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Tamworth Solar Farm

Response to Request for Information September 2020

Prepared for: Tamworth Solar Farm Pty Ltd
September 2020

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Contents

1 Introduction

The Department of Planning, Industry and Environment (DPIE) have requested that Tamworth Solar Farm provide further consideration of measures to minimise visual impacts of the substation on the closest residential receivers including:

- whether alternate locations within the project site for the substation are reasonable and feasible; and
- further detail on the consideration of the mitigation measures and their effectiveness to reduce visual impact.

These points are addressed below.

2 Further consideration of mitigation measures for the existing substation location

As the design of the Tamworth solar farm has progressed, and following further feedback from DPIE, there have been some changes to the substation and battery energy storage system (BESS) layout and design. These changes are summarized below:

- Since the preparation of the initial visual impact assessment, the substation has been sited such that the long axis of the substation is perpendicular to the existing transmission line. This change reduces the width of the substation as seen from Residence R03.
- The BESS has been realigned such that the long axis of the BESS is now also perpendicular to the existing transmission line. In this position, the BESS is screened from R03 by the bund to be erected. The location of the infrastructure is shown in Figure 1.
- A preliminary general arrangement of the substation can now be provided following further discussions with Transgrid (refer to Figure 2). The preliminary general arrangement drawing indicates that the area of the substation that will be utilised by equipment (41.5 x 91m) is smaller than anticipated in the Environmental Impact Statement. The size of buildings and quantity and size of equipment is also reduced.
- The pad for the substation will be cut into the landscape, reducing the visual height of the substation In the north east corner of the substation, the lowest point in the terrain, the pad will be less than 500mm above ground level. The highest point is the south west corner of the substation where the cut may be up to 3m in depth (assuming the maximum pad size of 60 x 120m).
- The size of the bund in commitment V9 of the EIS has been estimated following further assessment of the groundworks required for the substation. The bund will be approximately 3m high and 103m long, dependant on the final substation groundworks required. The batters on the side will be 1 in 3 (18 degrees slope) and the batters at either end will

be 1 in 5 (11 degrees slope). The width of the flat area at the top shall be approximately 7m. The bund has been placed inside the development site on the southern side of the transmission line to screen the view of the substation from R03. The location of the bund is shown in Figure 1. The bund will not infringe on the easement of the TransGrid transmission line. The bund runs directly down the slope and will therefore not adversely impact the flow of water across the site. Vegetation will be planted on the bund to increase the height of the visual screen. This will consist of three rows of vegetation that will grow to a height of 5 to 10m plus some lower growing species and ground covers to stabilise the bund and to help it blend it into the landscape. This bund and cutting the substation pad into the terrain were not taken into account in the original visual impact assessment.

The result of these changes is illustrated in Figure 3 and Figure 4. From R03, only the top section of the lightning masts and gantry will be visible once the bund is complete. All other infrastructure in the substation and BESS will not be visible from R03 regardless of the stage of growth of the vegetation screen. When the vegetation has reached 5m in height, the gantry will not be visible and only about 5 to 7m of the lightning masts will be visible depending on the location of the masts. There are eight of these masts in total. They are a relatively thin mast towards the top of the mast with no wires attached to them (refer to Figure 5). Particularly once the vegetation has grown on the bund, these masts will have minimal visual impact from R03.

3 Assessment of alternative substation locations

3.1 Selection of alternative substation locations

Four alternative substation locations have been assessed to determine their ability to reduce visual impact and maintain the project's integrity. The locations considered, and the transmission lines that would be associated with each location are shown in Figure 6. The factors considered when selecting the sites were:

- Distance and visibility from neighbouring residences;
- Shading impacts of the substation on the solar array;
- The impacts of shading and easement requirements related to the new transmission line;
- Service access for maintenance by TransGrid; and
- Environmental constraints and other known constraints.

These factors are discussed in more detail below.

Shading

The substation is generally the tallest infrastructure associated with a solar farm and the shading impact that such infrastructure can have on a solar farm's energy production has a significant bearing on its placement. It is therefore necessary in this case for an optimised plant layout to locate this infrastructure on the southern side of the panels so that the panels are not shaded. The

alternative is locate the substation a significant distance away from the solar panels to eliminate any shading, however, this is often impractical due to the amount of land available to develop the solar farm, and the inefficiencies associated with this movement of the substation (namely loss of land to locate solar panels, additional construction costs and increased electrical losses). Other implications of locating a substation away for existing transmission infrastructure are discussed further below.

Transmission Line

Substation locations that are located away from an existing transmission line (in this case Transmission Line 969 (Tamworth-Gunnedah)) will require a double circuit 132 kV transmission line to connect the substation to the transmission line. The line is required to be a double circuit line as it effectively loops into the substation and then back out to the existing transmission line.

An example of the type of a double circuit tower is shown in Figure 7. The height of the towers will be approximately 35m to 40m to comply with the current regulatory requirements for this voltage level. Consequently, the new towers will be considerably higher than the existing line which is approximately 20 m high. This difference in height is illustrated in Figure 8, please fefer to the two tower types on the right-hand side of the figure. Given the height of the towers, significant shading impacts can also be caused by the transmission towers.

It is possible to locate new transmission lines underground, as opposed to aboveground on circuit towers, dependent on ground conditions and other factors. The cost of unground cabling is approximately double that of an overground connection, and for a project of Tamworth Solar Farm's scale, it is considered that this cost burden would make the project unviable and uneconomic.

Land Requirements

Any new transmission line of the type referred to above requires an easement with a width of 45m. As a result of this additional land easement requirement (which cannot be built within), a significant area of land may be lost within the project site that would otherwise be used to accommodate other solar farm infrastructure (particularly the solar modules). This impacts on the economics of the project.

Vegetation Screening

It should also be noted that visual screening using vegetation will not be possible on the side of the substation where the new transmission line will exit.

Maintenance Access

Another consideration relates to maintenance of the substation. The substation will be maintained by Transgrid personnel. It is highly preferable that the substation has its own access that is separate from the access to the solar farm. This means that the Transgrid personnel do not have to conduct the solar farm induction and comply with other solar farm OHS requirements in order to access the substation. This is important as Transgrid have a large workforce and would want to have flexibility when conducting operations at the substation. There

may also be requirements for Transgrid staff to access the substation at very short notice. It is therefore, highly preferable that the substation is at the perimeter of the solar array and able to have its own access track that does not divide the solar farm. The location of Option 2 in particular may create maintenance access implications.

3.2 Visual impact assessment of alternate substation locations

Moir Landscape Architecture have conducted a visual impact assessment of the alternate substation locations and the existing substation location with the changes that have been described in Section 2. The assessment can be found in Appendix 1. The findings of the visual impact assessment can be summarized as follows:

- For the current substation layout next to the existing transmission line, only the top section of the gantry and the masts will be visible from the curtilage of R03 once the bund is constructed. Part of the solar array will also be hidden by the bund. When the screening vegetation has grown to 5m, the visual impact of the substation will be low.
- The residence at R02 will not be adversely impacted by the final substation layout or alternative options 1 and 2 as the views to these areas are screened by vegetation on the north-western side of the house. There are likely to be views to the transmission towers of options 3 and 4 from this house to the north-north-east. There may also be views to the substation of Option 3.
- Moving the substation away from the existing transmission line will require the construction of a new double circuit transmission line with towers approximately 35 to 40m in height, none of which would be required for the existing location. This transmission line will have a high visual impact on R03 for Options 1 and 2. It will also significantly increase the impact in the public domain.

3.3 Cost

Solar power is the cheapest form of new energy generation available to consumers and businesses throughout New South Wales and Australia, and additional construction of renewable energy is predicted to cut energy costs for both consumers and businesses over the coming decades.

