



Talison Lithium Pty Ltd
GREENBUSHES LITHIUM OPERATION

132 KV Power Line
Visual Impact Assessment

Talison Greenbushes Lithium Operation

132kV Power Line - Visual Impact Assessment

Talison Lithium Pty Ltd

ABN: 15 140 122 078

Greenbushes, Western Australia

Submitted as part of the Development Application to the Shire of Bridgetown - Greenbushes for the 132kV Power Line, from Western Power Hester Substation to Greenbushes Lithium Operation



EXECUTIVE SUMMARY

Background

On 15 November 2021, Talison submitted a Development Application to the Shire of Bridgetown – Greenbushes for construction of a 132 Kilo-Volt electrical supply Power Line to support the mine-site expansion operations, which includes the operation of new production facilities.

The proposed Power Line route will extend from the Hester Road Western Power substation, just east of the Bridgetown Golf Course, to the intersection of South-West Highway and Forest Park Avenue, where it will then cross the highway heading directly west where it will join the Mine Power Line infrastructure corridor, within the Mine Development Envelope.

At its meeting on the 25th November 2021, the Shire considered the Development Application and resolved that the *“proposed Use Not Listed – Proposed 132 kV Power Line is consistent with the objective of the Rural Zone 2 – General Agriculture and may be considered for development approval subject to public consultation and detailed assessment and subject to the proponent lodging a landscape architectural concept plan showing the visual impacts of the power line with regard to terrain and view scapes”*.

This Report provides the Visual Impact Assessment required by the Shire to assess the 132kV Power Line Development Application.

Scope

Geographical Information Systems datasets and aerial photography were used to generate a visual map of a “Study Area” that encompasses the Power Line corridor. This identifies the Study Area within which the Project can potentially be seen and Viewpoints that may be impacted by the Power Line.

The document “Visual Landscape Planning in Western Australia – a manual for assessment, siting and design” (Western Australian Planning Commission and Department for Planning and Infrastructure, November 2007) was used to develop the scope of the Visual Impact Assessment, and included consideration of the following:

- Commonwealth and State Government requirements;
- Local Government policy and planning considerations relevant to landscape issues, including review of Legislation, Policies, Strategies and Guidelines, including the Shire of Bridgetown – Greenbushes Planning Scheme No. 4 requirements;
- description of the existing visual landscape character;
- identification of the 132kV Power Line corridor route and description of the proposed development;
- use of Geographical Information Systems datasets and aerial photography to generate a visual map of a “Study Area” that encompasses the Power Line corridor;
- visiting local landowners to identify potential impacts and take representative photographs of affected view-scapes;
- identification of impacts on the visual landscape at representative Viewpoints;



- description and evaluation of the potential visual impacts to public, residential and recreational Viewpoints;
- identification of the limitations and assumptions of the visual impact methodology;
- consultation with relevant stakeholders including government and local Community; and
- implementation of visual management measures to minimise impacts to Viewpoints and the visual landscape.

Landscape Character

The landscape within the Study Area lies within the “Rural Zone 2”, General Agriculture, zoning of the Shire of Bridgetown Greenbushes Town Planning Scheme No. 4.

Existing landscape character and the relative percentage of each land use was determined using aerial photographs and Geographical Information Systems datasets. The following land uses within the Study Area (total area of 698 hectares) were identified:

- Agriculture – pasture, sheep and cattle grazing (60%);
- Forestry plantations, primarily blue gums (24%);
- Public Utilities, including roads and power lines (5%);
- Natural forest remnant vegetation, both Crown Land State Forest and private forest (3.6%);
- Rural-residential (2%);
- Public Recreation (4%); and
- Rural Industry (0.65%).

The predominant land use is agriculture and forestry plantation (blue gums), which comprises over 80% of the land use. Natural forest and remnant vegetation comprises less than 4% of the total land use.

The proposed Power Line corridor would comprise approximately 3.9% of the Study Area.

Visual Effects of the Proposal

The following definitions were used to differentiate between the various Viewpoints in the Study Area:

- **Public Viewpoint(s)**– where Viewpoints within the landscape are visible to the public;
- **Residential Viewpoint(s)** – where Viewpoints are located at rural residential properties; and
- **Recreational Viewpoint(s)** – where Viewpoints are located within a recreational area.

The Visual Impact Assessment is presented as a series of images (or viewsapes) taken from a number of Viewpoints in the Study Area, representative of existing land uses. Some images show the views from different directions from the various Viewpoints.

Viewsapes are presented showing the “before and after” images, showing the influence of the Power Line on the landscape.



Stakeholder Consultation

Community and Landholders

Community consultation on the Power Line commenced in November 2018, with plans showing the Power Line route being displayed at the Greenbushes Community Resource Centre during November and December 2018.

Talison also advertised and held a public meeting in November 2018 to provide details on the Power Line and other projects associated with the Mine expansion. Details of the Power Line were made available by Talison at its company displays at the Bridgetown Show (November 2018) and general information was provided at the Balingup Field Day (April 2018 & 2019).

Talison has had a Community Liaison Office at the Greenbushes CRC since 2018. Talison has also advertised for at least the last two (2) years in its Community Newsletter every month for local residents or interested community members to come forward to ask questions.

No issues or concerns about the Power Line have been raised by the community at the Community Liaison Office or via Talison's Stakeholder Management System during this time.

Talison has previously undertaken consultation on the Power Line route selection with affected landholders commencing in early 2018.

Talison has sought support from all landholders who are directly impacted by the Power Line on their properties. As a result of this consultative process, Talison has reached agreement with all landholders whose properties are directly impacted by the Power Line, this includes Access Agreements and Notice of Entry agreements.

In January 2022, whilst in the process of undertaking the VIA, Talison also undertook additional visits and consultation with a number of residents whilst seeking permission to enter properties and take photographs. It was evident from these visits that local residents were aware of the Power Line corridor proposal.

Aboriginal Communities and Heritage

Consultation with an anthropologist from Heritage WA and representatives from the Bibbulmun Noongar community has been undertaken. The outcomes and recommendations of this consultation were provided in a report from Heritage WA to Talison in April 2019.

The proposed alignment traverses the area known as "Knight Hill" that is recognized as a heritage site in the Shire of Bridgetown-Greenbushes Municipal Inventory.

The Shire has confirmed (in a letter dated 25 November 2018) that "it is the view of the Shire that the proposed location of the transmission line will not impact on the heritage value of this site".

Visual Impact Assessment

Power Pole locations

There are 22 Power Poles located within the Study Area. Of these Power Poles:

- 1 is at the Western Power Bridgetown Sub Station;
- 2 are in a Recreational Area (Golf Course);



- 7 are in Plantations; and
- 12 are on Talison-owned property.

No Power Poles are directly located on private residential properties outside of Talison ownership.

Public Viewpoints - Users of South-West Highway

The Visual Impact Assessment shows that any potential Power Line impacts to users of South-West Highway will be intermittent, and of short duration, until a vehicle passes roadside vegetation or hillsides which will block views to Power Line poles or Power Line corridors.

The length of Power Line visible from South-West Highway for users travelling north (towards Greenbushes) is less than four (4) kilometres; and for users heading south (towards Bridgetown) it is approximately three (3) kilometres.

At an average speed of 90 – 100 kilometres per hour (**km/h**), the Power Line will be visible for less than three (3) minutes, noting that the speed limit is 110km/h along this part of the Highway.

Residential Viewpoints – Rural Residences

There are three (3) residences where the Power Line will be in close proximity and directly visible from the properties; and there are two (2) properties where the Power Line will directly traverse through the properties.

The three (3) residences where the Power Line will be in close proximity are:

- two (2) residences on South-West Highway; Residential Viewpoint 3 (approximately 440 metres from the Power Line), and Residential Viewpoint 4 (approximately 300 metres from the Power Line) respectively; and
- one (1) residence on South-West Highway, bordering Forest Park Avenue East, which will have Power Lines within the adjacent blue gum plantation, within 160 metres of the residence.

In the near future (estimated at less than two (2) years), these visual impacts will be obscured or “absorbed” by the growth of blue gum tree plantations between the residences and Power Line.

The two (2) residential properties where the Power Line will directly traverse through are:

- one (1) residence on Wadgebanup Road, approximately 320 metres from the Powerline. This property will be traversed by Power Lines on the eastern border of the property, but will not have any Power Poles on the property itself. An Agreement between Talison and the residence has been negotiated, including Access and Notice of Entry Agreements; and
- one (1) residence on Forest Park Avenue East, which is Talison owned. This property will have three (3) Power Poles on its northern boundary, with the Power Line approximately 60 metres from the residence.

Almost all rural residences (except for those few with underground power or off-grid power) have existing 22kV power lines on their properties.



Recreational Viewpoint (Bridgetown Golf Course)

The most significant visual impact is likely to be at the Bridgetown Golf Course. Two (2) Power Poles will be directly located across the central part of the Golf Course, from south to north, and two (2) Power Lines will directly traverse across the Golf Course.

The Power Poles and Power Lines will be directly seen from a number of fairways, with some of these views being intermittent as views will be blocked by existing vegetation as golfers move from fairway to fairway. Views of the Power Poles will be visible from outside the Club House, but is likely to be partially obscured by surrounding vegetation.

The Golf Course has an Access and Notice of Entry Agreement with Talison.

Conclusions

The 132kV Power Line is consistent with the objectives of Rural Zone 2 as it allows for “Public Utilities”, which includes provision of electricity services as a permitted use within the Zone. From the Visual Impact Assessment, the proposed 132kV Power Line is not considered to constitute a significant additional visual impact due to the following:

- the Rural Zone 2 existing landscape is a modified rural environment with a number of different land uses. The natural environment (remnant forest vegetation) forms a very small part of this landscape (<4%);
- there are numerous existing 22kV Power line corridors connecting rural residences on the western and eastern side of South-West Highway, with power lines a common feature within the rural landscape. The 132kV Power Line is not expected to significantly alter the overall character of the landscape;
- potential visual impacts to traffic on South-West Highway will be intermittent as Power Line views are often shielded by vegetation and topography along the Highway;
- in general, users of South-West Highway are not likely to be distracted by the 22kV and 132kV power poles as power poles are a familiar feature within the rural landscape;
- there are a number of residences where visual impacts will be more apparent in the short term; however, the views are tempered (blended, or visually absorbed) with views of blue gum plantations, and will eventually be absorbed by future growth of the plantations;
- blue gums can grow up to 2m per year with the fastest growth in the first 7-10 years, with harvesting between 10 – 20 years depending on yield. The fast-growing blue gums will eventually shield the power poles, visually absorbing the impact of Power Lines;
- the overall character of the landscape will change as the blue gum plantations grow. This would be viewed as a positive development through “greening of the landscape”;
- prominent locations have been avoided wherever possible, such as parallel to South-West Highway, and locating the Power Poles below prominent ridge lines (avoiding the crest of hills);
- the most significant visual impact is likely to be at the Bridgetown Golf Course; however, an Agreement between Talison and the Golf Course has been negotiated, including Access and Notice of Entry Agreements; and



- locating Power Lines within existing easements wherever practicable. In areas where there are no existing easements, Power Lines will be located in areas that will have minimal impact on agricultural areas or native vegetation, such as cleared farmland or other partly cleared areas to avoid additional clearing. Where necessary, minor clearing will be required to remove vegetation within the Power Line easement.



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1.0 INTRODUCTION – 132KV POWER LINE PROJECT

1.1 Project Overview and Background to the 132kV Power Line Project

Talison Lithium Australia Pty Ltd (**Talison, Company**) is currently undertaking an expansion of the Greenbushes Lithium Operation (**Mine**) in order to increase production of lithium mineral concentrate to meet increasing global demand for lithium products.

To support the expansion operations, which includes the operation of new production facilities, Talison needs to upgrade the existing power requirements and power infrastructure to the Mine.

On 15 November 2021, Talison submitted a Development Application (**DA**) to the Shire of Bridgetown – Greenbushes (**Shire**) for construction of a 132 Kilo-Volt (**kV**) electrical supply Power Line.

The Power Line development within the Mine Development Envelope (**MDE**) has previously been assessed and approved under the *Environmental Protection Act 1986* (August 2019), and *Mining Act 1978* (September 2019). See Section 2.2 for a further description of relevant State Government approvals.

1.1.1 The 132kV Power Line – Route and Construction

The proposed Power Line route will extend from the Hester Road Western Power substation, just east of the Bridgetown Golf Course (**Golf Course**), to the intersection of South-West Highway (**SW Hwy**) and Forest Park Avenue, where it will then cross the highway heading directly west where it will join the Mine Power Line infrastructure corridor, within the MDE. The location of the Power Line corridor, between the Hester Road substation and the Greenbushes mine site is shown in Figure 1.

The following details relate to the Power Line route and construction:

- 22 galvanised steel poles are proposed over a distance of approximately 7.2 kilometres (**km**);
- Poles are 32.25 metres (m) in height;
- distances between poles will vary between 200 to 500m (average 300m) depending on topography;
- poles will consist of four (4) conductors strung between each pole in a fern tree configuration, as shown in Figure 17;
- there will be no transformers on Power Lines or along the Power Line route;
- all pole foundations will be encased and bolted within in a concrete and steel foundation with no-stay wires anticipated. The design of this transmission line will conform to all applicable Australian Standards, Codes and Practices, of which there are 26 Australian Standards and two (2) additional electrical standards; and
- poles will be located within a 40m easement, utilising existing access roads and tracks wherever possible. In areas where there are no existing easements, Power Lines will be located in areas that will have minimal impact on agricultural areas or native vegetation, such as cleared farmland or other partly cleared areas to avoid additional clearing. Where necessary, minor clearing may be required to remove vegetation within the Power Line easement.



