

**Table 4-53: Noise Sensitive Receivers Exceeding State Planning Policy 5.4 Noise Limits**

Location	Complies with Daytime Noise Limit (60 L <sub>Aeq</sub> dB)	Predicted Daytime Noise Level (L <sub>Aeq</sub> dB)	Complies with Night-time Noise Limit (55 L <sub>Aeq</sub> dB)	Predicted Night-time Noise Level (L <sub>Aeq</sub> dB)
Lot 1 (no. 428) Gingilling Road, Mooliabeenee	✗	61	✓	55

#### 4.6.5.2 Visual Amenity, Dust and Light Spill

##### Visual Amenity

To determine the potential impacts of the Bindoon Bypass to visual amenity, a Viewshed analysis using ArcGIS was undertaken as outlined in *Visual landscape planning in WA; a manual for evaluation, assessment, siting and design* (WAPC & Department for Planning and Infrastructure 2007). From this, 24 viewpoints were selected to be assessed for visual amenity impacts. These viewpoints were selected for assessment based on their sensitivity and proximity to the Disturbance Footprint, with the majority of these viewpoints representing occupied houses (local residents). The Viewshed output and selected viewpoints are shown on **Figure 4-33**.

Each viewpoint has been assessed in terms of the existing character, level of sensitivity and extent to which the Bindoon Bypass will change the views (magnitude of change) (**Table 4-54**). Impacts range from Negligible to High, and in most instances where impacts have been assessed as High-Moderate or High, photomontages have been developed to better understand what the impact may look like. Detailed information in relation to the visual impact assessment is contained in **Appendix J**.

**Table 4-54: Potential Visual Impacts by Viewpoint**

Viewpoint (VP)	Sensitivity	Magnitude	Impact
VP 1 Chittering Roadhouse	Low	Moderate	Low-moderate
VP 2 Great Northern Highway Stockyard	Moderate	High	High-moderate
VP 3 Kings Property	Low	Negligible	Negligible
VP 4 Windermere Way	High	Moderate	High-moderate
VP 5 Teatree North Access Road	Moderate	Negligible	Negligible
VP 6 Gray Road	Moderate	Low	Low-moderate
VP 7 Crest Hill Road	High	High	High
VP 8 Mooliabeenee Road (east)	Moderate	Low	Low-moderate
VP 9 Mooliabeenee Road (west)	Moderate	Moderate	Moderate
VP 10 Cullala Road (1)	Moderate	Negligible	Negligible
VP 11 Cullala Road (2)	Moderate	Negligible	Negligible
VP 12 Gingilling Road (1)	Moderate	High	High-moderate
VP 13 Gingilling Road (2)	Moderate	Negligible	Negligible
VP 14 Gingilling Road (3)	Moderate	High	High-moderate
VP 15 Gingilling Road (4)	Moderate	Negligible	Negligible
VP 16 Bindoon-Moora Road (1)	High	Moderate	High-moderate
VP 17 Bindoon-Moora Road (2)	High	High	High
VP 18 Kangaroo Gully Road (1)	High	High	High

Viewpoint (VP)	Sensitivity	Magnitude	Impact
VP 19 Kangaroo Gully Road (2)	Moderate	Negligible	Negligible
VP 20 Head Road (south)	High	High	High
VP 21 Hay Flat Road (1)	High	Moderate	High-moderate
VP 22 Great Northern Highway (west 1)	High	High	High
VP 23 Hay Flat Road (2)	High	Moderate	High-moderate
VP 24 Great Northern Highway (west 2)	Moderate	Negligible	Negligible

#### *Viewpoint 2 Great Northern Highway Stockyard*

Viewpoint 2 looks toward stockyards and agricultural buildings west of the existing GNH. To the east of the viewpoint is the existing GNH corridor, with views to the west and north filtered by stands of intermittent trees. There is also an unclassified residential premises at Viewpoint 2, which is considered to have moderate sensitivity given its proximity to the existing GNH corridor. The magnitude of the change is considered high, as that the Bindoon Bypass will sever the existing field pattern, require removal of a large stand of trees, and the aesthetic qualities of the landscape would be altered. This results in an impact at Viewpoint 2 of High-Moderate. However, the construction of the Bindoon Bypass is likely to require the removal of the buildings at this viewpoint.

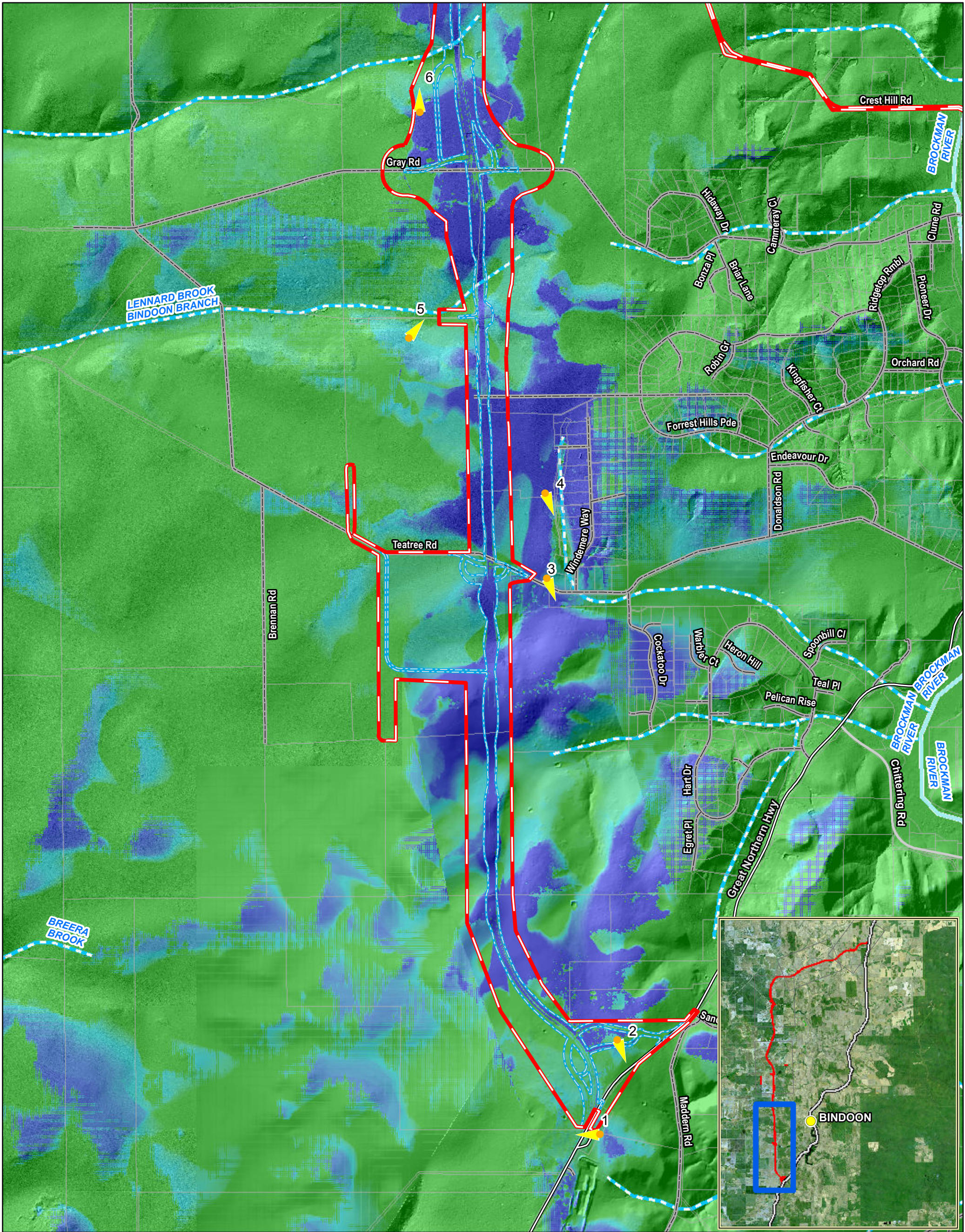
#### *Viewpoint 4 Windermere Way*

Viewpoint 4 is the view west from Windermere Way. This viewpoint has established elevated properties to the east and more recent property development on lower slopes to the west. The properties at this viewpoint generally experience elevated views of agriculture land filtered by mature vegetation. To the west there is a band of vegetation that marks the boundary of recent development, and this filters views to adjoining agricultural land. Due to the elevation of the properties at this viewpoint, and the scenic and remote nature of the view, the sensitivity is considered high. It is also considered that the composition of the view and sense of rural amenity will cause change of a moderate magnitude. Therefore, the overall impact is High-Moderate. Given the nature of the potential impact, photomontages were developed for Viewpoint 4, which indicate that the view of the Bindoon Bypass is obscured by nearby vegetation, and therefore the impact would be lower than the impact assessment framework indicates.

#### *Viewpoint 7 Crest Hill Road*

Viewpoint 7 is on the edge of mature bushland south of Mooliabeenee Road. The west facing views towards cleared agricultural fields are filtered by mature vegetation with a range of texture, form and colour. The sensitivity of this viewpoint is considered high due to the remote, scenic nature of the view. The magnitude of the change is also considered high due to the rural agricultural context, and new filtered view towards the Bindoon Bypass on the embankment approaching Mooliabeenee grade-separated interchange. Due to the high sensitivity and magnitude of the change, the overall impact is considered to be potentially High. However, given the nature of vegetation close to the viewpoint and the fact that this vegetation is proposed to remain undisturbed by the Bindoon Bypass, the actual visual impact would be lower than the impact assessment framework indicates.





