Valley of the Winds

APPENDIX 2
PRELIMINARY LANDSCAPE AND VISUAL ASSESSMENT REPORT (GREEN BEAN DESIGN)

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GREEN BEAN DESIGN landscape architects

VALLEY OF THE WINDS WIND FARM

Stage 1 Preliminary Environmental Assessment

PRELIMINARY LANDSCAPE AND VISUAL ASSESSMENT

Prepared for:

Ramboll Australia Pty Ltd on behalf of UPC / AC Renewables

Prepared by:

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DOUCMENT CONTROL

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Report structure

Section 1

1.1 Report structure

This Preliminary LVA report has been structured as follows:

Table 1 – Report structure

Report section	Description
1 – Report structure	This section outlines the content and structure of the Preliminary LVA report.
2 – Introduction	This section provides an introduction that describes the intent and purpose of the Preliminary LVA.
3 – Methodology	This section sets out the key tasks employed in the LVA preparation.
4 – Wind Energy Visual Assessment Bulletin	This section sets out the objectives, stages and key steps described in the Visual Bulletin as applicable to this Preliminary LVA.
5 – Community Consultation	This section describes the community consultation activities undertaken by the Proponent and feedback received from the community relevant to this Preliminary LVA.
6 – Preliminary assessment tool Visual Magnitude	This section provides an analysis of the preliminary assessment tool for visual magnitude as set out in the Visual Bulletin.
7 – Preliminary assessment tool Multiple Wind Turbine Tool	This section provides an analysis of the preliminary assessment tool for the multiple wind turbine tool as set out in the Visual Bulletin.
8 – Summary and next steps	This section provides a summary of the Preliminary LVA and an outline of key Stage 2 tasks

Introduction

Section 2

2.1 Introduction

Green Bean Design Pty Ltd (GBD) has been commissioned by Ramboll Pty Ltd on behalf of UPC/AC Renewables (the Proponent) to undertake a Stage 1 Preliminary Environmental Assessment: Landscape and Visual Assessment (Preliminary LVA) for the Valley of the Winds Wind Farm (the project).This Preliminary LVA has been prepared as required by the New South Wales Government, Department of Planning, Industry and Environment (DPIE) in order to meet the objectives of the Wind Energy – Visual Assessment Bulletin, December 2016 (the Visual Bulletin). This Preliminary LVA supports the Preliminary Environmental Assessment (PEA)/Scoping Report and has been prepared to specifically address the Visual Bulletin requirements applicable to a new wind farm development application for a State Significant Development (SSD) through the Secretary's Environmental Assessment Requirements (SEARs).

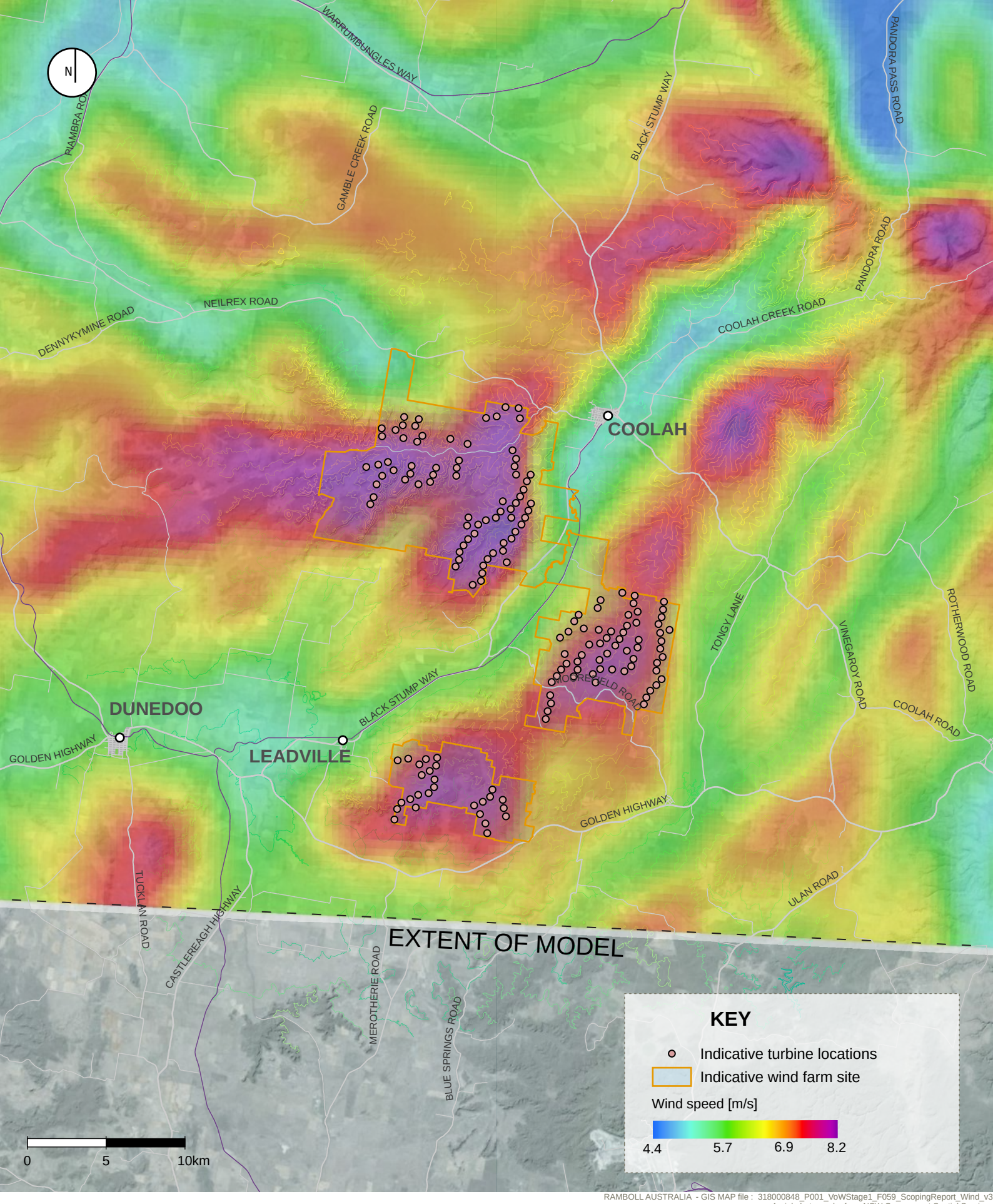
This Preliminary LVA has been prepared to consider a layout consisting of approximately 175 wind turbines with a tip height up to 250 metres. The wind turbine layout has been subject to a number of iterations and should be considered as a draft layout for the purposes of this Preliminary LVA. This Preliminary LVA has not considered the location or extent of typical ancillary infrastructure commonly associated with wind farm developments, including electrical infrastructure and access tracks. Ancillary infrastructure items, including proposed overhead transmission lines and easements, will be detailed, and assessed in the Stage 2 Environmental Impact Statement (Stage 2 EIS) Assessment and Determination process.

The Visual Bulletin requires consideration of dwellings and key public viewpoints within a defined study area. The study area for the Preliminary LVA has been established within a 3.4 km offset from the wind turbines. The 3.4 km offset is in accordance with the 'black line threshold' illustrated in the Visual Bulletin (Figure 2 Preliminary Assessment Tool 1) indicating visual impacts for further consideration. The study area extends to 8km from selected representative view locations (dwellings), within 3.4 km of the wind turbines, for the application of the Multiple Wind Turbine Tool (refer Section 7 of this Preliminary LVA).

A preliminary analysis of the study area within 3.4 km (below the black line) of the wind turbines did not identify any key public viewpoints (e.g. dedicated lookouts, public spaces, recreational areas etc.), and accordingly the preliminary analysis has focused on residential dwellings. A further and detailed analysis of key public viewpoints surrounding the wind farm will be undertaken in the Stage 2 EIS report.

GBD also notes the Visual Bulletin requirement to provide an overlay of the wind resources (Issue of SEAR's, page 11). GBD understand that the collection of wind data is ongoing, however the following figure provides an overlay of the wind resource based on publicly available information.

Information and stated requirements from the Visual Bulletin included in this Preliminary LVA are presented in *italics*.



RAMBOLL AUSTRALIA - GIS MAP file : 318000848_P001_VoWStage1_F059_ScopingReport_Wind_v3
Aerial photography from NSW Government Spatial Services

2.2 Professional assessment skills

The Visual Bulletin states that *'Professional assessment skills are critical to the effective application of visual assessment'*, and that *'The proponent is expected to engage professionals from relevant natural resource management and design professions (for example environmental planners, geographers, landscape architects, architects, or other visual resource specialists), with demonstrated experience and capabilities in visual assessment to carry out a wind energy project visual assessment'.*

GBD confirms that this Preliminary LVA has been prepared by GBD Principal Landscape Architect Andrew Homewood. Andrew is a registered Landscape Architect and member of the Australian Institute of Landscape Architects and the Environmental Institute of Australia and New Zealand. Andrew holds tertiary qualifications in Landscape Management, Landscape Design, Archaeology and Horticulture and has over 30 years' experience in landscape consulting. Andrew has prepared numerous wind farm LVA in New South Wales, Victoria, Queensland, South Australia and Tasmania, at preliminary and detailed stages. He has also prepared independent expert peer reviews of wind farm LVA on behalf of DPIE.

2.3 Project overview

The project would be located close to the township of Coolah, in the Warrumbungle Local Government Area (LGA), with the transmission line running generally south through the Warrumbungle, Mid-Western and Upper Hunter LGAs. The project would involve the construction, operation and decommission of three clusters of wind turbines. These are:

- Mount Hope cluster
- Girragulang Road cluster
- Leadville cluster.

The clusters refer to turbines that have been grouped due to the local topographic conditions, however, would be connected electrically. The wind farm would be connected via a series of low voltage underground cables (expected to be 33 kV) connecting each turbine to a substation within each cluster (i.e. 'secondary substations'). The secondary substations would then be connected to one central substation within the Girragulang Road cluster. The central substation would transform the electricity from low voltage to high voltage, transporting the electricity generated to the NEM via a single high voltage transmission line of either 330 kV or 500 kV.

The Project would include the following key components:

- Approximately 175 wind turbines
    - Maximum tip height of 250 metres
    - Hardstand area at the base of each turbine
- Electrical infrastructure
    - Substations - one central substation and secondary substations as required within each cluster

  - Underground electrical reticulation connecting the turbines to a substation
  - Above ground conductors connecting the secondary substations to the central substation
  - Other electrical infrastructure as required including the potential of onsite battery storage
  - A high voltage transmission line connecting the central substation to the NEM
- Access track network
  - Access and egress points to each cluster from public roads
  - Operational access tracks and associated infrastructure on private property
- Other permanent on-site ancillary infrastructure
  - Permanent operation and maintenance facility
  - Meteorological masts
- Temporary construction ancillary facilities
  - Construction compounds
  - Laydown areas
  - Batching plants
  - Construction access tracks.

A high voltage transmission line (330kV or 500kV) would be required to connect the wind farm to the Bayswater to Mt Piper transmission line (lines 5A3 or 5A4).

Three route options for the transmission line are being considered:

- Option A: A total length of approximately 70 kilometres to the existing Wollar substation, running to the existing 500 kV Wollar extension through the existing Peabody mining lease areas
- Option B: A total length of approximately 55 kilometres to the existing Wollar substation, running to the existing 500 kV Wollar extension through the Peabody mining lease areas
- Option C: A total length of approximately 65 kilometres to the Mt Piper to Bayswater 500kV transmission line. This option would require the construction of a new substation.

Whist the Visual Bulletin does not require a preliminary analysis of overhead transmission line connections in the Stage 1 PEA, GBD notes that the proposed 330kV or 500kV would potentially incorporate large scale steel lattice towers or single pole structures with the potential to result in a visual effect on sensitive view locations proximate to proposed easements and electrical infrastructure. Sensitive view locations may include road corridors (including designated tourist routes) as well as dwellings, lookouts or designated landscape areas (including State Forests and National Parks).

The three route options under consideration exhibit a variety of landscape characteristics, and varying degrees of absorption capability (i.e. ability to accept modification without significant change to existing visual characteristics). These include:

- areas of open cultivated agricultural land within and beyond river flood plains (generally low absorption capability),
- gently undulating livestock pasture with scattered tree cover (generally low to moderate absorption capability) and
- areas of dense woodland covering low hills and gullies (generally moderate to high absorption capability).

These options will be subject to further assessment and refinement, leading to a preferred option being presented in the Stage 2 EIS. The refinement will consider each options viability using the avoid and minimise principle for environmental impacts, giving justification to the preferred option. The three route options for the transmission line are illustrated in the main Scoping Report. A preferred route option would be assessed in the Stage 2 EIS.

Methodology

Section 3

3.1 Introduction

This Preliminary LVA has been prepared to address the Visual Bulletin through a range of tasks outlined in the Visual Bulletin and/or tasks commonly applicable to landscape and visual assessment. This Preliminary LVA included the following key tasks:

- Desktop studies
- Site inspections
- Mapping and analysis

3.2 Desktop studies

A desktop study reviewed the preliminary wind turbine layout provided by the Proponent in Google Earth and Google Maps applications. The Proponent provided updated wind turbine layouts during the desktop review process to indicate adjustments to wind turbine locations following on-going landowner consultation by the Proponent.

The desktop study also reviewed dwelling locations against built form considered to be potential agricultural structures such as shearing sheds. The desktop study identified the location, extent and general boundaries between broad landscape character areas to be reviewed during the site inspection work. Desktop studies also identified key sensitive landscape elements and points of interest for consideration during the site inspection.

3.3 Site inspection

A site inspection was undertaken to record landscape characteristics within the project site, as well as gain an understanding of wind turbine locations relative to surrounding dwellings. The site inspection also presented an opportunity to visit key public view locations including informal lookouts and rest areas along road corridors. Landscape characteristics and elements within and surrounding the project site were captured in a series of ground and aerial images utilising a 35mm SLR full sensor digital camera (Nikon D850) and aerial drone (DJI Mavic Pro 2). The CASA registered drone was flown in strict accordance with CASA rules and regulations applicable to a sub 2 kg drone operated for commercial purposes. Outputs from the site inspections included preparation of illustrated material to inform community consultation undertaken by the Proponent.

3.4 Mapping and analysis

A series of figures have been prepared to address the Visual Bulletin requirement to demonstrate the potential influence of visual magnitude and multiple wind turbines on dwellings. This was undertaken with WindPro software using the line of sight analysis. Inputs included wind turbine coordinates, tip of blade height, the regional digital elevations model and dwelling locations provided by the Proponent. The Visual Bulletin requirement to adopt distances of 3.4 km for visual magnitude and 8 km for multiple wind turbines are set out in Section 6 of this Preliminary LVA.

Wind Energy Visual Assessment Bulletin

Section 4

4.1 Introduction

The Visual Bulletins stated objectives are to:

- *provide the community, industry and decision-makers with a framework for visual impact analysis and assessment that is focused on minimising and managing the most significant impacts*
- *facilitate improved wind turbine and ancillary infrastructure siting and design during the pre-lodgement phase of a project, and encourage early consideration of visual impacts to minimise conflicts and delays where possible, and provide for a better planning outcome*
- *provide the community and other stakeholders with greater clarity on the process along with an opportunity to integrate community landscape values into the assessment process and*
- *provide greater consistency in assessment by outlining appropriate assessment terminology and methodologies.*

GBD confirm that this Preliminary LVA has been prepared in order to satisfy the key objectives of the Visual Bulletin.

The Visual Bulletin breaks the visual assessment process in to 2 main stages. These include:

- Stage 1 Preliminary Environmental Assessment and
- Stage 2 Assessment and Determination.

This Preliminary LVA has been prepared to address the requirements of the Stage 1 PEA, which is to be submitted to DPIE as part of a request for SEAR's. Stage 1 is broken down into 3 steps which include:

- *Undertake community consultation on likely areas of development and establish key landscape features, areas of scenic quality and key viewpoints valued by the community*
- *Apply the Preliminary Assessment Tools to the preliminary turbine layout and*
- *Prepare a Preliminary Environmental Assessment.*

Source: *The Visual Bulletin (Figure 1 Steps in Visual Assessment)*

The Visual Bulletin also states that Stage 1 must *'undertake a preliminary environmental assessment that considers the landscape in which a proposed wind energy project will be located. The analysis must include':*

- *undertaking community consultation to establish key landscape features valued by the community, key viewpoints in the area (both public and private) along with information about the relative scenic quality of the area*

- *production of a map detailing key landscape features (informed by community consultation and any ground-truthing undertaken), the preliminary wind turbine layout, the location of dwellings and key public viewpoints and an overlay of the wind resource; and*

- *results of the application of the preliminary assessment tools for both the visual magnitude and multiple wind turbine parameters.*

GBD confirms that this Preliminary LVA has been prepared in accordance with the Visual Bulletin for Stage 1 PEA (pre-lodgement).

Community Consultation

Section 5

5.1 Introduction

The Visual Bulletin notes that *'Consultation with the community at this early stage may be broad, but should include discussions about the proposed project area, likely corridors for development, or preliminary turbine layouts and must involve people from the visual catchment'.*

The Visual Bulletin describes the purpose of early communications is to:

- *establish the key landscape features, areas of scenic quality and key public viewpoints valued by that community*
- *allow the community to have input into the ranking of those features and scenic quality into high, moderate or low visual significance*
- *inform landholders about the proposed project area, likely corridors for development, preliminary turbine layouts and access routes and*
- *inform the community about the proposed project, listen to the community's concerns and suggestions for alternative siting and location designs, and discuss potential visual impacts.*

Key landscape features can include natural features of the landscape (for example, a distinctive mountain peak) as well as important cultural features (for example, an iconic church). Consideration of areas of scenic quality involves the identification of areas of the landscape that are of high scenic quality and those that are moderate or low. It is also important to establish which viewpoints are important to the community. An important source of information at this stage is likely to be the local council. A community survey or focus group could also be utilised to gather this information. Any surveys undertaken should reflect the population profile in the project area as indicated by the most up-to-date Census data available.

A detailed summary of consultation conducted for the Project is provided in the Main Volume of the PEA. Issues relevant to this assessment are described below.

In order to support the community consultation process GBD prepared figures to illustrate the results of preliminary site work. The figures outline landscape characteristics associated with Scenic Quality Areas (SQA's). The landscape characteristics are generally defined by land use, land cover and topography. A preliminary landscape analysis identified 9 landscape areas within and surrounding the Project site. These included:

- Cultivated agricultural land
- Creek line and irrigated land
- Hills with dense timber
- Hills, rock outcrops and dense timber

- Gullies and valleys
- Township-urban
- Pastoral land
- Hills with open timber
- Wind farm (approved not constructed).

Each landscape area was photographed and described for the purpose of the community information session. The figures presented at the information session was used to inform the community about the approach to landscape analysis and processes involved in the determination of scenic quality. **Refer Appendix A Figures 1 to 3.** Notable observations or comments made during face to face meetings, information sessions and as provided in the feedback forms which are relevant to this assessment are summarised below.