1.2 Purpose of the Report

The Shire considered the DA from Talison for the proposed 132kV Power Line and Hester substation at its meeting on the 25th November 2021, and resolved the following:

1. *Pursuant to Clause 3.2.5 and 4.3.3 of Town Planning Scheme No. 4, determines that the proposed Use Not Listed – Proposed 132 kV Power Line is consistent with the objective of the Rural Zone 2 – General Agriculture and may be considered for development approval subject to public consultation and detailed assessment and subject to the proponent lodging a landscape architectural concept plan showing the visual impacts of the power line with regard to terrain and view scapes;*

and

2. *Directs the Chief Executive Officer to undertake necessary public consultation in relation to Point 1 above, and grants delegated authority to the Chief Executive Officer to determine the development application, where no objections are received, subject to appropriate conditions.*

This Report provides the Visual Impact Assessment (**VIA**) required by the Shire to assess the 132kV Power Line DA.

1.3 Stakeholder Consultation

Community and Local Landholders

Community consultation on the Power Line commenced in November 2018, with plans showing the Power Line route being displayed at the Greenbushes Community Resource Centre (**CRC**) during November and December 2018. Talison also advertised and held a public meeting on 21 November 2018 to provide details on the Power Line and other projects associated with the Mine expansion. Details of the Power Line were made available by Talison at its company displays at the Bridgetown Show (November 2018) and Balingup Field Day (April 2018 & 2019).

Talison has had a Community Liaison Office at the Greenbushes CRC since 2018. Talison has also advertised for at least the last two (2) years in its Community Newsletter every month for local residents or interested community members to come forward to ask questions.

No issues or concerns about the Power Line have been raised by the community at the Community Liaison Office or via Talison's Stakeholder Management System during this time.

Talison has previously undertaken consultation on the Power Line route selection with affected landholders commencing in early 2018.

Talison has sought support from all landholders who are directly impacted by the Power Line on their properties. As a result of this consultative process, Talison has consulted with and reached agreement with all landholders whose properties are directly impacted by the Power Line, including Access Agreements and Notice of Entry Agreements. These agreements are commercial-in-confidence and are not discussed in this VIA.



In January 2022, whilst in the process of undertaking the VIA, Talison also undertook additional consultation with a number of residents whilst seeking permission to enter properties and take photographs. It was evident from these visits that local residents were aware of the Power Line corridor proposal.

Aboriginal Communities and Heritage Assessment

Consultation with an anthropologist from Heritage WA and representatives from the Bibbulmun Noongar community has been undertaken. The outcomes and recommendations of this consultation were provided in a report from Heritage WA to Talison in April 2019.

The objective of the consultation was to gather the views of the Bibbulmun representatives on the revised power pole locations, as these views mainly relate to a recorded Aboriginal heritage site: 'Blackwood River' (DPLH #20434).

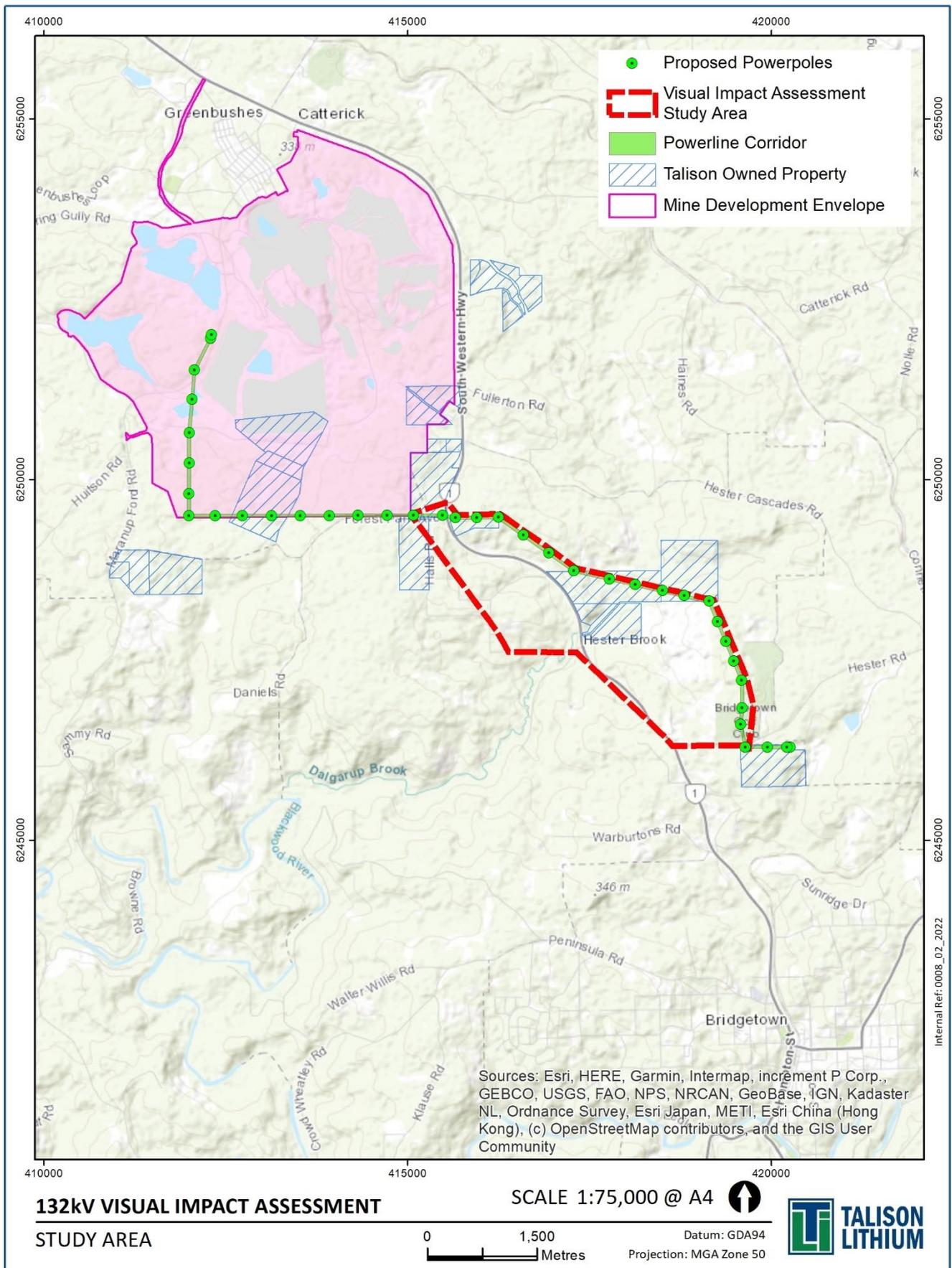
The recommendations from the Heritage WA Report state:

- The representatives from the Bibbulmun Noongar community do not have any objection to the tower locations as they are outside of the heritage site 'Blackwood River' (DPLH #20434) boundary; and
- Laying and stringing the power line through the heritage site 'Blackwood River' (DPLH #20434) is not considered a site disturbance as it is only temporary and will not impact water flow.

The proposed alignment traverses the area known as "Knight Hill" that is recognized as a heritage site in the Shire of Bridgetown-Greenbushes Municipal Inventory.

The Shire has confirmed (letter Ref 054.1, dated 25 November 2018) that "it is the view of the Shire that the proposed location of the transmission line will not impact on the heritage value of this site".

Figure 1: Location of 132kV Power Line (Hester Road to Mine Development Envelope) and VIA Study Area





2.0 LEGISLATION, POLICY & GUIDELINES

2.1 Commonwealth Legislation

Under Section 528 of the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, the term 'Environment' is defined as:

- (a) *Ecosystems and their constituent parts, including people and communities; and*
- (b) *Natural and physical resources; and*
- (c) *The qualities and characteristics of locations, places and areas; and*
- (d) *Heritage values of places; and*
- (e) *The social economic and cultural aspects of a thing mentioned in paragraph (a), (b) or (c).*

Under this definition, impacts to visual amenity can be considered an 'environmental' impact, as it falls under the definition in (c).

There are three (3) types of triggers under the EPBC Act whereby Commonwealth environmental impact assessment and approval may be required. These are:

1. where an action has, will or is likely to have a significant impact on a matter of national environmental significance;
2. where an action has, will or is likely to have a significant impact on the environment on Commonwealth land; and
3. where an action by the Commonwealth or its agencies has, will or is likely to have a significant impact on the environment inside or outside Australia.

The 132kV proposal does not trigger any of the above under the EPBC Act, and therefore Commonwealth approval is not required.

2.2 State Legislation

The activities undertaken at the Greenbushes mine are primarily approved and regulated under the *Environmental Protection Act 1986 (EP Act)*, and the *Mining Act 1978 (Mining Act)*.

Environmental Protection Act 1986

Part IV of the EP Act defines approvals relating to Environmental Impact Assessment. These approvals are undertaken by the Department of Water and Environmental Regulation (**DWER**) on behalf of the Environmental Protection Authority (**EPA**), ultimately resulting in Ministerial approval conditions.

The Greenbushes Mine operates under Ministerial Statement Number 1111 (**MS1111**), issued on 19 August 2019.

MS1111 defines the location and authorised extent of the physical and operational elements of the mining activity, called the Mine Development Envelope (**MDE**), as well as imposing conditions relating to compliance and reporting, and the implementation of various Management Plan requirements defined in the Conditions of MS1111.



The DWER, under Part V of the EP Act, also issues Licences for the operation and on-going regulation of an activity, and Works Approvals for construction activities.

Talison currently operates under Environmental Protection Act (**EP Act**) Licence L4247/1991/1, and one (1) current active Works Approval (W6283/2019/1).

Mining Act 1978

The Mining Act 1978 (**Mining Act**) allows individuals or companies to apply for rights to explore for and extract minerals. These rights, including prospecting licences, exploration licences, retention licences and mining leases, are known collectively as “mining tenements”.

The MDE is covered by six (6) mining tenements, with a further eight (8) tenements held outside the MDE.

Talison operates under a number of separate approved mining approvals (known as Mining Proposals). These include the following Mining Act Registration Identification numbers (**ID**), ID 45382 (2013), ID 56542 (2015), ID 63657 (2016), ID 60857 (2017), ID 70390 (2017), ID 80328 (2020), ID 87604 (2020), ID 95694 (2021), and ID 96748 (2021).

The current mine expansion was approved under ID 80328 in September 2019.

2.3 State Strategy, Policy and Guidelines

Activities undertaken outside the MDE are primarily approved and regulated under State, Regional and Local Planning legislation, as well as policies, guidelines and strategies.

State Planning Strategy

The State Planning Strategy 2050 offers a strategic context and guide for future strategies, plans, policies and decisions by public and local authorities with specific responsibilities or influence in the sustainable use and development of land throughout the State. The document is a high-level strategic document which does not specifically comment on visual impacts, but does reference the document “Visual Landscape Planning in Western Australia – a manual for assessment, siting and design” Western Australian Planning Commission and Department for Planning and Infrastructure, November 2007, listed below.

State Planning Policy

State Planning Policy No 2: Environment and Natural Resource Policy, elaborates on the importance of protecting and enhancing landscapes by stating that planning strategies, schemes and decision making should:

- (i) identify and safeguard landscapes with high geological, geomorphological or ecological values, as well as those of aesthetic, cultural or historical value to the community, and encourage the restoration of those that are degraded;
- (ii) consider the level or capacity of the landscape to absorb new activities and incorporate appropriate planning and building design and siting criteria to ensure that new development is consistent and sensitive to the character and quality of the landscape; and
- (iii) consider the need for a landscape, cultural or visual impact assessment for land use or development proposals that may have a significant impact on sensitive landscapes.



Visual Landscape Planning Guidelines

The document “Visual Landscape Planning in Western Australia – a manual for assessment, siting and design” (Western Australian Planning Commission and Department for Planning and Infrastructure, November 2007) (the **Assessment Manual**) is an advisory document, providing advice to State agencies, local governments, developers and the community on techniques for incorporating visual landscape into the planning system.

Part Three (3) of the Assessment Manual provides Principles and Guidelines (**Guidelines**) for the location, siting and design of Utility towers, such as for power generation or power transfer.

2.4 Local Plans and Policies

The proposed Power Line corridor lies within the “Rural Zone 2”, General Agriculture, zoning of the Shire of Bridgetown Greenbushes Town Planning Scheme No. 4, amended 2018 (**Planning Scheme**).