The electrical infrastructure required to connect a solar farm to the transmission network can vary significantly in cost between projects but will consistently make up 10-15% of the capital expenditure required for the project, and a significant proportion of the ongoing operational costs. As such, much attention has been given by the Tamworth Solar Farm to locating the electrical infrastructure for this project in a location which is both visually unobtrusive (via direct siting and the commitment to deliver significant mitigation measures) and cost effective.

A large element of a project's electrical costs can include the requirement for a new transmission line. This has been avoided in this case through appropriate siting and early engagement with Transgrid. Further material considerations include the area of land required for the electrical infrastructure due to the knock-on effects of any loss of land for solar modules would have on overall energy generation. The land area required for the Tamworth Solar Farm has been optimised through siting of the substation adjacent to existing transmission tine 969 (Tamworth-Gunnedah).

Our assessment of the four alternative substation locations shown in Figure 6 has determined that Options 2, 3 and Option 4 in particular would results in a loss of generation from this project when compared with the current substation location. This reduction in generation would further add to the potential for the project to become unviable.

3.4 Summary of alternative substation locations

Option 1
Option 1 is further 100m away from R03 relative to the current substation layout. However, the substation will be more difficult to screen as the connecting transmission line will prevent the planting of vegetation on the southern side of the substation. Furthermore, the double circuit transmission line required to connect the substation will mean that the visual impact to R03 will be significantly higher and there will also be a higher visual impact to the public domain. All options away from the existing transmission lines will increase project costs.

Option 2
The substation of Option 2 is unlikely to be visible from R03, however the connecting transmission line (630m in length) will be highly visible and will have a greater visual impact on R03 than the current substation layout. It will also have a greater impact on the public domain and require panels to be moved to the south of the property.

Option 3
The substation of Option 3 is 930m from R03 and will therefore only be visible in the distant view. The connecting transmission line will visible from R03. The transmission line will be highly visible from the public domain even when the vegetation screens have grown. The transmission line will also be visible from R02 and the substation may also be visible from R02 until the vegetation screen has grown. The transmission line easement will displace panels that will either have to be moved to the south of the site or the solar farm's energy generation capacity will be impacted.

Option 4
The transmission line connecting this option to the existing transmission line will be visible from R03. The transmission line will also be highly visible from the public domain even when the vegetation screens have grown. The

transmission line will also be visible from R02. The transmission line easement is long (1000m) and will therefore displace a large number of panels that will either have to be moved to the south of the site or the solar farm's energy generation capacity will be impacted.

4 Conclusion

The initial site selection process for the Tamworth Solar Farm site comprised of an extensive screening process using geographical information systems, local scouting and other information sources. One of the main criteria under consideration was the proximity of the project site to the existing power lines in order to minimize the construction of additional electricity infrastructure, to reduce both visual impact upon the surrounding community and project costs. The site has been developed with the minimum impact concept at the core of all its design and technical considerations, from minimising ground disturbance, tree removal and so on. The substation has been located based on the same concept. The proximity of the substation to the existing infrastructure eliminates the need for additional towers minimising the visual impact and ground disturbance.

A summary of the impacts is shown in Table 1. This table illustrates that moving the substation away from the existing transmission line will increase the visual impact for the neighbouring residences and the public, as well as negatively impacting upon other factors such as access, construction cost and the solar farm layout. Tamworth Solar Farm Pty Ltd does not consider that there are any benefits in moving the substation from the position shown in Figure 1, and that the movement of the substation would generate additional negative impacts. Through the siting of the substation and the mitigation measures that have been proposed, Tamworth Solar Farm considers the impacts from the substation to be low.

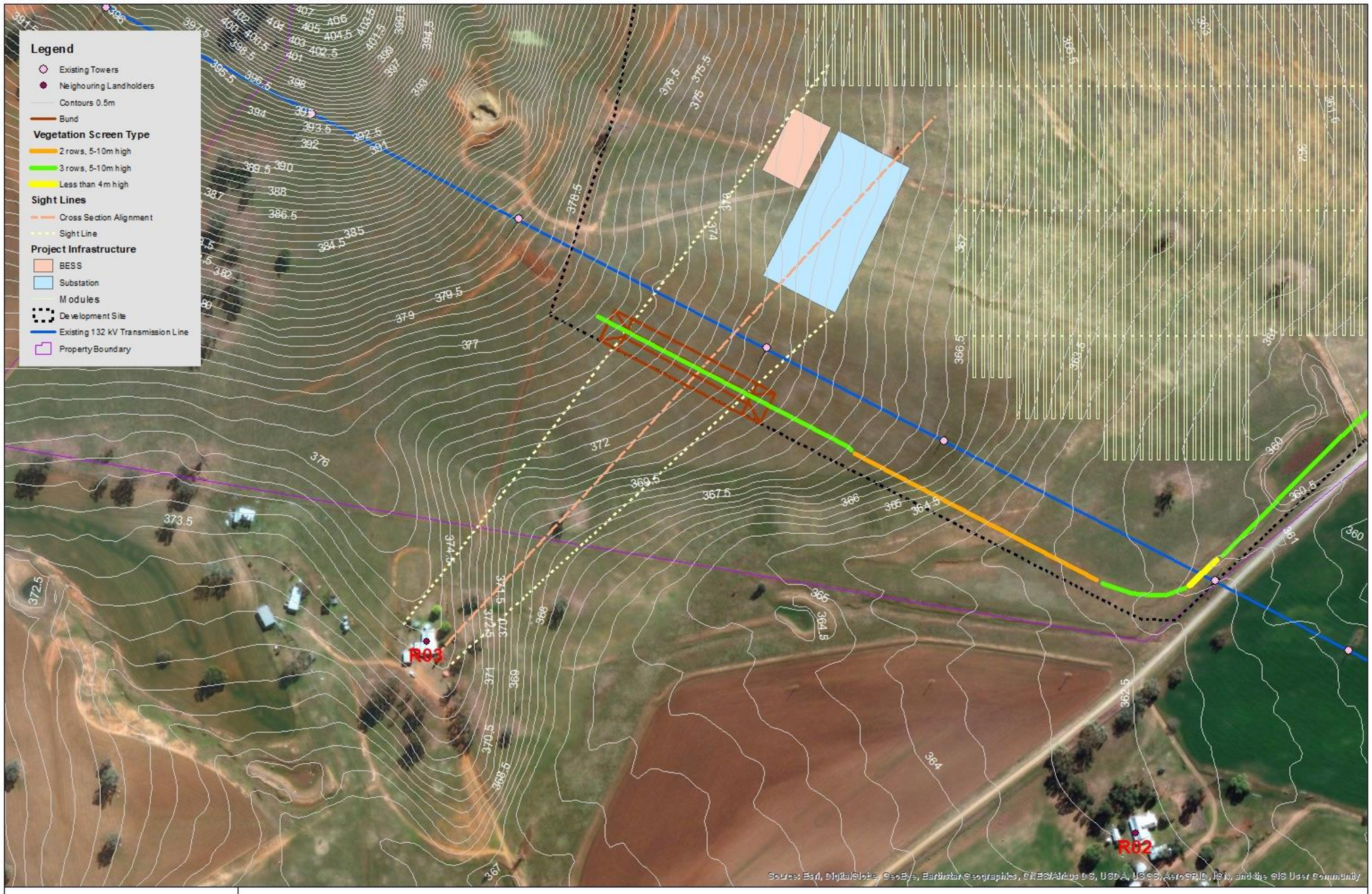
Table 1. Impacts of alternative substation locations.