Legend

- Development Envelope

Development Footprint

Highway

Major Road

Minor Road
- Cadastral Boundary

View Points

Major Watercourse

Minor Watercourse
- High : Visibility

Low : Visibility

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Viewshed Analysis and  
Selected Viewpoints

Figure: 4-33 Page 1 of 5

Drawing No  
GNH-CN12-EA-PER-00001  
- F4-33

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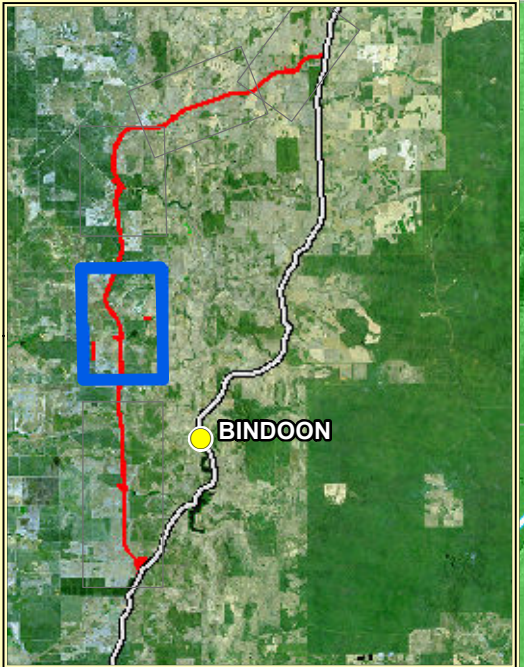
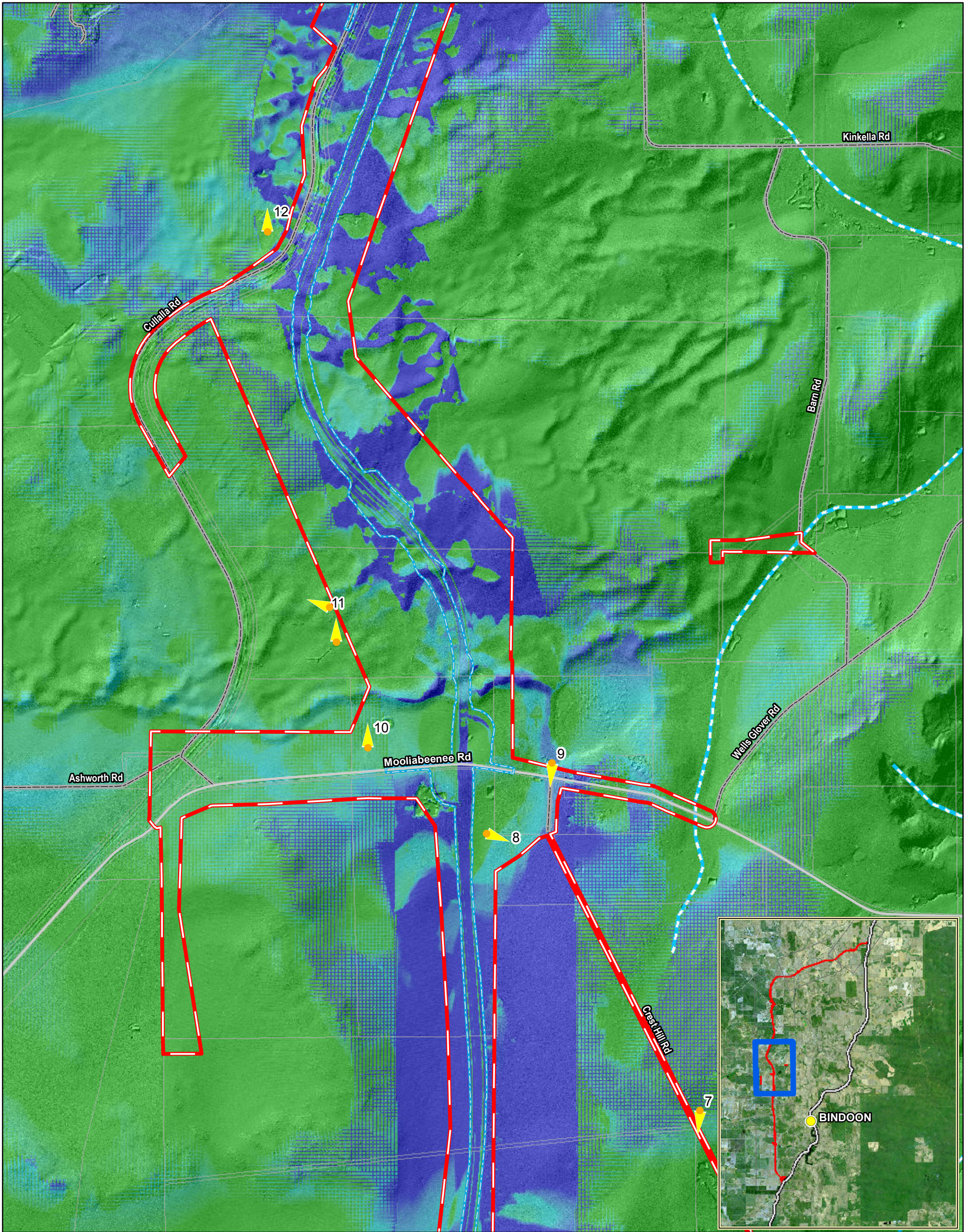
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LB

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TJ

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**Legend**

- Development Envelope
- Development Footprint
- Major Road
- Minor Road
- Cadastral Boundary
- View Points
- Minor Watercourse
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- Low : Visibility

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**Viewshed Analysis and  
Selected Viewpoints**

**Figure: 4-33 Page 2 of 5**

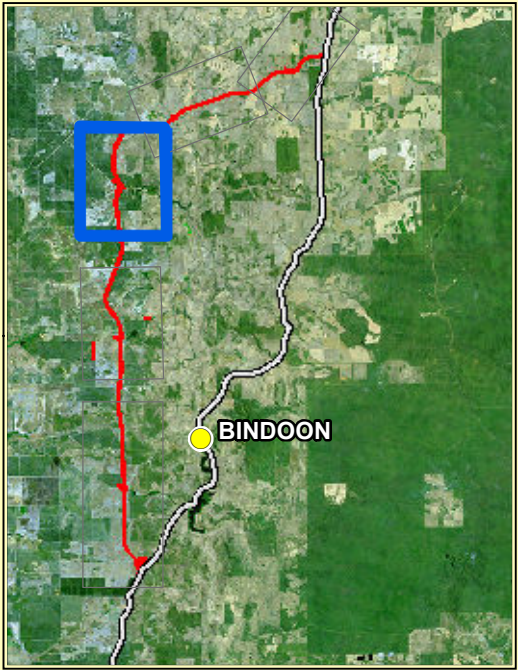
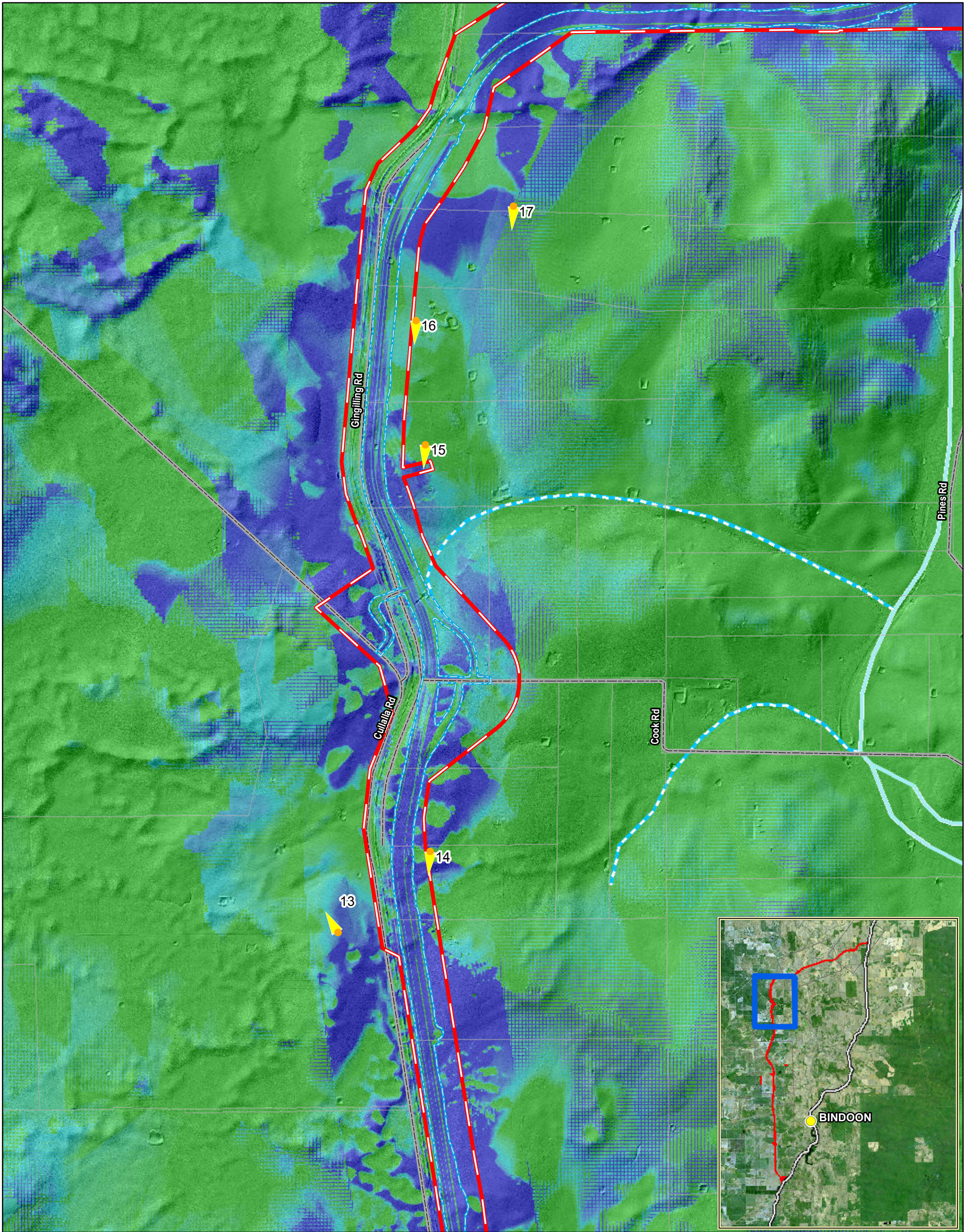
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Legend

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- Development Footprint
- Minor Road
- Cadastral Boundary
- View Points
- Major Watercourse
- Minor Watercourse
- High : Visibility
- Low : Visibility