People were interested to understand the proposed locations for wind turbines. During the consultation process maps were prepared showing the area of investigation and identifying elevated ridges that had the potential to host wind turbines. This was done to allow for feedback to be incorporated into the design of the layout at the earliest stage. Key comments and observations noted during consultation include:

- Landscape and scenic values are not limited to certain locations, but related to wide views of the landscape, vegetation and valleys when viewed from public areas, dwellings and townships
- Community values the trees along ridges and streams, but recent drought has meant some mature trees are visibly deteriorating
- Community values were expresses for rocky outcrops or large boulders visible within the landscape
- Most attendees at the describe the visual impact as acceptable on the basis of flow-on benefits to the community, but some community members voiced concerns regarding the visual impacts
- Coolah township is located on the lower east facing slope and the main views from the town are towards the east
- Potential for some Aboriginal cultural sites, particularly King Togees Grave, Neilrex Road, Coolah.

The Visual Bulletin notes that *'Where a regional survey or study of landscape values has been undertaken, it must be considered. Proponents should confirm with the Department if there is any such recognised study in place'.*

GBD is not aware of any regional surveys or study of landscape values that has been undertaken within or surrounding the wind farm site. This will be confirmed with DPIE prior to the commencement of the EIS detailed assessment work.

Consultation will be ongoing during the EIS Assessment and Determination process.

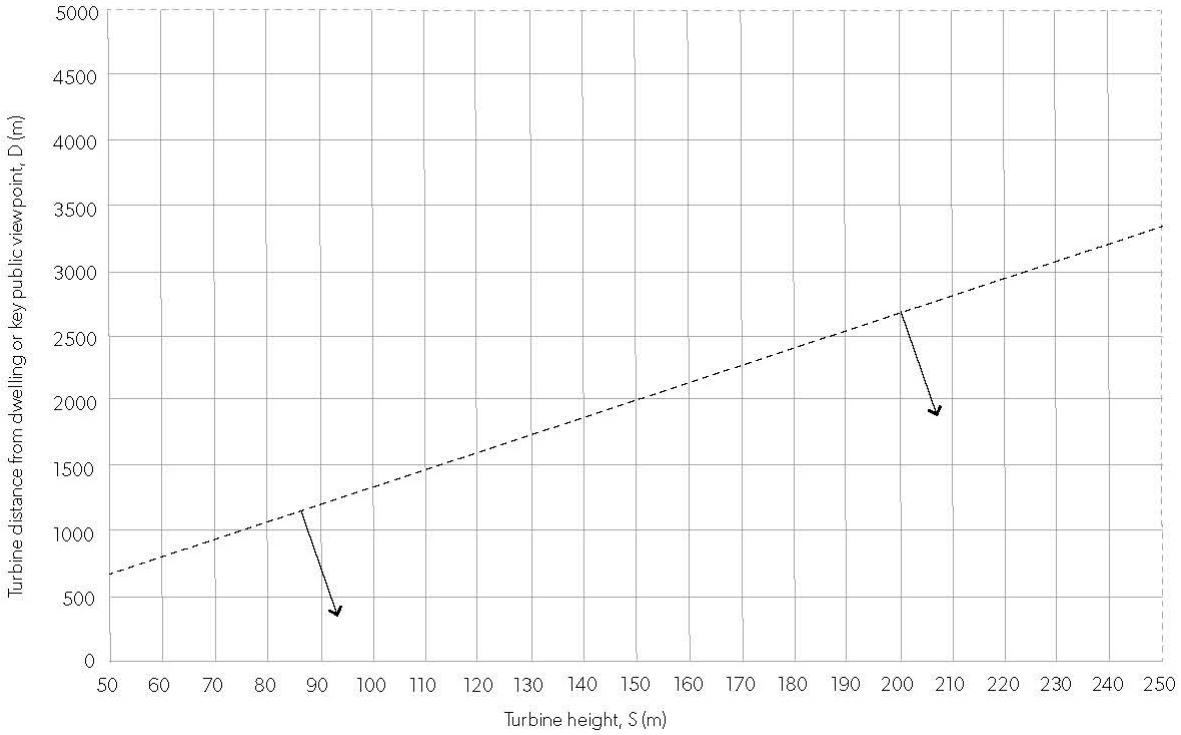
Preliminary Assessment Tool – Visual Magnitude

Section 6

6.1 Introduction

The Visual Bulletin states that *'By mapping the dwellings, key public viewpoints and proposed turbines at scale, the potential visual magnitude of a turbine relative to that dwelling or public viewpoint can be established. This is based on the height of the proposed wind turbines to the tip of the blade and distance from dwellings or key public viewpoints shown in the graph at Figure 2'* (The Bulletin, page 9). *'The line depicted in the graph at Figure 2 provides an indication of where proponents should give detailed consideration to the visual impacts on dwellings or key public viewpoints from turbines located below the black line'.*

For the purpose of the Preliminary LVA the proposed wind turbines are nominated at a 250 m tip height (from base of tower to tip of blade at vertical position). In accordance with the Visual Bulletin, the black line intersects at a distance of 3.4km from a tip height of 250m.



Source: *The Visual Bulletin (Figure 2 Preliminary Assessment Tool 1 indicating visual impacts for further consideration)*

The Visual Bulletin states the *'Proposed turbines below the black line must be identified, along with the dwellings or key public viewpoints as part of the request for SEARs'.*

The Visual Bulletin notes that *'Further assessment and justification for placement of turbines located in these sensitive areas in the EIS will be required, along with a description of the mitigation and management measures*

being employed to reduce impacts. This assessment may identify that factors such as topography, relative distance and existing vegetation may minimise or eliminate the impacts of the project'.

The Visual Bulletin also notes that *'there may be circumstances where dwellings or key public viewpoints located above the line may require further consideration due to topography or other landscape features. The further detailed assessment and ground-truthing at the visual assessment stage must also consider impacts on these dwellings or key viewpoints.*

The EIS Assessment and Determination will undertake an assessment and justification for the placement of wind turbines in sensitive areas, including those located within and between the 3.4 km and 4.95 km distance offsets from the wind turbine locations.

This Preliminary LVA also illustrates dwellings located to a distance of 4.95 km from the wind turbines which coincides with the blue line threshold as indicated in the Visual Bulletin Figure 5 (page 19). Dwellings located between 3.4 km and 4.95 km have been identified and illustrated to provide a greater degree of context regarding the location and number of dwellings surrounding the proposed wind farm.

Non-associated and associated residential dwellings located below the black line, as well as residential dwellings between the black and blue lines, are illustrated in **Appendix A Figures 4**, **5** and **6**.

Preliminary Assessment Tool – Multiple Wind Turbines

Section 7

7.1 Introduction

The Visual Bulletin states that *'This tool will provide a preliminary indication of potential cumulative impacts arising from the proposed wind energy project. To establish whether the degree to which dwellings or key public viewpoints may be impacted by multiple wind turbines, the proponent must map into six sectors of 60° any proposed turbines, and any existing or approved turbines within eight kilometres of each dwelling or key public viewpoint.*

This Preliminary LVA has identified 34 individual representative view locations which contain single or multiple non-associated residential dwellings out to a distance of 3.4 km from the wind turbines. This Preliminary LVA has incorporated multiple residential dwellings into a single view location where dwellings occur within a 500 m radius of each other. GBD consider that views from these locations would be similar or identical in most cases.

The Visual Bulletin (at Stage 2 EIS Assessment and Determination, page 12) permits representative view locations, and states *'where relatively close clustering of houses belonging to different landowners or occupants occur, representative viewpoints may be selected and assessed in lieu of every single dwelling in the following types of areas:*

- *rural residential clusters*
- *rural villages and*
- *urban residential and commercial areas.*

The 34 representative view locations are identified in **Appendix A Figure 7** (shown in red) and the multiple wind turbine analysis in **Appendix A Figures 8** to **41**.

Figure 7 also illustrates a Zone of Visual Influence analysis which indicates areas of the landscape from which wind turbines will not be visible, or visible toward blades only. The extent of potential screening illustrated in **Figure 7** relates to screening by landform only and does not account for vegetation (tree cover) within the landscape or surrounding residential dwellings.

Where wind turbines are visible within the horizontal views of the dwelling or key public viewpoints in three or more 60° sectors, the proponents must identify the turbines, relative dwelling and key public viewpoint, along with the relative distance and submit these to the Department as part of the request for SEARs. These turbines will become a focus for assessment in the EIS.

Table 2 summarises the results of the multiple wind turbine tool analysis undertaken as part of the Preliminary LVA. The results include the identification of non-involved residential dwellings within 3.4 km of the wind turbines, the distance to the closest wind turbine (and wind turbine ID), the number of 60° sectors the wind

turbines occur within out to a distance of 8 km from the dwelling, and the number of wind turbines visible within three or more 60° sectors out to a distance of 8 km from the dwelling location.

Table 2 Multiple wind turbine tool

Representative dwelling ID	Distance (km) from representative dwelling to closest wind turbine (and turbine ID)	Number of 60°sectors with wind turbines up to 8 km from dwelling	Number of visible wind turbines within 3 or more 60°sectors up to 8 km from dwelling
H3	3.14 (LV14)	2	
H5	1.84 (BS78)	4	58
H6	1.70 (BS203)	2	
H19	2.03 (LV27)	2	
H69	3.63 (MH38)	0	
H72	3.50 (MH68)	2	
H76	2.38 (MH68)	3	40
H79	2.73 (MH41)	3	31
H80	3.15 (MH37)	2	
H81	3.36 (MH77)	2	
H85	2.22 (MH77)	3	25
H86	2.07 (MH4)	4	30
H89	2.53 (BS47)	4	85
H90	2.27 (MH15)	4	69
H127	2.73 (MH59)	1	
H160	3.64 (LV27)	1	
H178	3.49 (LV27)	1	
H182	2.89 (LV28)	1	
H187	1.31 (LV10)	1	
H188	2.02 (LV2)	2	
H190	1.81 (LV2)	2	
H199	2.44 (MH77)	2	
H238	1.36 (MH74)	2	

Table 2 Multiple wind turbine tool

Representative dwelling ID	Distance (km) from representative dwelling to closest wind turbine (and turbine ID)	Number of 60°sectors with wind turbines up to 8 km from dwelling	Number of visible wind turbines within 3 or more 60°sectors up to 8 km from dwelling
H240	3.16 (MH59)	2	
H277	2.15 (BS35)	2	
H278	1.17 (BS35)	4	60
H282	1.84 (MH15)	4	59
H328	1.56 (MH16)	2	
H331	1.70 (BS74)	3	18
H333	3.36 (BS50)	4	37
H334	1.73 (BS202)	2	
H335	2.56 (LV1)	2	
H494	3.51 (MH16)	3	47
H497	1.36 (BS203)	3	64

Of the 34 representative residential view locations:

- 1 (H69) is predicted to have no views toward the wind turbines
- 20 are predicted to have views toward wind turbines in either 1 or 2 of the 60° sectors and
- 13 are predicted to have views towards wind turbines within 3 or more of the 60° sectors.

A further assessment and justification for placement of turbines in multiple sectors will be detailed in the EIS, along with a description of the mitigation and management measures being employed to reduce impacts. Such further assessment may identify that factors such as topography, relative distance and existing vegetation may minimise the visual impacts of the project.

The Stage 2 EIS Assessment and Determination will provide further assessment and justification for the placement of wind turbines within 3 or more 60° sectors where necessary and/or provide reasonable and feasible mitigation measures to reduce visual impacts.

This Preliminary LVA notes the approved Liverpool Range Wind Farm located to the north east of the project site and around 7 km from Coolah. Dwelling locations with 3.4 km of the project wind turbines would be beyond 8

km of the Liverpool Range wind turbines and therefore beyond the Visual Bulletin requirement to include in the multiple wind turbine tool analysis. An analysis and assessment of potential cumulative visual impacts, including wind turbines within the approved Liverpool Range Wind Farm would be included in the Stage 2 EIS. Whilst subject to further analysis, site inspections carried out for the Liverpool Range project noted that Liverpool Range wind turbine visibility would be restricted from most dwellings within Coolah.

Summary and next steps

Section 8

8.1 Summary

This Preliminary LVA has been prepared in accordance with the Visual Bulletin and specifically addresses the key steps set out in Stage 1 Preliminary Environmental Assessment (pre-lodgement). The Preliminary LVA has:

- outlined the community consultation activities undertaken by the Proponent and identified the key landscape features and characteristics that are found within and surrounding the Project site
- noted the landscape features and locations of concern to the community and will further consider these within the Stage 2 EIS Assessment and Determination process
- Applied the preliminary assessment tools (magnitude and multiple wind turbine) to the preliminary wind turbine layout and
- documented the process and analysis of the Stage 1 Preliminary Environmental Assessment.

The Preliminary LVA will be carried forward to the Stage 2 EIS which will consider the proposed wind farm development against the Visual Bulletin visual performance objectives and requirements.

8.2 Next steps

This Preliminary LVA, incorporating the preliminary assessment tools, will be submitted to DPIE together with the Scoping Report as a pre-requisite as a request for the Secretary's Environmental Assessment Requirements (SEARs). The Visual Bulletin notes that *'In relation to visual assessment, SEARs for wind energy applications will require the Proponent to provide a comprehensive assessment of the project in accordance with (the) Bulletin that analyses the proposed wind energy project in relation to the visual performance objectives'.*

The Steps in Visual Assessment (refer Section 4) identifies the key steps in the Stage 2 EIS visual assessment. These include:

- Prepare a Visual Baseline Study as part of the EIS
- Undertake community consultation aspects of the visual baseline study and describe mitigation and management options in the EIS
- Establish Visual Influence Zones from viewpoints using inputs from the visual baseline study
- Undertake an evaluation of project against the Visual Performance Objectives.

The Proponent will commission a detailed Landscape and Visual Impact Assessment (LVIA) report. The LVIA report will be prepared in accordance with the Visual Bulletin requirements and incorporate:

- Baseline Study Factors
- Visual Performance Evaluation and

- Visual Performance Objectives

The Stage 2 EIS will incorporate a detailed Landscape and Visual Impact Assessment to address the Visual Bulletin Stage 2 requirements.

Appendix A – Figures 1 to 41

Legend

AC	ul vated agricultural land	TH	ills with closed mber dense		losed valley mbered sides		ree line and irrigated land		ndica ve alley of the inds wind turbine strings proposed
	astoral land	OH	ills with open mber sparse	RT	ills roc outcrops closed mber	TU	Township urban		ndica ve iverpool ange wind turbine strings approved

0 5km

Figure 1
Scenic Quality Assessment - Landscape Character Areas

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Hills and areas of closed/open timber

Timbered hills are visually prominent and within the landscape forming moderate scale landscape features. They introduce a degree of visually topographical variety and are visually uniform in colour and texture. Timbered hills and mountains can be viewed within both close and distant views and can form backdrop and skyline views.

Lightly timbered hills and ridgelines/pastoral land

Lightly timbered hills are visually noticeable within the landscape forming moderate scale landscape features. They introduce a degree of visually topographical variety and are visually uniform in colour and texture. Pastoral land is less visually dominant often viewed as a foreground element with hills beyond, or extending across lightly or open timbered hills.

Hills and areas of open timber and pastoral land.

Pasture hills and open timber form a moderate scale landform that is partially visually contained between timbered ridgelines and hills with closed timber. They introduce a degree of visually moderate topographical variety and are visually uniform in colour and texture. Pasture hills do not tend to form distinct backdrops and skyline views.

Creek lines with cultivated agricultural land

The creek lines flood plain is a wide, but visually small scale landform with little topographical variation. There are a variety of human scale features and built structures within the flood plain, with some variation in colour and texture associated with agricultural and rural activities.

Figure 2 - Scenic Quality Assessment Photo Sheet 1

Road corridors

Road corridors do not form visually prominent features within the landscape and are generally small scale linear features. Views from principal road corridors around the site offer a variety of open or closed vistas across adjoining and distant landscape areas. Principal road corridors generally follow creek lines below hill and ridgeline features.

Township - urban

Townships and urban areas are generally located on gently sloping to level areas in proximity to creek and flood plain localities. The majority of built structures within township and urban areas are small to moderate scale. There are a variety of human scale features and built structures located within commercial and residential areas creating complex and visually diverse backdrops. Colour is varied but generally muted in constructed elements.

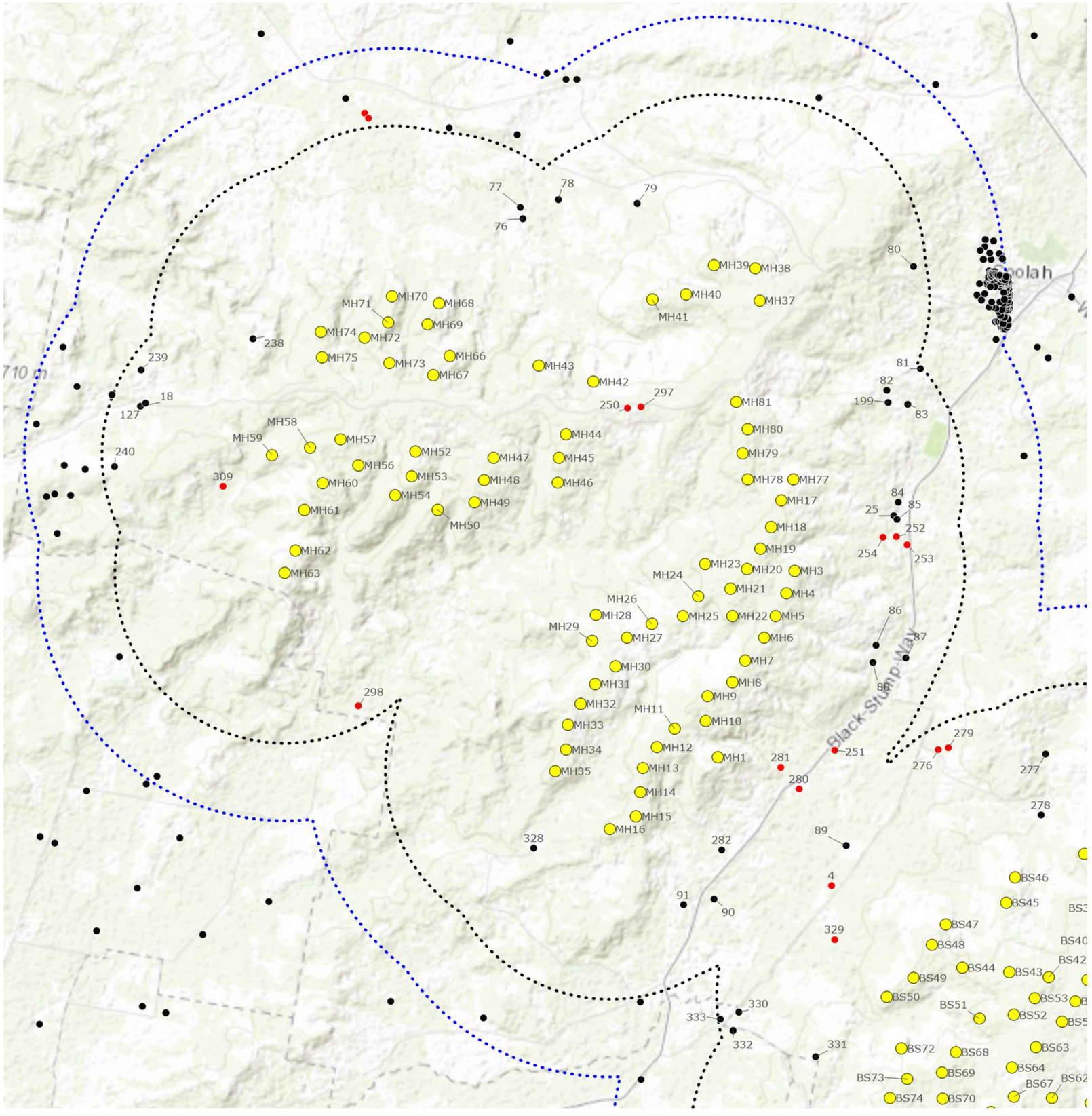
Hills with closed timber and rock outcrops

Timbered hills with rock outcropping are visually prominent and within the landscape forming moderate scale landscape features. They introduce a degree of visually topographical variety and are visually uniform in colour and texture. Timbered hills with rock outcropping can be viewed within both close and distant views and can form backdrop and skyline views.