Impact	Option 1	Option 2	Option 3	Option 4	Final Layout (Bund Only)	Final Layout (5m Veg Screen)
Visual impact from R03						
Visual impact from R02						
Visual impact from Public Domain						
Access for TransGrid						
Cost						
Impact on Solar Farm Layout						

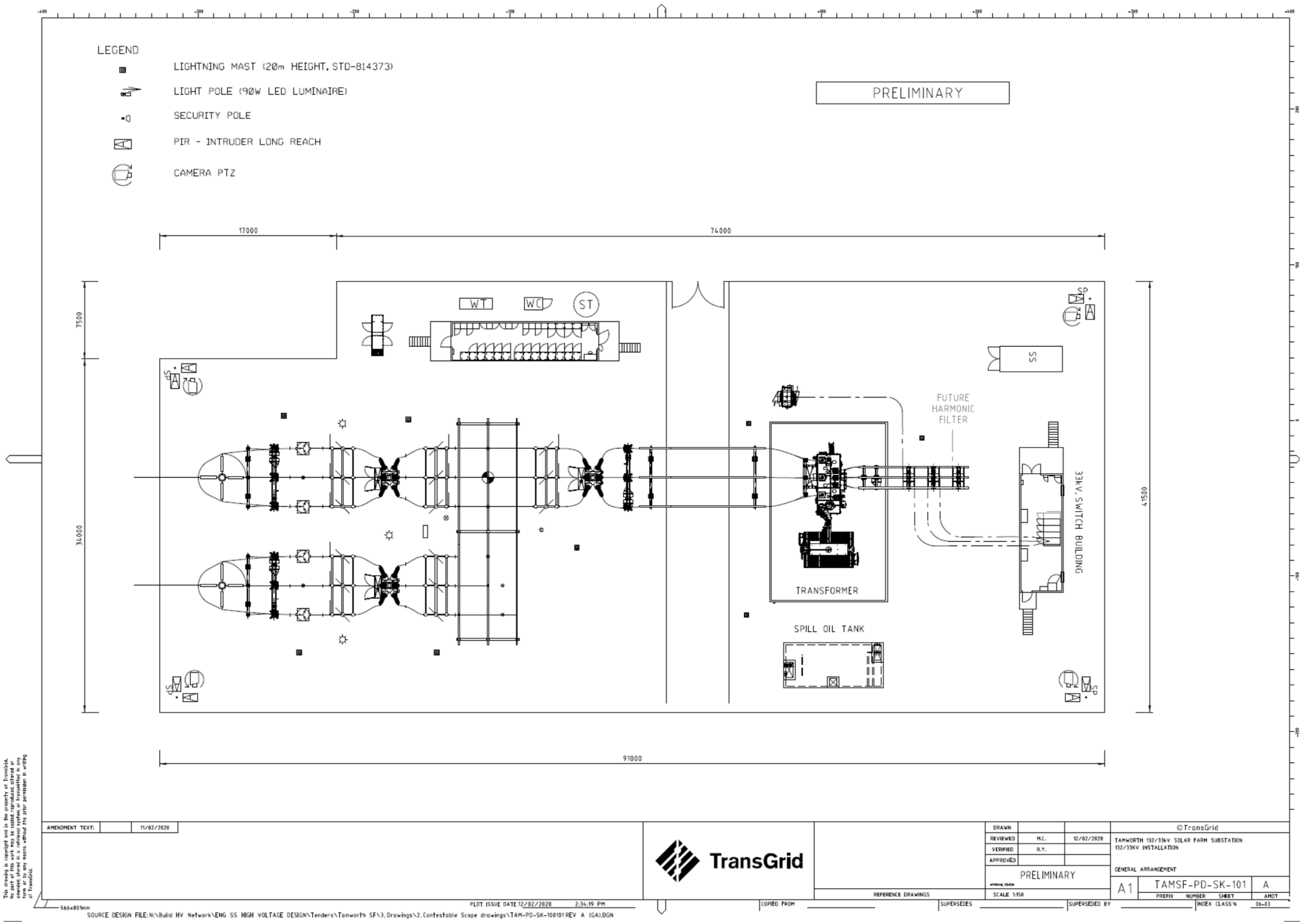
Key: Orange = High Impact, Yellow = Moderate Impact, Green = Low Impact.

5 Figures

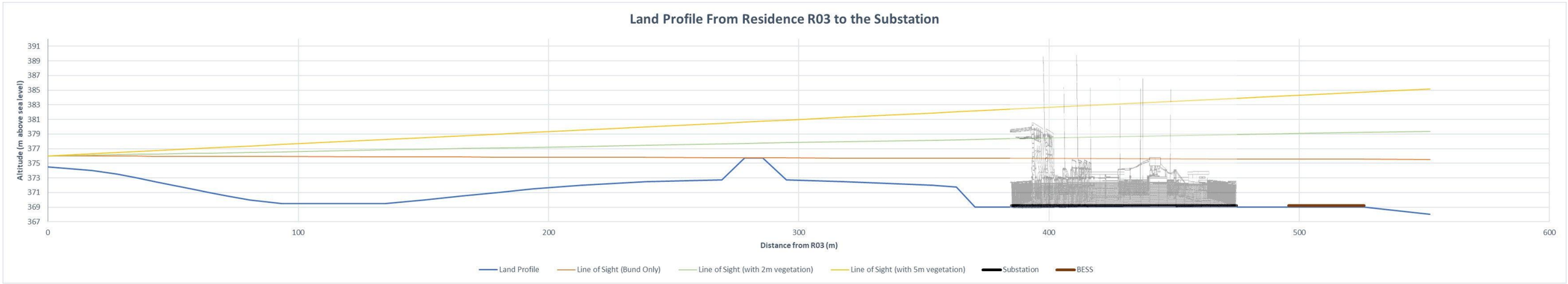
- **Figure 1 Revised substation and BESS location showing bund**



- **Figure 2. Preliminary general arrangement of substation**

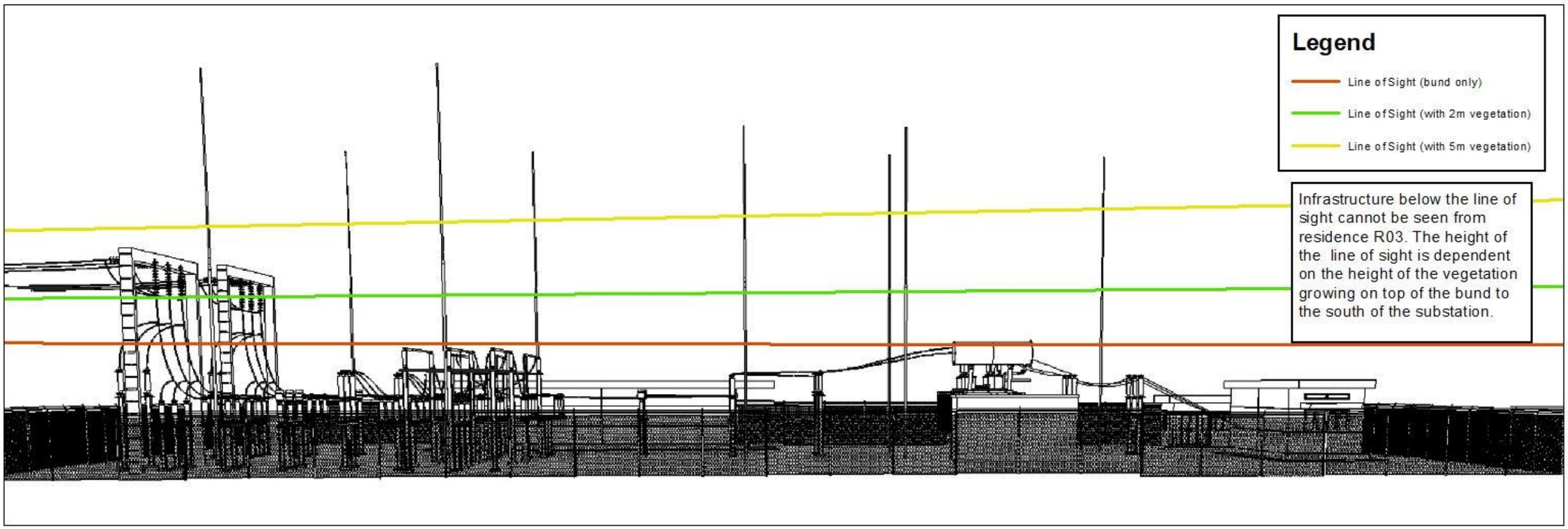


- **Figure 3. Land profile and lines of sight from Residence R03 to the substation**



Notes. Residents at R03 will not see below the line of sight to the right of the bund (the bump at 280m). The BESS is approximately 2.5m high at will not be seen from R03 once the bund is installed.