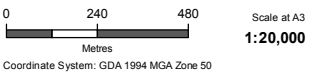


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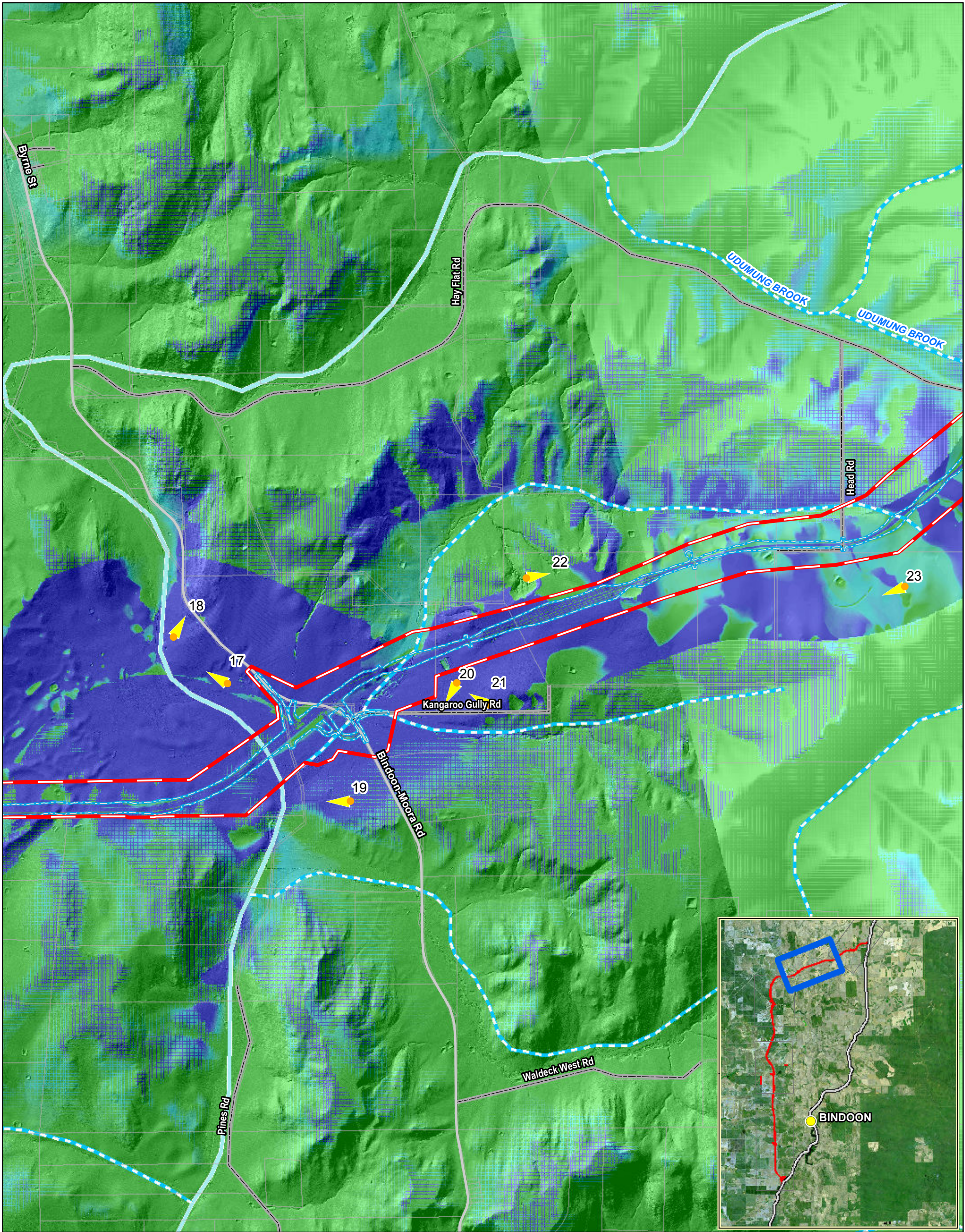
Viewshed Analysis and  
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Figure: 4-33

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Legend

- Development Envelope

Development Footprint

Major Road

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View Points

Major Watercourse

Minor Watercourse
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Low : Visibility



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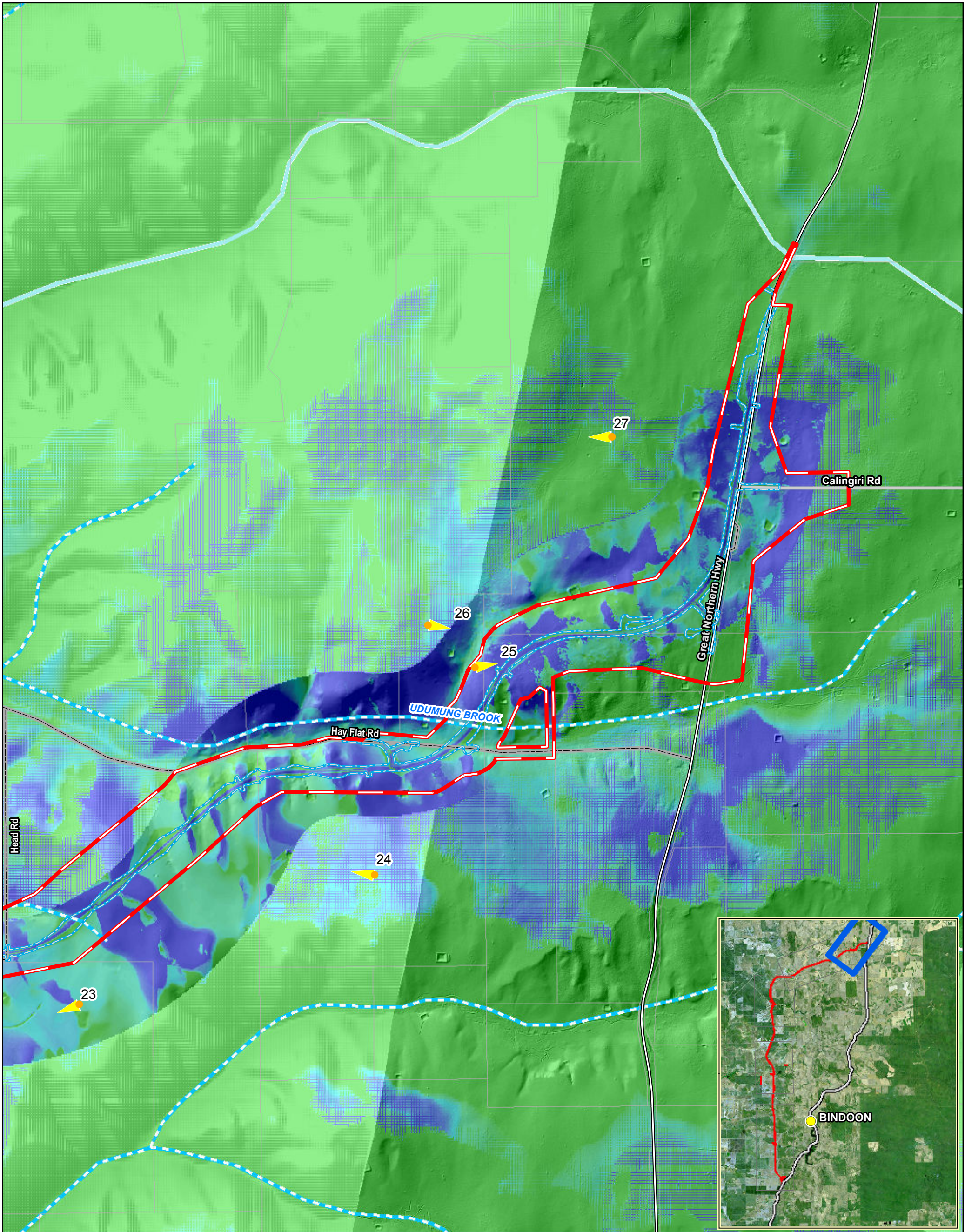
Viewshed Analysis and  
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Figure: 4-33

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Legend

- Development Envelope

Development Footprint

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Major Road

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View Points

Major Watercourse

Minor Watercourse
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Figure: 4-33

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#### *Viewpoint 12 Gingilling Road (1)*

Viewpoint 12 is located within mature bushland to the west of Crest Hill Road. The residential property at the viewpoint is surrounded by mature to semi-mature vegetation, planted during commercial nursery operations with limited continued operation. This vegetation offers enclosed views from the viewpoint with a variety of texture and colour. The sensitivity of this viewpoint is moderate due to the remote nature of the view and sense of enclosure and tranquillity offered by the boundary vegetation. The magnitude of the change arising from the Bindoon Bypass is considered high due to the extent of the vegetation clearance near the viewpoint. Therefore, the impact of the Bindoon Bypass at Viewpoint 12 is High-Moderate. Although vegetation will be removed near this viewpoint, the established nature of vegetation around the viewpoint will limit the impacts at the viewpoint.

Furthermore, the Bindoon Bypass near this viewpoint will be at ground level or in cut, and therefore the elevation of the alignment will not be above vegetation at the property.

#### *Viewpoint 14 Gingilling Road (3)*

Viewpoint 14 is characterised by an access gate to private property, Gingilling Road and the rail corridor. The rail corridor is enclosed by mature vegetation which restricts views of the trains. The area is predominantly pasture land with scattered tree canopy. The sensitivity of this viewpoint is moderate due to its rural nature, but also its proximity to the road and rail corridors. The magnitude of impact arising from the project is considered high as the alignment will be clearly visible from this viewpoint. The topography is reasonably flat with little vegetation to filter views, and therefore the impact has potential to be High-Moderate.

#### *Viewpoint 16 Bindoon-Moora Road (1)*

Viewpoint 16 has a view of rolling topography with mature vegetation. Hills in the foreground are used for agricultural purposes, are cleared with intermittent stands of vegetation, and Bindoon-Moora Road is located to the east. The sensitivity of this viewpoint is high due to the current scenic nature of the viewpoint and sense of remoteness. The magnitude of the change is also considered to be moderate, as there will be intermittent views of the Bindoon Bypass and change in the continuity of the broad rural landscape patterns. The impact is therefore High-Moderate, and photomontages show that the Bindoon Bypass will be visible from this viewpoint.