Closed timbered valley and gully areas

Creek lines form a number of short closed valleys and gullies within and beyond the site, often with closed timbered slopes rising to rounded hills. The valleys are generally visually contained within the site forming moderate scale landscape features. They introduce a degree of visually topographical variety and are visually uniform in colour and texture. Valley and gully features can be viewed within both close and distant views but do not form backdrop and skyline views.

Figure 3 - Scenic Quality Assessment Photo Sheet 2



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Proposed wind turbine

Residential dwelling

- associated
- non associated

Distance buffer from proposed wind turbine

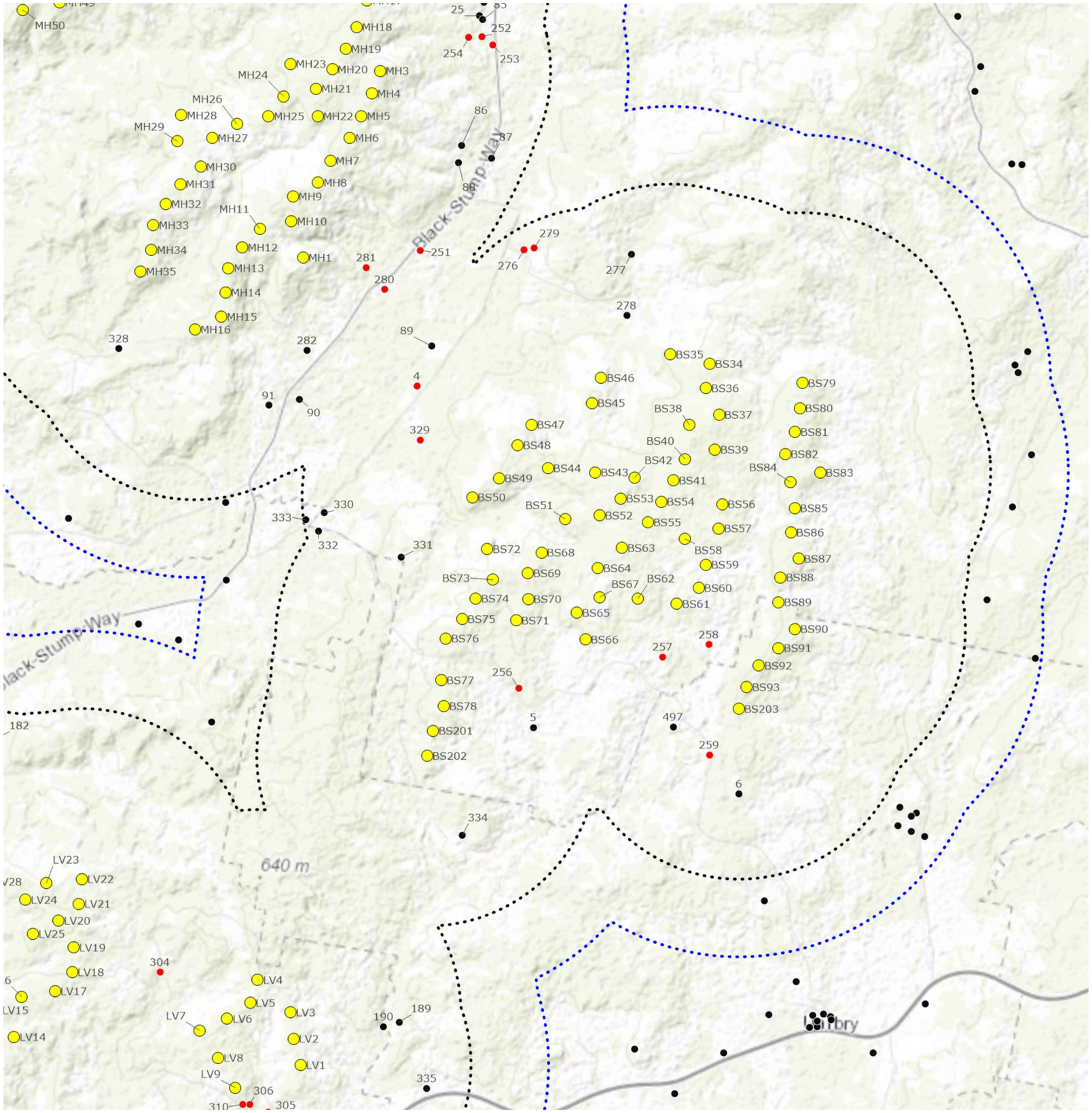
- *3.40 km*
- *4.95 km*

0 3km

Figure 4
Mount Hope wind turbine cluster
Residential dwellings -
multiple wind turbine tool

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

GREEN BEAN DESIGN
landscape architects



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Proposed wind turbine

Residential dwelling

- associated
- non associated

Distance buffer from proposed wind turbine

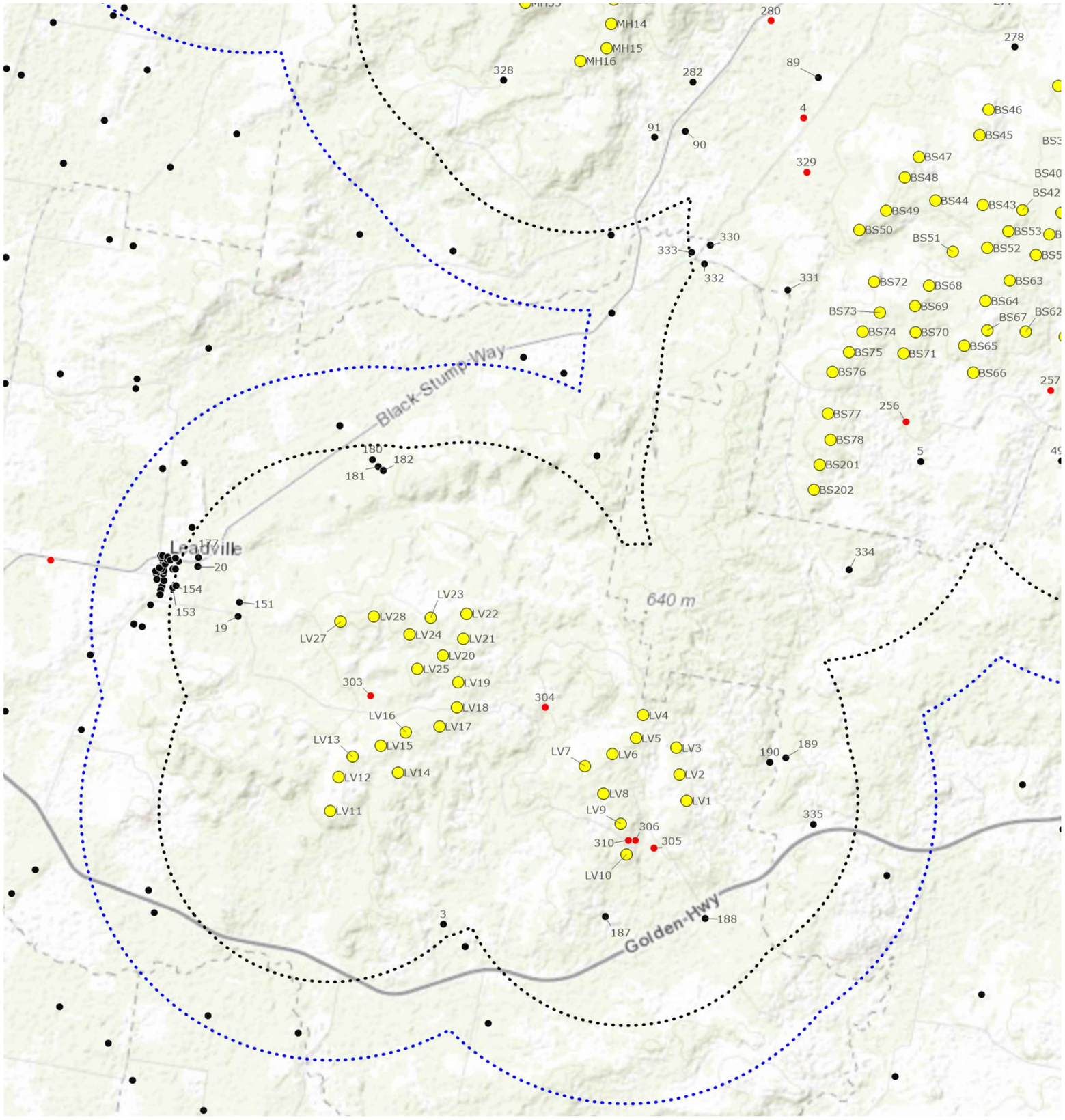
- *3.40 km*
- *4.95 km*

0 3km

Figure 5
Girragulang Road wind turbine cluster
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Legend

- Proposed wind turbine

Residential dwelling

- associated
- non associated

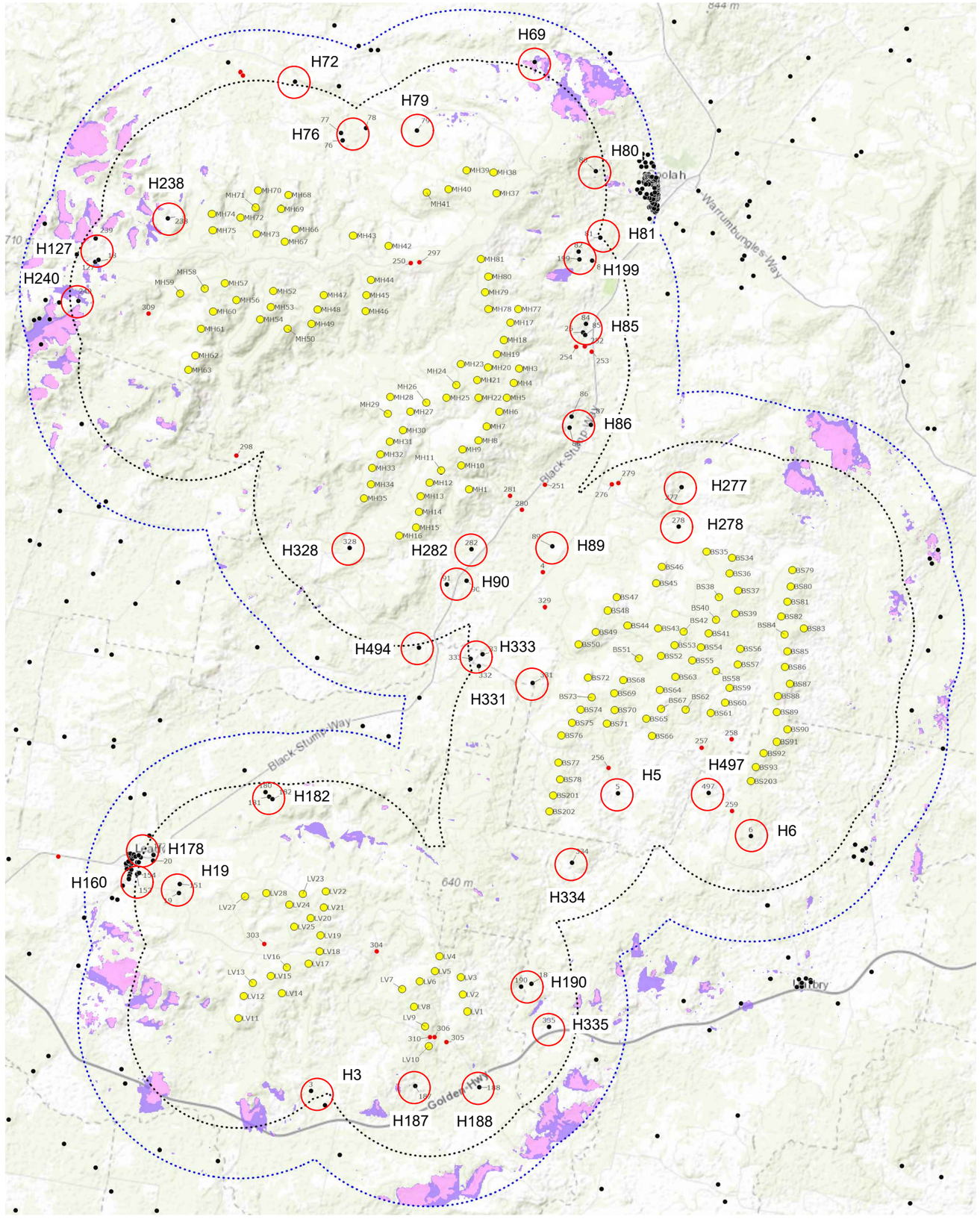
Distance buffer from proposed wind turbine

- *3.40 km*
- *4.95 km*

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Figure 6
Leadville wind turbine cluster
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Proposed wind turbine

Residential dwelling

- associated
- non associated

Distance buffer from proposed wind turbine

- *3.40 km*
- *4.95 km*

areas where turbines are visible above the nacelle only

areas where turbines are not visible

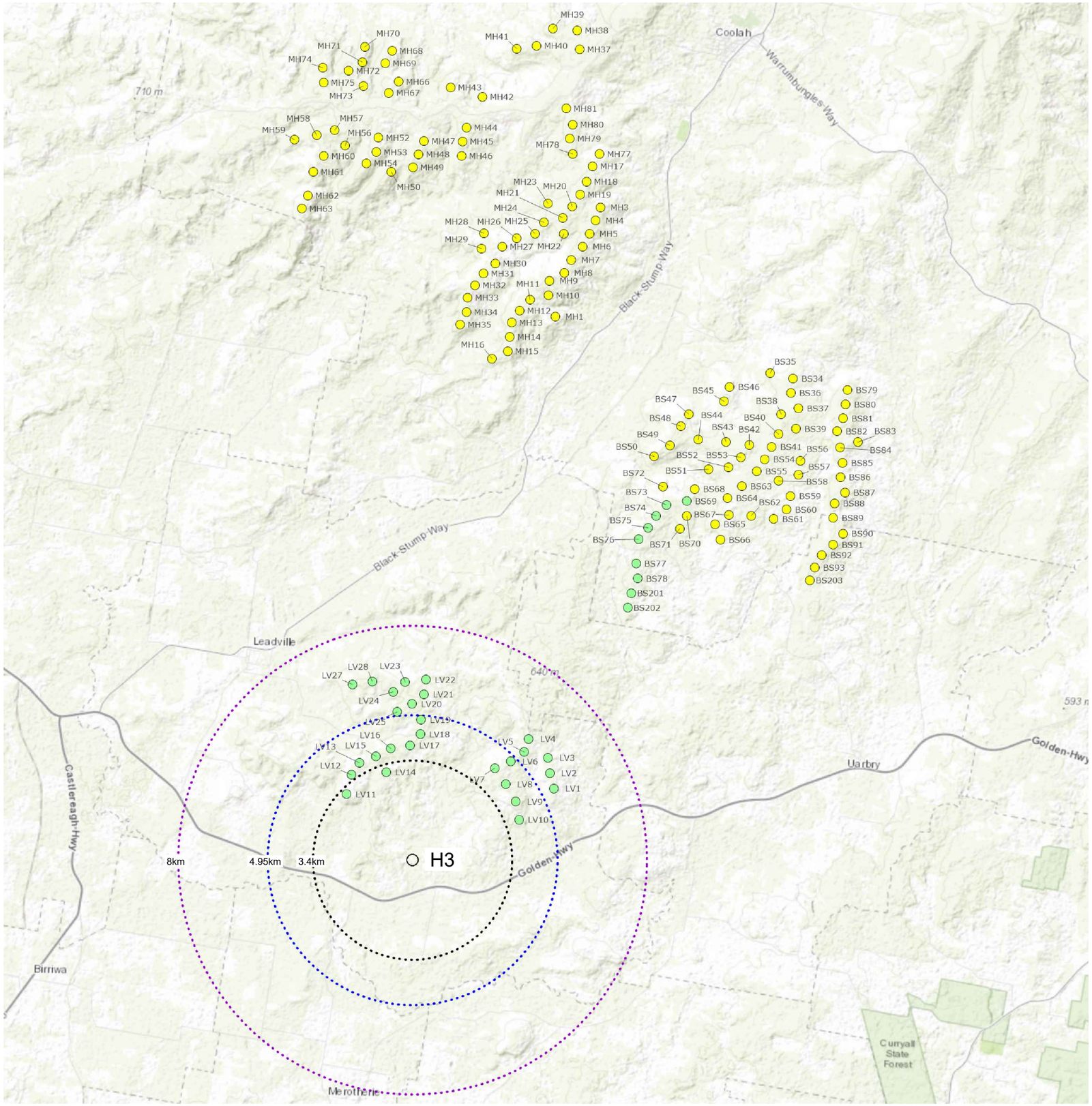
representative dwelling view location generally within 3.4km of a wind turbine