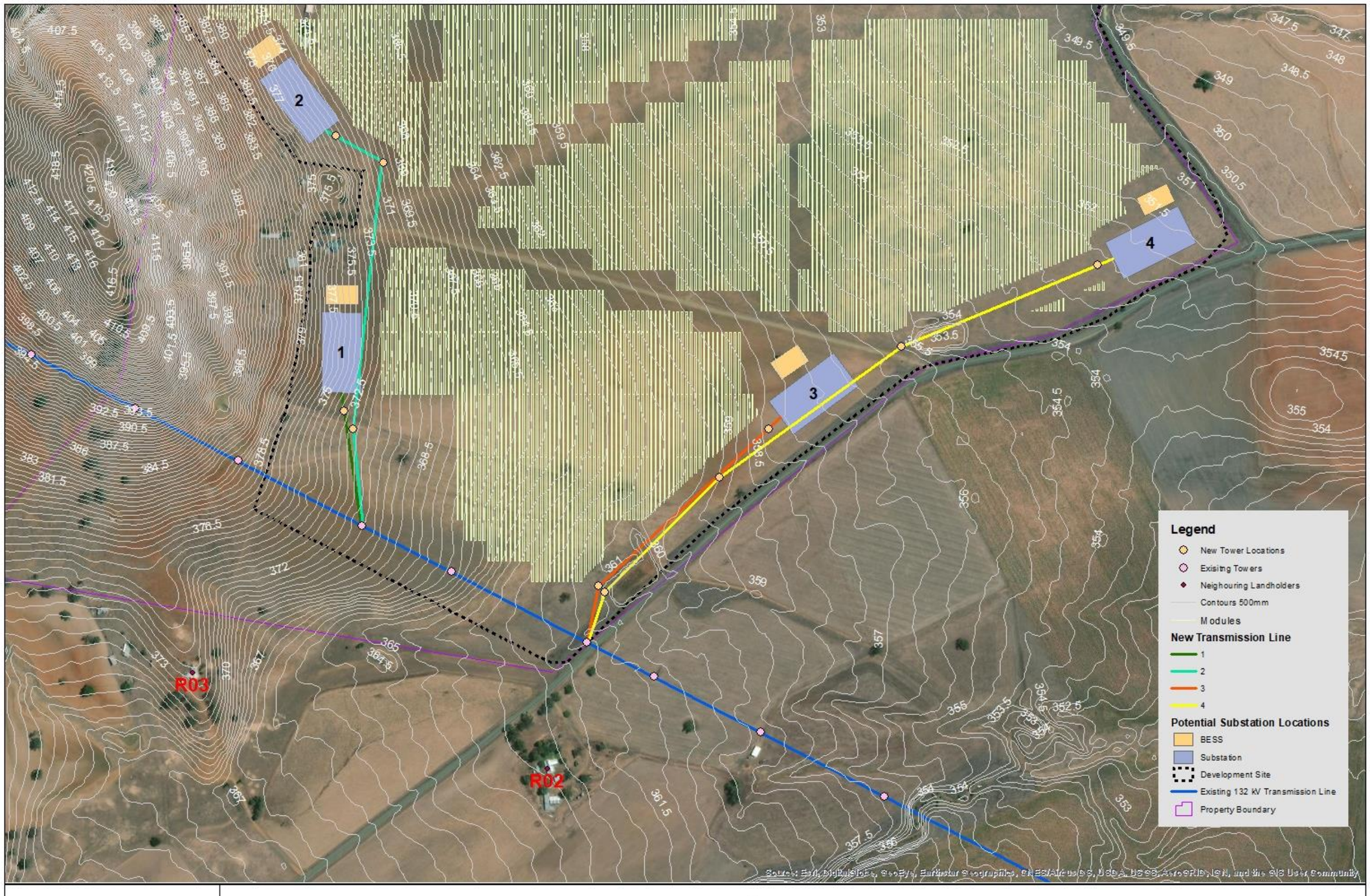
- **Figure 4. Infrastructure that can be seen from Residence R03 relative to the height of vegetation on the bund.**



Notes. Infrastructure below the line of sight can not be seen from R03.

Figure 5. Example of a lightning mast

- **Figure 6. Alternative substation locations**



- **Figure 7. Typical double circuit tower.**

- **Figure 8 Typical 132kV transmission lines used by Transgrid**

Source: www.transgrid.com.au
Note. The existing line at solar farm site is the 132 kV single circuit wood pole (far right). The alternative substation sites away from the existing transmission line will need to be connected with the 132 kV double circuit steel tower (second from the right).

6 Appendices

ADDENDUM REPORT
Tamworth Solar Farm LVIA

moir
landscape architecture

Prepared for: PROJECT.e / Oriens Energy

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Contents

1.0 Introduction

1.1 Introduction

The Tamworth Solar Farm proposal site is located at 2209 Soldiers Settlement road, Bective NSW, on Lot 186 DP 755340, approximately 25km west of Tamworth and south of the Oxley Highway in the Somerton area.

In October, 2019 Moir Landscape Architecture (MLA) were commissioned by PROJECT.e to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed Tamworth Solar Farm Project (SSD-9264).

As part of this Study, MLA conducted a visual impact analysis of the proposed development (including the substation infrastructure) on the nearby receptors and public domain.

In response to the LVIA, the Department of Planning and Environment has requested further consideration of the impacts of the substation on the closest residential receivers including:

- *whether alternate locations within the project site for the substation are reasonable and feasible; and*
- *further detail on the consideration of the mitigation measures and their effectiveness to reduce visual impact.*

In response to these requests from the Department, the proponent has provided four alternative substation locations along with a final substation layout.

The purpose of this addendum report is to undertake a comparative visual assessment of the four alternative substation locations and the final substation layout and provide recommendations on the most suitable option.

In particular the final substation layout is focused on reducing the potential visual impacts to the closest residential receivers (namely R03 and R02).

This addendum report also demonstrates the effectiveness of mitigation measures to assist in reducing the visual impact to the closest receptors.