#### *Viewpoint 17 Bindoon-Moora Road (2)*

Viewpoint 17 looks towards the mature trees that line Bindoon-Moora Road. The terrain rises to the north and agricultural fields are visible with mature vegetation along the boundaries. The view from this viewpoint is panoramic with cleared pasture dominating the landscape. The sensitivity of this receptor is considered high due to the rural nature of the surrounding area, and the current sense of remoteness at the viewpoint. The magnitude of the change is considered to be high as the intersection of the Bindoon Bypass with Bindoon-Moora Road would be visible from this viewpoint. Trees visible from this viewpoint are also proposed to be removed and their absence will further alter the landscape as viewed from this viewpoint. The impact is potentially High, and photomontages show that the Bindoon Bypass will be visible from this viewpoint.

#### *Viewpoint 18 Kangaroo Gully Road (1)*

Viewpoint 18 is located on flat agricultural land with the topography rising in the north, south and west. In the foreground of Viewpoint 18 are intermittent large mature trees, with the majority of the surrounding area being pastoral land. The sensitivity of the viewpoint is high due to the sense of remoteness and rural character of the area. The magnitude of the impact is expected to be high as the Bindoon Bypass will traverse east-west in close proximity to the property. The overall impact is considered to be High, and photomontages show that the Bindoon Bypass will be visible from the viewpoint.

#### *Viewpoint 20 Head Road (south)*

Viewpoint 20 is enclosed by a stand of vegetation to the northern boundary and hedge to the west. The viewpoint has oblique extended views to the north and northwest towards rolling terrain with mature vegetation lining Head Road. The sensitivity of this view point is considered to be high due to the scenic, rural and remote



nature of the view. The magnitude of the change is also likely to be high, due to the changes that would be experienced in the long vistas of natural forms that can be seen from the viewpoint. Overall the impact is High, and the photomontages show that the Bindoon Bypass will be visible from the viewpoint.

#### *Viewpoint 21 Hay Flat Road (1)*

Viewpoint 21 is located to the south of Hay Flat Road and to the west of Udumung Nature Reserve, which can be seen as consistent green forest from the viewpoint. The topography is rolling and there are intermittent mature trees throughout the view. The sensitivity of the area is high due to the panoramic, scenic, rural and remote nature of the view. The magnitude of the change is moderate due to the Bindoon Bypass traversing lower slopes limiting views from Viewpoint 17. The impact is expected to be High-Moderate; however, the topography of the site would indicate that the impact will be lower than this.

#### *Viewpoint 22 Great Northern Highway (west 1)*

Viewpoint 22 is located on rolling terrain with intermittent mature trees; in particular, one mature tree which is in the foreground at this viewpoint and forms a feature of this view. The sensitivity of the viewpoint is high due to the panoramic, scenic, rural and remote nature of the view. The magnitude of the change is also expected to be high due to the close proximity of the Bindoon Bypass to the viewpoint. The impact is therefore High, with photomontages illustrating how close the Bindoon Bypass will be to the viewpoint

#### *Viewpoint 23 Hay Flat Road (2)*

Viewpoint 23 is located on the east facing slopes of undulating topography. The site looks towards a slight valley whereby there is increased vegetation associated with a small creek. The sensitivity of the area is considered to be high due to the panoramic, scenic, rural and remote nature of the view. The magnitude of the change is considered to be moderate due to some vegetation being required to be removed and the Bindoon Bypass being visible from the viewpoint. The impact is High-Moderate; however, photomontages show that vegetation close to the viewpoint screens the majority of the road, and therefore the impact may be less than the impact assessment framework indicates.

### **Light Spill and Headlight Glare**

Potential visual impacts may also come from lighting associated with the construction and operation of the road.

During construction, activities are planned to be conducted during daylight hours; therefore, no light spill impacts are expected during construction. There may be exceptions to this where Main Roads may provide approval for night works. Any instances of night works would be over a short duration, and any light impacts would be temporary in nature.

The lighting design for the Proposal has the potential to impact on local residences through light spill into occupied houses. Lighting will be installed at intersections, with the type of lighting based on the expected traffic volumes in accordance with the requirements of AS/NZS 1158:2005 (lighting for roads and public spaces), as follows:

- V3 Category lighting:
  - ▶ Southern Interchange
  - ▶ Mooliabeenee Interchange
  - ▶ Bindoon – Moora Road Interchange.
- Flag lighting:
  - ▶ Calingiri Road
  - ▶ Gray Road
  - ▶ Teatree Road



- ▶ Barn Road
- ▶ Cook Road
- ▶ Hay Flat Road.

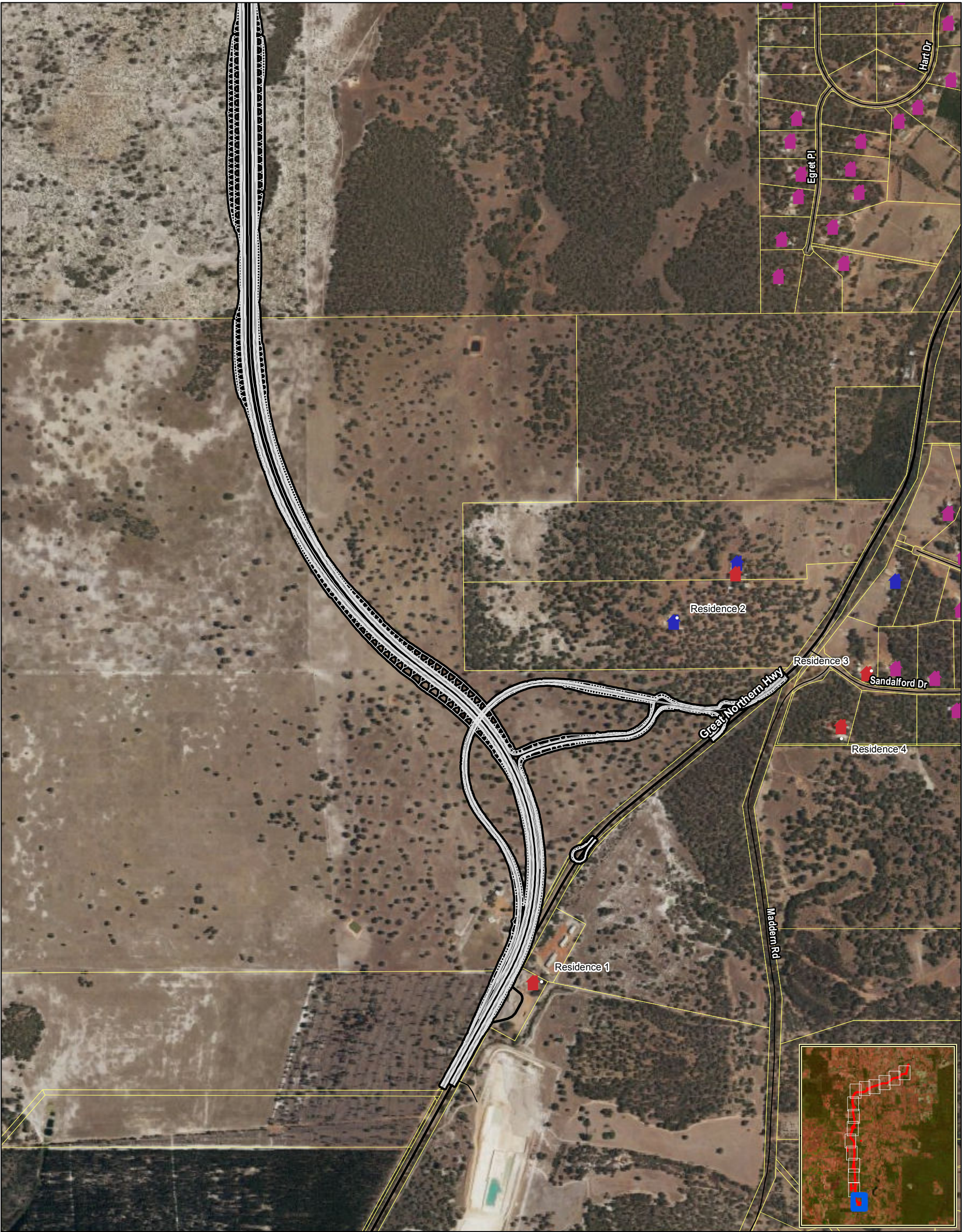
An assessment of the proposed lighting was undertaken against the AS/NZS 4282 Control of the Obtrusive Effects of Outdoor Lighting (Arup 2018b). The standard recommends that the illuminance on windows of habitable dwelling is no more than one lumen when in dark surrounds. The assessment found that no residences would be impacted by light level higher than one lumen as a result of the Proposal (**Appendix K**).

Headlights from road traffic have the potential to impact occupied houses through glare cast into windows. To determine the potential level of impact, residences in close proximity to the Development Footprint were identified, and their occupation status determined. Impacts to occupied premises, or premises with unverified occupation status, have been determined based on their distance from the Development Footprint. A similar approach has been taken for unliveable residences; however, in these instances the occupation status has also been taken into consideration. Impacts based on distances have been applied as follows:









- possible high impact: residences located 200 m from the vehicle in the direction of the high beam emitted light
- moderate impact: residences located between 200 m and 300 m from the vehicle in the direction of the high beam emitted light;
- low impact: residences located between 300 m and 400 m from the vehicle in the direction of the high beam emitted light;
- negligible impact: residences located greater than 400 m from the vehicle in the direction of the high beam emitted light.

The residences considered for impacts from light spill and headlight glare are shown on **Figure 4-34**. **Table 4-55** analyses the potential impacts from headlight glare at each of the residences. Impacts to all residences (whether they are of unverified, unliveable or occupied status) had negligible or low light spill impact.