The Planning Scheme defines Rural Zone 2 as follows:

Rural Zone 2 - General Agriculture

Council's Objective, recognising that land within the Zone is by reason of its physical characteristics and location suited to the development of a wide range of uses appropriate to the growth of the District's economy and activity generally, will be to retain as far as possible, an agricultural base whilst assisting desirable changes in land use and activity through Planning Policies and Controls. Council's Policies will therefore be to:

- a) *support and assist in studies of land use and management which may be desirable and appropriate;*
- b) *promote the introduction of new and/or improved agricultural practices;*
- c) *permit, subject to adequate location and controls, establishment of uses of a tourist or recreational nature, and where appropriate, additional residential settlement;*
- d) *consider the establishment of Special Rural Zones within the defined Policy areas.*

Table 1, below, shows the “Table 1 - Zoning Table” from the Planning Scheme. Under Column 6 (Rural 2) of the Zoning Table (highlighted in yellow), it can be seen that “Public Utility”, which includes electricity services, is a permitted use.

The proposed use for a 132kV Power Line is not specifically listed as a permitted use within Rural Zone 2; however, the Shire has determined that the Proposed 132 kV Power Line is consistent with the objective of the Rural Zone 2 – General Agriculture and may be considered for development approval subject to public consultation and detailed assessment.

The Power Line would be considered to be a Public Utility if it were operated by a public authority (such as Western Power), and therefore would be a “permitted use” within the zone. As a permitted use it would be unlikely to require Shire planning consent approval (Shire of Bridgetown - Greenbushes personal communication, 2022).



The proposed 132kV Power Line is consistent with the provision of electricity services; however, in this instance, as it is privately owned, it would require Shire planning consent approval.

Table 1: Zoning Table from Shire of Bridgetown-Greenbushes Town Planning Scheme No. 4

TABLE I - ZONING TABLE (continued)

KEY TO COLUMNS

- | | |
|----------------|-------------------------|
| 1. RESIDENTIAL | 6. RURAL 2 |
| 2. COMMERCIAL | 7. RURAL 3 |
| 3. INDUSTRIAL | 8. RURAL 4 |
| 4. COMMUNITY | 9. SPECIAL RURAL |
| 5. RURAL 1 | 10. SPECIAL USE |
| | 11. SPECIAL RESIDENTIAL |

	1	2	3	4	5	6	7	8	9	10	11
INDUSTRIAL											
Fuel Depot			P		AA	AA		P	*		X
Industry - Cottage <i>AMD 70 GG 20/03/18</i>	X	X	P		X	X	X	X	X		X
- General			P						*		X
- Light			P						*		X
- Service			P						*		X
- Extractive					AA	AA	AA	P	*		X
- Hazardous			SA					P	*		X
- Noxious			SA			AA			*		X
- Rural			AA		AA	AA	AA	AA			
Motor Vehicle Repairs		AA	P						*		X
- Wrecking			P						*		X
Sawmill			P		AA	AA	AA	AA	*		X
Salvage Yard			P		AA	AA		AA	*		X
Transport Depot			P		AA	AA		AA	*	**RU	X
COMMUNITY											
Ambulance-Fire Brigade Depot		P		P					*		X
Civic Building	P	P		P		P			*		AA
Club Premises		P		P					*		X
Consulting Rooms	AA	P		P					*		X
Day Care Centre - Kindergarten	AA	P		P					*		X
Educational Establishment		P		P					*		X
Hospital				P					*		X
Medical Centre				P					*		X
Public Utility	P	P	P	P	P	P	P	P	*		P
Public Worship - Place of	SA	P		P					*		X
Telecommunications Infrastructure	AA		AA								
Veterinary – Consulting		P			P	P		P	*		X
Veterinary – Hospital					AA	AA		AA	*		X

* Uses restricted to those listed in Schedule III.
 ** Uses restricted to those listed in Schedule VI.

'P' means that the use is permitted provided it complies with the relevant standards and requirements of the Scheme and all conditions (if any) imposed by the Council in granting Planning Consent where this is required by the Scheme;

Public Utility – means any work or undertaking constructed or maintained by a public authority or the Council as may be required to provide water, sewerage, electricity, gas, drainage, communications or other similar services



3.0 POWER LINE VISUAL IMPACT ASSESSMENT METHODOLOGY

3.1 Scope

The Assessment Manual has been used to develop the VIA methodology. The Scope of the VIA (**the Study**) included consideration of the following:

1. consultation with relevant stakeholders including government and local Community (Section 1.3);
2. identification of the 132kV Power Line corridor route and description of the proposed development (Section 1.1.1 and Figures 1 and 3);
3. Commonwealth and State Government requirements relevant to the landscape issue, including identification and review of Legislation, Policies, Plans and Guidelines (Section 2.0);
4. Local Government policy and planning considerations relevant to landscape issues, including review of Legislation, Policies, Strategies and Guidelines, including the Shire of Bridgetown – Greenbushes Planning Scheme No. 4 requirements (Section 2.4);
5. identification of the limitations and assumptions of the VIA methodology (Section 3.3);
6. description of the existing visual landscape character (Section 3.4);
7. use of Geographical Information Systems (**GIS**) datasets and aerial photography to generate a visual map of a “Study Area” that encompasses the Power Line corridor. This identifies the Study Area within which the Project can potentially be seen and Viewpoints that may be impacted by the Power Line (Figure 18);
8. visiting local landowners to identify potential impacts and take representative photographs of affected view-scapes;
9. description and evaluation of the potential visual impacts at selected Viewpoints (Section 4 and Table 6);
10. identification of impacts on the visual landscape at representative Viewpoints (Section 4 and Table 6); and
11. identification of visual management measures to minimise impacts to the visual landscape (Section 4.2 and Section 5, Tables 5 and 6).

These objectives are considered to be consistent with the requirements of the Assessment Manual.

In addition to the above Scope, the VIA has been developed in consideration of the following criteria relating to power lines, taken from the Guidelines:

- route and corridor analysis;
- assessment of alternative routes;
- alignment - land use boundaries and contours of the land;
- alignment - minimising major land use boundaries where transmission lines pass from an open landscape to an enclosed landscape;
- tower location within valleys and hills to avoid impacts on scenic Viewpoints;
- avoiding road intersections;
- siting and design of access roads for construction and maintenance;
- minimising creation of new access roads and corridors;
- siting routes to run parallel to the land use and in a similar direction;



- perpendicular crossings of highways to allow for maximum setbacks of towers for low visibility from highways and roads;
- retaining existing vegetation where possible;
- joint use of easement corridors for additional utilities;
- limiting siting of easements near buildings and houses to reduce visual impacts due to the comparison between their relative sizes;
- design of the individual transmission towers should reflect the surrounding landscape as much as possible;
- placement of towers to reduce the impacts against the skyline;
- use of easements to form an appropriate buffer between different land uses;
- use of dense trees for screening as they are more effective than open heath or scrub; and
- construction – vegetation removal and access to minimise visual impact.

The results of the VIA are presented in Section 4 and Table 6.

3.2 Visual Impact Assessment Methodology

The methodology to evaluate visual impacts from the proposed 132kV Power Line consisted of a desktop study and field evaluation and combines both qualitative and quantitative methods to determine the likely impacts at various Viewpoints. The desktop evaluation was integral to understand the current and predicted landscapes and how they might impact the likely receptors. The field assessment allows the assessor to be exposed to views of the landscape that the general public are also likely to be exposed to and is the easiest method of determining whether the Viewpoints chosen are appropriate.

The VIA was undertaken at various prominent vantage points along the proposed Power Line route, within the Study Area. These vantage points include areas that are visible to the public travelling north and south along SW Hwy, and at various rural residential properties and a recreational area (Golf Course) within the Study Area.

The Study Area was defined based on a number of considerations, discussed below.

Northern limits of Study Area

The northern limit of the Study Area is defined as being a point approximately 200m past the intersection of SW Hwy and Forest Park Avenue (Public Viewpoint 8). Up to this point (when travelling south towards Bridgetown) the 132kV Power Line cannot be seen due to the elevation of the hill just before Forest Park Avenue and the remnant native forest vegetation to the east. This elevation is shown in Figure 4. Within 100m of Forest Park Avenue, it is likely that the Power Line crossing SW Hwy and Forest Park Avenue will be visible (Figure 35).

Eastern Limits of Study Area

All of the Viewpoints are located to the west of the Power Line corridor, including residents and road users. This is because the Power Line lies below a ridge-line to the east, and there are no identified residents to the east of the Power Line. From Figure 4, it can be seen that areas to the north and east of the Power Line are at higher elevation.



Southern Limits of Study Area

The southern limit of the Study Area is the juncture of South-West Highway and Hester Road, and east to the Bridgetown Western Power Sub Station, just off Hester Road, south of the Golf Course. The Power Poles in this location (Poles 1 to 3) are located on Talison-owned property, and are unlikely to be visible from further south due to the height of the hill (see Figure 4) and the native forest remnant vegetation along the southern side of Hester Road.

Western Limits of Study Area

The Western limit of the Study Area is defined by residents located in the vicinity of Halls Road and Hester Hall Road, rural gravel roads situated approximately 1.5km south of Forest Park Avenue, represented by Residential Viewpoint 7. These rural residences are generally surrounded by vegetation, with westerly views to the Bluegum plantations and distant, interrupted views of the Power Line (ranging from 1.3km to 3.3km). At these distances the Power Lines

In this methodology, to differentiate the various Viewpoints, the following nomenclature has been adopted:

- ***Public Viewpoints***

These are Viewpoints within the landscape generally absorbed by the surrounding landscape. e where the Power Lines or easements are visible to the public. Nine (9) Public Viewpoints located along SW Hwy were selected during the desktop assessment and later verified in the field:

- ***Residential Viewpoints***

These are Viewpoints located at rural residential properties where the Power Line(s) is located within a property or directly intersects the property, and Power Lines are directly visible from the residence. These Residential Viewpoints are considered to be more sensitive as residents would have continuous views of the Power Line. Seven (7) Residential Viewpoints were selected during the desktop assessment and visited in the field: and

- ***Recreational Viewpoint(s)***

These are Viewpoints located within a recreational area, in this instance, the Bridgetown Golf Course (Recreational Viewpoint 1).

The Public, Residential and Recreational Viewpoints are listed in Table 4, as well as the validation reason as to why they were chosen.

The majority of the desktop evaluation was achieved using GIS datasets combined with aerial photography and on-ground surveys and photographs to provide visual modelling of the 132kV Power Line route to develop an understanding of how it will interact with the landscape.

It should be noted that the use of drone photography may have provided a more detailed view of landscapes; however, this method was not utilised for the VIA to protect the privacy of residents and to alleviate public concerns.

The field survey quantified many of the findings from the desktop evaluation and gave an opportunity to understand visual characteristics from Viewpoints that would commonly be experienced by residents and the public. The data collected from the evaluations was used in Section 4 to formalise the predicted impacts associated with the development on visual amenity and landscapes.

Figure 3 shows the identified Public and Residential Viewpoints that have the potential to be impacted by the Power Line.



To obtain the reference images to allow for a correct transfer to the individual location photos, a regional digital elevation model (**DEM**) was developed utilising the publicly available Landgate contour dataset using GIS software. The extent of this was determined by encompassing all the photo locations within the Study Area. Area specific data was then made into individual DEM datasets for each location. This data was then merged with the regional data to form a single dataset for each location. The data was then depicted within a 3D visualisation. Each photo location was placed within the environments based upon the geotag information with the relevant height of the image taken into consideration. The base image was then rotated to conform with the representative viewing angles to ensure the correct view.

3.3 Limitations of the Visual Impact Assessment

The VIA process aims to be objective and describe any changes factually. Potential changes as a result of the Power Line have been defined; however, the significance of these changes requires qualitative (subjective) judgements to be made. The conclusions to this assessment therefore combine objective measurement and subjective professional interpretation. This assessment has attempted to be objective; however, it is recognised that visual assessment can be highly subjective and individuals are likely to associate different visual experiences to the Study Area.

3.4 Visual Character Analysis

The following terms are used in this VIA, derived from the Assessment Manual:

Visual landscape refers to the appearance of an area of land, incorporating the combination of elements such as landform, vegetation, water bodies and human land use. The emphasis is on visual characteristics;

Visual landscape character refers to the appearance of those landscape elements such as landform, vegetation, water bodies and human land use that makes an area identifiable or unique;

Landscape character units refers to areas of homogenous (similar) patterns of visual characteristics such as landform, vegetation, water form and land use as well as individual features;

Landscape values describes those landscape characteristics that the community considers are significant for reasons such as their aesthetic (predominately visual), social, environmental and heritage values;

Viewshed (also known as the “seen” area) is a portion of the landscape that can be seen from one or more observer positions. The extent of area that can be viewed is normally limited by landform, vegetation and distance;

Viewpoint the point from which a view is observed;

View significance a portion of a landscape seen by an observer that is highly valued; and

Visual absorption capacity refers to an area’s ability to visually absorb or sustain change as a result of new development, without altering the overall character of the landscape, based on variables such as landform, vegetation pattern and height, and existing land use.



3.4.1 Rural landscape character

Figure 2 shows the Landscape Character Units within the Study Area, and Table 2 shows the area estimates of all land uses within the Rural Zone 2 zoning within the Study Area.