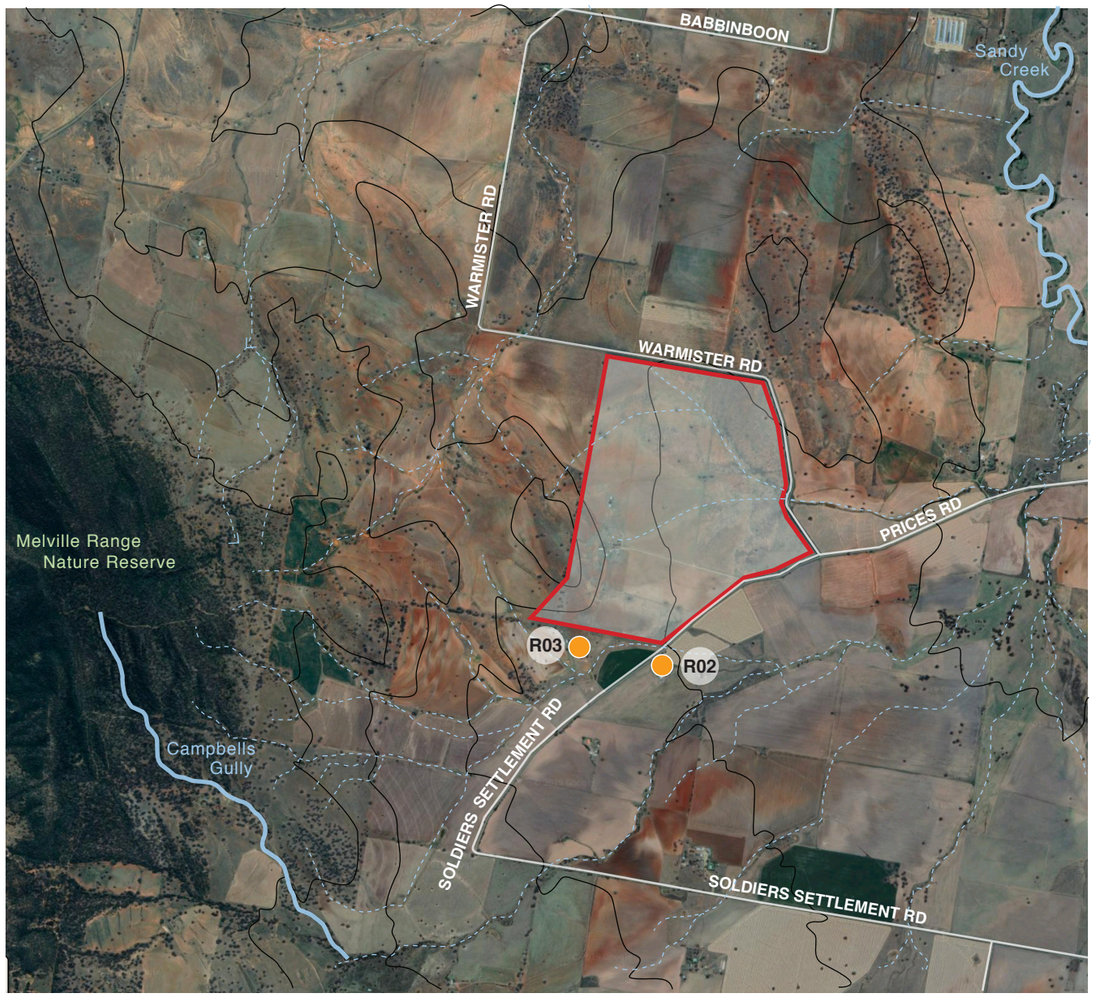

Figure 1: The Proposed Development Site (Source: Google Earth, Google Map, Six Map)

2.0 Final Substation Layout

2.1 Proposed final substation layout & mitigation methods

A number of updates have been made to the substation design and mitigation methods since the previous LVIA submission. These key changes are summarised below:

- The substation has been rotated 90 degrees with the long axis of the substation running perpendicular to the existing transmission line. The BESS has been moved to the western edge of the substation. The location of the infrastructure is shown in Figure 10.
- The area covered by equipment is to be approximately 41 x 91m. The size of buildings and quantity and size of equipment are reduced.
- The pad for the substation will be cut into the landscape.
- A bund (3m high and 103m long) will be added to assist in screening views from R03.
- Further mitigation vegetation will be planted on the bund to increase the height of the visual screen. This will consist of three rows of trees that will grow to a height of 5 to 10m plus some lower growing species and ground covers to stabilise the bund and to help it blend it into the landscape in accordance with landscape screening principles that were included in the original LVIA.

The view from R03 and the driveway of R02 toward the final substation layout can be found in the following pages.

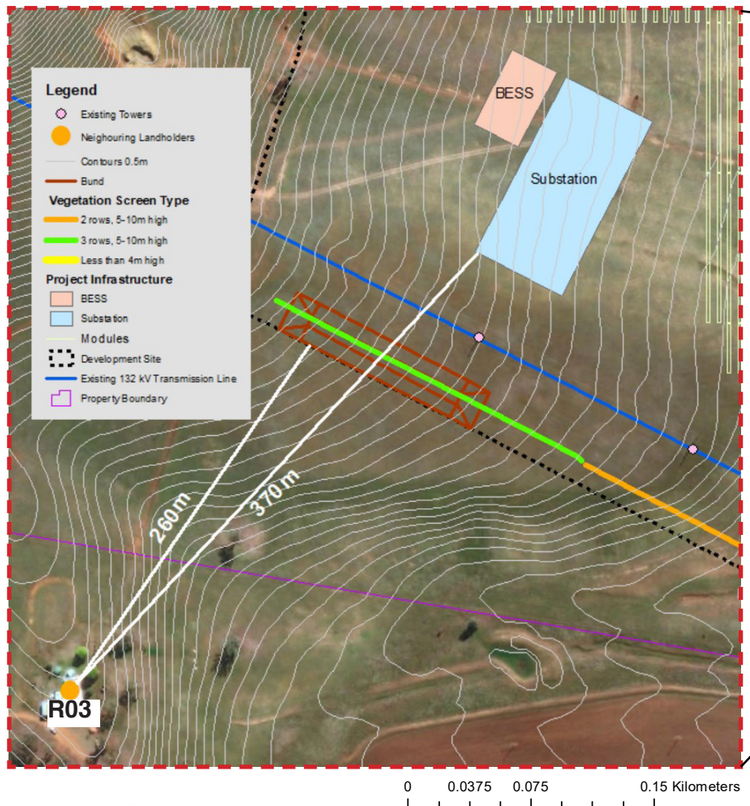

Figure 2: Final Substation Layout (Source: Google Map, Project E)