Legend

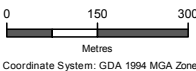
-  Occupied House
-  Unverified House
-  Unverified Structure
-  Design - CN12
-  Freeway / Highway
-  Major Road
-  Minor Road
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Bindoon Bypass  
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Figure: 1 of 15

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


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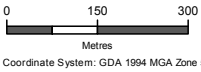
-  Occupied House
-  Verified Shed - Workshop
-  Unverified Structure
-  Design - CN12
-  Freeway / Highway
-  Major Road
-  Minor Road
-  Cadastral Boundary



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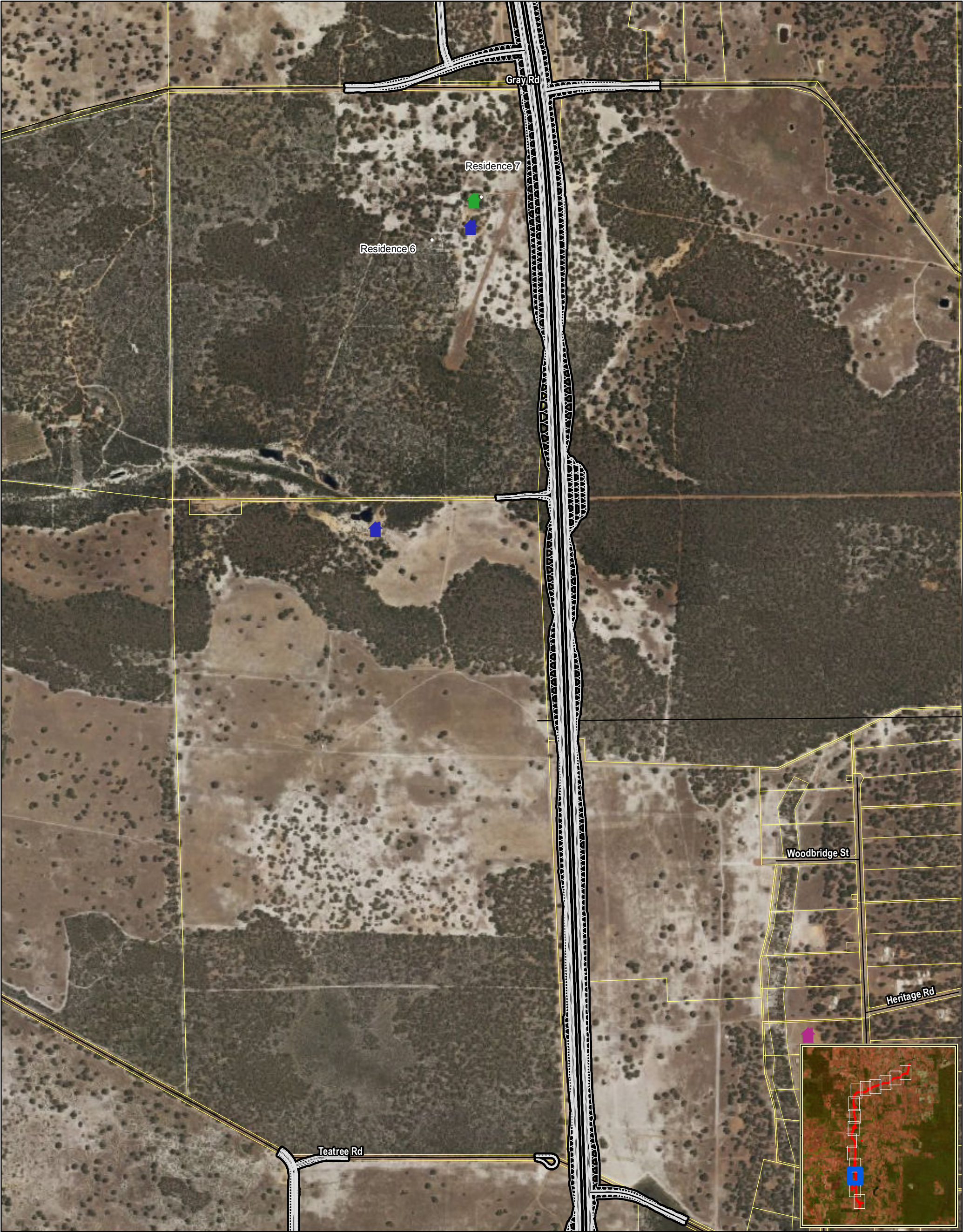
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

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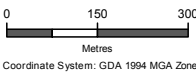
-  Occupied House
-  Unliveable House
-  Unverified Structure
-  Design - CN12
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Great Northern Highway  
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


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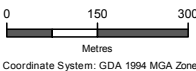
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-  Unliveable House
-  Unverified Structure
-  Design - CN12
-  Freeway / Highway
-  Major Road
-  Minor Road
-  Cadastral Boundary



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Bindoon Bypass  
Buildings and Structures  
Figure: 4 of 15

Drawing No  
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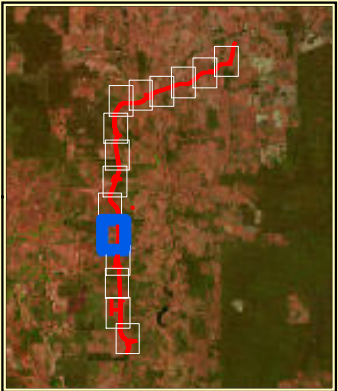
Issue  
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Task No  
GNH-CN12








Drawing Status / Other  
Draft / Other Info

Date	By	Chkd	Appd
2/07/2018	BG	XX	XX





Legend

-  Occupied House
-  Unverified House
-  Design - CN12
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0 150 300  
Metres

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


Bindoon Bypass  
Buildings and Structures  
Figure: 5 of 15

Drawing No GNH-CN12-RW01-GIS-0039		Issue A	
Task No GNH-CN12		Drawing Status / Other Draft / Other Info	
Date 2/07/2018	By BG	Chkd XX	Appd XX





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-  Occupied House
-  Unverified House
-  Design - CN12
-  Freeway / Highway
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Bindoon Bypass  
Buildings and Structures  
Figure: 6 of 15

Drawing No  
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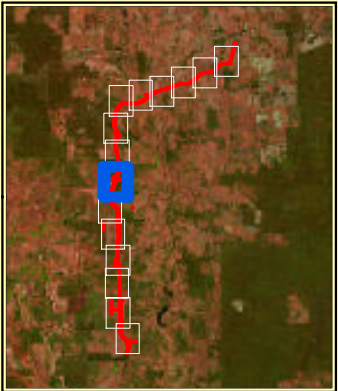
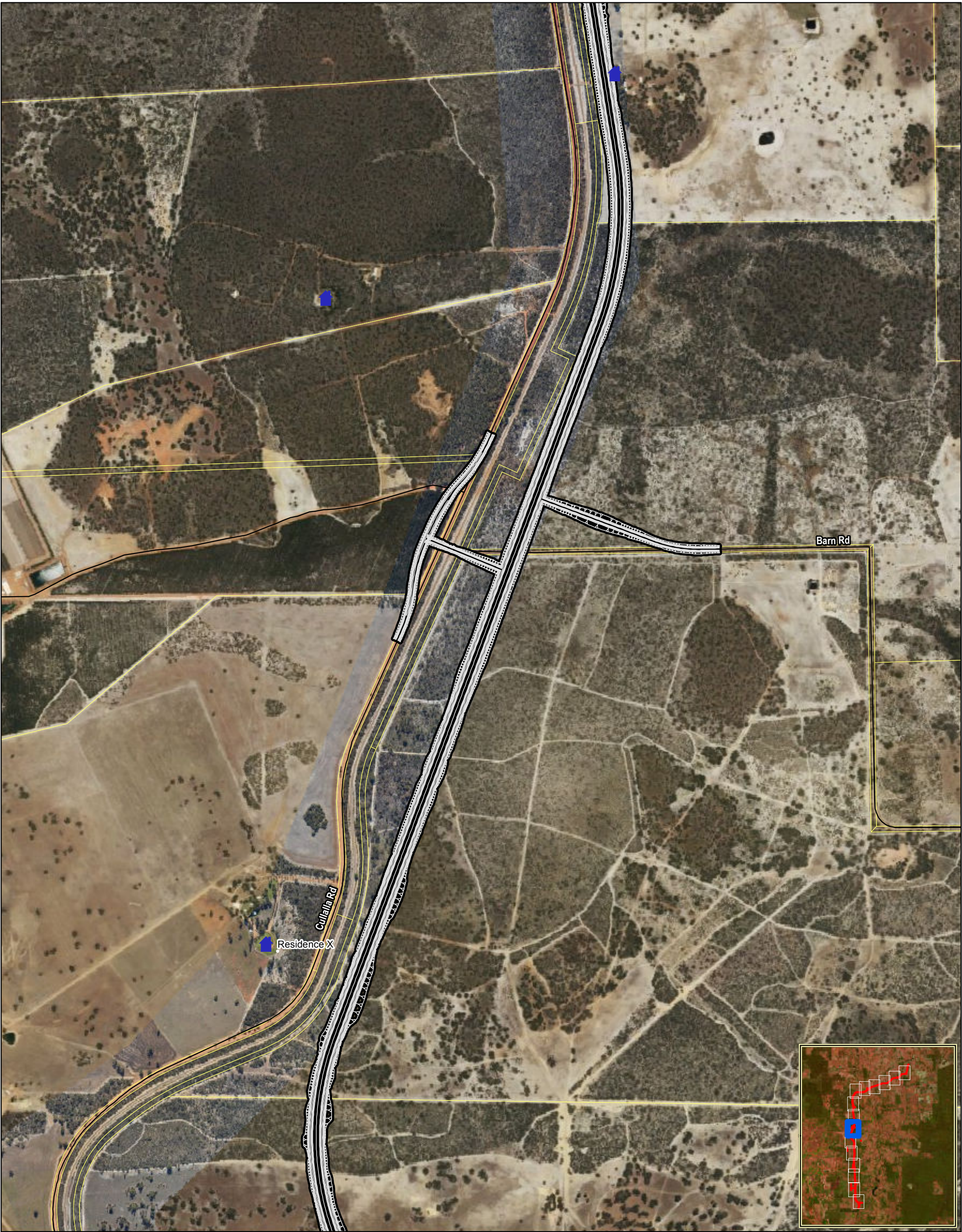
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Task No  
GNH-CN12







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Draft / Other Info

Date 2/07/2018	By BG	Chkd XX	Appd XX
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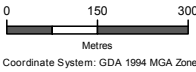
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Figure: 7 of 15