Table 2: Existing Land Uses and their areas within the Study Area

Land Use	Hectares within Study Area	Percentage of Study Area
Agriculture – pasture, sheep and cattle grazing	408.54	60.26
Forestry plantations (primarily blue gums)	163.63	24.14
Public Utilities (roads, power lines)	35.82	5.3
Natural forest remnant vegetation, both Crown Land State Forest and private forest	24.06	3.55
Rural-residential	13.45	1.98
Public Recreation (Golf Course)	27.99	4.13
Rural Industry	4.44	0.65
TOTAL	677.93	100
Proposed 132kV Power Line	26.15	3.86

The following rural landscape character has been determined from aerial photographs, GIS datasets and on-ground surveys:

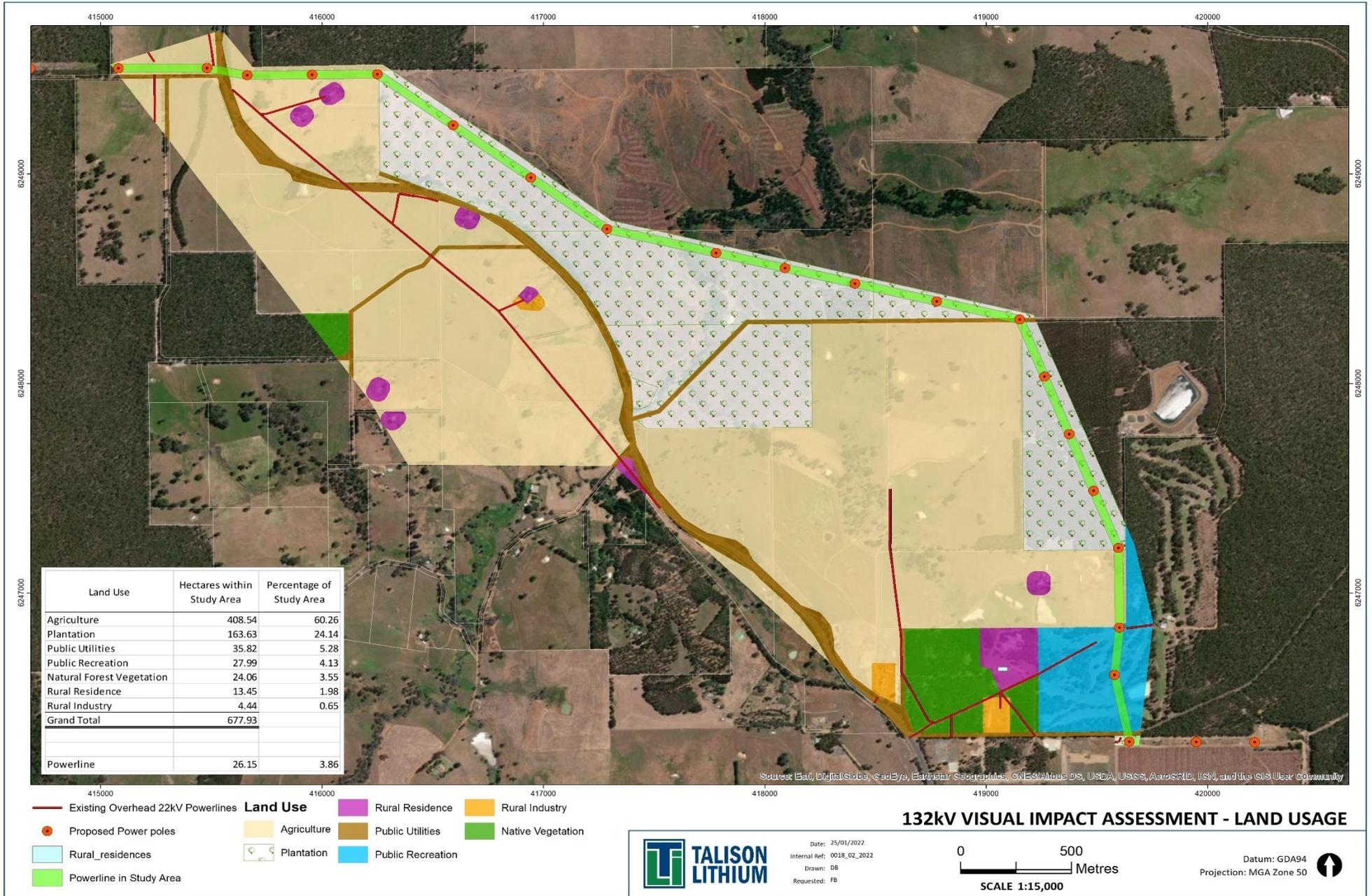
- the rural landscape character within the Study Area consists of a low species diversity agricultural landscape, dominated by pasture cropping and blue gum plantations. These two (2) land uses comprise approximately 84% of the Study Area landscape clearly showing the modified nature of the rural landscape;
- there is a large topographic variation and visual contrast with hills and valleys;
- the majority of natural forest vegetation, other than fringing road verge vegetation, is located on private land and comprises less than 4% of the landscape;
- there are distinct transition zones between agricultural land and natural landscape (forest) and plantations where pasture and blue gum plantations would provide visual seasonal colour and contrast;
- native trees and native tree stands located at roadside intervals along SW Hwy and within the agricultural landscape, acting as buffers alongside SW Hwy and rural unsealed roads and



agriculture (pasture). These native tree stands along SW Hwy often block views of the surrounding agricultural landscape from users of SW Hwy;

- individual residential structures, including houses, sheds, water tanks and other rural structures such as dams and hay bales (seasonal) that add to the local rural character;
- infrastructure, consisting of major highway (SW Hwy), major regional roads (Hester Road), and predominantly unsealed rural roads and tracks with 22kV powerlines on almost all rural residential properties, except for the few that have off-grid power; and
- recreational areas (Bridgetown Golf Course).

Figure 2: Landscape Character Units within the Study Area





3.5 Significance Assessment

Table 3 identifies the three (3) Levels of Significance for viewing locations and viewer experience associated with each Level of Significance (taken from Appendix 1, Table 5 of the Assessment Manual), these are:

- Level 1: National/State Significance;
- Level 2: Regional Significance; and
- Level 3: Local Significance.

Table 3: Levels of significance for viewing locations and viewer experience

Level of Significance	View
<p>Level 1: National/State Significance</p>	<ul style="list-style-type: none"> • SW Hwy from Hester Road to Greenbushes, which is a major Highway, part of the Highway 1 network, and a designated tourist route (Figure 1); and • Nine (9) Public Viewpoints were chosen along SW Hwy where the Power Line would be visible. <p>The following land uses of national/State significance are not present within the Study Area:</p> <ul style="list-style-type: none"> • recreation, conservation, cultural or scenic sites, Viewpoints and lookouts; • towns and large settlements; • navigable waterways; • walking, cycle or bridle tracks; and • freight or passenger railway lines.
<p>Level 2: Regional Significance</p>	<ul style="list-style-type: none"> • Hester Road (sealed) is the only major road of regional significance as it joins SW Hwy with the Bridgetown - Boyup Brook Road; and <p>The following land uses of Regional Significance were not evident within the Study Area:</p> <ul style="list-style-type: none"> • recreation, conservation, cultural or scenic sites; and Viewpoints and lookouts; • navigable waterways; • walk, cycle or bridle paths; and • views of regional importance.
<p>Level 3: Local Significance</p>	<p>There are a number of locally significant minor roads or tracks, including:</p> <ul style="list-style-type: none"> • Blackwood Park Road East – unsealed; • Forest Park Avenue East and West – unsealed; • Wagebadenup Ridge - unsealed;



Level of Significance	View
	<ul style="list-style-type: none"> • Halls Road – unsealed; and • Hester Hall Road – unsealed. <p>Other landscape/land use values of local significance include:</p> <ul style="list-style-type: none"> • Agriculture; • Forestry (plantations); • Public Utilities (roads, power); • Remnant native forest; • Rural Residential on large rural lots; • Public recreation (Golf Course); and • Rural Industry. <p>The following land uses of local significance were not present within the Study Area:</p> <ul style="list-style-type: none"> • navigable waterways; • recreation, conservation, cultural or scenic sites, and Viewpoints and lookouts of local importance; and • walk, cycle or bridle paths.

3.6 Existing Landscape Viewpoints

3.6.1 Public Viewpoints

Figures 5 to 15, 31, and 35 to 37 show Public Viewpoints within the Study Area. These Public Viewpoints are representative of existing land uses observed at various distances along SW Hwy (with distances indicated). The distances are based on distances from a Reference Point (Public Viewpoint No. 1 at the intersection of SW Hwy and Hester Road). Table 4 provides a summary of these Public Viewpoints.

Figure 16 shows existing electricity infrastructure within the Study Area and surrounds, as well as the proposed 132kV Power Line. It can be clearly seen that Power Lines are common throughout the rural landscape.

3.6.2 Residential Viewpoints

Views from the (seven (7) Residential Viewpoints are shown in Figures 23 to 230, and 32 to 34.

3.6.3 Recreational Viewpoints

Views from the one (1) Recreational Viewpoint (Golf Course) are shown in Figures 20 – 22w.

Table 4: Public Viewpoints and Land Uses

Public Viewpoint #	Figure #	Location and distance from Reference Point	Land Uses	Validation as Viewpoint
1	5, 6	0m - Reference Point. Intersection of SW Hwy and Hester Road; start of "Hester Hill" Reference Point (beginning of Study Area).	Transport (SW Hwy) and Public Utility (existing Power Lines).	Reference Public Viewpoint at start of 132kV Power Line Study Area.
1	7	50m from Reference Point. SW Hwy and Hester Road 22kV Power Line Easement looking East (50m).	Public Utility (existing 22kV Power Lines).	View of high density 23kV Power Lines.
1	8	100m from Reference Point. SW Hwy and Hester Hill - Rural Industry (Davmech).	Rural industry.	Potentially representative of future Rural Industry.
2	9, 19	400m from Reference Point. Hester Hill looking North towards Mine site on horizon.	Agriculture – pasture and blue gums, transport, fringing native vegetation.	Expansive view of hills, and agricultural activities – blue gum plantations, pasture and fringing native vegetation. Distant views of mine-site on horizon.
3	10	1,400m from Reference Point. Lower Hester Hill heading north.	Broad vista of agricultural land use, with plantations, native forest and rural residential.	Lower Hester Hill with broad vista of agricultural land use, with plantations, native forest and rural residential.
4	11	1,800m from Reference Point. SW Hwy - Blackwood Park Road turnoff, lower Hester Hill heading south.	Predominantly blue gum plantations, with some pasture.	Lower part of Hester Hill, with Predominantly blue gum plantations to east of SW Hwy.

Public Viewpoint #	Figure #	Location and distance from Reference Point	Land Uses	Validation as Viewpoint
5	12, 26 - 29	2,800m from Reference Point. SW Hwy, rural residential and rural industry (Boarding Kennels).	Blue gum plantations and native forest in background.	Public Viewpoint at entrance to rural industry.
6	13, 31	3,550m from Reference Point. SW Hwy heading south (Recruits Blue gum Tree Farm).	Plantations, pasture with fringing native vegetation on horizon with 22kV Powerline crossing Highway.	Low point on SW Highway, close proximity to Blue gum Tree Farm.
7	14, 34	4,500m from Reference Point. SW Hwy view of rural property with existing 22kV Powerlines.	Agriculture (pasture) with individual stands of native vegetation. Existing Power Line on rural property.	View is representative of 23kV Powerlines on rural properties with high visibility to public.
8	15, 35, 36	4,900m from Reference Point. SW Hwy/ Forest Park Avenue intersection.	Pasture with native forest on eastern boundary, and existing 22kV Powerlines.	SW Hwy cross-over point for 132kV Power Line.
9	37	5,010m from Reference Point. Forest Park Avenue (West).	Rural road transport, agriculture (pasture and grazing) and public utility (22kV Power Line).	View is representative of 23kV Powerlines on rural roads and properties, with high visibility to public.