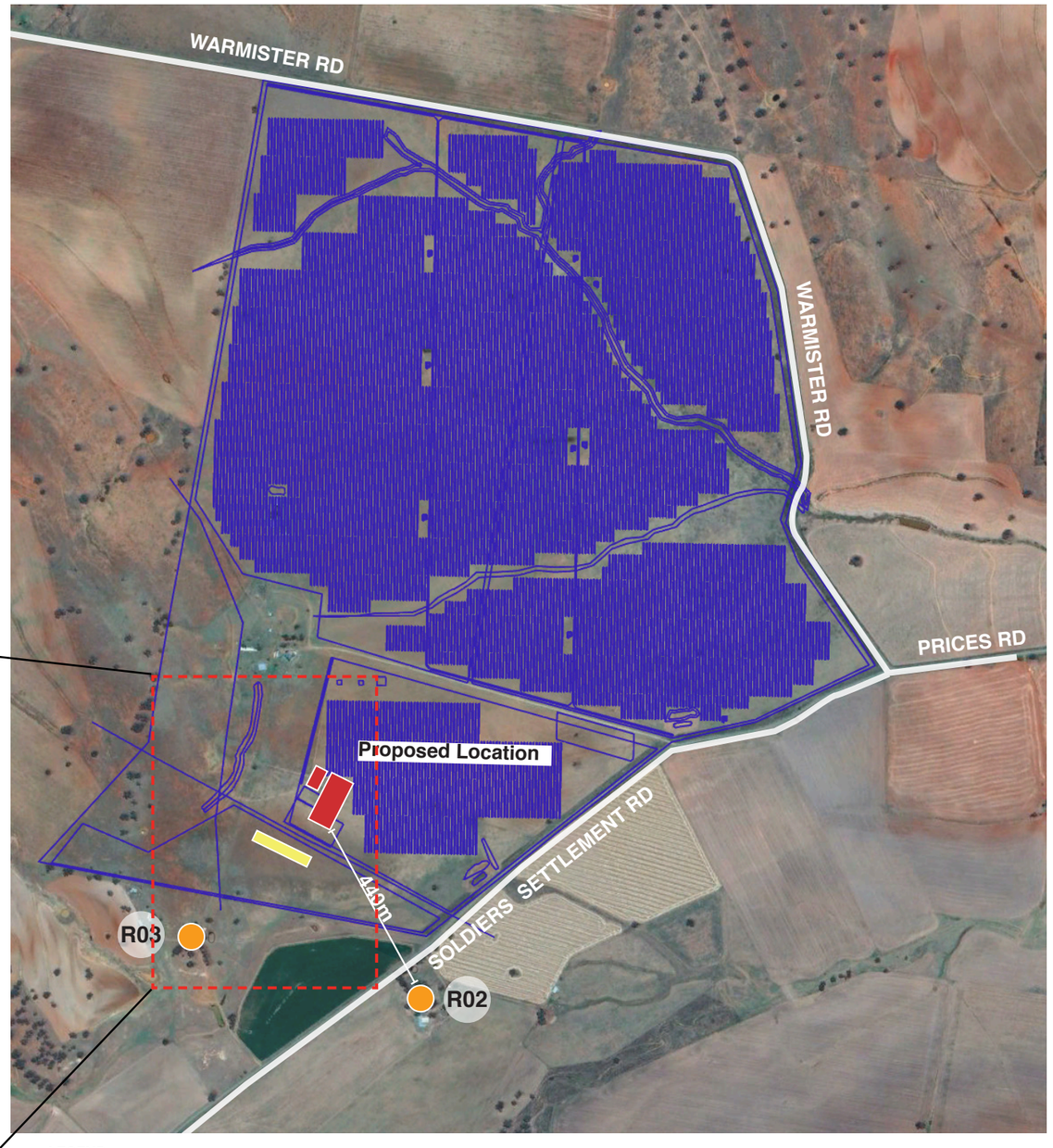

Figure 3: Final Substation Location (Source: Google Map, Project E)

2.0 Final Substation Layout

EXISTING VIEWPOINT 06 WITH THE FINAL SUBSTATION LAYOUT

EXISTING VIEWPOINT 06 WITH THE FINAL SUBSTATION LAYOUT & MITIGATION METHODS (5M)

2.2 Viewpoint 06 Visual Assessment

The proposed final substation layout is located at approximately 369m above sea level, approximately 440m NW from the residence of R02 and 350m NW from the viewpoint location.

This viewpoint is taken from the driveway of R02, outside of the curtilage of the residence toward the proposed final substation layout. This viewpoint is not representative of the views available from the main residence which are likely to be contained due to vegetation, particularly to the northern side of the residence.

The substation will be visible from the driveway of R02 in the background of the view. The land use associated with the viewpoint is that of a local road that is predominantly used for access to properties. Therefore, it is likely opportunities for views toward the substation will be fleeting.

The use of mitigation methods as described in 2.1 and as shown above are likely to screen the majority of the substation and solar panels from this location.

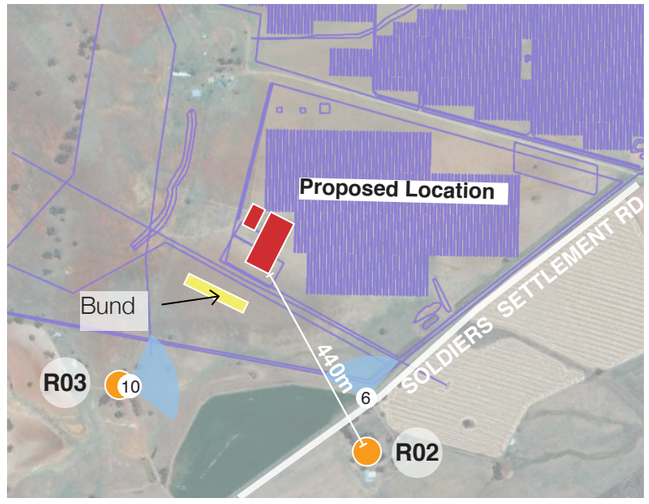

Figure 4: Context Plan (Source: Google Map, Project E)

2.0 Final Substation Layout

EXISTING VIEWPOINT 10 WITH THE FINAL SUBSTATION LAYOUT

EXISTING VIEWPOINT 10 WITH THE FINAL SUBSTATION LAYOUT & MITIGATION METHODS (5M)

2.3 Viewpoint 10 Visual Assessment

The proposed final substation layout is located at approximately 369m above sea level, approximately 370m NE from the residence of R03 .

This viewpoint is taken from within the curtilage of R02. Scattered vegetation exists along the fenceline of R03 and the mid ground of the view.

Opportunities for views toward the substation are likely from this location toward the NE. However, vegetation in the mid ground is likely to fragment some views from the NE side of the residence toward the proposed final substation, reducing the visual impact from this location.

The use of mitigation methods as described in 2.1 and as shown above are likely to screen the majority of the substation and solar panels from this location.

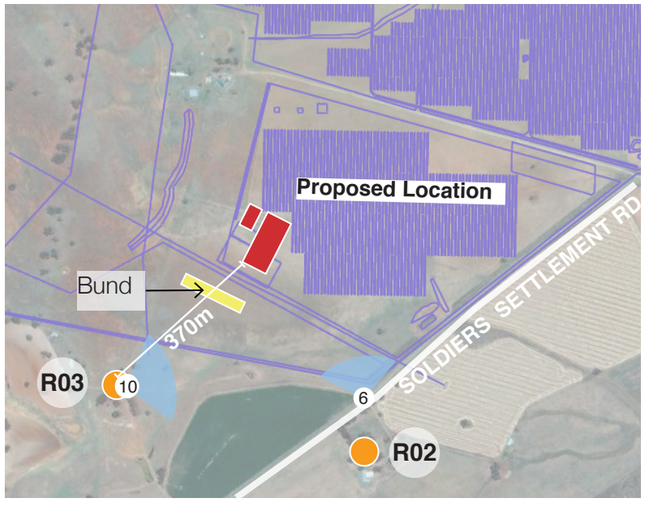

Figure 4: Context Plan (Source: Google Map, Project E)

3.0 Alternative Substation Locations

3.1 Overview of Comparative Assessment

To address the Department's query *'whether alternate locations within the project site for the substation are reasonable and feasible',* four (4) alternative substation locations have been proposed for consideration as part of this comparative assessment.

An overview of each option along with a comparison against the final substation layout can be found in the following pages.

3.2 Transmission Lines

Transmission lines feature heavily in the landscape and form part of the existing landscape character of the area. Additional transmission towers will be required as part of the four (4) alternative options. It is anticipated that these will be 132kV double circuit lines, around 35-40m in height.

