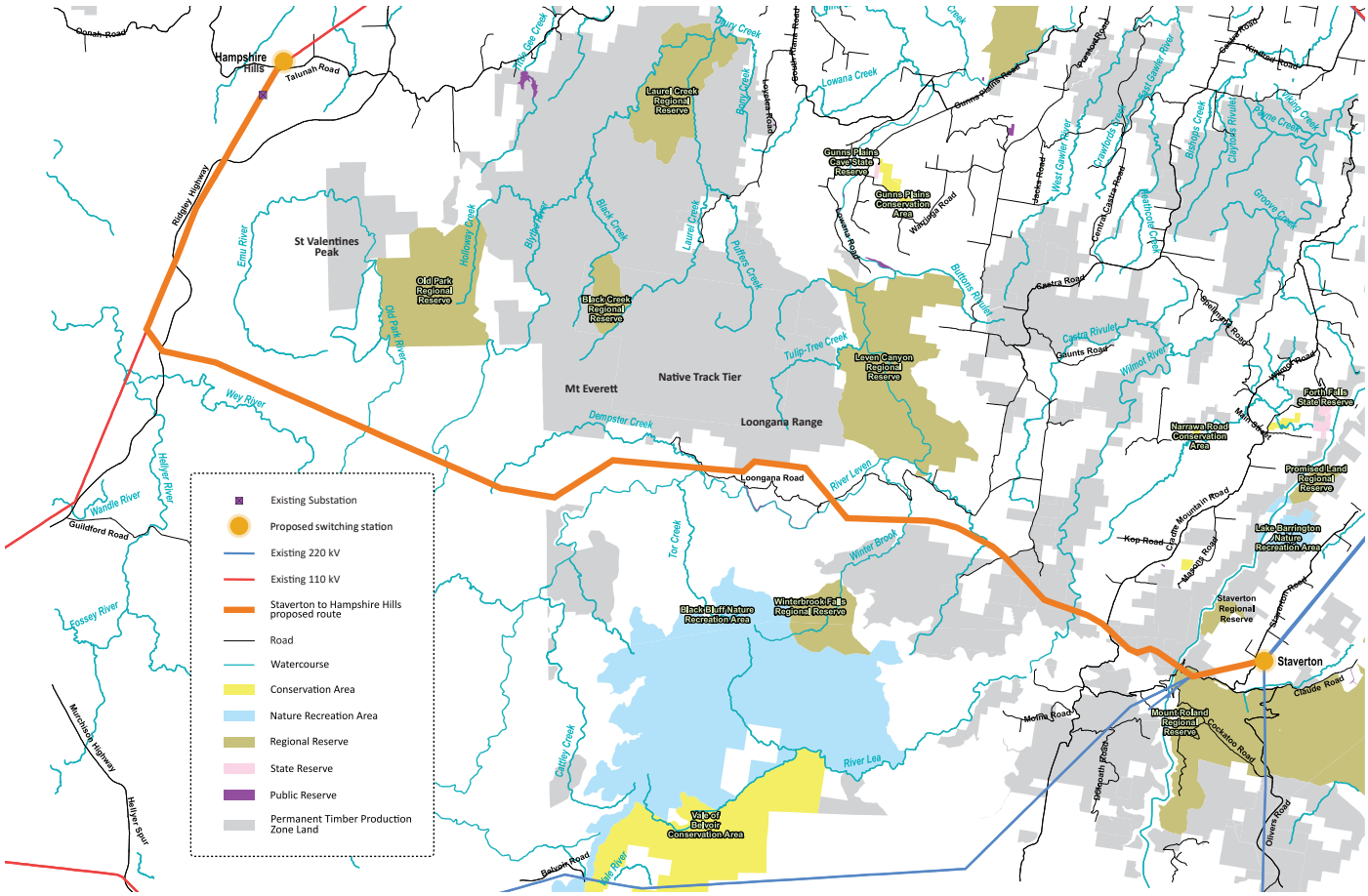
Routes in the '**southern corridor**' were significantly longer than routes in the other corridors. Routes in this corridor passed through the Vale of Belvoir conservation area and a conservation covenant with potential significant impacts on the subalpine grassland, sedgeland and rushland ecological communities and associated state and federally listed threatened species.

A route in the '**central corridor**' was found to be least constrained and nominated as the proposed route.