Figure 3: Residential, Public and Recreational Viewpoint locations in Study Area

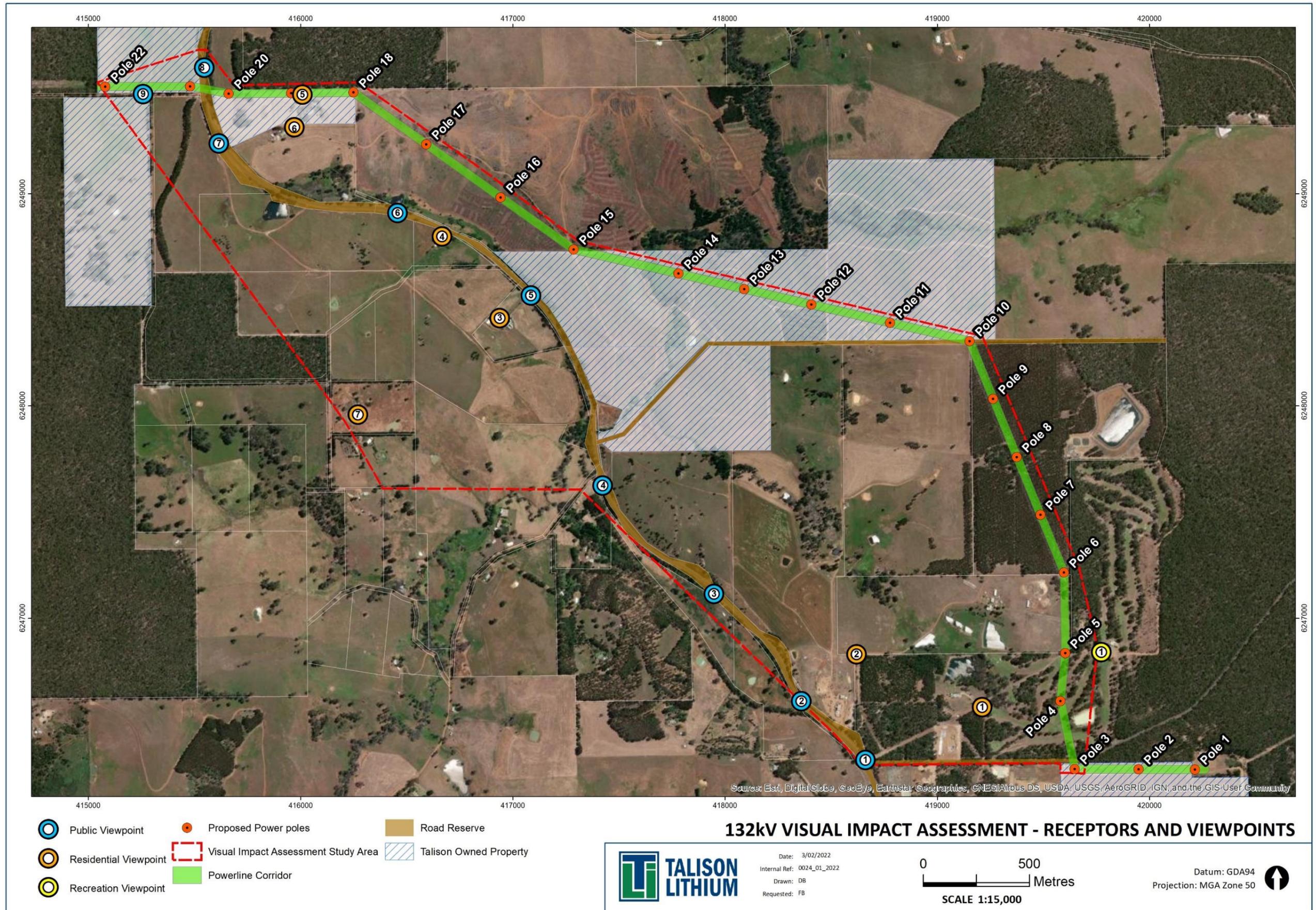


Figure 4: Contours within the Study Area

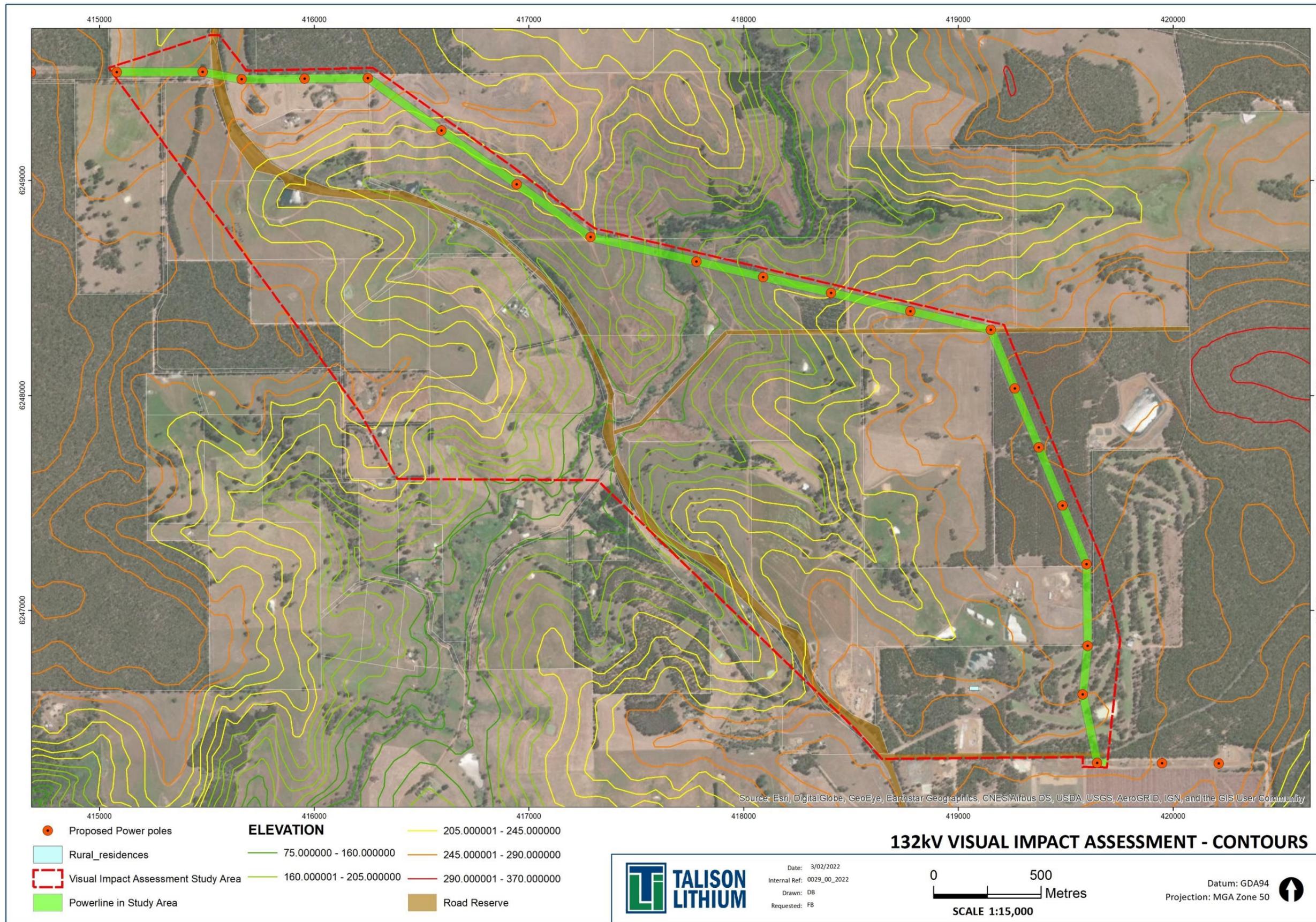


Figure 5: Corner SW Hwy and Hester Road (Reference Point for Start of Study Area) (Public Viewpoint #1)



Figure 6: 22kV Power lines SW Hwy and Hester Road (Public Viewpoint #1, Reference Point)



Figure 7: SW Hwy and Hester Road 22kV Power Line Easement looking East (50m from Reference Point)



Figure 8: SW Hwy and Hester Hill - Rural Industry (100m from Reference Point)



Figure 9: SW Hwy - Hester Hill looking North towards Mine site on horizon (Public Viewpoint #2, 400m from Reference Point)



Figure 10: SW Hwy - Lower Hester Hill with broad vista of agricultural land use, with plantations, native forest and rural residential (Public Viewpoint #3, 1,400m from Reference Point)



Figure 11: SW Hwy and Blackwood Park Road entry – predominantly blue gum plantations (Public Viewpoint #4, 1,800m from Reference Point)



Figure 12: SW Hwy – Views of blue gum plantations and native forest in background, outside Rural Industry property (Kennels) (Public Viewpoint #5, 2,800m from Reference Point)



Figure 13: SW Hwy heading South, plantations and pasture landscape with 22kV Powerline crossing SW Hwy (Public Viewpoint #6, 3,550m from Reference Point)



Figure 14: SW Hwy – view of Rural Residential and 22kV Powerlines (Public Viewpoint #7, 4,500m from Reference Point)



Figure 15: SW Hwy and Forest Park Avenue – Existing 22kV Powerlines (Public Viewpoint #8, 4,900m from Reference Point)



Figure 16: Existing Electricity Power Line Infrastructure and Proposed 132kV Power Line within Rural Zone 2





4.0 VISUAL IMPACT ASSESSMENT

4.1 Visual effects of the proposal

The Power Line will traverse private property and crown road reserves between the Western Power substation located just off Hester Road, and the MDE at the Greenbushes mine, which is on crown land north of Forest Park Avenue (Figure 1).

Figure 17 shows a representative image of a 132kV power pole and Power Line (in the vicinity of the town of Boyanup). These are the same type of Power Pole proposed for the 132kV Power Line.

The VIA is presented as a series of images taken from a number of Viewpoints in the Study Area. Some images show the views from different directions from the Residential Viewpoints. The locations of these Residential Viewpoints and Public Viewpoints, and the direction of the Viewpoint images are shown in Figure 18.

Power Pole locations

There are 22 Power Poles located within the Study Area. Of these Power Poles:

- 1 is at the Western Power Bridgetown Sub Station;
- 2 are in a Recreational Area (Golf Course);
- 7 are in Plantations; and
- 12 are on Talison-owned property.

No Power Poles are directly located on private residential properties outside of Talison ownership.

4.1.1 Visual Impacts to Users of South-West Highway

The VIA shows that any potential Power Line impacts to users of SW Hwy will be intermittent, and of short duration until a vehicle passes roadside vegetation or hillsides which block views to Power Line poles or Power Line corridors.

The total length of SW Hwy that runs parallel to the Power Line corridor is approximately 4.8km (between Hester Road and Forest Park Avenue); however, the Power Line is not visible from SW Hwy for this entire distance as the Power Line will be intermittently obscured by hills and vegetation to the East of SW Hwy. The actual length of Power Line visible from SW Hwy travelling north (to Greenbushes) has been estimated to be less than four (4) kilometres; and travelling south (to Bridgetown) to be approximately three (3) kilometres.

At an average speed of 90 – 100 kilometres per hour (**km/h**), the Power Line will be visible for less than three (3) minutes (noting that the speed limit is 110km/h).

4.1.2 Visual Impacts to Residents within the Study Area

The distances from the seven (7) Residential Viewpoints to the Power Line corridor are shown in Table 5.



Table 5: Residential Viewpoints and distance to Power Line Corridor

Residential Viewpoint #	Location	Closest Distance to Power Line Corridor
1	Private Residence West of Golf Course (Green 15)	480m
2	Private Residence North of Golf Course	320m
3	Private Residence and Rural Industry (SW Hwy, (Kennels)	440m
4	Private Residence (SW Hwy)	290m
5	Private Residence, Talison Owned (Forest Park Ave East)	80m
6	Private Residence (SW Hwy and Forest Park Ave East)	250m
7	Private Residence (Hester Hall Road)	1,250m (no direct view) 3,250 (distant view)

There are four (4) residences, Residential Viewpoints 3, 4, 5 and 6, where visual impacts will be more apparent in the short term due to the proximity to the Power Line corridor, or due to the high visibility of the Power Line in relation to the surrounding landscape. However, in the near future (estimated at approximately two (2) years) these visual impacts will be obscured by blue gum tree plantations located between the residences and Power Line.

The impacts to Residential Viewpoints and the assessment of impacts to the Residential Viewpoints are described in Table 6.

From the Residential Viewpoints it can be clearly seen that the majority of residences already have existing 22kV power lines on their properties. The 132kV Power Line will directly traverse through two (2) residential properties (Residential Viewpoints 2 and 5). Residential Viewpoint two (2) has existing Access Agreements and Notice of Entry Agreements with Talison, and Residential Viewpoint 5 is Talison owned.

Residential Viewpoint 7 is located on Hester Hall Road. Views to the east are obscured by native vegetation, with the only significant view to the South-East, over 3km distant. At this distance Power Lines would be absorbed in to the existing landscape.

Table 6: Assessment summary of impacts to Public Viewpoints and Residential Viewpoints within the Study Area (Ref. Fig 4 for all locations)

Viewpoint No. (from Fig. 3)	Viewpoint Location and distance from Reference Point	Viewpoint Characteristics	Reference Figure(s)	Assessment and mitigation of Impact
Public Viewpoints				
1 (Reference Viewpoint)	0m Corner SW Hwy and Hester Road intersection.	Reference Public Viewpoint at start of 132kV Power Line Study Area.	5, 6, 7, 8	<ul style="list-style-type: none"> No impact; and photos depicting existing Public Viewpoints, including Rural Industry (Davmech Equipment Hire – hiring and selling of earthmoving and heavy machinery equipment), and existing 22kV Power lines.
2	400m SW Hwy (Hester Hill) looking North-East.	Expansive view of hills, and agricultural activities – blue gum plantations, pasture and fringing native vegetation. Distant views of mine-site on horizon.	9, 19	<ul style="list-style-type: none"> Medium impact (short term) to low impact (long term). Visual impacts will be of short duration; 132kV Power Lines will be visible within blue gum plantations and adjacent to fringing native forest vegetation in distance. Impacts from Power Lines will eventually be reduced by the masking effect (visual absorption capacity) of the blue gum plantations as the trees grow; Blue gums can grow up to 2m per year with the fastest growth in the first 7-10 years, with harvesting between 10 – 20 years depending on yield; and the overall character of the landscape will change as the plantations grow. This would be viewed as a positive development through “greening of the landscape”.
3	1,400m Prior to Blackwood Park Road turnoff.	Lower Hester Hill with broad vista of agricultural land use, with plantations, native forest and rural residential.	10	<ul style="list-style-type: none"> Medium impact (short term) to low impact (long term). Visual impacts will be of short duration; and 132kV Power Lines will be visible within blue gum plantations and adjacent to fringing native forest vegetation in distance. Impacts from Power Lines will be reduced by the masking effect, or visual absorption capacity of the surrounding vegetation and blue gum plantations as the trees grow.