Drawing No  
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Issue  
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Task No  
GNH-CN12

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


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Legend

-  Occupied House
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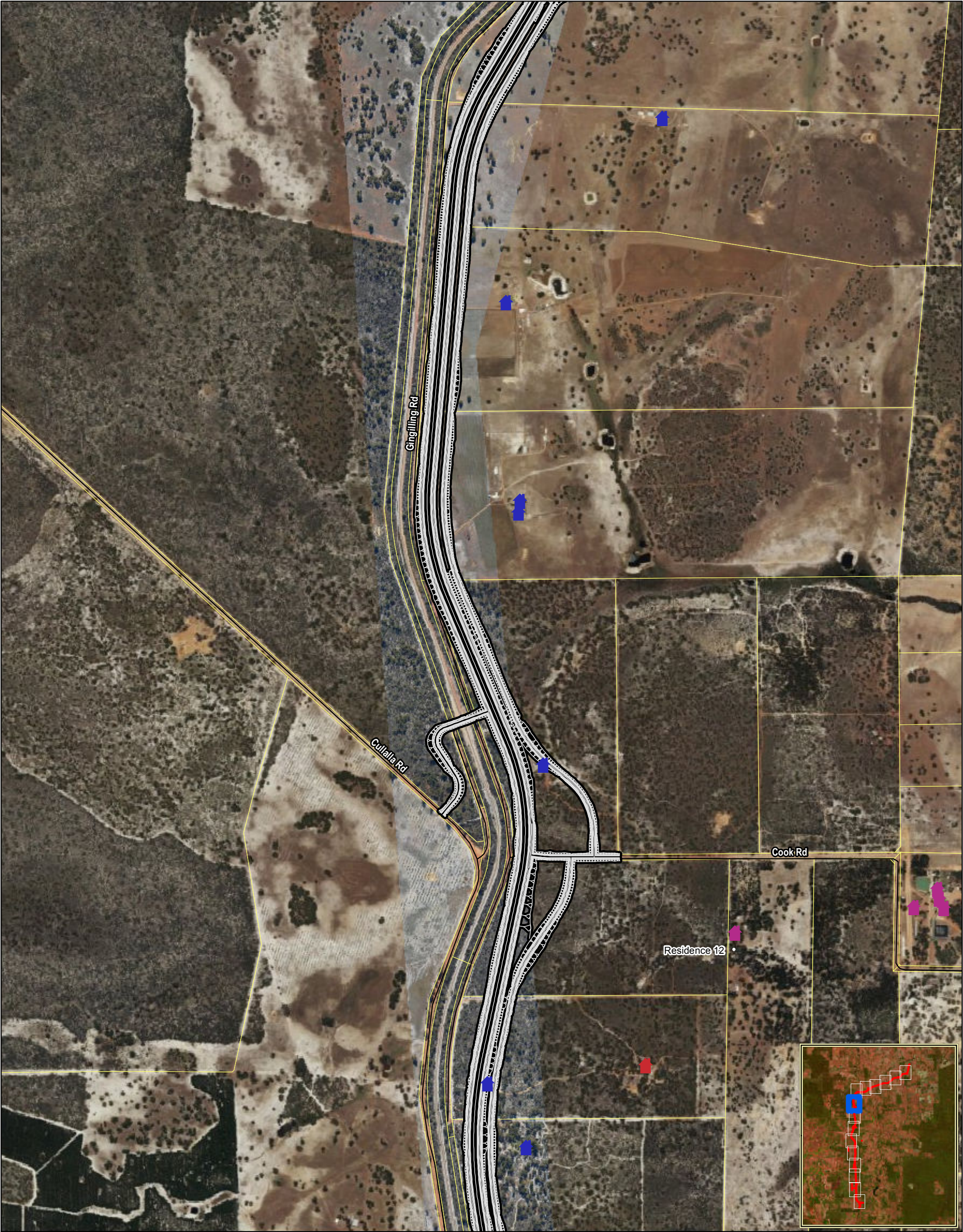
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

Bindoon Bypass  
Buildings and Structures  
Figure: 8 of 15

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Task No GNH-CN12		Drawing Status / Other Draft / Other Info	
Date 2/07/2018	By BG	Chkd XX	Appd XX





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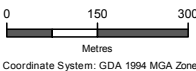
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Buildings and Structures  
Figure: 9 of 15

Drawing No  
GNH-CN12-RW01-GIS-0039

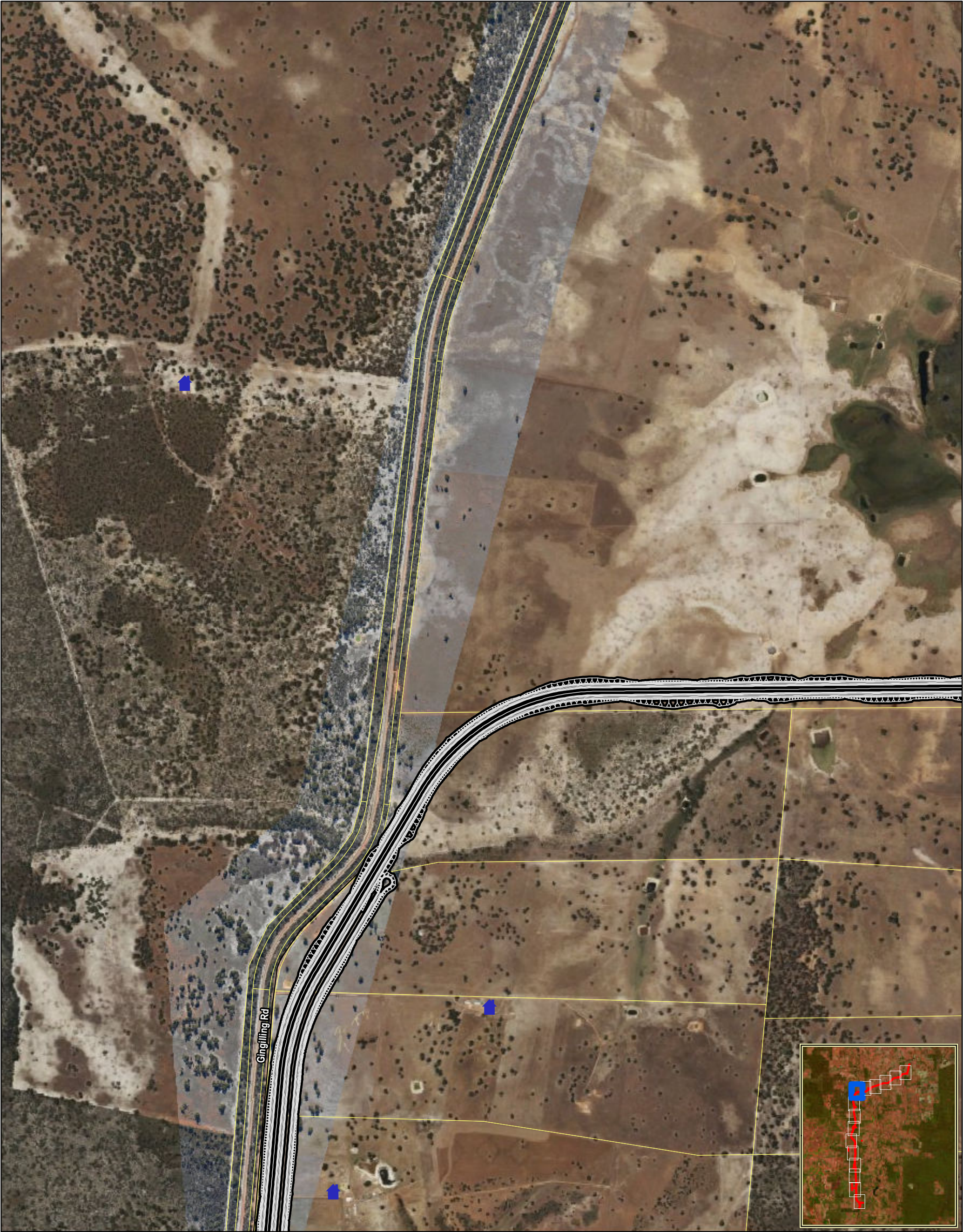
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Task No  
GNH-CN12







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Draft / Other Info

Date	By	Chkd	Appd
2/07/2018	BG	XX	XX





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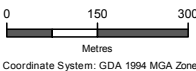
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Figure: 10 of 15