Identifying a Proposed Route for consultation

Following evaluation of all prudent and feasible route options, the proposed route was released for public consultation in November 2019.

2019 proposed transmission line from Staverton to Hampshire Hills



Seek landowner and community feedback

TasNetworks released the proposed Staverton–Hampshire Hills route for consultation in November 2019. Landowner, community and other stakeholder feedback was sought, including through a community engagement survey and a series of workshops and meetings with individuals, groups, communities and organisations across the region.

A number of individuals, groups, communities and organisations raised concerns about the proposed route and requested changes including proposals for alternative routes. A number of stakeholders raised broader concerns about new renewable energy projects in Tasmania and the corresponding need for any new transmission.

A report summarising the feedback provided during these engagement activities is available on TasNetworks' website: Summary of Engagement October - December 2019. https://talkwith.tasnetworks.com.au/59134/widgets/304463/documents/176795

Evaluate feedback and route change requests

Route change requests arising from community feedback were reviewed to determine if they raised material new information not known or considered in earlier stages of the route selection process. In some instances, the feedback and suggestions introduced material new information.

The feedback relating to the proposed route and route change requests can be broadly grouped as follows:

- requests for an underground option
- a strong preference for a southern route through the Vale of Belvoir
- requests for refinement of the proposed route

Underground option

Transmission circuits can be constructed as overhead transmission lines or underground cables. A range of factors determine the feasibility of overhead or underground technologies. TasNetworks prefers to use overhead transmission lines when progressing high voltage alternating current projects, as this allows for more efficient additional connections, reflects our existing transmission network assets, and is generally the least cost to deliver energy to customers, while still allowing land use and environmental impacts to be managed.

An underground option was discounted for the Staverton to Hampshire Hills route as the difficult terrain would increase the length of the route and environmental impacts would be greater. The environmental impacts reflect that the entire underground route (with a nominal easement width of between 15 to 20 metres) would need to be cleared and trenched, except for major watercourse and road crossings, which could be crossed using horizontal directional drilling if geotechnical conditions were suitable. Karst limestone and landslip hazard zones on the steep slopes of the major watercourses would expose the underground cable to risk of damage. These issues contribute to underground options which cost significantly more than overhead transmission lines.

The 2019 proposed route (and preferred route) is best constructed as an overhead transmission line as the route traverses deeply incised valleys, unstable geology including karst limestone and landslip hazard zones.

Vale of Belvoir (Sheffield to Farrell corridor)

Routes along the Sheffield to Farrell 220 kV overhead transmission line corridor, which go through the Vale of Belvoir conservation area and conservation covenant, were originally discounted. However, TasNetworks committed to revisit route options through this area after numerous requests from community members. Overhead and underground options were reviewed. This review confirmed the earlier assessment that routes through the Vale of Belvoir would have significant environmental impacts on threatened ecological communities and species and would significantly increase the cost of the project. The cost differences change depending on the circumstances.

The Tasmanian Land Conservancy (**TLC**) actively manages the conservation area and conservation covenant and undertakes scientific research, ecological burns and conservation programs aimed at protecting and enhancing its values. The TLC expressed considerable concern at the prospect of routes through the Vale of Belvoir. Routes through the Vale of Belvoir were again discounted.

Refinement of the proposed route

TasNetworks' review of route change requests and suggested alternative routes identified a number of potential route options to refine the proposed route.

Viable route change requests were grouped into sections to aid review and evaluation of potential alternative routes. These included:

- Cethana to River Leven (eastern section), which had two alternatives identified (north and south of Bell Mount)
- River Leven to Blythe Road (central section), which had one alternative (north of Loongana)
- Blythe Road to Wey River (western section), which had one alternative (south through Rabbit Plain)

In assessing the alternative routes, detailed ecology, cultural heritage and geomorphology desktop studies and an eagle nest survey were undertaken to ensure the evaluation process was based on an equivalent level of data to that used for the originally proposed route.

The alternative routes were evaluated against the proposed route using key route selection criteria including technical, environmental and social aspects. Findings from the desktop studies and the experience of TasNetworks' subject matter experts were also key inputs to the evaluation. The alternative routes for each section were evaluated as to whether they were an improvement on the proposed route or a detriment.

The Preferred Route

The preferred route is a combination of the proposed route originally consulted on in late 2019, and alternative route sections identified through the consultation process. This outcome was found to address a number of landholder and community concerns and route change requests, while also considering other variables such as constructability and environmental impacts.