Viewpoint No. (from Fig. 3)	Viewpoint Location and distance from Reference Point	Viewpoint Characteristics	Reference Figure(s)	Assessment and mitigation of Impact
Public Viewpoints				
4	1,800m SW Hwy - Blackwood Park Road turnoff looking North -East.	Predominantly blue gum plantations.	11	<ul style="list-style-type: none"> 132kV Power Lines will be visible within blue gum plantations and adjacent to fringing native forest vegetation in distance. Impacts from Power Lines will eventually be reduced by the masking effect, or visual absorption capacity of the blue gum plantations as the trees grow.
5	2,800m SW Hwy – Boarding Kennels.	High density fringing vegetation (trees and bushes) surrounding residence. Established residential gardens, with surrounding open landscapes and pastures. Distant views of blue gum plantation.	12	<ul style="list-style-type: none"> Low impact from SW Hwy. Visual impacts will be of short duration; medium impact (short term) to low impact (long term) from residence due to visibility to Power Line within blue gum plantation; and low impact in long term due to blending and absorption by plantation. Impact will be mitigated by plantation growth in near future (two years).
6	3,550m SW Hwy looking East towards Recruits Blue Gum Tree Farm.	Blue gum Plantation.	31	<ul style="list-style-type: none"> Low impact to users of SW Hwy; visual impacts will be of short duration; and impacts from Power Lines will eventually be reduced by the masking effect, or visual absorption capacity, of the blue gum plantations as the trees grow.
7	4,500m SW Hwy looking North-East.	View of rural residential property and 22kV Powerlines.	14, 34	<ul style="list-style-type: none"> No impact; and view is representative of 23kV Powerlines on rural properties.
8	4,900m SW Hwy/ Forest Park Ave intersection.	SW Hwy and Forest Park Avenue Powerline crossing SW Hwy.	35	<ul style="list-style-type: none"> Low impact; Power Line will only be visible for a few seconds as vehicles approach the Power Line from the South and North and then pass the Power Line. There are many other 23kV Power Lines crossing the highway, or adjacent to the Highway; and

Viewpoint No. (from Fig. 3)	Viewpoint Location and distance from Reference Point	Viewpoint Characteristics	Reference Figure(s)	Assessment and mitigation of Impact
				<ul style="list-style-type: none"> Power Line crosses the Highway at approximately 80 degrees (almost perpendicular).
9	5,010m Forest Park Ave /Hester Halls Rd intersection.	132kV Powerline on northern side of Forest Park Avenue near Hester Halls Road intersection.	37	<ul style="list-style-type: none"> Low impact; rural roads have low volume of traffic; and Power Line will only be visible for a few seconds as vehicles approach the Power Line East from SW Hwy and West, from Forest Park Avenue.
Residential Viewpoints				
1	Private residence located adjacent to Golf Course (Hole 14).	Rolling greens with stands of fringing, large native vegetation (eucalypts) interspersed amongst greens.	23	<ul style="list-style-type: none"> There is unlikely to be any significant impact due to high native trees providing shielding to Power Lines and the orientation of the residence, facing north, away from the Golf Course.
2	Private Residence located on Wadgebanup Road, approximately 320m from Power Lines between Poles 5 and 6.	Open landscapes, rolling pastures and agricultural activities.	24, 25	<ul style="list-style-type: none"> High impact due to view of Power Lines to residence; no Power Poles on property; Compensation Agreement with landholder including Access and Notice of Entry Agreements; and Residential Viewpoint 2 has an existing 23kV Power Line.
3	Rural Residence on SW Hwy with Rural Industry (Kennels	High density fringing vegetation (trees and bushes) surrounding residence. Established residential gardens, with surrounding open landscapes and pastures. Views	26 - 29	<ul style="list-style-type: none"> Visibility to Power Line within blue gum plantation approx. 440m from Power Lines; and medium impact in short term and low impact in long term due to blending and visual absorption by plantation.

Viewpoint No. (from Fig. 3)	Viewpoint Location and distance from Reference Point	Viewpoint Characteristics	Reference Figure(s)	Assessment and mitigation of Impact
		across SW Hwy to blue gum plantation.		
4	Rural residence on SW Hwy.	Established gardens around residence, with surrounding open landscapes and pastures, with blue gum plantation views on eastern side of SW Hwy.	30	<ul style="list-style-type: none"> • Visibility to Power Line within blue gum plantation, approximately 350m; and • medium impact in short term and low impact in long term due to blending and shielding by plantations.
5	Rural residence on Forest Park Avenue East (Talisson owned).	Agricultural viewsapes – hills and valleys with pasture and plantations, with native private forest on northern boundary within 100m of residence.	32	<ul style="list-style-type: none"> • Power Line is approximately 60m from the residence (Talisson owned); and • residence is largely obscured (screened) by trees surrounding residence.
6	Rural residence on Forest Park Avenue East.	Hills and valleys with pasture and plantations, native vegetation on distant ridges and hill slopes, adjacent blue gum plantation within 100m of residence.	33, 34	<ul style="list-style-type: none"> • Fig. 33 - Potentially high impact due to visibility to Power Line within blue gum plantation; • high impact in short term and medium to low impact in long term due to blending and shielding by plantations; and • residence has existing 23kV Power Lines running through property (Fig. 34).
Recreational Viewpoints				
1	Greenbushes Golf Course	Golf Course greens and fringing tall native vegetation (eucalypts) and tall shrubs.	20 -23	<ul style="list-style-type: none"> • The most significant visual impact is likely to be at the Bridgetown Golf Course. Two (2) Power Poles will be directly located within the central part of the Golf Course, from south to north, and three (3) Power Lines will directly traverse across the Golf Course. The most significant views are likely to be across fairways 17, 15, 10, 11, 12 and the Driving Range, where Power Poles and Power Lines will be clearly

Viewpoint No. (from Fig. 3)	Viewpoint Location and distance from Reference Point	Viewpoint Characteristics	Reference Figure(s)	Assessment and mitigation of Impact
		Golf Course recreational area. frequented by many public users on continuous basis.		<p>seen. Views from other fairways are likely to be partially obscured or intermittent as views will be blocked by existing vegetation as golfers move from fairway to fairway; and</p> <ul style="list-style-type: none"> views of Power Pole 5 will be visible from outside the Club House down the existing 22kV Western Power easement, but are likely to be partially obscured by surrounding vegetation. The Golf Course has an Access and Notice of Entry Agreement with Talison.



4.2 Summary of Visual Impact Significance

The following is a summary of the VIA:

- the Rural Zone 2 existing landscape is a modified rural environment with a number of different land uses. The natural environment forms a very small part of this landscape (<4%);
- Figure 15 shows that there are numerous existing 22kV Power line corridors connecting rural residences on the western and eastern side of SW Hwy, which are visible for longer distances than the proposed 132kV Power Line. These clearly show that power lines are a common feature within the rural landscape as they are present on nearly all rural properties;
- potential Visual Impacts to traffic on South-West Highway will be intermittent as Power Line views are often shielded by vegetation and topography. The length of 132kV Power Line visible from South-West Highway for users travelling north (towards Greenbushes) is less than four (4) kilometres; and for users heading south (towards Bridgetown) it is approximately three (3) kilometres;
- at an average speed of 90 – 100 km/h, the Power Line will be visible intermittently for less than three (3) minutes;
- in general, users of SW Hwy are not likely to be distracted by the 22kV and 132kV power poles as power poles are a familiar feature within the rural landscape. This is recognised in the Guidelines, which makes the assumption “that towers are least tolerated in natural landscapes and are more likely to be considered acceptable in rural landscapes”;
- the most significant visual impact is likely to be at the Bridgetown Golf Course. Two (2) Power Poles will be directly located within the central part of the Golf Course, from south to north, and three (3) Power Lines will directly traverse across the Golf Course. The most significant views are likely to be across fairways 17, 15, 10, 11, 12, and the Driving Range, where Power Poles and Power Lines will be clearly seen. Views from other fairways are likely to be partially obscured or intermittent as views will be blocked by existing vegetation as golfers move from fairway to fairway. Views of Power Pole 5 will be visible from outside the Club House down the existing 22kV Western Power easement, but are likely to be partially obscured by surrounding vegetation. The Golf Course has an Access and Notice of Entry Agreement with Talison;
- there are a few residences (such as Residential Viewpoints 3 and 4) where visual impacts will be more apparent in the short term; however, the views are tempered (blended) with views of blue gum plantations in the foreground and background and will eventually be visually absorbed by the plantations (Figures 25 to 29);
- Talison has sought support from all landholders on which the Power Line development is planned to occur. Talison has also reached agreement with all the landholders whose properties are directly impacted by the Power Line, this includes Access Agreements and Notice of Entry agreements; and
- the 132kV Power Line is consistent with the objectives of Rural Zone 2 as it allows for “Public Utilities”, which includes provision of electricity services as a permitted use within the Zone.



4.2.1 Mitigation of Impacts

Visual Impacts from the proposed 132kV Power Line have been reduced by adopting the following strategies:

- avoiding prominent locations, such as parallel to SW Hwy, and locating the Power Poles below ridge lines to reduce their prominence;
- locating Power Lines within existing easements wherever practicable to avoid additional clearing. In areas where there are no existing easements, Power Lines will be located in areas that will have minimal impact on agricultural areas or native vegetation, such as cleared farmland or other partly cleared areas to avoid additional clearing. Where necessary, minor clearing may be required to remove vegetation within the Power Line easement; and
- reducing the future prominence of Power Lines by utilising the visual absorption capacity of the existing plantations, and future growth of the plantations.

5.0 RESPONSE TO PLANNING SCHEMES AND RELEVANT POLICIES

As stated previously, the following Planning Scheme is the most relevant to the VIA:

- Shire of Bridgetown Greenbushes Town Planning Scheme No. 4 (amended 2018)

There are no other relevant policies specifically applicable to the Shire (Shire of Bridgetown-Greenbushes, personal communication, January 2022).

The Assessment Manual, although an advisory document, was used extensively in the assessment of visual impacts and in developing a response to the Planning Scheme and other relevant Policies and Guidelines.

Table 7 provides the response to relevant Planning Scheme, Policies and Guidelines relevant to the VIA.

Table 7: Response to relevant Planning Scheme, Policies and Guidelines (relating to VIA)

Instrument	Requirement	Response
Shire of Bridgetown-Greenbushes Planning Scheme No. 4	<p>s4.1 GENERAL OBJECTIVES AND POLICIES</p> <p>(c) provide for reasonable expansion of residential, industrial and associated uses based on the District's established settlement structure;</p> <p>f) protect, wherever possible and consistent with the General Objective, the District's landscape and rural character.</p>	<ul style="list-style-type: none"> • The proposed 132kV Power Line does not limit the reasonable expansion of residential, industrial and any associated uses; and • the District's landscape and rural character will not be significantly affected by the Power Line. The existing landscape is an altered rural landscape with limited native vegetation. The Power Line is consistent with the objectives of Rural Zone 2 as it allows for "Public Utilities", which includes provision of electricity services as a permitted use within the Zone.
	<p>s4.3.2 Rural Zone 2 - General Agriculture</p> <p>Council's Objective, recognising that land within the Zone is by reason of its physical characteristics and location suited to the development of a wide range of uses appropriate to the growth of the District's economy and activity generally, will be to retain as far as possible, an agricultural base whilst assisting desirable changes in land use and activity through Planning Policies and Controls.</p>	<ul style="list-style-type: none"> • The proposed 132kV Power Line will not limit the growth of the District's economy and activity generally, and will still retain the predominant agricultural base; and • Planning Policies and Controls will not be altered by the Power Line.
	<p>s4.10 AMENITY AND DEVELOPMENT</p> <p>Council's objectives will be to ensure that the overall amenity of the district is retained and enhanced for the benefit of residents and in the interests of the District's tourist potential, and that the landscape values of the environment are maintained.</p>	<ul style="list-style-type: none"> • The overall amenity and character of the landscape within the District will not be significantly affected by the Power Line as Power Lines are common and widespread throughout the District; and • the visual impact of the Power Line will not affect tourist potential or landscape values as Power Lines are already an established part of the rural landscape, and the 132kV Power Line will only be visible intermittently for a short period of time from tourists travelling on SW Hwy.
Visual Landscape Planning in Western Australia – a manual for assessment, siting and design	<p><i>Route and corridor analysis</i></p> <p>This must be undertaken to ensure that the route and corridor of the proposed transmission line is determined using the outcomes of a visual impact assessment as well as other environmental assessments.</p>	<ul style="list-style-type: none"> • The route and corridor have been chosen to avoid impacts on significant infrastructure and rural residential properties wherever practicable;