Drawing No  
GNH-CN12-RW01-GIS-0039

Issue  
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Task No  
GNH-CN12

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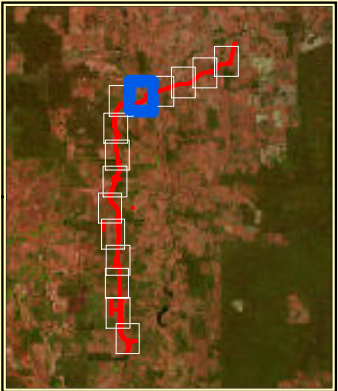
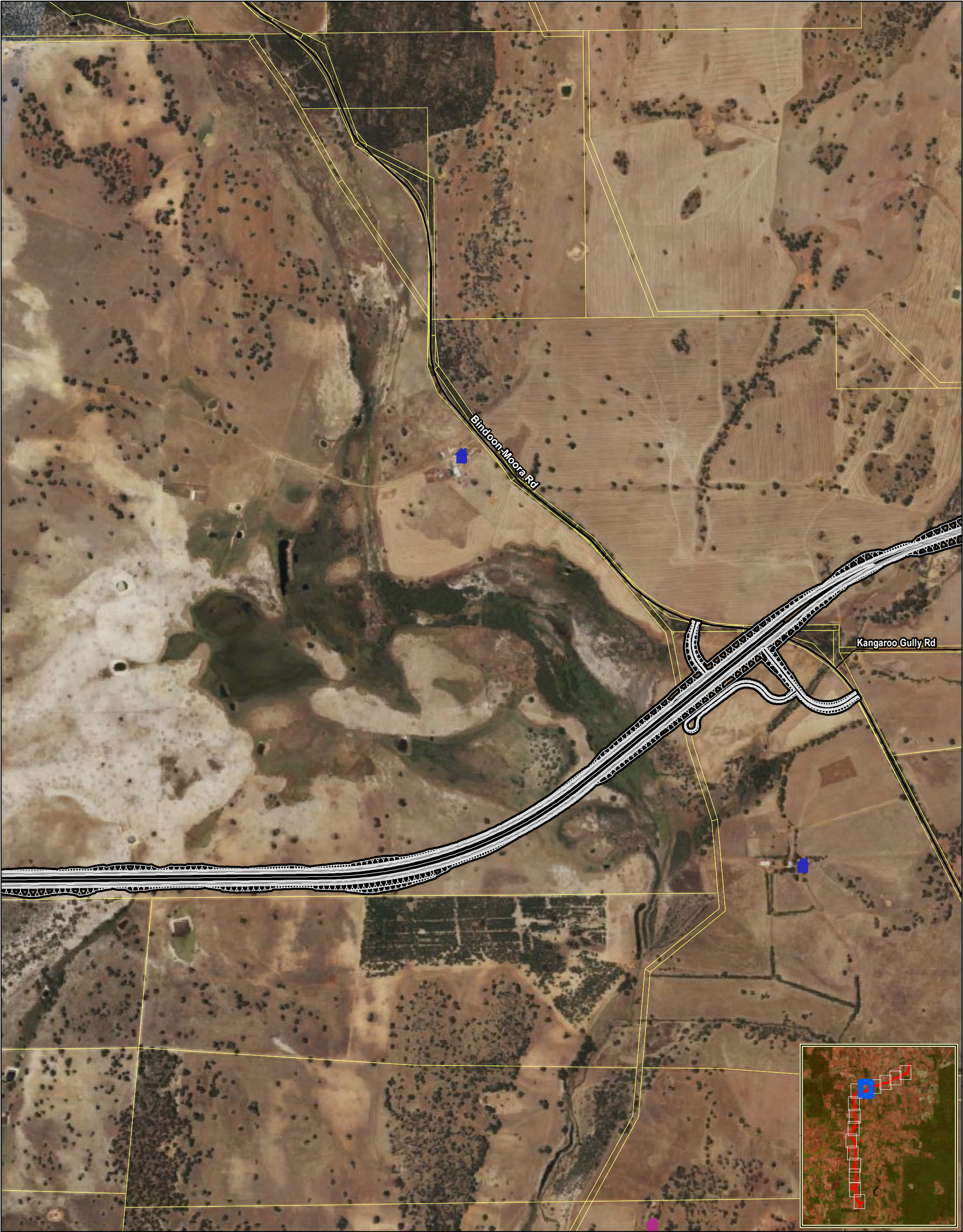
Date  
2/07/2018

By  
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

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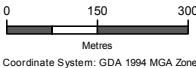
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Figure: 11 of 15

Drawing No  
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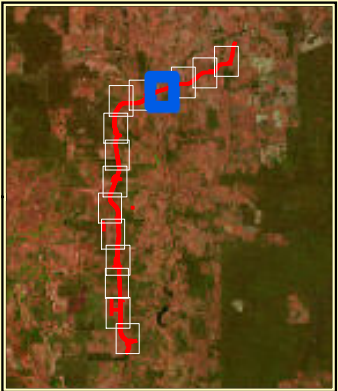
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Task No  
GNH-CN12








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Draft / Other Info

Date	By	Chkd	Appd
2/07/2018	BG	XX	XX





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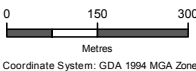
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Figure: 12 of 15

Drawing No  
GNH-CN12-RW01-GIS-0039

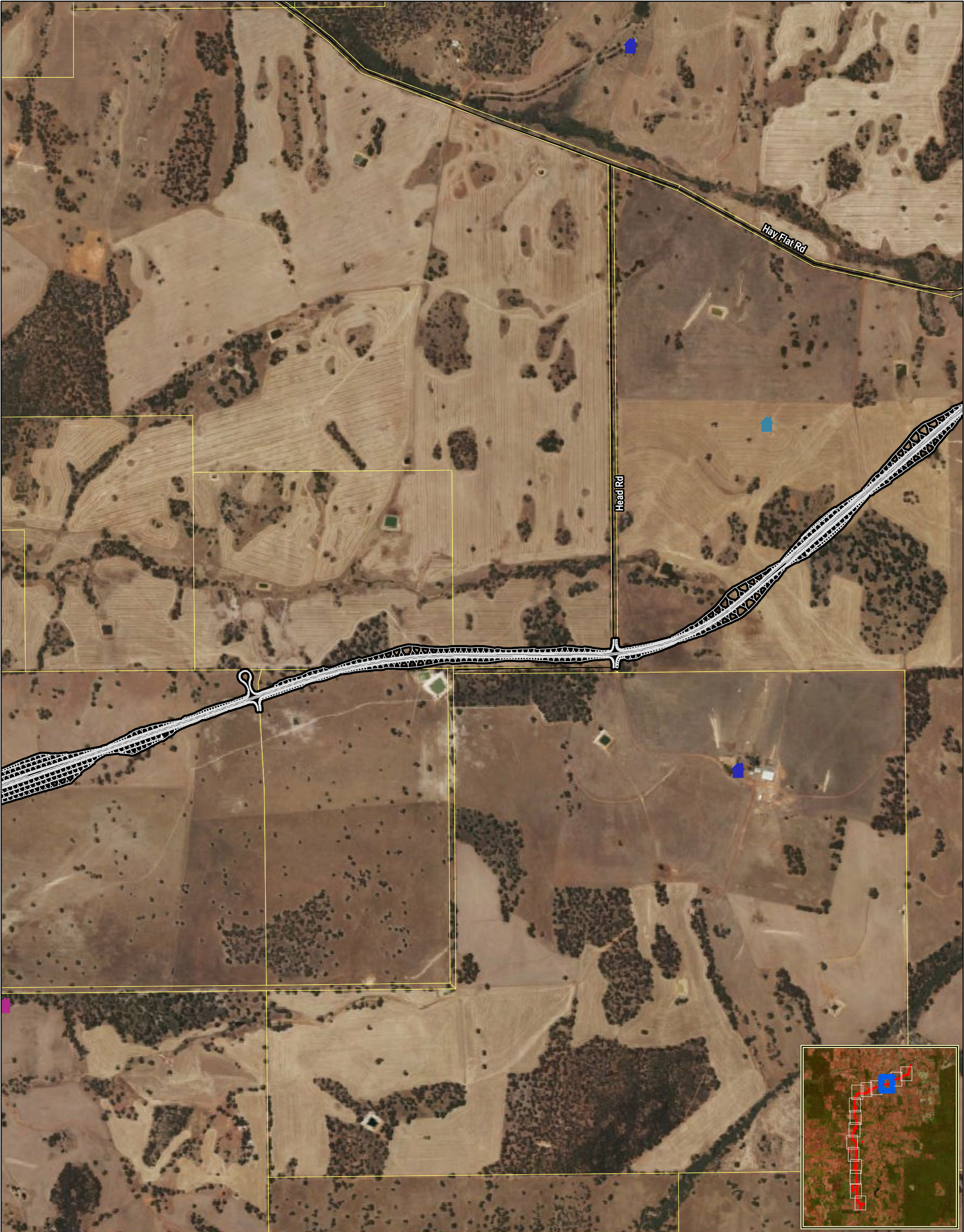
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Task No  
GNH-CN12









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Date	By	Chkd	Appd
2/07/2018	BG	XX	XX





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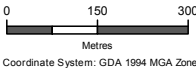
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Figure: 13 of 15

Drawing No  
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Issue  
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Task No  
GNH-CN12

Drawing Status / Other  
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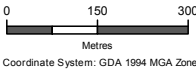
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Figure: 14 of 15

Drawing No  
GNH-CN12-RW01-GIS-0039

Issue  
A

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GNH-CN12








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Date	By	Chkd	Appd
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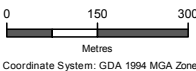
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Figure: 15 of 15

Drawing No  
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Issue  
A

Task No  
GNH-CN12

Drawing Status / Other  
Draft / Other Info

Date	By	Chkd	Appd
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**Table 4-55: Light Spill Impact Assessment**

Residence ID	Distance and Impact Criteria	Residence Status	Analysis
1	363 m – Low impact	Unverified	The low impact on Residence 1 is further minimised, due to proposed V3 sub-category lighting on the ramp nearby, therefore less apparent glare.
2	601 m – Negligible impact	Occupied	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source.
3	493 m – Negligible impact	Unverified	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source.
4	510 m – Negligible impact	Unverified	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source.
5	386 m – Low impact	Occupied	The low impact will be further minimised as this residence is not in the direction of the headlight. Moreover, this residence is not adjacent to the highway, but to a side road with lower traffic volume. Hence, the impact on this residence can be considered negligible.
6	662 m – Negligible impact	Occupied	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source, as well as the source of light coming from a property access road with fairly low traffic volume.
7	559 m – Negligible impact	Unliveable	Based on the survey, this residence is uninhabitable. Should it be made habitable in the future, the residence 6 analysis will apply to it.
8	350 m – Low impact	Occupied	The low impact will be further minimised as this residence is not in the direction of the headlight. Moreover, this residence is not adjacent to the highway, but to a property access road with low traffic volume.
9	402 m – negligible impact	Occupied	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source, as well as the source of light not coming from the highway, but from a local road with lower traffic volume.
10	538 m – Negligible impact	Occupied	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source, as well as the source of light not coming from the highway, but from a local road with lower traffic volume.
11	524 m – Negligible impact	Occupied	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source, as well as the source of light not coming from the highway, but from a local road with lower traffic volume.



Residence ID	Distance and Impact Criteria	Residence Status	Analysis
12	790 m – Negligible impact	Unverified	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source, as well as the source of light not coming from the highway, but from a property access road with low traffic volume.
13	440 m – Negligible impact	Occupied	It is not considered that headlight glare will have an impact on this residence, due to distance from the light source.
14	529 m – Negligible impact	Unverified	It not considered that headlight glare will have an impact on this residence, due to distance from the light source.
15	682 m – Negligible impact	Occupied	It not considered that headlight glare will have an impact on this residence, due to distance from the light source, as well as the source of light coming from the vehicles turning onto a side road with low traffic volume.