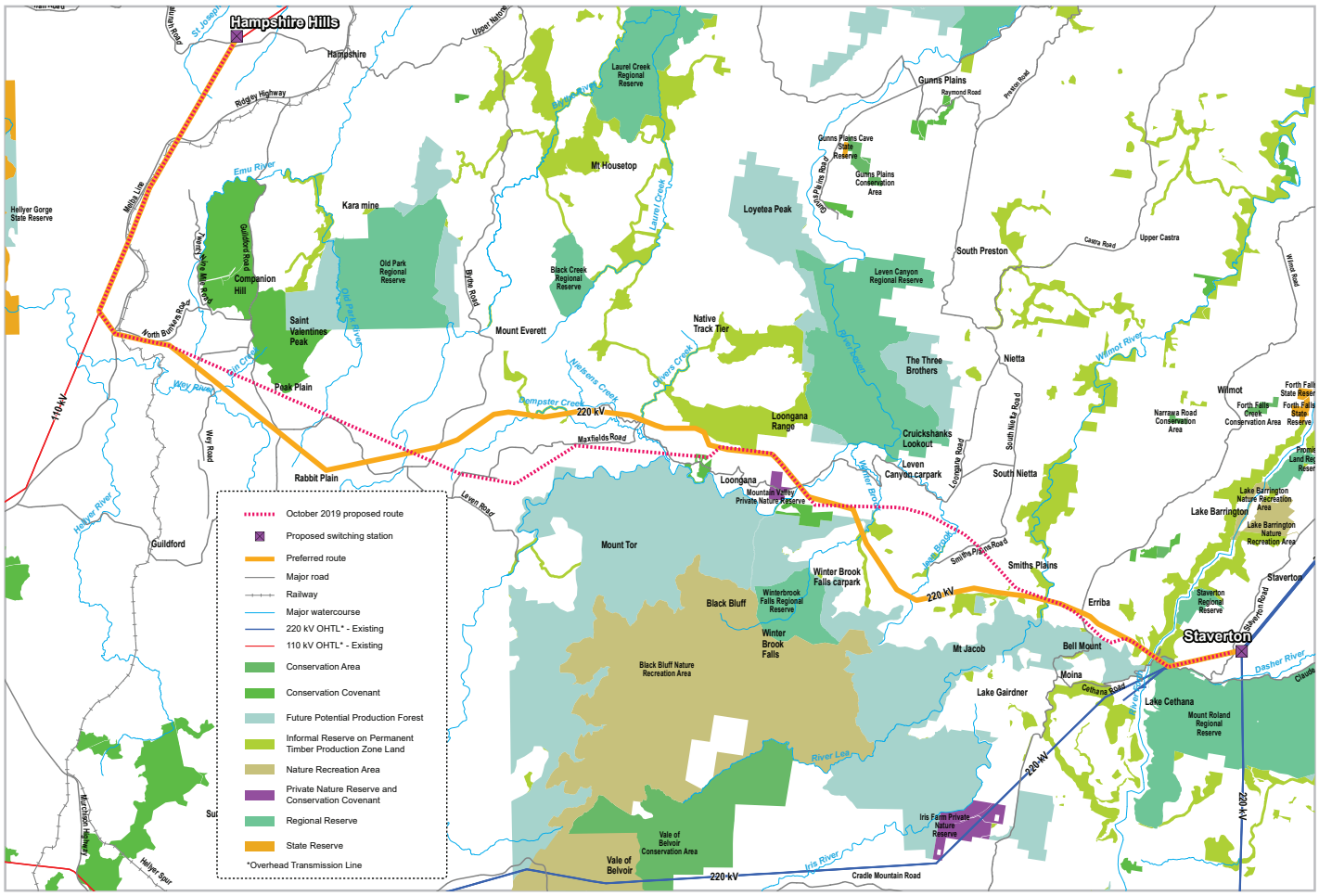
Our design seeks to balance landowner, community and other stakeholder feedback with environmental impacts, cultural heritage considerations, constructability, current and future land use, project costs and specific electricity system requirements.