Instrument	Requirement	Response
		<ul style="list-style-type: none"> • Blue gum plantations within the Study Area will provide an ideal backdrop to the Power Lines, limiting or absorbing their visual impact; • prominent locations, such as routes parallel to SW Hwy, and hill ridge lines have been avoided; and • Power Lines have been located within existing easements wherever practicable, to avoid additional clearing. In areas where there are no existing easements, Power Lines will be located in areas that will have minimal impact on agricultural areas or native vegetation, such as cleared farmland or other partly cleared areas to avoid additional clearing. Where necessary, minor clearing may be required to remove vegetation within the Power Line easement.
	<p><i>Assessment of alternative routes (including use of existing corridors)</i></p> <ul style="list-style-type: none"> • Identification of a number of alternative routes will be another outcome of the visual impact assessment. These should be explored and assessed against each other to determine the route that has the least visual impact. • Produce transmission line route alternatives in light of impact upon visual landscape character; including using existing utility corridors, rail and road reserves, as well as creating new corridors. 	<ul style="list-style-type: none"> • A more direct route would have been along an easement corridor adjacent to SW Hwy; however, this route would have created a more significant visual impact, and would have been closer to residents along SW Hwy; and • other alternative routes could take the Power Line further east, avoiding residents; however, such a route would cross ridge lines and would require significantly more clearing for easements, making them more prominent in the landscape. The current proposed route uses existing easements wherever practicable.
	<p><i>Alignment (land use boundaries)</i></p> <ul style="list-style-type: none"> • The easement must protect the character of each landscape area that forms the edge between different landscape types and/or land use types. 	<ul style="list-style-type: none"> • The proposed route uses existing easements wherever practicable. A new easement has been created within the blue gum plantation and therefore does not separate or interfere with existing landscapes or land uses.
	<p><i>Alignment (line)</i></p> <ul style="list-style-type: none"> • Transmission lines should run parallel to the contours of the land (ie changing direction with the scale and flow of topographic change). 	<ul style="list-style-type: none"> • The Power Line does generally run parallel to the contours of the land, except where it is required to cross SW Hwy at Forest Park Avenue, where it forms a perpendicular crossing; and • the major land use boundaries would be considered to be crossings from pastures to blue gum plantations and <i>vice versa</i>, and across SW Hwy at Forest Park Avenue. In these instances, the impact of the

Instrument	Requirement	Response
	<ul style="list-style-type: none"> Where the lines cannot avoid cutting across major land use boundaries the impact of the transmission lines passing from an open landscape to an enclosed landscape should be minimised by alignment choice and screening the point of entry with appropriate vegetation. 	<p>Power Lines is minimised by the screening of blue gums, or by screening of tall verge native vegetation at Forest Park Avenue and SW Hwy.</p>
	<p><i>Route avoidance</i></p> <p>Routes should avoid crossing elevated areas at right angles to contours especially where the easement is centred on a hillcrest; this draws attention to the easement. The line running against the natural pattern of the landscape becomes intrusive.</p>	<ul style="list-style-type: none"> The route has been chosen such that easements centred on hill crests or ridge lines have been avoided.
	<p><i>Tower Location</i></p> <p>Locate the towers at the edge of a valley: if sited in the centre of a valley, focus is drawn to the transmission line. Towers should be placed below the crest of a hill or horizon line that reduces the impacts against the skyline. Scenic Viewpoints may be affected in such a situation.</p>	<ul style="list-style-type: none"> Location of towers within the valley is unavoidable given the length of the Power Line (7.2km); however, Power Lines are located on upward slopes of the valley, below the crest of hills and not in the centre of the valley.
	<p><i>Avoid road intersections:</i> they require open views for safety, they receive high attention from motorists and it is very difficult to reduce the impact once placed at road intersections.</p>	<ul style="list-style-type: none"> The 132kV Power line crosses SW Hwy at one road intersection, at Forest Park Avenue. The Power Line has sufficient distance from either side of the Highway intersection and is sufficiently high off the road so as not to cause a safety concern.
	<p><i>Access road siting and design</i></p> <p>Access roads for construction and maintenance require careful siting and design, otherwise attention will automatically be drawn to the easement.</p>	<ul style="list-style-type: none"> The proposed route uses existing easements wherever practicable. A new easement has been created within the blue gum plantation and therefore does not separate or interfere with existing landscapes or land uses.
	<p><i>Route selection</i></p> <p>Where specific landscape types and land use are dominant, the route should run parallel to the land use and in a similar direction; the edge of the landscape type or land use will</p>	<ul style="list-style-type: none"> The Power Line does generally run parallel to the contours of the land, except where it is required to cross SW Hwy at Forest Park Avenue, where it forms a perpendicular crossing; and

Instrument	Requirement	Response
	<p>provide a suitable background for the easement, while providing easy access for maintenance.</p>	<ul style="list-style-type: none"> • A large portion of the Power Line easement lies within blue gum plantations, thus shielding the easement from view, whilst providing easy access for maintenance.
	<p><i>Alignment</i></p> <ul style="list-style-type: none"> • Where a transmission line crosses a highway, or any road, the alignment should be as perpendicular as possible to allow for maximum setbacks of towers for low visibility from the highway or road. • Alignments should consider possible future patterns of growth (ie proposed urban development). 	<ul style="list-style-type: none"> • The 132kV Power Line crosses roads at three (3) points: <ul style="list-style-type: none"> ○ SW Hwy at Forest Park Avenue. The crossing is almost perpendicular (at approximately 80 degrees), and the Power Line has sufficient distance from either side of the Highway intersection and is sufficiently high off the road so as not to cause a visibility or safety concern; ○ Hester Road from the Bridgetown Sub Station to the Bridgetown Golf Course. This is a perpendicular crossing and towers have been set back to reduce safety and visibility concerns; and ○ Maranup Ford Road from the MDE to the transmission line corridor to the Mine-site 132kV sub-station. This is a perpendicular crossing and towers have been set back to reduce safety and visibility concerns. This crossing has previously been approved under the EP Act and Mining Act. • Future patterns of growth or urban development should not be impacted by the Power Line as it mostly traverses cleared agricultural land, blue gum plantations or the Mine Site Development Envelope.
	<p><i>Vegetation retention</i></p> <ul style="list-style-type: none"> • Existing vegetation should be retained where possible to be used as foreground screening, and to provide a backdrop for the transmission line alignment. Foreground screening can block the view of the intrusive upper portion of towers. Background screening such as trunks and branches can assist in reducing the overall visual impact of the tower webs (ie poles and wires). • Screening: dense trees are more effective than open heath or scrub. 	<ul style="list-style-type: none"> • Existing vegetation has been retained wherever practicable, although there may be some minor clearing required within existing easements; • the use of blue gum plantations will provide both foreground and background screening to residents and users of SW Hwy; and • blue gum plantations will eventually provide a dense screen for the Power Line.

Instrument	Requirement	Response
	<p><i>Vegetation clearing</i></p> <p>If vegetation is cleared for an easement, then the natural form and placement of the vegetation needs to be maintained, the trees and shrubs should appear to flow through and counter to the alignment of the easement. The land use can continue underneath the lines without a break.</p>	<ul style="list-style-type: none"> • The majority of the vegetation clearing for easements will be within blue gum plantations and will generally not be visible from outside the plantation; and • the visual impact of the Power Line is expected to blend with, or be absorbed by, blue gum plantations.
	<p><i>Consideration of other uses for easements</i></p> <p>Joint use of the easement corridor for additional utilities (road, railway, gas and electric) is often encouraged to reduce the visual impact of having several easements.</p>	<ul style="list-style-type: none"> • Talison is unlikely to have any objection to joint use of easement corridors in the future, except where the safety or integrity of the Power Line is compromised.
	<p><i>Placement near buildings and houses</i></p> <p>The visual impacts of the easements are increased if placed near buildings and houses due to the comparison between their relative sizes.</p>	<ul style="list-style-type: none"> • Easements have been located away from buildings or houses wherever practicable.
	<p><i>Design to reflect landscape</i></p> <p>The design of the individual transmission towers should reflect the surrounding landscape as much as possible.</p>	<ul style="list-style-type: none"> • The design of the transmission Towers has been chosen in accordance with relevant Australian Standards for Transmission Lines. However, the chosen transmission line is not considered particularly obtrusive, and should blend in with the surrounding landscape.
	<p><i>Placement below crest of a hill</i></p> <p>Towers should be placed below the crest of a hill or horizon line to reduce the impacts against the skyline.</p>	<ul style="list-style-type: none"> • The Power Line route has been chosen to be below the crests of hills.
	<p><i>Easement buffers</i></p> <p>Easements can form an appropriate buffer between different land uses such as extractive, agricultural or forestry uses. (Easements generally not visible).</p>	<ul style="list-style-type: none"> • The majority of the easement buffer lies within blue gum plantations, or along existing easements.
	<p><i>Construction</i></p> <p>Ensure during construction that vegetation removal and access is undertaken carefully to minimise visual impact.</p>	<ul style="list-style-type: none"> • During construction, vegetation removal will be undertaken by experienced contractors. However, in general, easements are not directly visible by the public;

Instrument	Requirement	Response
	<p><i>Additional works</i> Any additional works such as new substations, conductor and/or transformer</p>	<ul style="list-style-type: none"> • A new substation has been constructed at the Greenbushes Mine Site, within the MDE; and • no transformers will be located within the Power Line route.

Figure 17: Representative image of a 132kV Power Pole and Power Line (Boyanup)



This picture is representative of the type of Power Pole that will be used for the 132kV Power Line. Poles will be approximately 32m in height.

Figure 18: Location of Public and Residential Viewpoints showing direction of Visual Impact Assessment

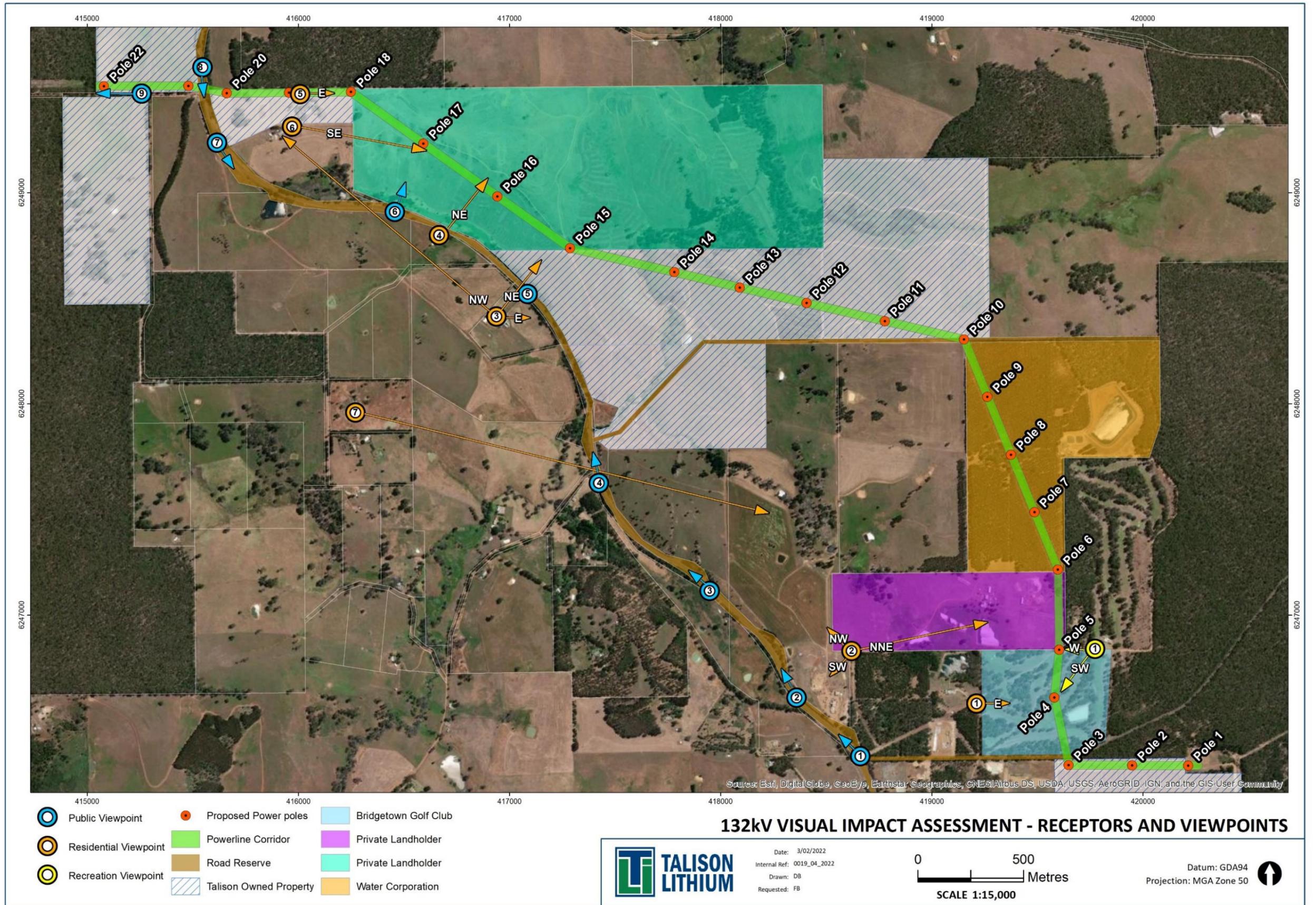


Figure 19: Public Viewpoint 2 - SW Hwy, Hester Hill looking North towards Mine site on horizon

Before



Location	Public Viewpoint 2 - 400m from Reference Point.
Viewing direction	North to Talison Mine site in the distance.
Land use	Major transport corridor (SW Hwy); Agriculture, predominantly blue gum plantation, pasture and livestock (sheep and cattle); with stands of remnant native forest.
Valued Land Use Characteristics	Hills and valleys with rural vistas, agriculture, plantations, road transport.
Visual Impact	Medium to high impact of short duration from top of hill (approximately 30 seconds) and decreases as vehicles go down hill.
Mitigation of Impact	Power Line will eventually blend into landscape as plantation trees grow to become dominant viewscape.