Figure 6 and 7: Proposed 132kv double circuit transmission lines and image of a similar substation

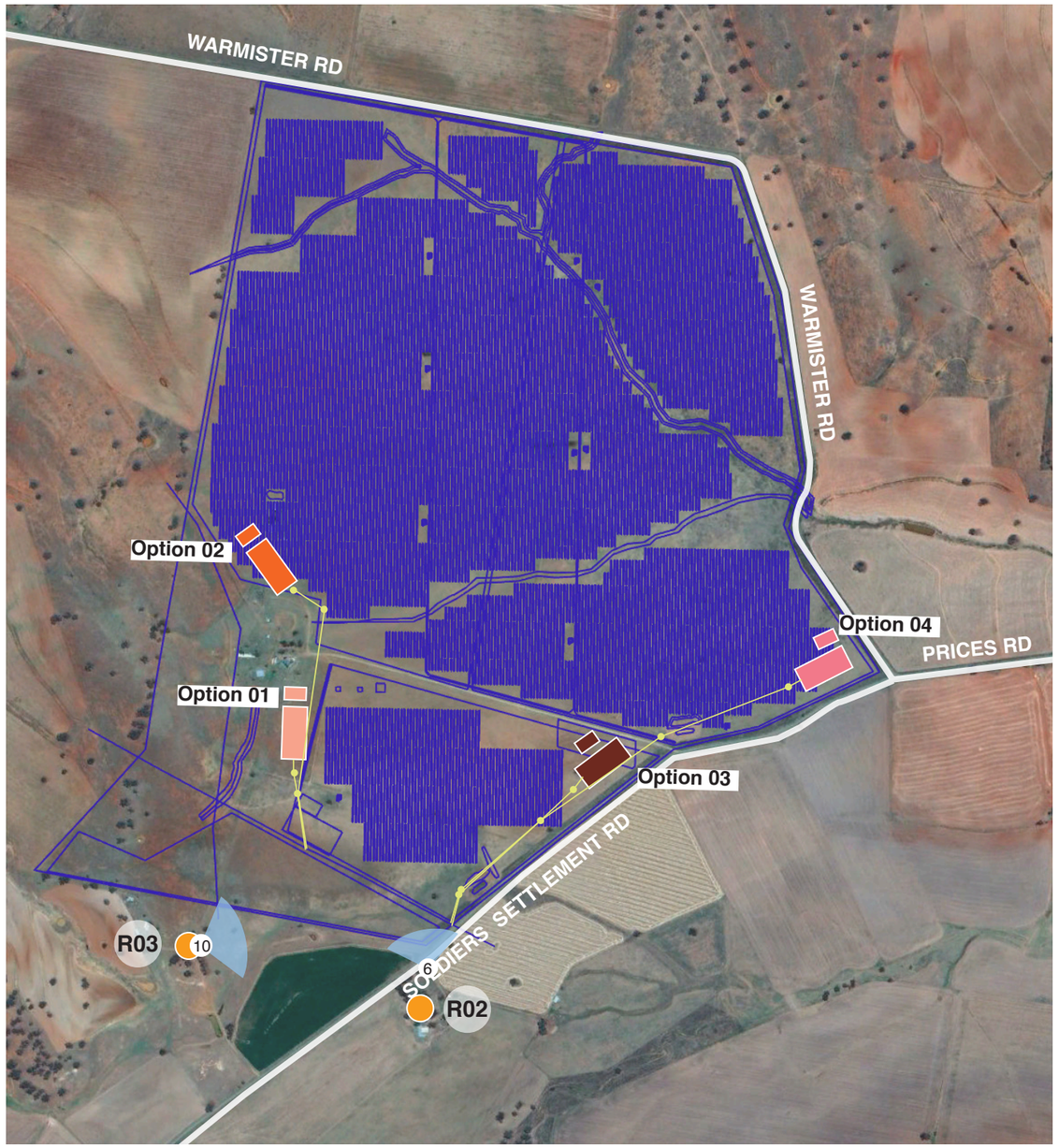

Figure 8: Proposed Substation Locations (Source: Google Map, Project E)

3.0 Alternative Substation Locations

3.3 Comparative Assessment

3.3.1 Option 01

Option 01 is located at approximately 372m above sea level, approximately 100m NE of the original proposal, 450m from R03 and 600m from R02. As it will be located at a distance to the existing power lines, it will require 2 (two) additional transmission towers and translines, at approximately 35-40m in height to connect into the existing line. The closest tower is located around 415m from R03.

Views toward this option are likely to be available from R03, particularly from the NE side of the residence. Vegetation along the residents boundary and in the mid ground of the view are likely to fragment the view toward the substation. The new transmission towers are likely to be visible from this residence.

As mentioned in the original LVIA, views out of R02 toward the project site are likely to be limited due to the vegetation within the lot boundary. However, from the driveway of R02 views are likely to be available in the background of the view.

The transmission towers, in particular the tower located closest to the receptors, are likely to be visible from the driveway of R02 and the NE side of R03. Due to the heights and location of the transmission towers in relation to the substation, it is unlikely these will be able to be planted with screen vegetation.

This option is likely to provide a higher level of visual impact for R03 when compared to the proposed final substation layout. As R02 is heavily vegetated it is unlikely to have visual impacts from the residence. However, from the driveway is it also likely to have a higher level of visual impact when compared to the proposed final substation layout.

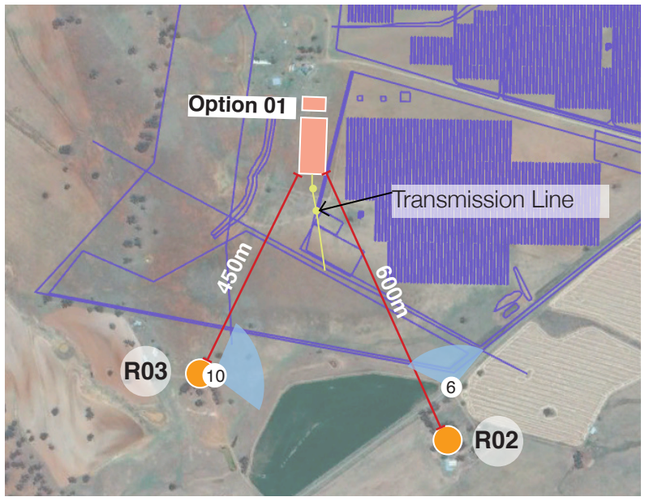

Figure 9: Option 01 (Source: Google Map, Project E)

3.3.2 Option 02

Option 02 is located at approximately 374m above sea level, approximately 470m NW of the original proposal, 800m from R03 and 1000m from R02. As it will be located at a distance to the existing power lines, it will require 3 (three) additional transmission towers, at approximately 35-40m in height to connect into the existing line. The closest tower will be located approximately 400m from the R03 and 450m from R02.

Views toward the substation portion of this option are likely to be unavailable from R03. Views towards the transmission towers are likely to be visible from the NE areas of the residence.

Views out of R02 toward the project site are likely to be limited due to the vegetation containing views out of the residence. However, from the driveway of R02 it is likely to have views toward the substation in the distance of the view. Due to the distance to the substation, views are likely to be difficult to discern from this location.

The transmission towers, in particular the tower located closest to the receptors, is likely to be visible R03 and the driveway of R02. Due to the heights of the transmission towers, it is unlikely these will be able to be screened by vegetation.

This option is likely to provide a higher level of visual impact on R03 when compared to the proposed final substation layout. As views out of R02 are contained it is unlikely to have any visual impacts from the residence. However, from the driveway is it also likely to have a higher level of visual impact when compared to the proposed final substation layout.

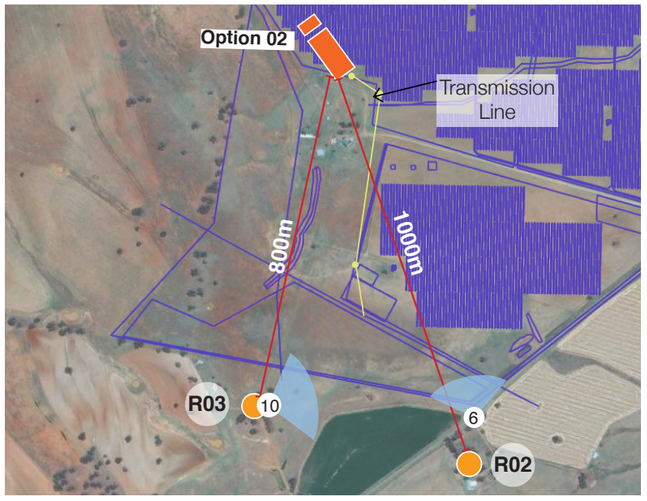

Figure 10: Option 02 (Source: Google Map, Project E)

3.0 Alternative Substation Locations

3.3.3 Option 03

Option 03 is located at approximately 358m above sea level, 550m NE of the original proposal, 950m from R03 and 615m from R02. As it will be located at a distance to the existing power lines, it will require 2 (two) additional transmission towers and translines, at approximately 35-40m in height to connect into the existing line. Within this option, the nearest transmission tower will be located approximately 170m from the driveway of R02 and 600m from R03.