## Dust

Dust impacts are only likely to occur during the construction phase. During operations, the Bindoon Bypass will be completely sealed and no dust will be generated. The extent and nature of dust generating activities during construction will be minor, short term and temporary, particularly in relation to other dust generating activities that regularly occur in the study area (i.e. cropping). Construction activities with the potential to generate the most dust are clearing and earth moving activities. However, due to the dry environment in the study area, dust plumes may also be generated from other construction activities including movement of light vehicles. Dust generated by the Proposal may cause nuisance to those living near the construction site.

### 4.6.6 Mitigation

#### 4.6.6.1 Noise

Noise generated during construction of the Bindoon Bypass will be managed in accordance with the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations). Noise Regulations require that the following management occurs during construction:

- the construction work will be carried out in accordance with control of environmental noise practices set out in section 4 of Australian Standard (AS) 2436-2010 *Guide to noise and vibration control on construction, maintenance and demolition sites*
- the equipment used on the premises will be the quietest reasonably available
- if Main Roads is required to prepare a construction noise management plan in respect of the construction site:
  - the noise management plan will be prepared and given in accordance with the requirement, and approved by the Local Government
  - the construction work will be carried out in accordance with the noise management plan, excluding any ancillary measures
- if out-of-hours works are required, a noise management plan will be developed and approved by the local government (in accordance with the local government's delegated authority from the DWER):
  - plan will be submitted to the local government not later than 7 days before proposed works commence



- ▶ all nearby sensitive receivers will be consulted on the noise management plan prior to its submission to local government
- ▶ all nearby noise sensitive receivers will be notified in writing at least 24 hours prior to the works commencing.

Further mitigation measures have been proposed to reduce ongoing (operational) noise impacts as a result of the Proposal, including preparation of a Noise Management Plan in line with the requirements of State planning policy 5.4. Mitigation measures will be employed along the alignment as required, with particular attention to areas near the residences that have been identified as likely to experience noise levels above the targets and limits set out in State planning policy 5.4 (**Table 4-56**). Noise mitigation measures employed by Main Roads in rural settings generally includes:

- consider a low-noise pavement for sections of the alignment
- building modifications and improvements (such as double glazing, installation of air conditioning units) to reduce noise inside residences where State planning policy 5.4 targets or limits are exceeded.

Construction of noise walls or earthen bunds is generally not considered in rural settings, due to their negative impacts on other factors such as amenity.

Noise complaints during operation will be managed by MRWA through a specific procedure that includes:

- A framework for receiving and responding to noise-related complaints (e.g., free call number, online form).
- A noise complaint register where details of the complainant and nature of the complaint are recorded.
- Timeframes and protocols for MRWA to contact and liaise with the complainant to establish gather further information and to identify the nature and source of the complaint.
- The process for further investigation of the complaint (if required).
- Details of how the results of the investigation will be recorded and communicated to the complainant.
- Details of how any changes in mitigation measures will be identified and implemented as a result of the investigation.

**Table 4-56: Proposed noise mitigation measures**

Location	Mitigation Measure
428 Gingilling Road, Wannamal	A noise management plan as required by State Planning Policy 5.4 (SPP 5.4) will be prepared for the proposal. Noise mitigation, as set out in the Implementation Guidelines for SPP 5.4, will be offered to these properties. The mitigation to be applied will be discussed and agreed with by Main Roads and each affected property owner, prior to the construction of the proposal.
Lot 3281 (no. 9071) GNH, Wannamal	
Lot 36 (no. 620) Gray Road, Bindoon	
Lot 502 (no. 737) Crest Hill Road, Mooliabeenee	
739 Crest Hill Rd, Mooliabeenee	
431 Cullalla Rd, Moondah	
630 Gingilling Rd, Wannamal	
Lot 53 (no. 644) Gingilling Road, Wannamal	
828 Gingilling Rd, Wannamal	
907 Cullalla Rd, Cullalla	
1121 Hay Flat Rd, Wannamal	
Lot 2917 (no. 75) Kangaroo Gully Road, Wannamal	



#### 4.6.6.2 Visual Amenity, Dust and Light Spill

##### Visual Amenity

In order to minimise or mitigate the impacts to visual amenity the Proposal, the following measures and practices will be put in place:

- Landowners will be consulted to identify suitable types of planting/landscaping (for example, trees and tall shrubs, rather than low shrubs and groundcovers), and to investigate opportunities for early planting of screening vegetation prior to commencement of construction.
- The detailed design phase will assess the viability of alignment adjustments and design criteria such as steepening of cut/fill batter slopes, median width, or provision of barriers to minimise the amount of existing native vegetation to be cleared.
- The road reserve will be revegetated to reflect the existing vegetation patterns and structure.

Additional mitigation measures for specific viewpoint locations are detailed in **Table 4-57**. The particular environmental conditions (for example the distinctive character of the vegetation or landscape at the location), proximity of the Proposal, or type of earthworks required at these viewpoints were considered to warrant additional management measures to those detailed above.

**Table 4-57: Proposed visual amenity mitigation measures by viewpoint.**

Viewpoint (VP)	Mitigation Measures (Source: Arup 2018a)
VP 7 Crest Hill Road	Retention of <i>Xanthorrhoea</i> spp. outside the Development Footprint
VP 11 Cullala Road (2)	Planting along the road reserve with a focus on covering exposed earthworks
VP 16 Bindoon-Moorra Road (1)	Planting with linear canopy planting and intermittent planting to mirror existing open wooded landscape
VP 17 Bindoon-Moorra Road (2)	Planting along road corridor with gaps that mirror the existing open woodland
VP 21 Hay Flat Road (1)	Intermittent planting of shrubs along the road reserve away from viewpoint to achieve vegetation consistent with the surrounding area.

##### Light Spill and Headlight Glare

To reduce light spill from intersection lighting the following mitigation measures will be incorporated into the design:

- review of best practice lighting during detailed design to confirm high-pressure sodium light remains appropriate
- luminaire photometry selection which provides sufficient illumination of the road surface with minimal light spill beyond the road
- zero-degree tilt for luminaires for minimal light spill
- use of aeroscreen (flat glass) luminaires wherever possible for minimal glare and light spill
- lighting will be installed at intersections only: no lighting will be installed along the remainder of the alignment.

Where required to reduce impacts to residences from headlights of vehicles travelling on the Bindoon Bypass, planting will be undertaken around the outside of curves, including intersections, near those residences that may be impacted.



## **Dust**

To reduce dust during construction, the following mitigation measures will be implemented:

- wetting of cleared areas as required (water trucks or similar will be available during construction)
- should visible dust plumes be observed, works will be reduced or stopped until either conditions become less favourable for dust lift-off or additional measures (wetting of cleared areas) are undertaken to reduce dust lift-off
- reduced vehicle speed limits (e.g. 40km/hr) on site to reduce the potential for dust to be generated by vehicle movements
- progressive revegetation of cleared areas to reduce the amount of time these remain bare and susceptible to wind erosion
- investigation and trialling of dust suppressants and soil stabilisation treatments (e.g. Dustex, gluon, hydro-mulch) for exposed areas.

### **4.6.7 Predicted Outcome**

#### **4.6.7.1 Noise**

The traffic noise assessment conducted by the GNH IPT in 2018 (GNH IPT 2018b) found that up to 11 noise sensitive receivers have potential to experience noise levels above State planning policy 5.4 targets, and one sensitive receiver with potential to experience noise levels above the limits. These results were determined by noise modelling. Main Roads will work with impacted landowners and residents to reduce impacts from road noise to as low as reasonably practicable through noise mitigation measures to be agreed with each land owner.

#### **4.6.7.2 Visual Amenity, Dust and Light-spill**

A number of potential landscape and visual amenity impacts may be caused by the Bindoon Bypass. The existing rural character of the area will be compromised by the presence of the highway, and this will be experienced at a range of magnitudes from various viewpoints. The mitigation measures proposed will reduce impacts to visual amenity, with the reduction become more pronounced over time as vegetation matures and establishes. Planting along the road reserve will mirror existing landscape character along the Development Envelope, and therefore it is expected that visual impacts will not be significant.

The proposed intersection lighting for the Proposal is not anticipated to result in light spill impacts to residences. As such, light spill impacts are negligible. Impacts due to headlight glare may occur, particularly where vehicles turn off the Bindoon Bypass and onto local roads. The mitigation proposed in these areas will reduce potential impacts to residents, thus residual impacts are expected to be negligible.

Dust impacts from the construction and operation of the Bindoon Bypass will not be significant. The operation of the road will not generate dust due to it being sealed. During construction, a range of mitigation measures will be available to be employed by site construction teams. Dust levels are therefore not expected to increase beyond those levels already generated by surrounding agricultural land uses.



## 5. Other Environmental Factors or Matters

An Agreement to Reserve (AtR) and Conservation Covenant is in place on Lot 2138 Hay Flat Road, Wannamal (**Figure 5-1**). This AtR and Conservation Covenant was established under the *Soil and Land Conservation Act 1945* and pertains to the vegetated portion of the property. In order to avoid impacting the nearby Udumung Nature Reserve, the Proposal crosses Hay Flat Road and Udumung Brook in the south east corner of this property. The AtR is not associated with any EPBC Act offsets.

A total of 1.4 ha of vegetation subject to the AtR and Conservation Covenant is within the Development Footprint, of which 0.5 ha is mapped as *Eucalyptus wandoo* and *Casuarina obesa* sparse woodland (EwBeNa) and 0.9 ha is mapped as *Eucalyptus wandoo*, *Melaleuca raphiophylla* and *Casuarina obesa* over pasture (P EwMrCo) (FVC 2018a). All vegetation was mapped as being Degraded (FVC 2018a). Approximately 11 ha of similar vegetation exists on the property.

Given the degraded condition of the vegetation, the implementation of the proposal is unlikely to degrade the environmental values present and no significant impacts are anticipated. Further consultation will be undertaken with the land owner, DPIRD and DPLH in relation to this AtR and Conservation Covenant through the land acquisition process.