After



Figure 20: Recreational Viewpoint 1, Bridgetown Golf Course Club House looking West towards Pole 5

Before



Location	Recreational Viewpoint 1, Bridgetown Golf Course Club House looking West towards Pole 5.
Viewing direction	West from Club House.
Land use	Recreation (Golf Course).
Valued Land Use Characteristics	Relatively flat fairways and greens with stands of fringing, large native vegetation (eucalypts) and other trees interspersed amongst greens.
Visual Impact	High impact; some trees will be removed for the Power Line corridor and others will remain as a buffer to the Power Lines. Pole 5 will be visible from the Club House down the existing 22kV Western Power overhead distribution line (note 22kV power pole to left of 132kV Pole).
Mitigation of Impact	Views of the Power Pole will be visible from outside the Club House, but are likely to be partially obscured by the growth of surrounding vegetation in the future. Talison has a compensation agreement with the Golf Club, including Access and Notice of Entry agreements.

After



Figure 21: Recreational Viewpoint 1, Bridgetown Golf Course Tee 12, looking North from Pole 5 to Pole 6

Before



Location	Recreational Viewpoint 1, Bridgetown Golf Course Tee 12 (far left), North from Pole 5 to Pole 6.
Viewing direction	North, from Tee 12 through adjacent property 132kV easement.
Land use	Recreation (Golf Course)
Valued Land Use Characteristics	Relatively flat fairways, tees and greens with stands of large fringing native vegetation (eucalypts) and other trees interspersed amongst greens.
Visual Impact	High impact from Fairways 11 and 12. Some trees will be removed for the Power Line corridor.
Mitigation of Impact	Talison has a compensation agreement with the Golf Club, including Access and Notice of Entry agreements.

After



Figure 22: Recreational Viewpoint 1, Bridgetown Golf Course, Putting Green 15, South to Hester Road

Before



Location	Recreational Viewpoint 1, Bridgetown Golf Course Putting Green 1, south to Pole 3 on Hester Road.
Viewing direction	South to Hester Road.
Land use	Recreation (Golf Course)
Valued Land Use Characteristics	Relatively flat fairways, tees and greens with stands of large fringing native vegetation (eucalypts) and other trees interspersed amongst greens.
Visual Impact	High impact to Fairways 10, 15 and 17. The Power Poles and Power Lines will be directly seen from a number of Fairways, with some of these views being intermittent as views will be blocked by existing vegetation. Some trees will be removed for the Power Line corridor.
Mitigation of Impact	Talison has a compensation agreement with the Golf Club, including Access and Notice of Entry agreements.

After



Figure 23: Residential Viewpoint 1 boundary looking East to Putting Green 14 and Fairway 15 (in distance)

Before



Location	Residential Viewpoint 1, boundary of property and Golf Course (Green 14).
Viewing direction	Looking East from Green 14, towards Fairway 15.
Land use	Recreation – Golf Course .
Valued Land Use Characteristics	Relatively flat fairways, tees and greens with stands of large fringing native vegetation (eucalypts) and other trees interspersed amongst greens.
Visual Impact	Unlikely to be any impact to residence as not in direct line-of sight. Power lines will be visible in distance traversing across Fairway 15.
Mitigation of Impact	N/A

After



Figure 24: Residential Viewpoint 2 looking North-North-East towards Power Line (Poles 5 and 6)

Before



Location	Residential Viewpoint 2 looking North-North-East towards Power Line (Poles 5 and 6)
Viewing direction	North-North-East towards Power Line Poles 5 and 6.
Land use	Agricultural pasture with high density fringing native vegetation (trees).
Valued Land Use Characteristics	Open landscapes, rolling pastures and agricultural activities.
Visual Impact	High impact of Power Lines due to proximity to residence (approximately 320m). No Power Poles will be located on the property.
Mitigation of Impact	Compensation Agreement with landholder including Access and Notice of Entry Agreements.

After



Figure 25: Residential Viewpoint 2 - existing views of 22kV Power Poles and Power Line Corridor



Location	Residential Viewpoint 2
Viewing direction	North
Land use	Agriculture - pasture with fringing native vegetation (trees).
Valued Land Use Characteristics	Open landscapes, rolling pastures and agricultural activities.
Visual Impact	It is possible that Power Poles 10 and 11 may be visible in the distance (approx. 1.5km); however this is difficult to resolve in this figure against the background. Low impact due to absorption by vegetation and acceptance of Power Lines in rural landscape.
Mitigation of Impact	N/A. Existing impact.

Figure 26: Residential Viewpoint 3 looking North-East



Location	Residential Viewpoint 3.
Viewing direction	North-East towards Power Lines 13 – 15 (approx.. 400m to 1km).
Land use	Rural residential with rural industry (Kennels). Blue gum plantations and fringing native vegetation on hills in distance.
Valued Land Use Characteristics	High density fringing garden vegetation (trees and bushes) surrounding residence, with surrounding open landscapes and pastures not directly visible from residence at this location. Intermediate views of blue gum plantation and native hill-side vegetation in distance.
Visual Impact	Existing view. Power Lines may be visible in the distance; however, this is difficult to resolve in this figure against the background vegetation. Low impact due to distance to Power Lines and intervening vegetation.
Mitigation of Impact	Low impact due to distance to Power Lines and intervening vegetation and plantation. Distant views of Power Line will be obscured by trees in foreground.

Figure 27: Residential Viewpoint 3 looking North-East

Before



Location	Residential Viewpoint 3, rural residence on SW Hwy.
Viewing direction	North-East towards Power Line Poles 14, 15 and 16
Land use	Rural residential with rural industry, with surrounding pasture adjacent to residence and blue gum plantations across SW Hwy to ridge in distance.
Valued Land Use Characteristics	Established gardens around residence, with open landscapes and pastures with blue gum plantation views.
Visual Impact	Visibility to Power Line within blue gum plantation.
Mitigation of Impact	Medium impact in short term and low impact in long term due to blending and shielding by plantation. Impact will be mitigated by plantation growth in near future.

After



Figure 28: Residential Viewpoint 3 looking North-West

Before



Location	Residential Viewpoint 3, rural residence on SW Hwy.
Viewing direction	North-West towards Power Line poles 16 – 19.
Land use	Domestic rural residence with commercial business. Rural residence in distance.
Valued Land Use Characteristics	Open, cleared landscape, pasture, native vegetation and blue gum plantation views.
Visual Impact	Medium impact in short term and low impact in long term due to blending and shielding by plantations.
Mitigation of Impact	Impact mitigated by intervening and surrounding vegetation, eventually completely obscured as plantation grows.

After



Figure 29: Residential Viewpoint 3 looking West



Location	Residential Viewpoint 3, rural residence on SW Hwy.
Viewing direction	West towards 22kV Power Lines on property boundary.
Land use	Domestic rural residence with rural industry business, and Public Utility (22kV Power Lines) within 100m of residence.
Valued Land Use Characteristics	Predominantly non-native domestic garden vegetation in foreground and pasture in background.
Visual Impact	Existing impacts from 22kV Power Lines and transformer. The 132kV Power Line is not visible from this Viewpoint as this Viewpoint is looking west and the Power Line is east.
Mitigation of Impact	N/A. Existing impact.

Figure 30: Residential Viewpoint 4 looking North-East towards Power Poles

Before



Location	Residential Viewpoint 4, SW Hwy, rural residence on SW Hwy.
Viewing direction	North-East towards Power Line Poles 15 and 16.
Land use	Rural Pasture adjacent to residence with blue gum plantations across SW Hwy to ridge in distance.
Valued Land Use Characteristics	Rural residential with surrounding established gardens with blue gum plantation views on eastern side of SW Hwy.
Visual Impact	Visibility to Power Line within blue gum plantation, approximately 300m.
Mitigation of Impact	Medium impact in short term and low impact in long term due to blending and shielding by plantations.

After



Figure 31: Public Viewpoint 5 -Tree Farm on SW Hwy looking East

Before



Location	Viewpoint 5, Tree Farm on SW Hwy, 3,550m from Reference Point. .
Viewing direction	East towards Power Line Poles 16 and 17.
Land use	Agriculture - Blue gum Plantation.
Valued Land Use Characteristics	Treefarm with surrounding agricultural landscape (pasture) and rural residential.
Visual Impact	Visibility to Power Line within blue gum plantation.
Mitigation of Impact	Medium impact in short term and low impact in long term due to blending and absorption by plantation.

After



Figure 32: Residential Viewpoint 5 looking East on Forest Park Avenue (Talison owned)

Before



Location	Residential Viewpoint 5, rural residence on Forest Park Avenue East.
Viewing direction	East along Forest Park Avenue, along 22kV Power Line corridor.
Land use	Rural residence and agriculture.
Valued Land Use Characteristics	Agricultural viewsapes – hills and valleys with pasture and plantations, with native private forest on northern boundary within 100m of residence.
Visual Impact	Power Line is approximately 80m from the residence (Talison owned) and is largely obscured by trees surrounding residence.
Mitigation of Impact	Talison owned rural residence largely obscured by trees surrounding residence.

After



Figure 33: Residential Viewpoint 6, Forest Park Avenue, Eastern Boundary of Rural Residence

Before



Location	Residential Viewpoint 6, Forest Park Avenue East.
Viewing direction	East towards 22kV Power Lines.
Land use	Rural residence with agriculture, predominantly pasture.
Valued Land Use Characteristics	Hills and valleys with pasture and plantations, native vegetation on distant ridges and hill slopes, adjacent blue gum plantation.
Visual Impact	High impact due to visibility to Power Line within blue gum plantation, approximately 250m from residence.
Mitigation of Impact	High impact in short term and medium to low impact in long term due to future blending and visual absorption by plantations.

After



Figure 34: Residential Viewpoint 6, SW Hwy Boundary of Rural Residence looking East



Location	Residential Viewpoint 6, from boundary with SW Hwy.
Viewing direction	East from SW Hwy.
Land use	Rural residence with agriculture, predominantly pasture .
Valued Land Use Characteristics	Hills and valleys with pasture and plantations, native vegetation on distant ridges and hill slopes, adjacent plantation within 250m of residence.
Visual Impact	Existing 23kV Power Lines running through property. The 132kV Power Line is not visible from this Viewpoint as it is located further east of the residence.
Mitigation of Impact	Existing impact. Low impact due to acceptance of Power Lines in rural landscape. Power Lines are common on nearly all rural properties.

Figure 35: Public Viewpoint 8, SW Hwy and Forest Park Avenue Power Line crossing

Before



Location	Public Viewpoint 8, SW Hwy and Forest Park Avenue, 4,900m from Reference Point.
Viewing direction	South-West – intersection of SW Hwy and Forest Park Avenue.
Land use	Road transport, agriculture and public utility (22kV Power Line).
Valued Land Use Characteristics	National significance road transport route (SW Hwy), rural roads to rural properties and farms.
Visual Impact	Powerline crossing highway at approximately 30m high.
Mitigation of Impact	Powerline will only be visible for a few seconds as vehicles approach the Power Line from the South and North and then pass the Power Line. There are many other Power Lines (23kV) crossing the highway.

After



Figure 36: Public Viewpoint 8 - Existing Powerlines near intersection of SW Hwy and Forest Park Avenue



Location	Public Viewpoint 8; SW Hwy and Forest Park Avenue, 4,900m from Reference Point, 200m from intersection
Viewing direction	West – approximately 200m from intersection of SW Hwy and Forest Park Avenue.
Land use	Road transport, agriculture and public utility (22kV Power Line), fringing remnant native forest.
Valued Land Use Characteristics	National significance road transport route (SW Hwy), rural roads to rural properties and farms.
Visual Impact	Existing impact, Powerlines adjacent to SW Hwy. The 132kV Power Line is not visible from this Viewpoint, but becomes visible closer towards Forest Park Avenue and SW Hwy intersection, approximately 100m further south.
Mitigation of Impact	Existing impact. Low impact due to acceptance of Power Lines in rural landscape. Power Lines are common on nearly all rural properties.

Figure 37: Public Viewpoint 9 looking West on Forest Park Avenue

Before



Location	Public Viewpoint 9, Forest Park Avenue West. Talison owned property on right; 5,010m from Reference Point.
Viewing direction	West on Forest Park Avenue.
Land use	Rural road transport, agriculture (pasture and grazing) and public utility (22kV Power Line).
Valued Land Use Characteristics	Regional road transport route to rural residential properties and farms.
Visual Impact	Low impact. 132kV Powerline will be located on northern side of Forest Park Avenue, on Talison-owned rural property. Powerline crossing highway at approximately 30m high.
Mitigation of Impact	Road has low volume of rural traffic. Powerline will only be visible for a few seconds as vehicles approach and pass the Power Line East from SW Hwy and West, from Forest Park Avenue. View shows existing 23kV Power Line in same vicinity.

After



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