Views toward the substation and transmission towers will be available in the far background of the view from R03, particularly from the eastern side of the residence. A combination of vegetation in the mid ground of the view and distance to the substation is likely to fragment a portion of the view toward the substation.

Fragmented views out of residence of R02 to the east are likely to be available with the option appearing in the mid ground of the view. The substation is also likely to be visible from the driveway of R02.

This option is located at close proximity to the Soldiers Settlement Road. Although there is an opportunity for some vegetation along the fence line, due to the heights of the transmission towers it is unlikely they will be sufficiently screened by vegetation. The combination of these factors are likely to result in a high degree of visual impact on the public domain.

Due to the break in vegetation on the eastern boundary of R02 and the close proximity and heights of the towers, this option is likely to have a higher degree of visual impact to the R02 residence and driveway when compared to the proposed final substation layout.

This option is also likely to have a higher level of visual impact on R03 and the public domain when compared to the proposed final substation layout.

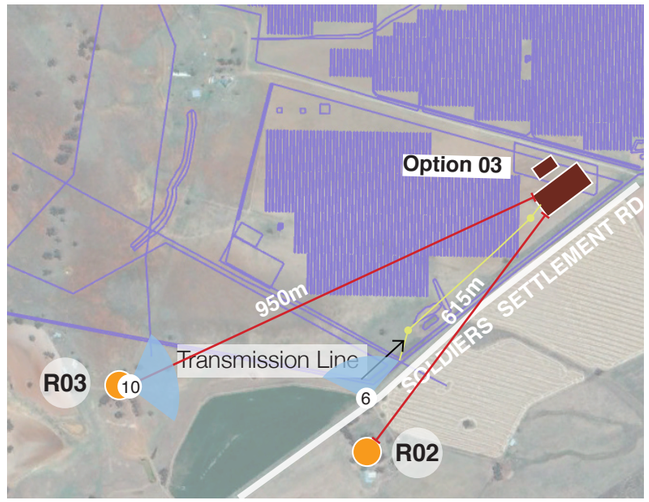

Figure 11: Option 03 (Source: Google Map, Project E)

3.3.4 Option 04

Option 04 is located at approximately 352m above sea level, approximately 1080m NE of the original proposal, 1500m from R03 and 1100m from R02. As it will be located at a distance to the existing power lines, it will require 4 (four) additional transmission towers, at approximately 35-40m in height to connect into the existing line. The closest tower will be located approximately 600m from the R03 and 250m from R02.

A view to the substation is likely to be available in the distance from R03, however due to the combination of distance and local vegetation it is not likely to dominate the view. Fragmented views towards the transmission towers are likely to be visible from the eastern areas of the residence.

Fragmented views out of residence of R02 to the east are likely to be available with the option appearing in the background of the view. The substation is also likely to be visible from the driveway of R02.

Due to the distance to the substation, views are not likely to dominate the view from this location. As the transmission towers will be located at a short distance from the viewpoint, it is likely that they will form a major feature in the context of the view from this location.

This option is located at close proximity to the Soldiers Settlement Road. Although there is an opportunity for some vegetation along the fence line, due to the heights of the transmission towers it is unlikely they will be sufficiently screened by vegetation. The combination of these factors are likely to result in a high degree of visual impact on the public domain.

Due to the break in vegetation on the eastern boundary of R02 and the close proximity and heights of the towers, this option is likely to have a higher degree of visual impact to the R02 residence and driveway when compared to the proposed final substation layout.

This option is also likely to have a higher level of visual impact on R03 and the public domain when compared to the proposed final substation layout due to the additional transmission towers required.

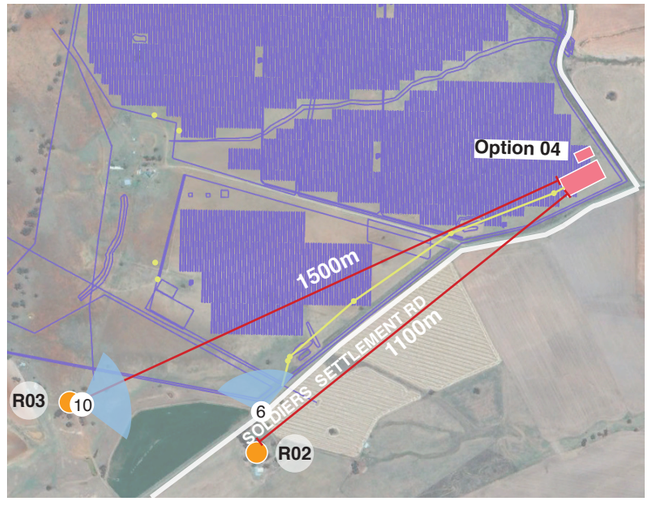

Figure 12: Option 04 (Source: Google Map, Project E)

3.0 Alternative Substation Locations

3.3 Comparative Assessment

A comparison between the four (4) alternative locations supplied by Project E and the proposed final substation layout, provides an indication of the varying degrees of visual impact to the nearby residence, in particular to R03, R02 the driveway of R02 and the public domain.

Option 01 requires additional transmission towers, which are likely to have a higher degree of visual contrast. This Option is likely to have a higher level of visual impact on R03 and the driveway of R02 when compared to the proposed final substation layout.

The substation portion of Option 02 is to not likely to be visible from R03 and is unlikely to be noticeable from the driveway of R02. The substation and transmission towers are unlikely to be visible from the residence of R02. However, the additional transmission towers are not likely to be sufficiently screened resulting in a higher degree of visual impact for R03, the driveway of R02 and the public domain. Therefore, Option 02 is likely to have a higher level of visual impact on R03 and the driveway of R02 when compared to the proposed final substation layout.

Due to the break in vegetation on the eastern boundary of R02, Option 3 and 4 are likely to have a higher level visual impact on the residence of R02 than the proposed final substation layout. Although views toward the substations of these options are in the distance and partially fragmented from R03, the transmission towers are likely to result in a higher visual impact when compared to the proposed final substation layout. These options may also have a higher degree of visual impact to the public domain when compared to the proposed final substation layout.

4.0 Conclusions

4.0 Conclusions

The final substation layout and the implementation of mitigation measures included as part of the final substation layout minimise the visual impact of the proposal to R02 and R03. It is our opinion that these measures better integrate the development into the surrounding landscape and reduce the visual impact to these receptors.

The alternative options present varying levels of visibility toward the substations for the receptors R02, the driveway of R02, R03 and the public domain. Each option is likely to have higher levels of visual impact from R03, R02, the driveway of R02, and the public domain when compared with the proposed final substation layout due to the additional transmission towers of the size and scale required for the project and the limitations of vegetation to sufficiently mitigate the visual impacts.

Although transmission lines already feature in the character of the area, the additional larger transmission towers required for all of the options are likely to increase the dominance of these structures in the landscape resulting in higher degree of visual impact.

It is our opinion that the proposed final substation layout and mitigation measures sufficiently address the potential visual impacts and display better visual outcomes for the concerned receptors and public domain than any of the alternative options.