0 5km

Figure 7
Dwelling Magnitude Tool - wind turbine visibility

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

GREEN BEAN DESIGN
landscape architects



Legend

○ Non associated residential dwelling

Distance buffer from dwelling

3.40 km

4.95 km

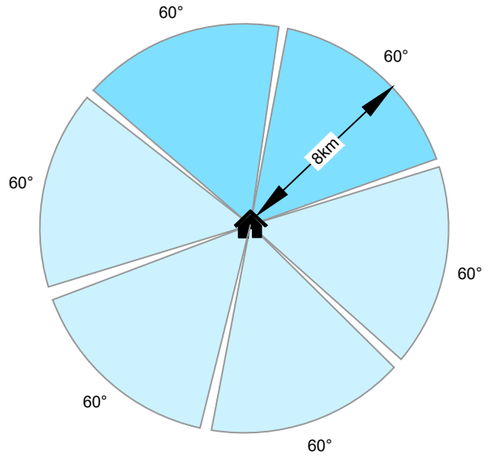
8.00 km

Proposed wind turbine

visible

not visible

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

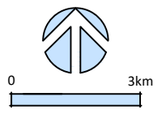


Figure 8
Representative location H3
Residential dwellings - multiple wind turbine tool

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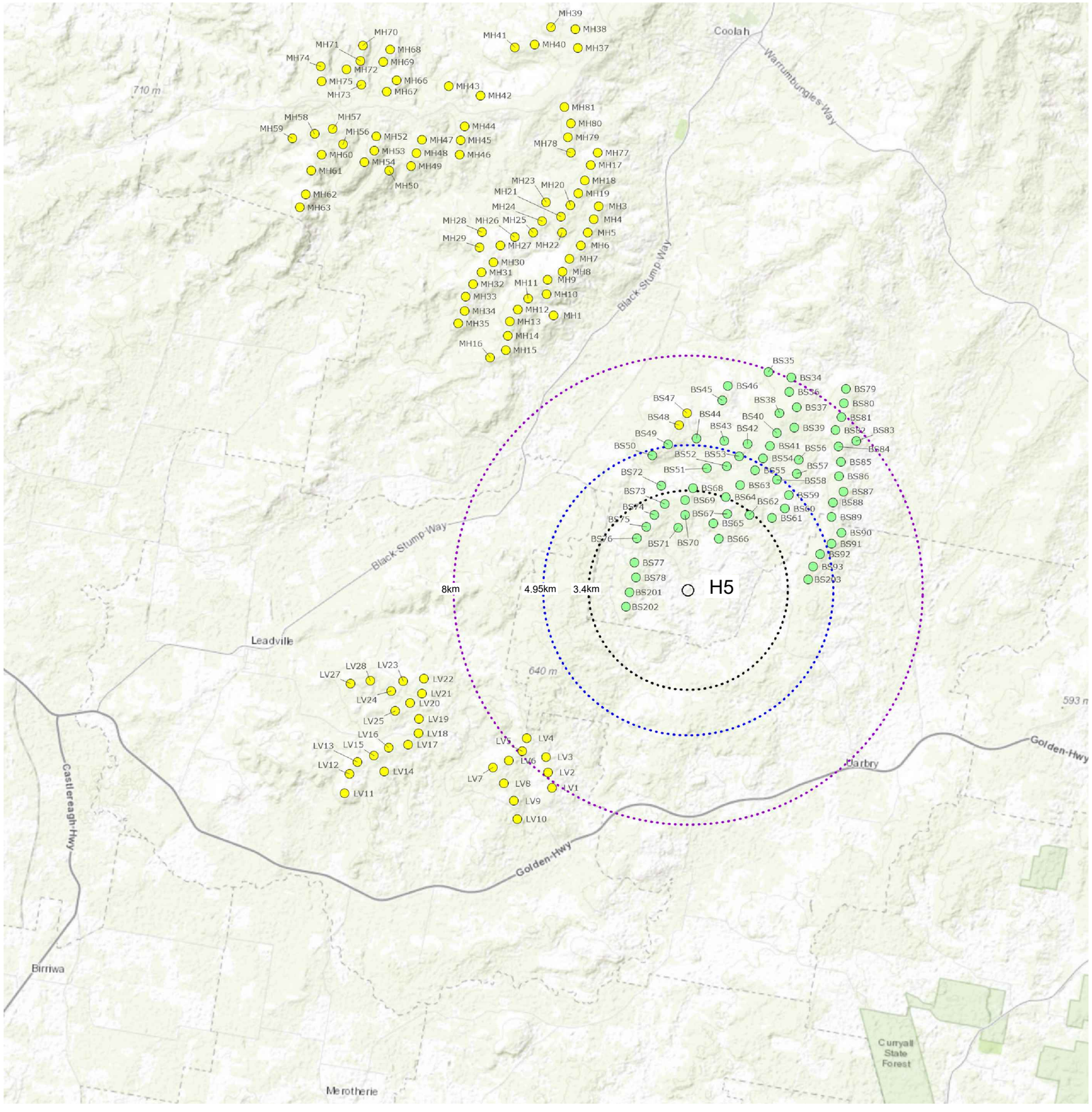
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Legend

- Non associated residential dwelling

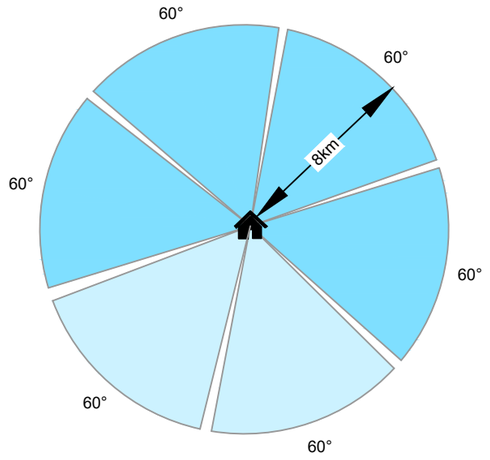
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

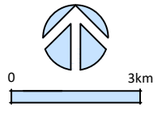


Figure 9
Representative location H5
Residential dwellings -
multiple wind turbine tool

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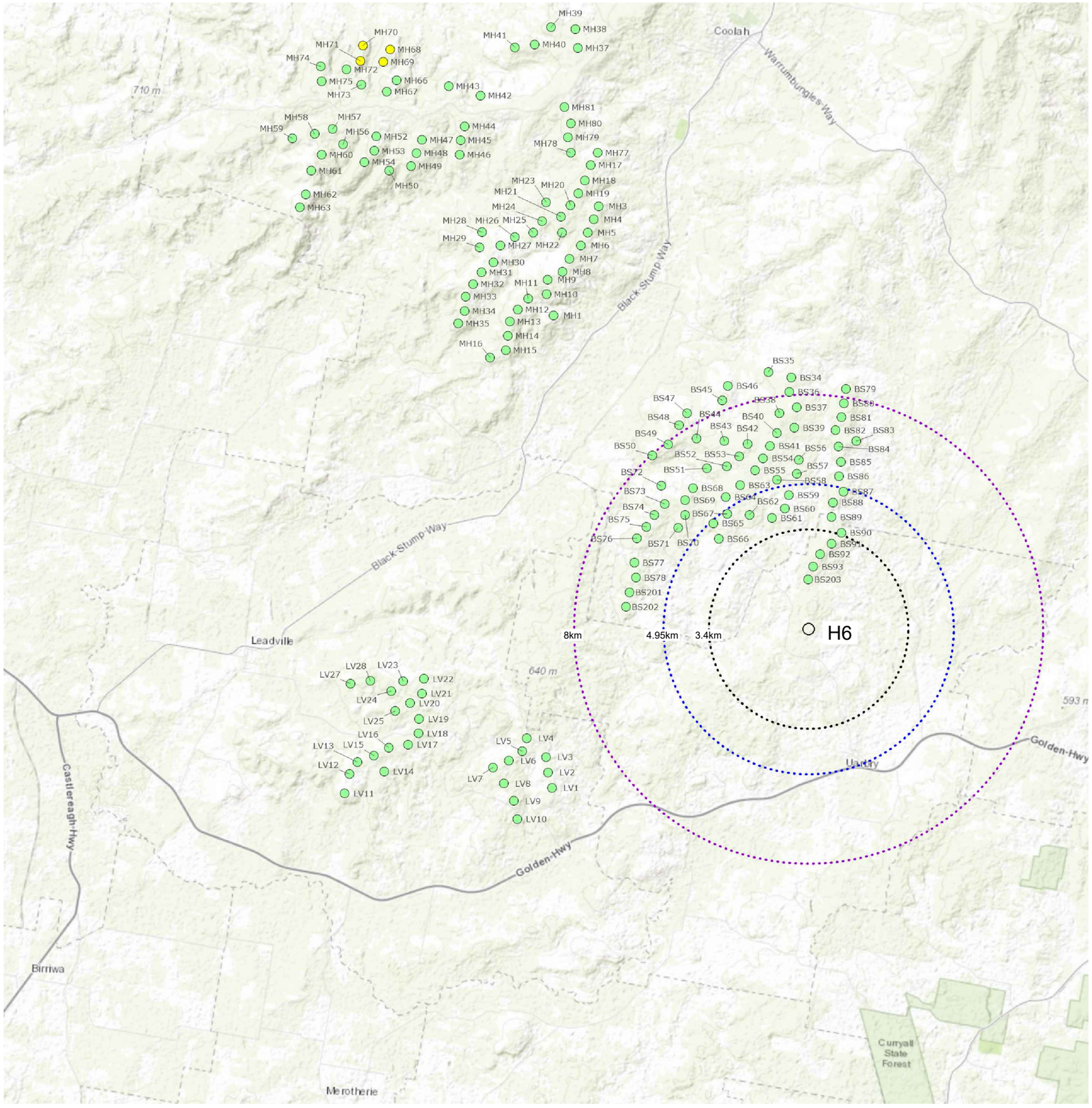
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Legend

- Non associated residential dwelling

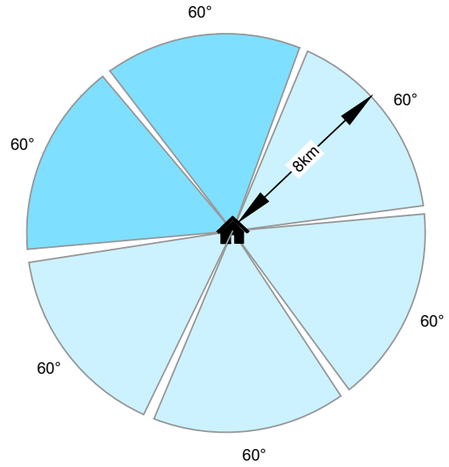
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

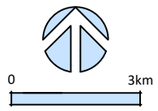


Figure 10
Representative location H6
Residential dwellings - multiple wind turbine tool

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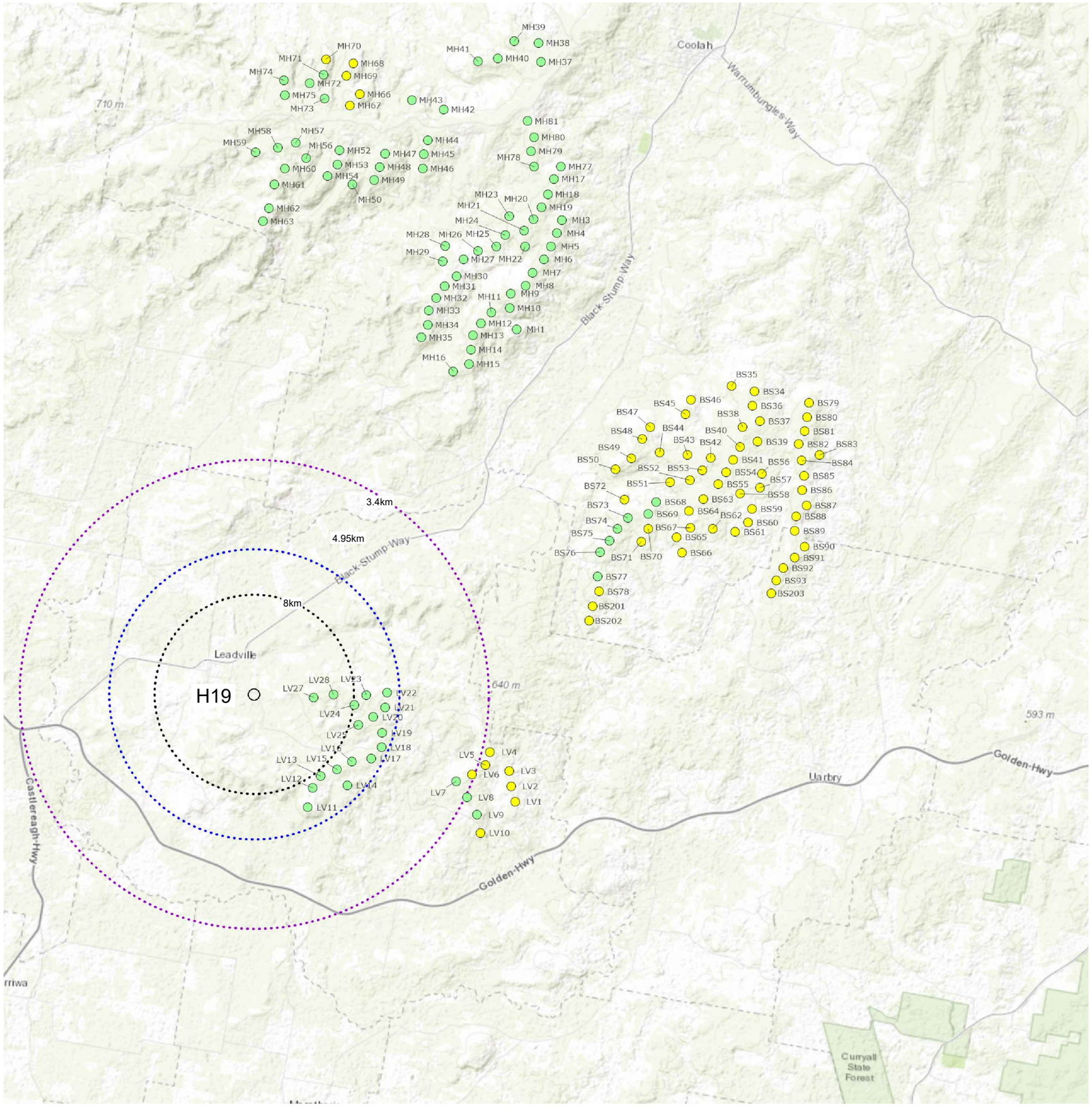
landscape architects

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

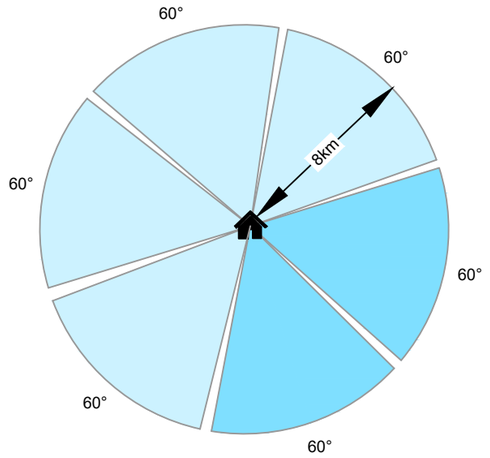
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

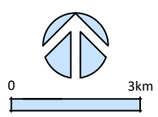


Figure 11
Representative location H19
Residential dwellings -
multiple wind turbine tool

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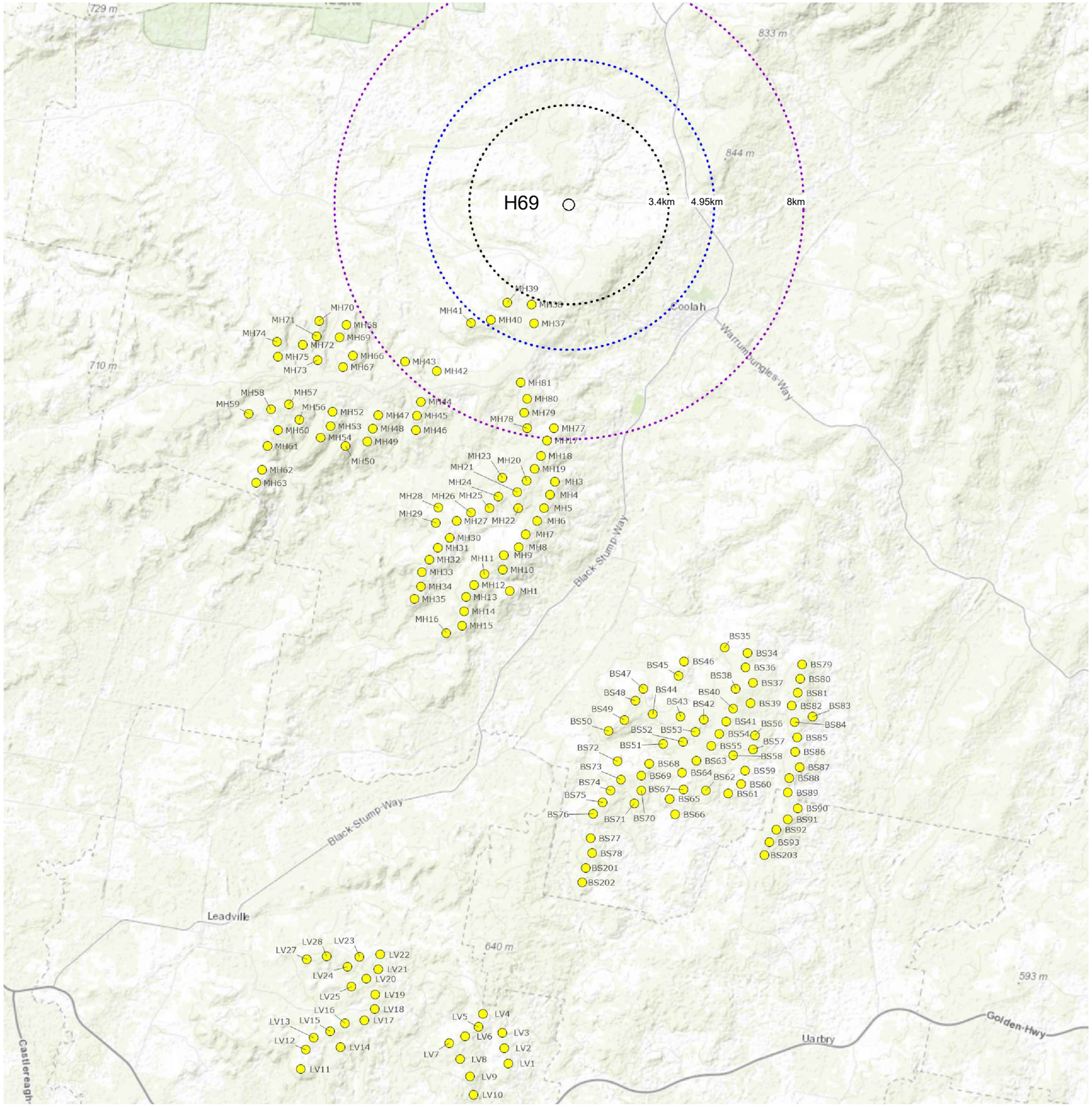
Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Legend