The preferred route crosses extensive plantations, reducing impacts on native vegetation and conservation values. It also crosses a smaller number of private landholdings. It avoids amenity impacts on the main access road to Leven Canyon visitor areas and viewpoints. Looking from Cruickshanks Lookout (situated at Leven Canyon visitor area), the proposed overhead transmission line on the preferred route will be visible partly and remotely where it crosses the River Leven. The preferred route will not be visible from the lower viewing platform at Leven Canyon.

Those aspects of the preferred route that have been confirmed or refined compared to the 2019 proposed route are outlined below:

2019 Proposed route	Preferred route
Staverton to Cethana	No change
Cethana to River Leven ('eastern section')	North of Bell Mount alternative route
River Leven crossing	No change
River Leven to Blythe Road ('central section')	North of Loongana alternative route
Blythe Road to Wey River ('western section')	Rabbit Plain alternative route
Wey River to Hampshire Hills	No change

A map of the preferred transmission route, compared with the 2019 proposed transmission route from Staverton to Hampshire Hills August 2020



Landowner and community concerns have been partially or wholly addressed with the preferred route as follows:

- conservation covenants have been avoided
- the number of small landholdings crossed has been reduced
- separation distances to small landholdings have been increased, with a few exceptions where the separation distances remain unchanged or slightly reduced
- the route has been moved away from public roads servicing the Loongana community, except at the River Leven crossing
- the route has been moved north of Loongana, as proposed by some community members
- realignment has reduced impacts on high productivity plantation coupes and existing and planned high value production forest coupes
- realignment in the Winter Brook area has reduced the extent of the overhead transmission line within the Cruickshanks Lookout viewshed
- realignment adjacent to Dempster Creek has lowered the overhead transmission line in the landscape west of Loongana Range, reducing its visibility in that area
- preliminary design has reduced tower heights in sensitive areas to reduce landscape and visual impacts
- preliminary design has avoided impacts on known Aboriginal cultural heritage sites by careful placement of towers
- watercourse crossings have been selected and designed to achieve, where practicable, maximum clearance over riparian vegetation to protect wildlife corridors
- access track lengths have been reduced to the extent possible through use of existing tracks and roads

Next Steps

TasNetworks will use the preferred route to progress further planning, assessment and engagement activities. Landowners, communities and stakeholders will have multiple opportunities to comment on the preferred route and its impacts. Formal opportunities to make submissions are provided through comprehensive and robust environmental, planning and heritage assessment processes, and informal opportunities are available through planned engagement activities.

Identification of the preferred route will enable:

- Tower positions to be confirmed, which will inform environmental, planning and heritage assessments and land access negotiations.
- Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 referral application.
- Land access negotiations to be completed to enable field surveys.
- Detailed terrestrial ecology, cultural heritage and geomorphology field surveys to accurately map existing conditions for environmental impact assessment purposes.
- Landscape and visual impact assessment to understand how the preferred route addresses community concerns about views from their properties and key tourist viewpoints. Community input on views and landscapes will inform this assessment and the development of appropriate mitigation.
- Preliminary geotechnical and constructability investigation (walk-through) to identify features and site conditions that require detailed investigation to inform detailed design.
- Environmental, cultural heritage and socioeconomic technical studies to inform environmental impact assessment and cultural heritage and planning approvals. The outcomes of these studies may require route refinement to address site-specific constraints and manage impacts.
- Landowner negotiations for the required easement valuations and compensation agreements.
- Detailed design of the proposed double circuit 220 kV overhead transmission line and Staverton Switching Station having regard to the environmental impact assessment including cultural heritage and socioeconomic studies and proposed mitigation measures.
- Submission of environment, land use planning and heritage applications for approval.
- Environment, land use planning and heritage approval decisions determines the final design of the overhead transmission line and Staverton Switching Station.

Opportunities to provide feedback include:

- The Landscape and visual impact assessment process
- The environmental, planning and heritage assessment and approval process, which provides further opportunities for landowners, land managers, communities and stakeholders to comment on the preferred route and its impacts.

How can I find out more?

TasNetworks remains committed to working closely with community, businesses and landowners as planning for Marinus Link and the proposed North West transmission developments continues.

More information on the landscape and visual impact assessment process, together with updates on engagement opportunities, can be found at: https://talkwith.tasnetworks.com.au/north-west-transmission-upgrades

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You can contact us with any questions about the proposed developments to the North West Tasmanian transmission network via our project email and phone line.

visit: **tasnetworks.com.au**
email: **projectmarinus@tasnetworks.com.au**
call: **1300 127 777**

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