- Non associated residential dwelling

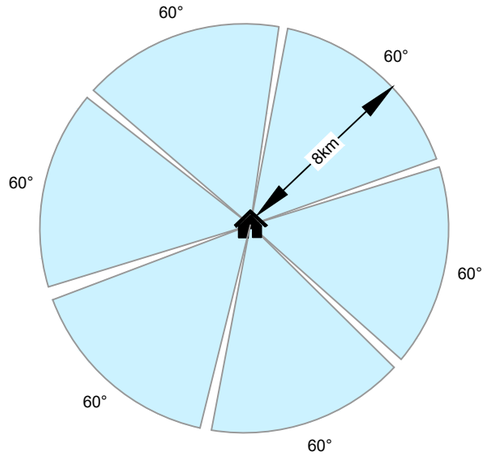
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

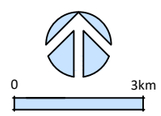


Figure 12
Representative location H69
Residential dwellings -
multiple wind turbine tool

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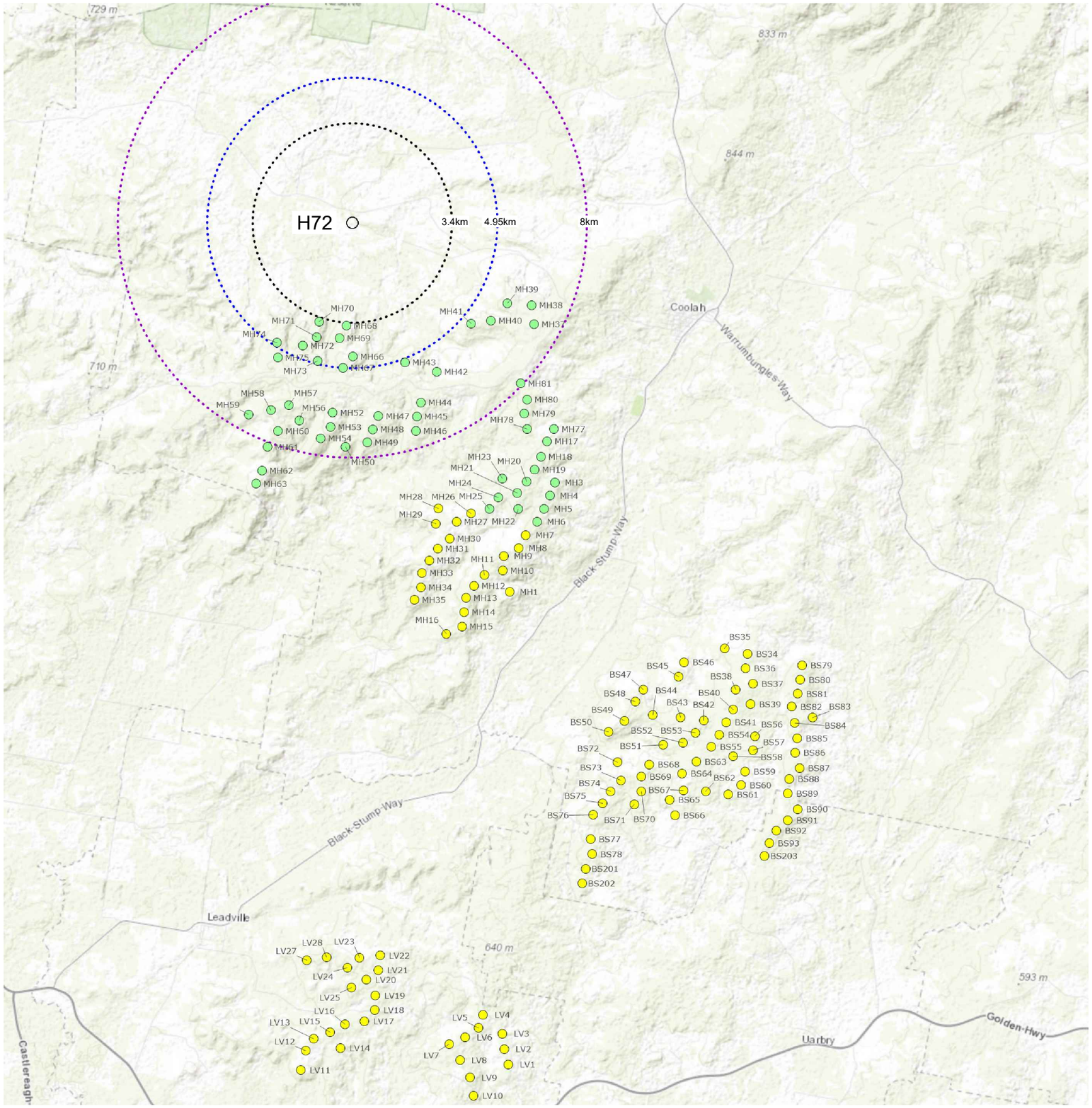
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

○ Non associated residential dwelling

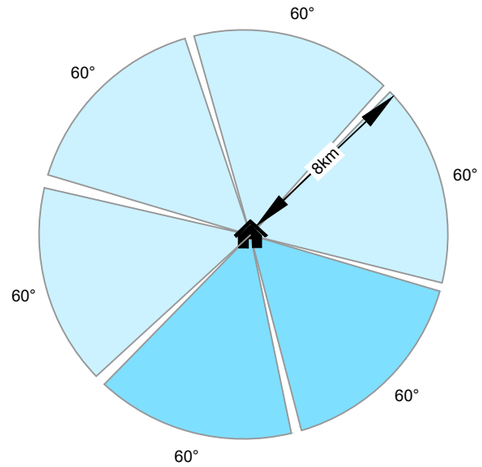
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

0 3km

Figure 13
Representative location H72
Residential dwellings -
multiple wind turbine tool

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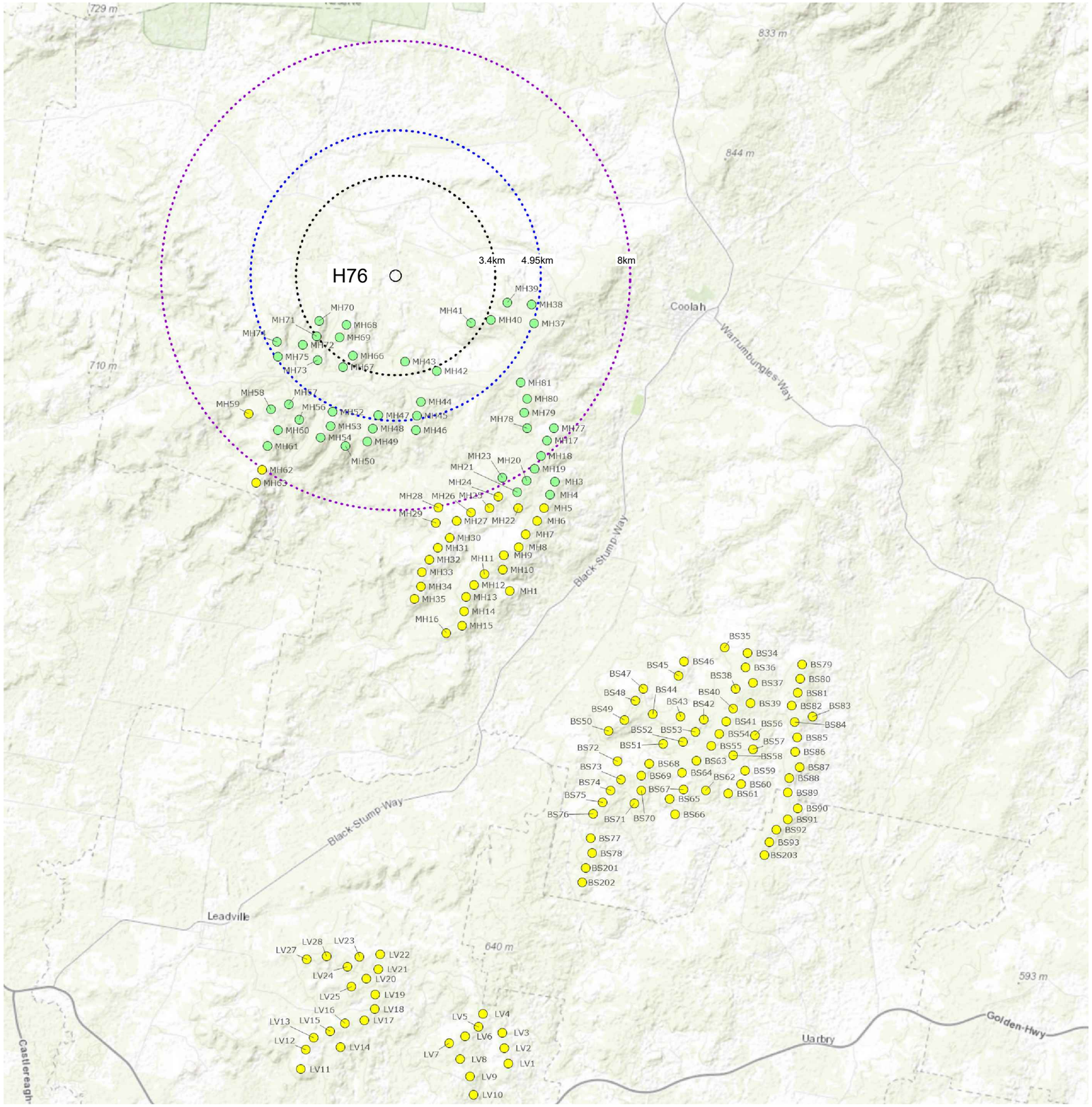
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Non associated residential dwelling

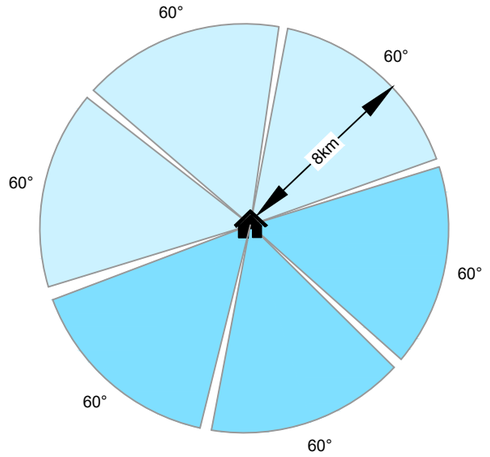
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

0 3km

Figure 14
Representative location H76
Residential dwellings -
multiple wind turbine tool

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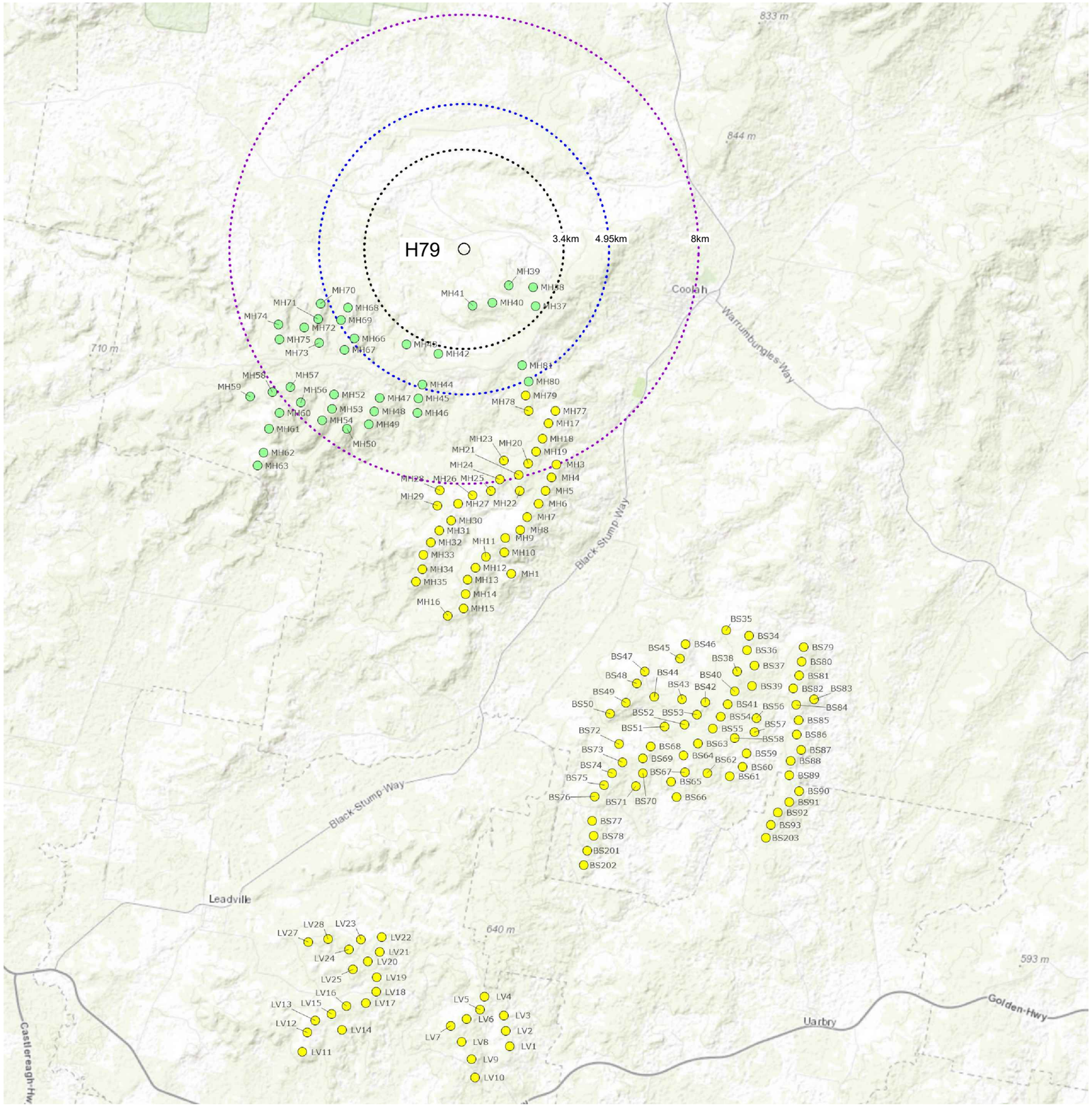
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

○ Non associated residential dwelling

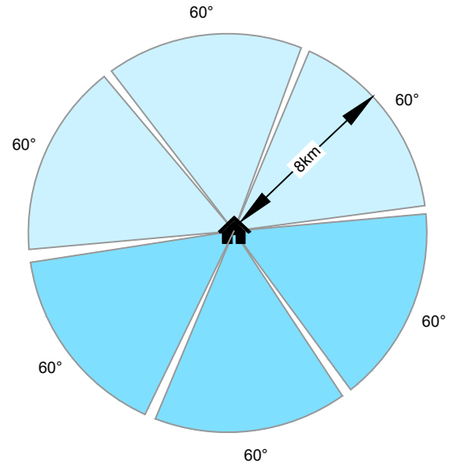
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

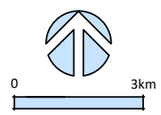


Figure 15
Representative location H79
Residential dwellings -
multiple wind turbine tool

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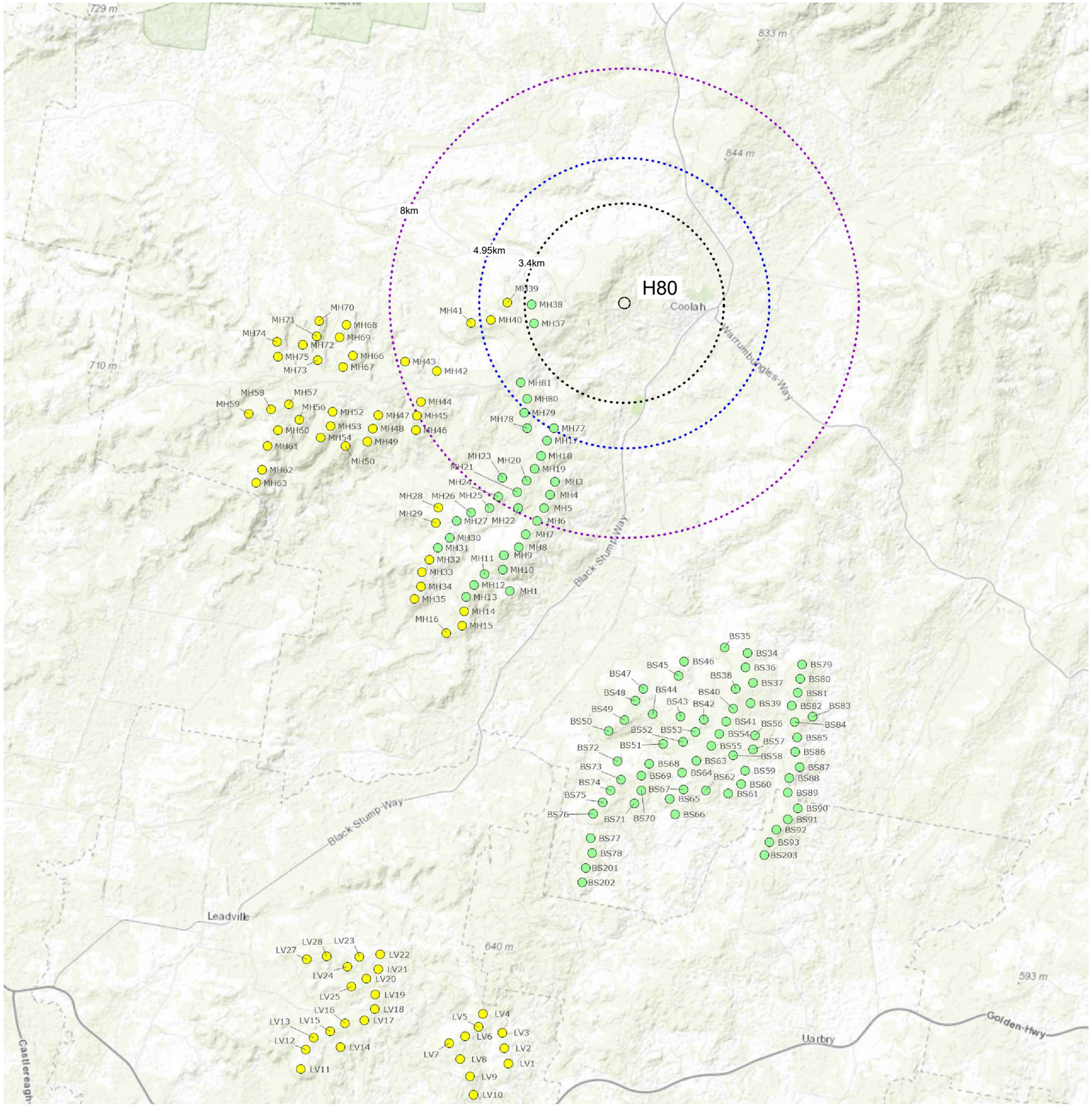
Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

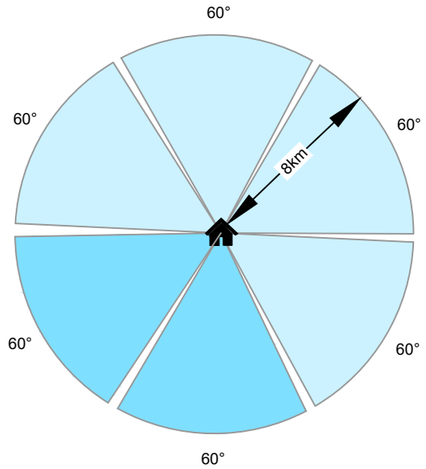
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

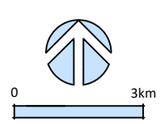


Figure 16
Representative location H80
Residential dwellings -
multiple wind turbine tool

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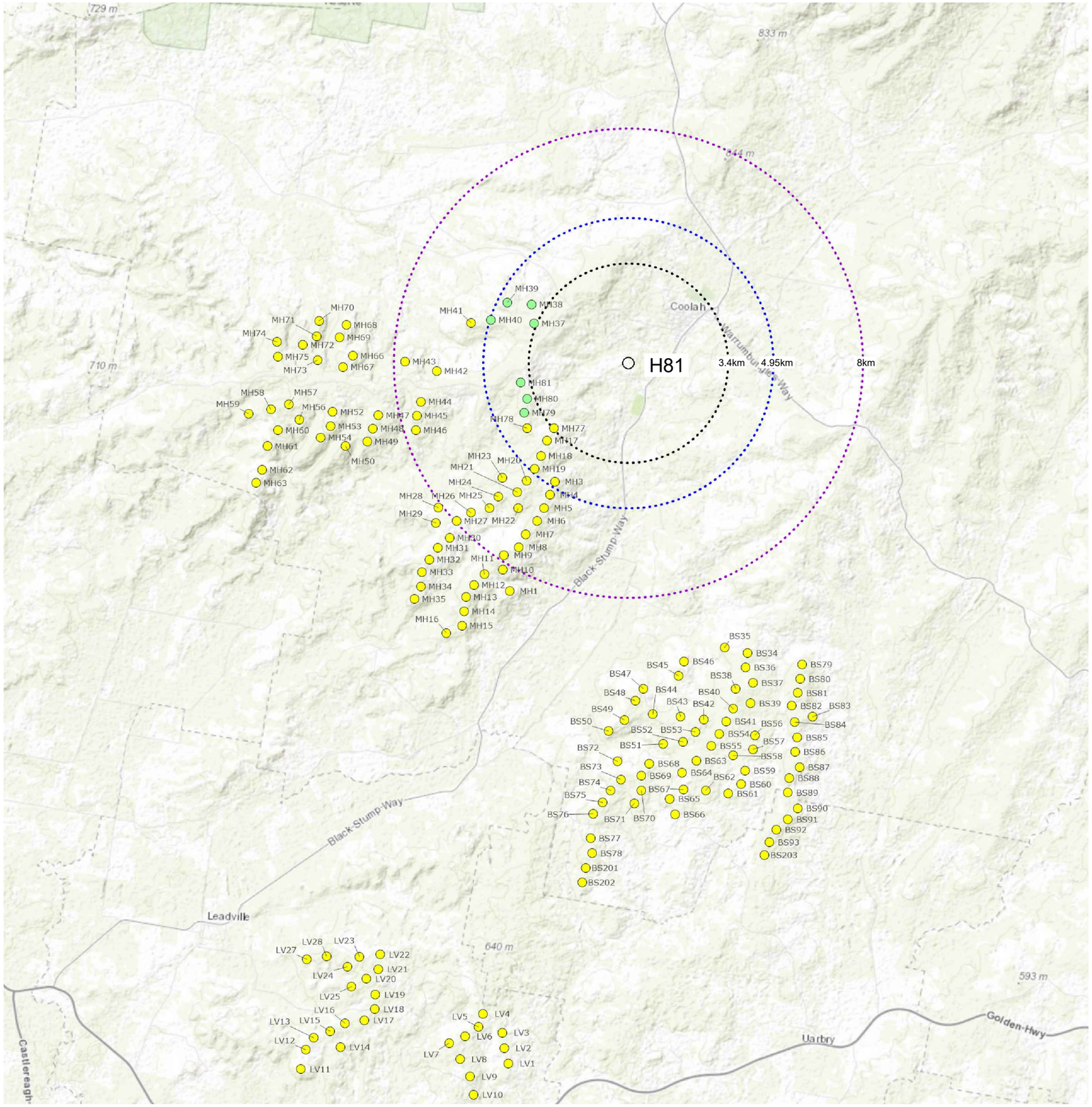
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Legend

- Non associated residential dwelling

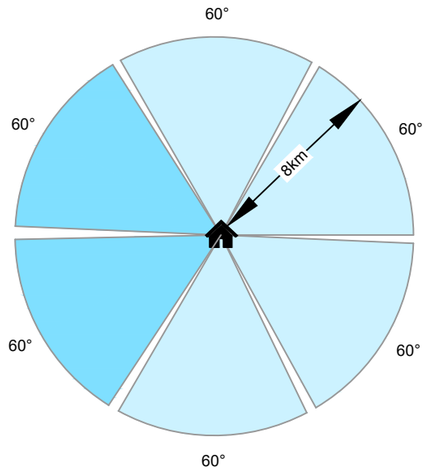
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

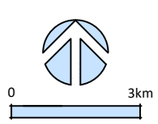
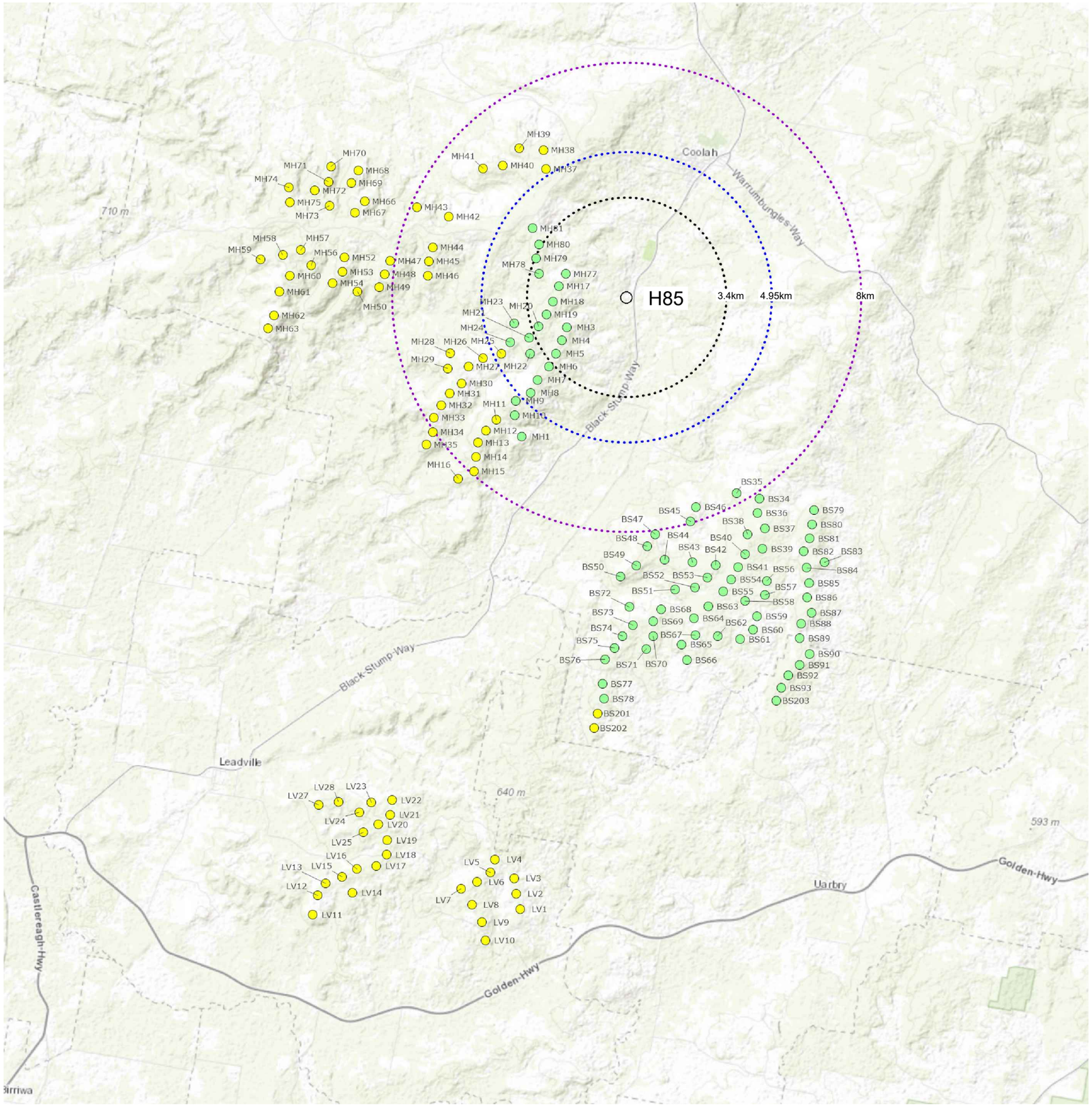


Figure 17
Representative location H81
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Non associated residential dwelling

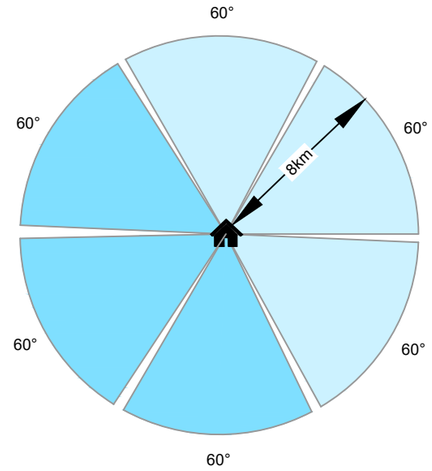
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

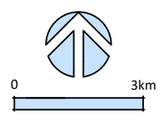
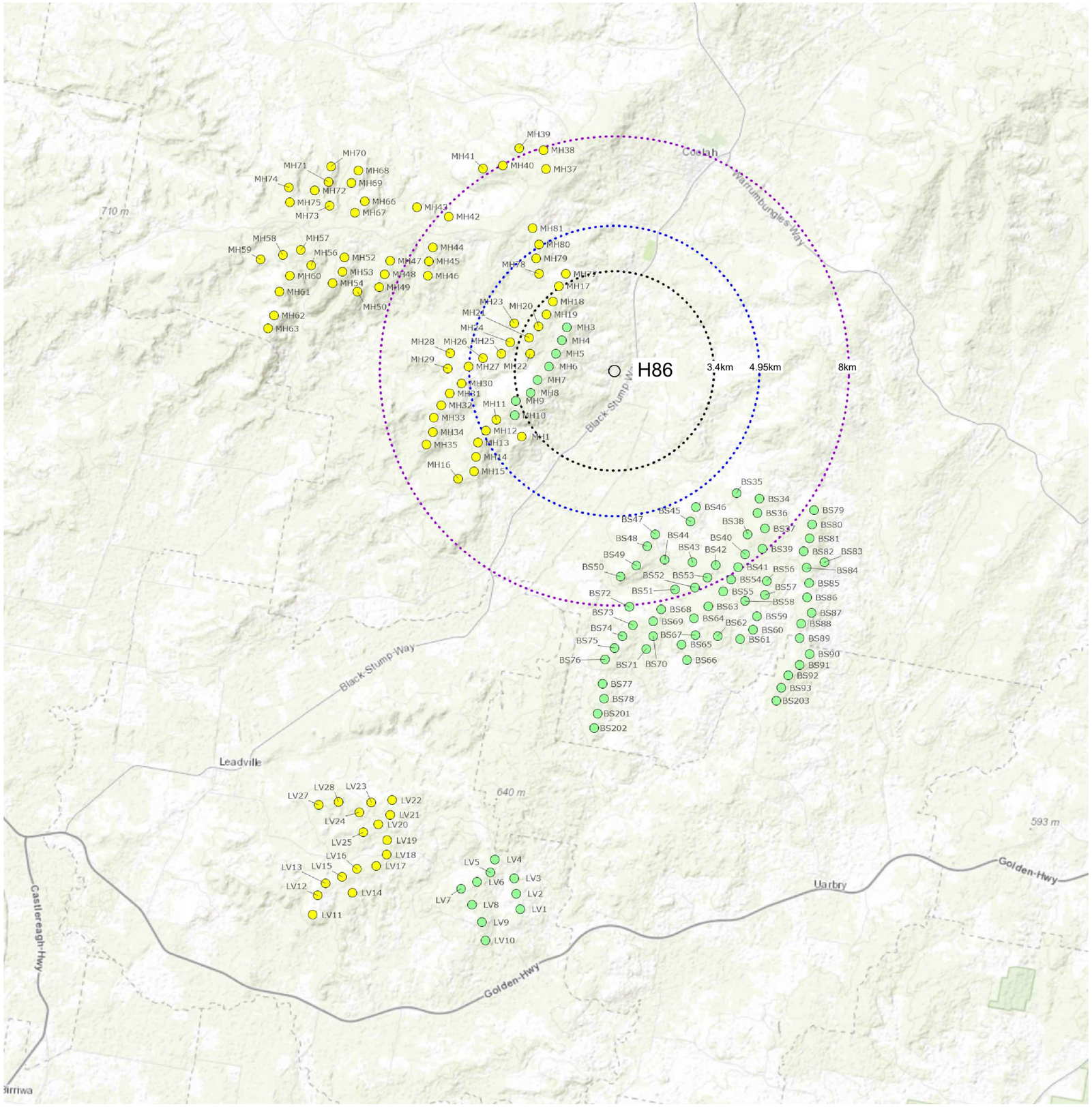


Figure 18
Representative location H85
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Non associated residential dwelling

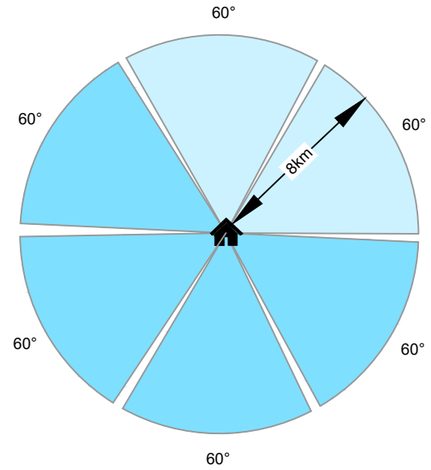
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

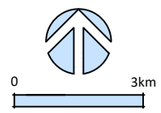
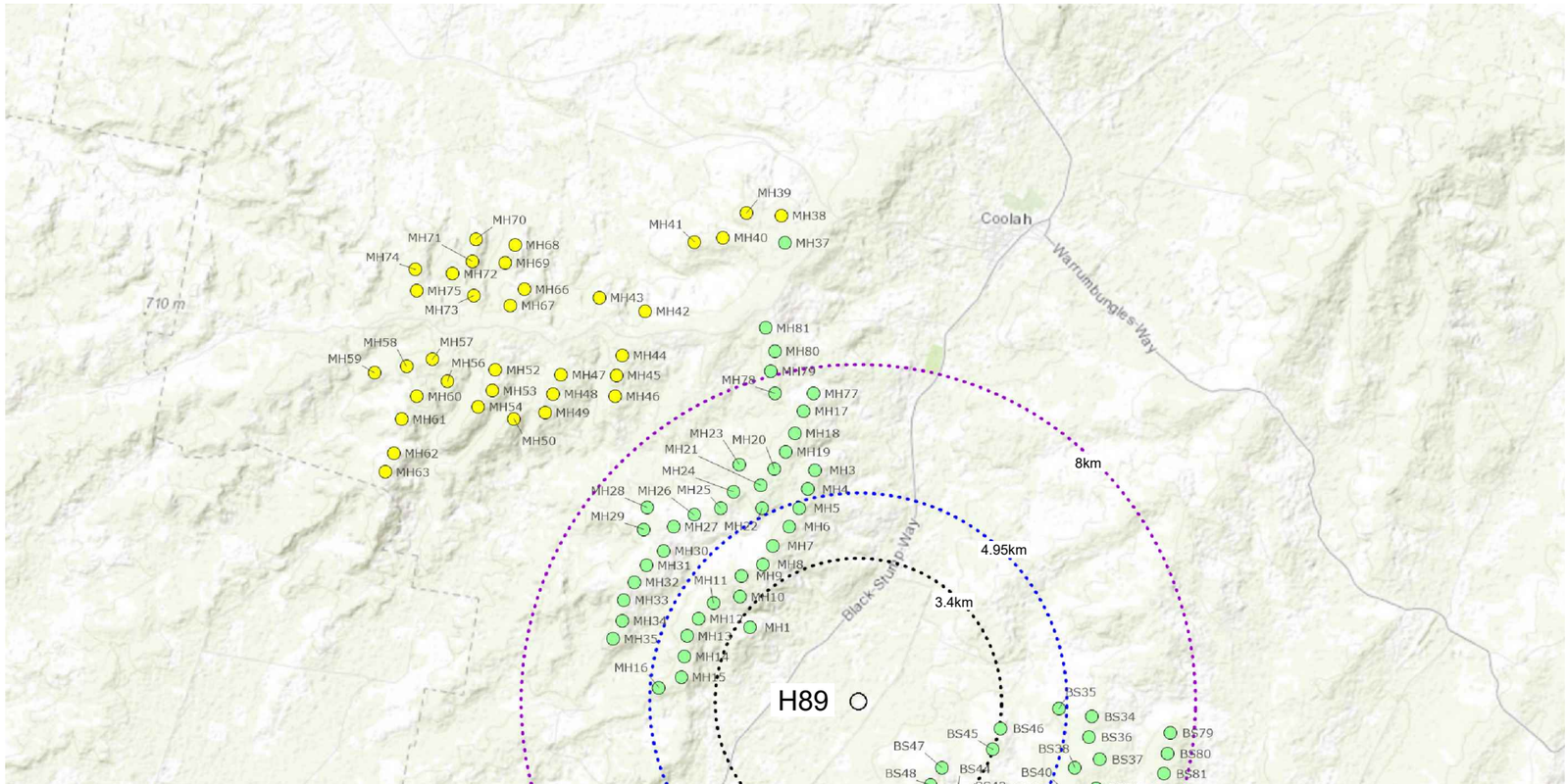


Figure 19
Representative location H86
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- ○ Non associated residential dwelling

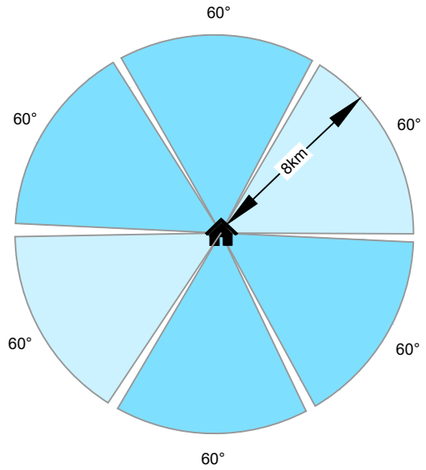
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

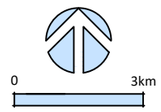
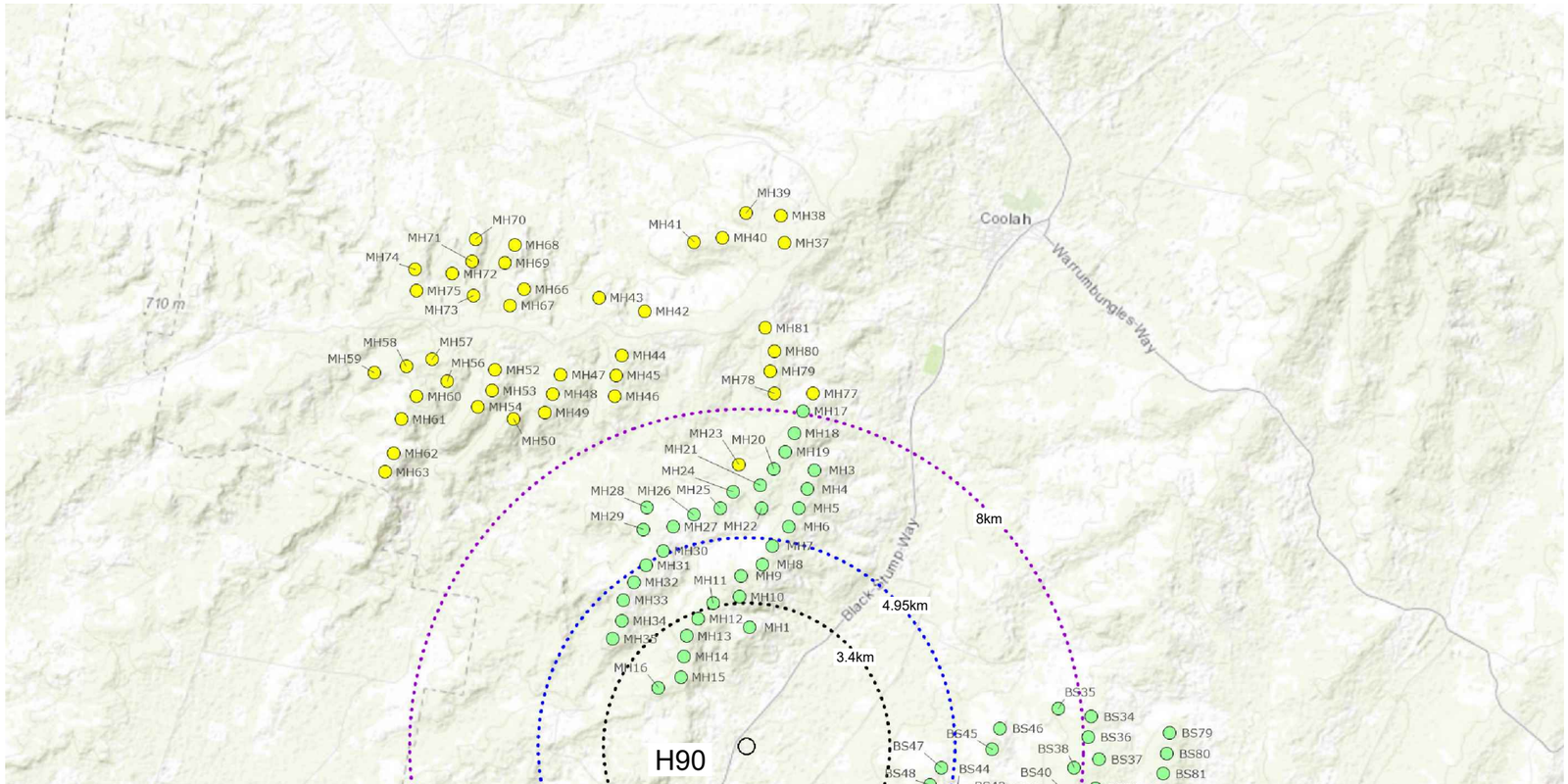


Figure 20
Representative location H89
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

- Non associated residential dwelling

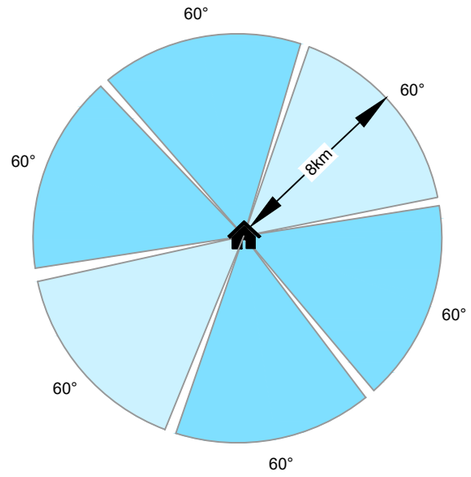
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

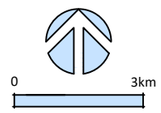
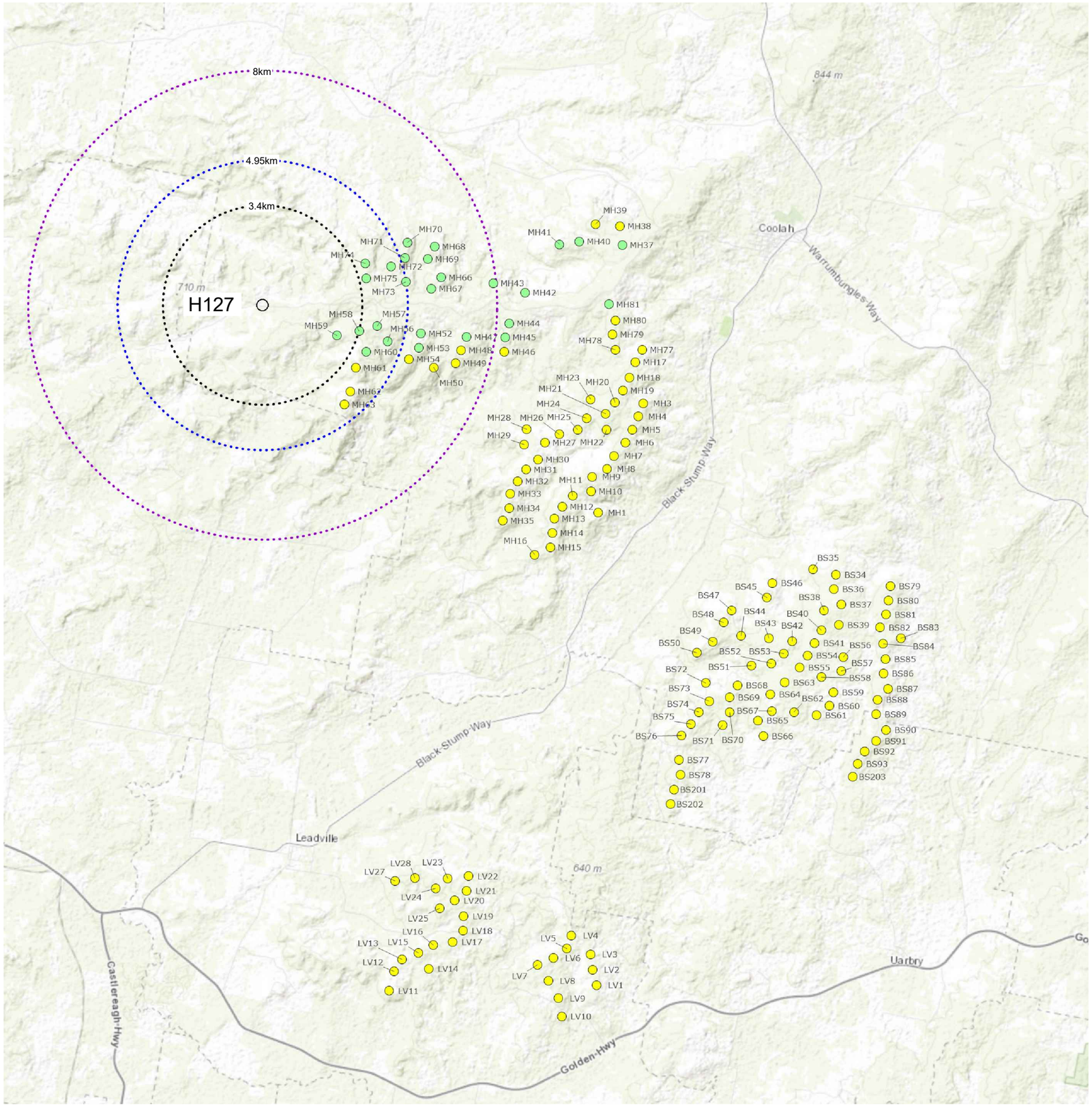


Figure 21
Representative location H90
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Non associated residential dwelling

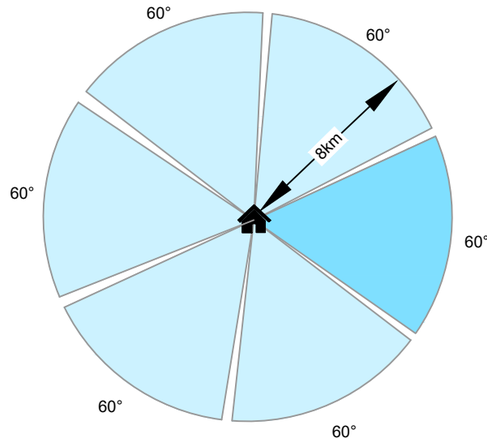
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



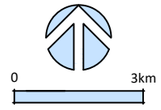
60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

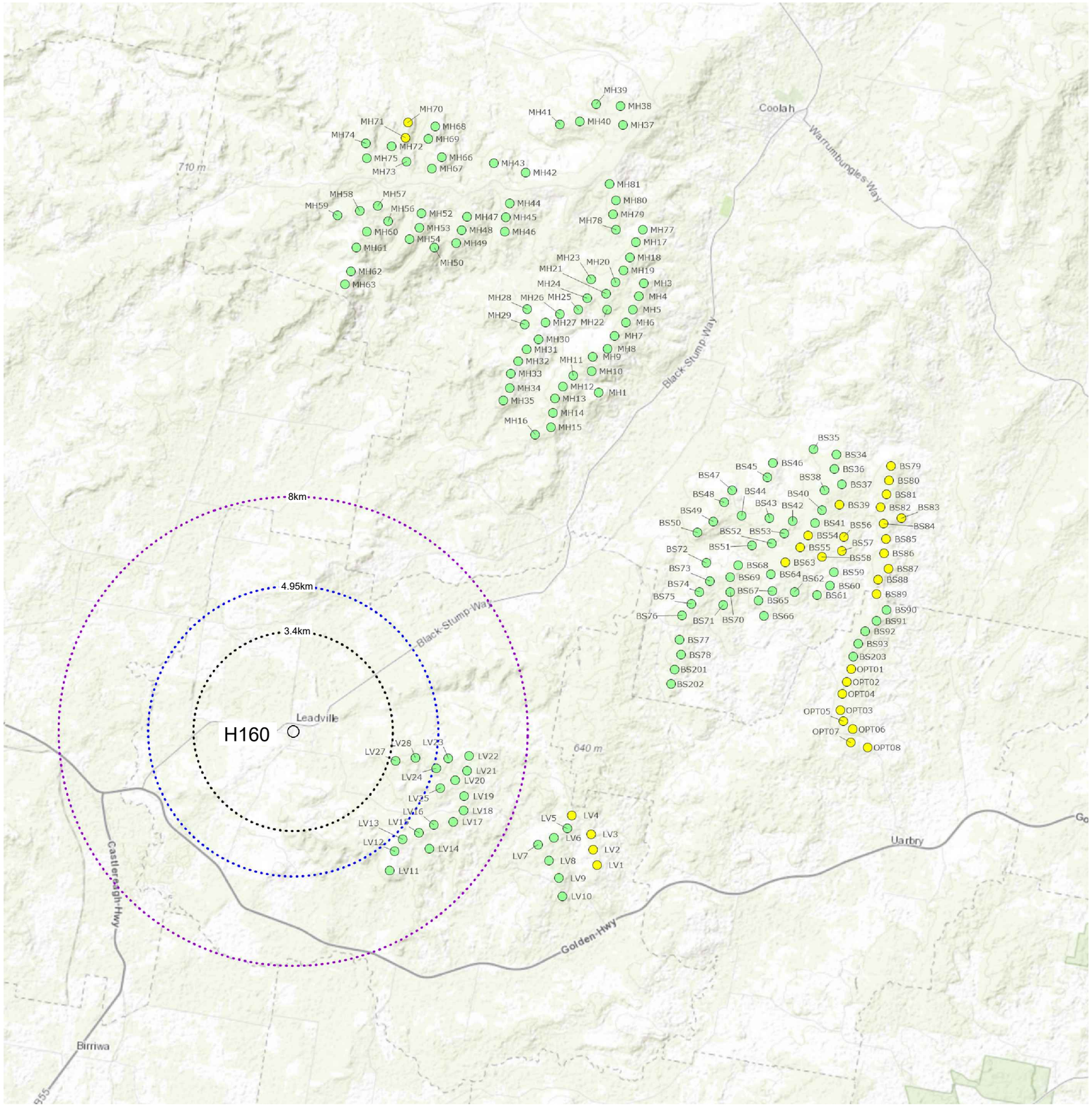
Figure 22
Representative location H127
Residential dwellings -
multiple wind turbine tool



GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

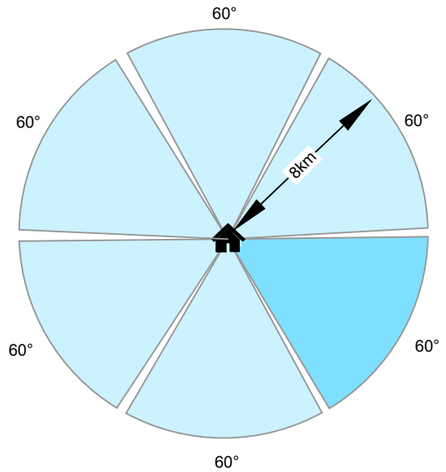
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

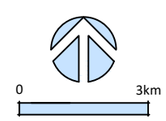
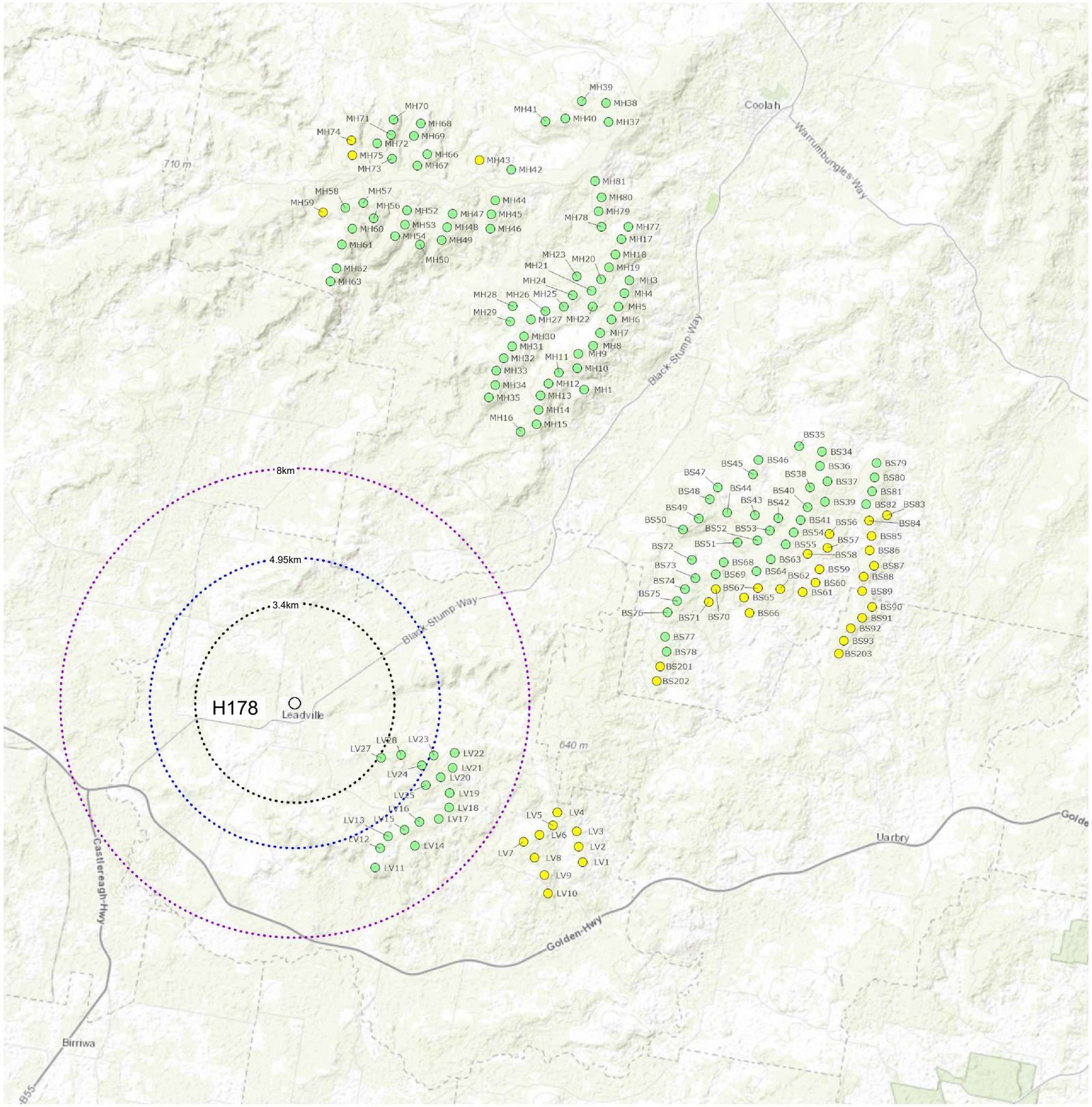


Figure 23
Representative location H160
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

- Non associated residential dwelling

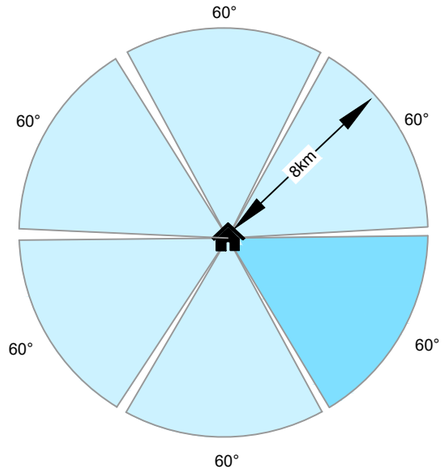
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

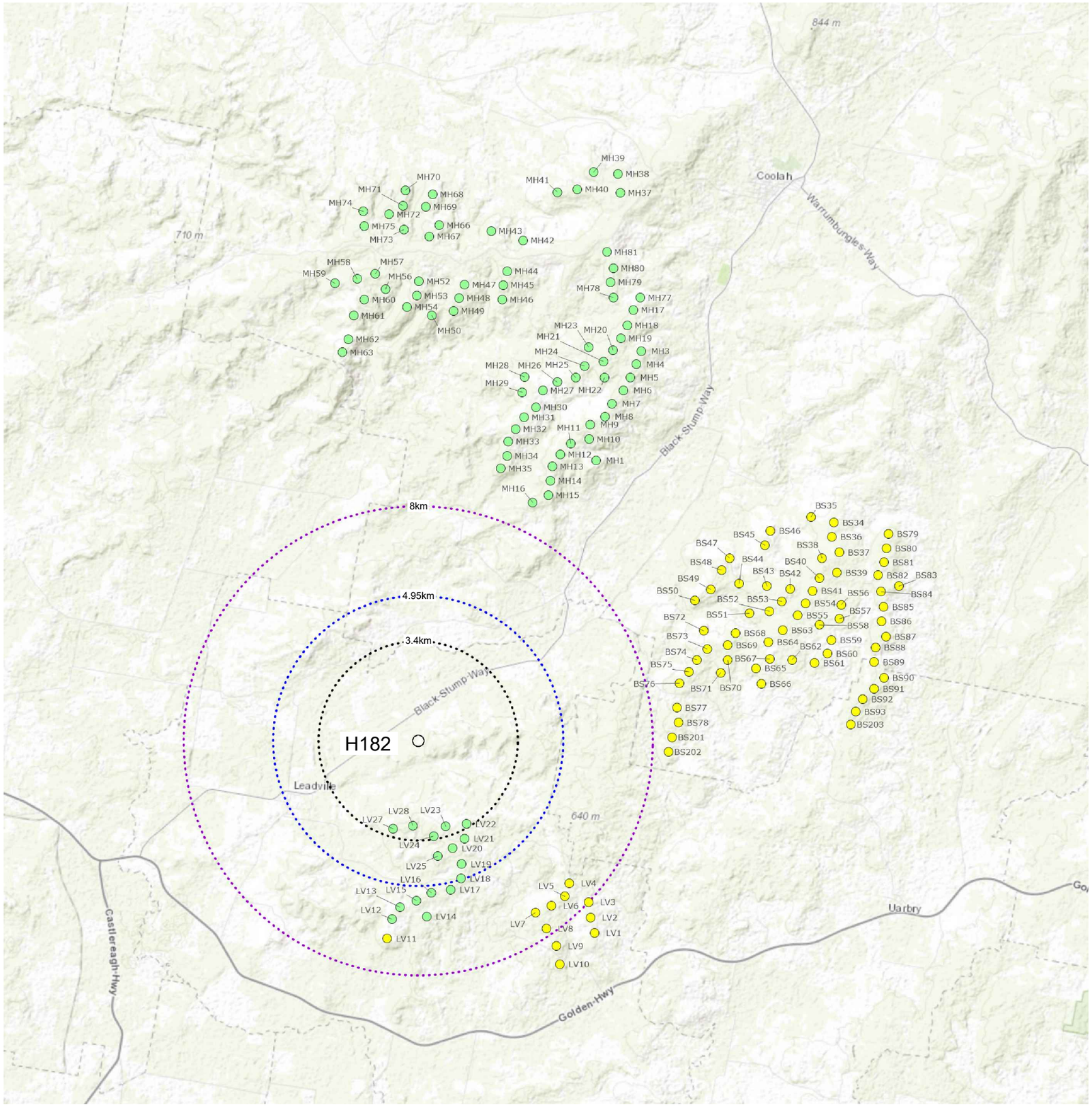
Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

0 3km

Figure 24
Representative location H178
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Legend

- Non associated residential dwelling

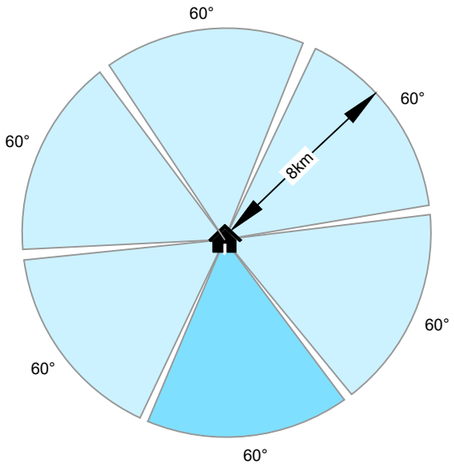
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

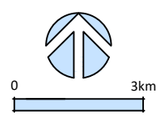
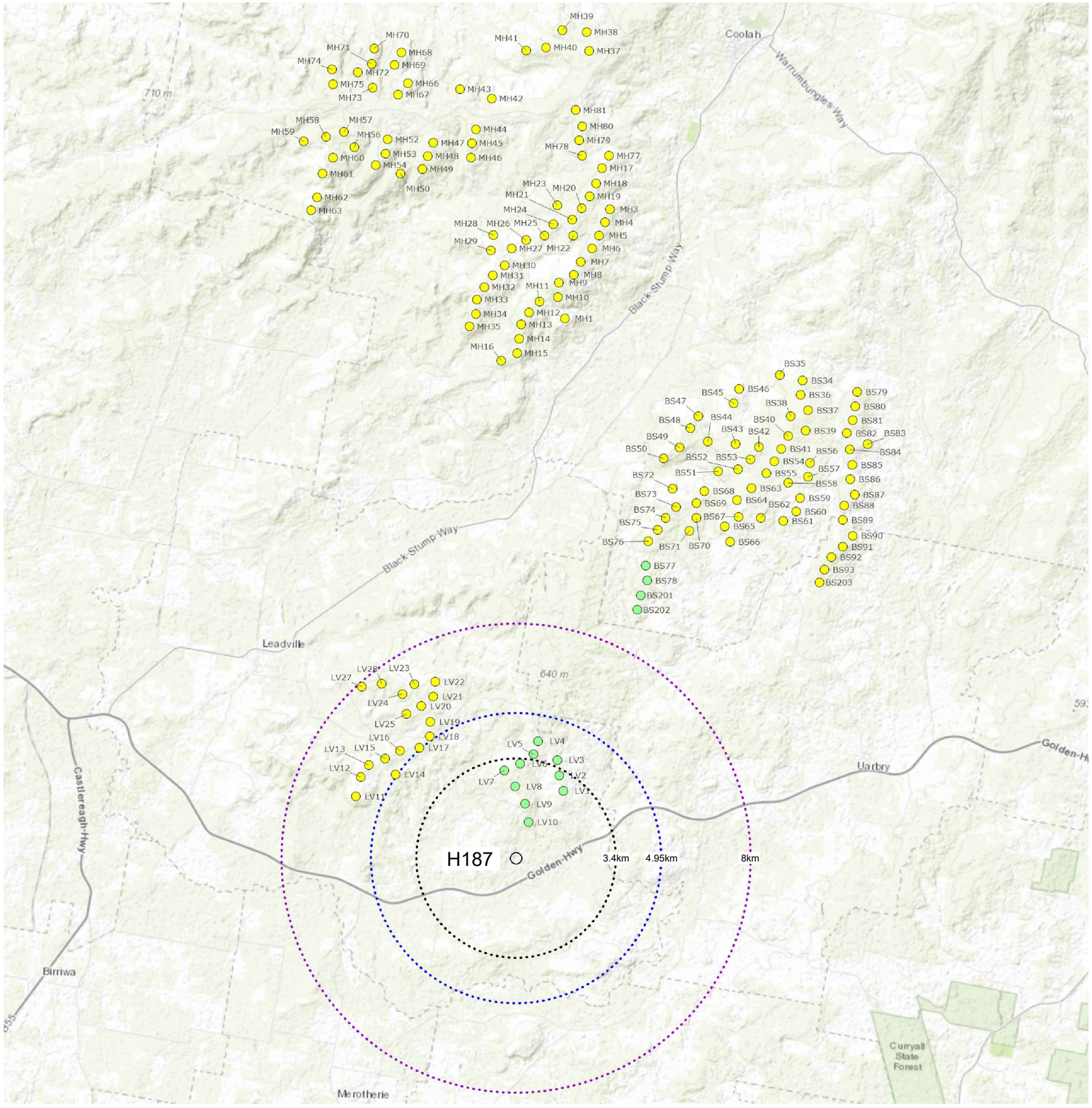


Figure 25
Representative location H182
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Legend

- ○ Non associated residential dwelling

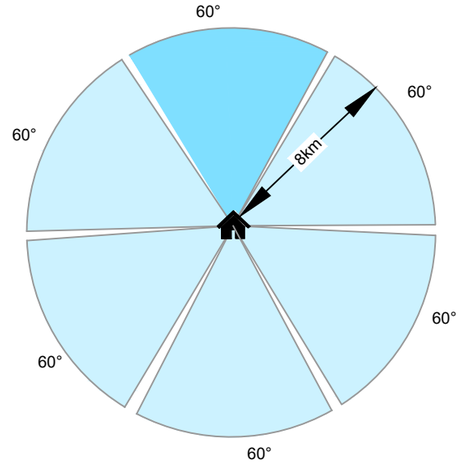
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

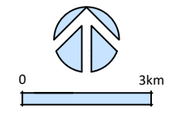
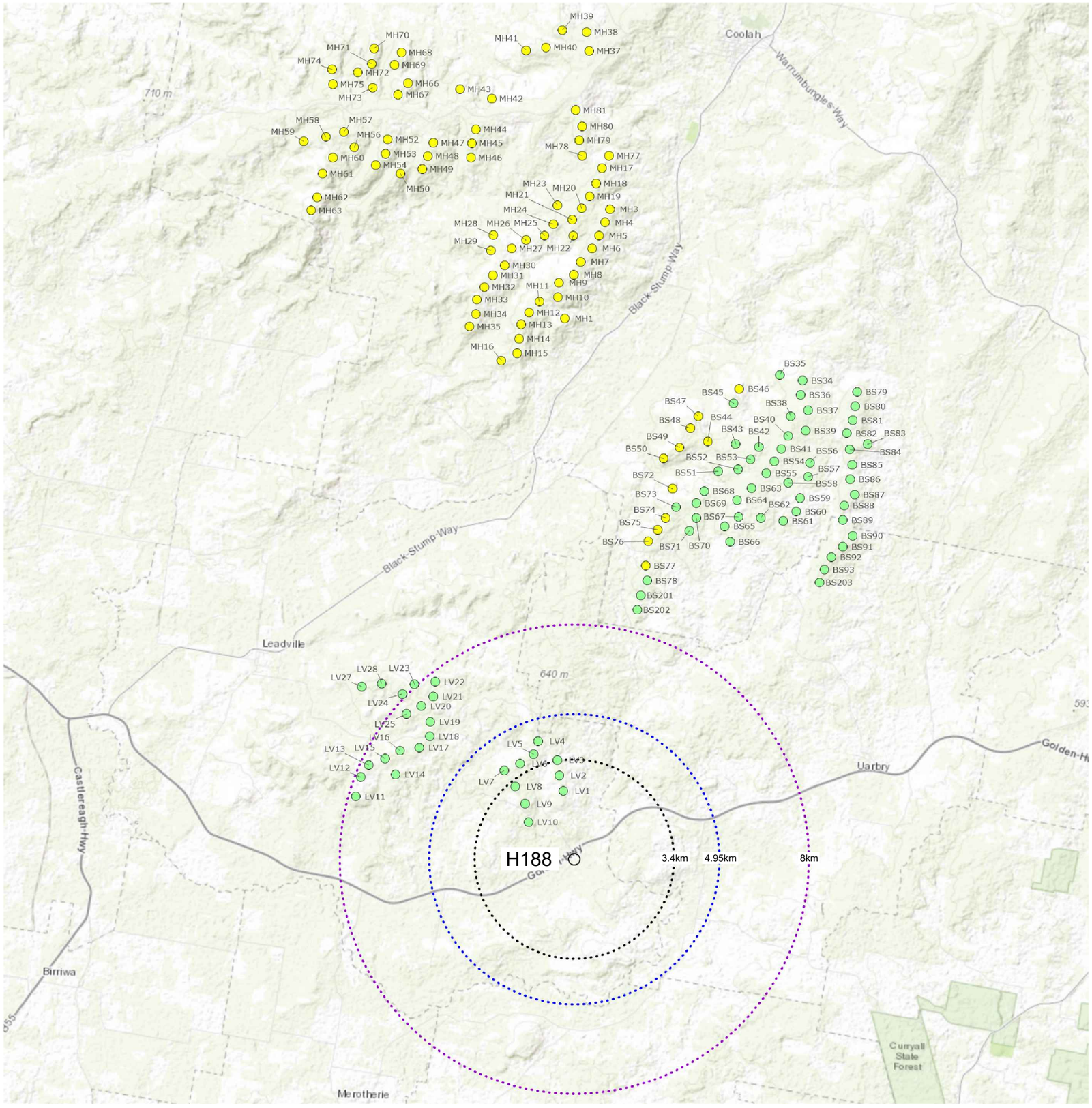


Figure 26
Representative location H187
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

○ Non associated residential dwelling

Distance buffer from dwelling

3.40 km

4.95 km

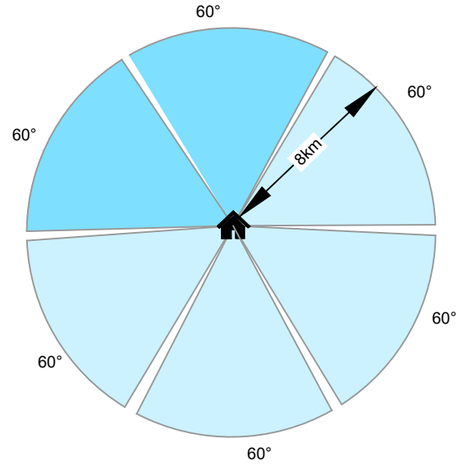
8.00 km

Proposed wind turbine

visible

not visible

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

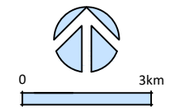
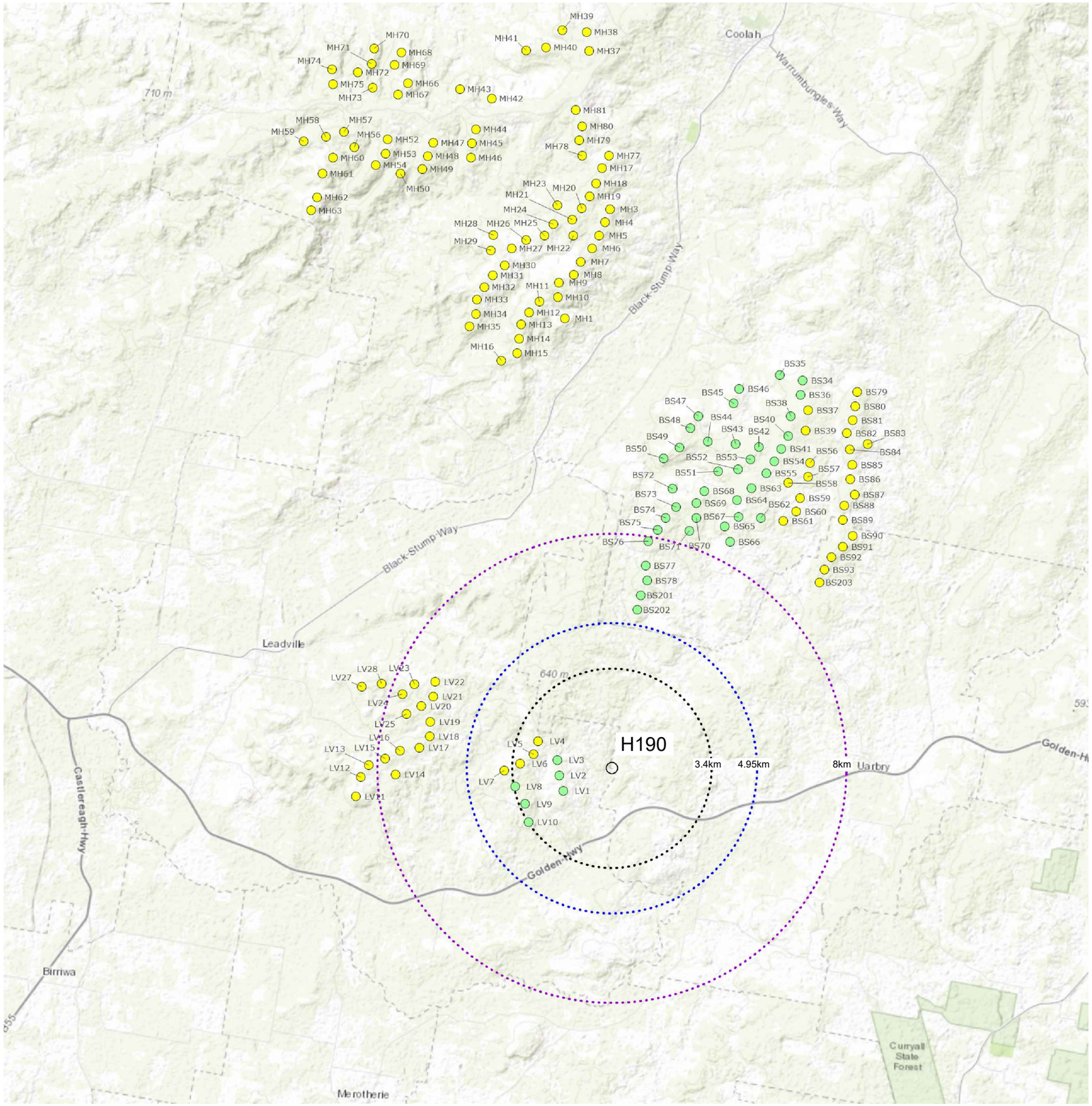


Figure 27
Representative location H188
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

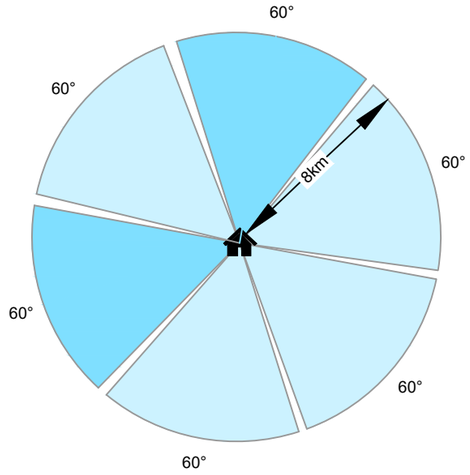
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

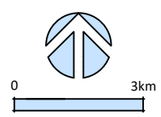
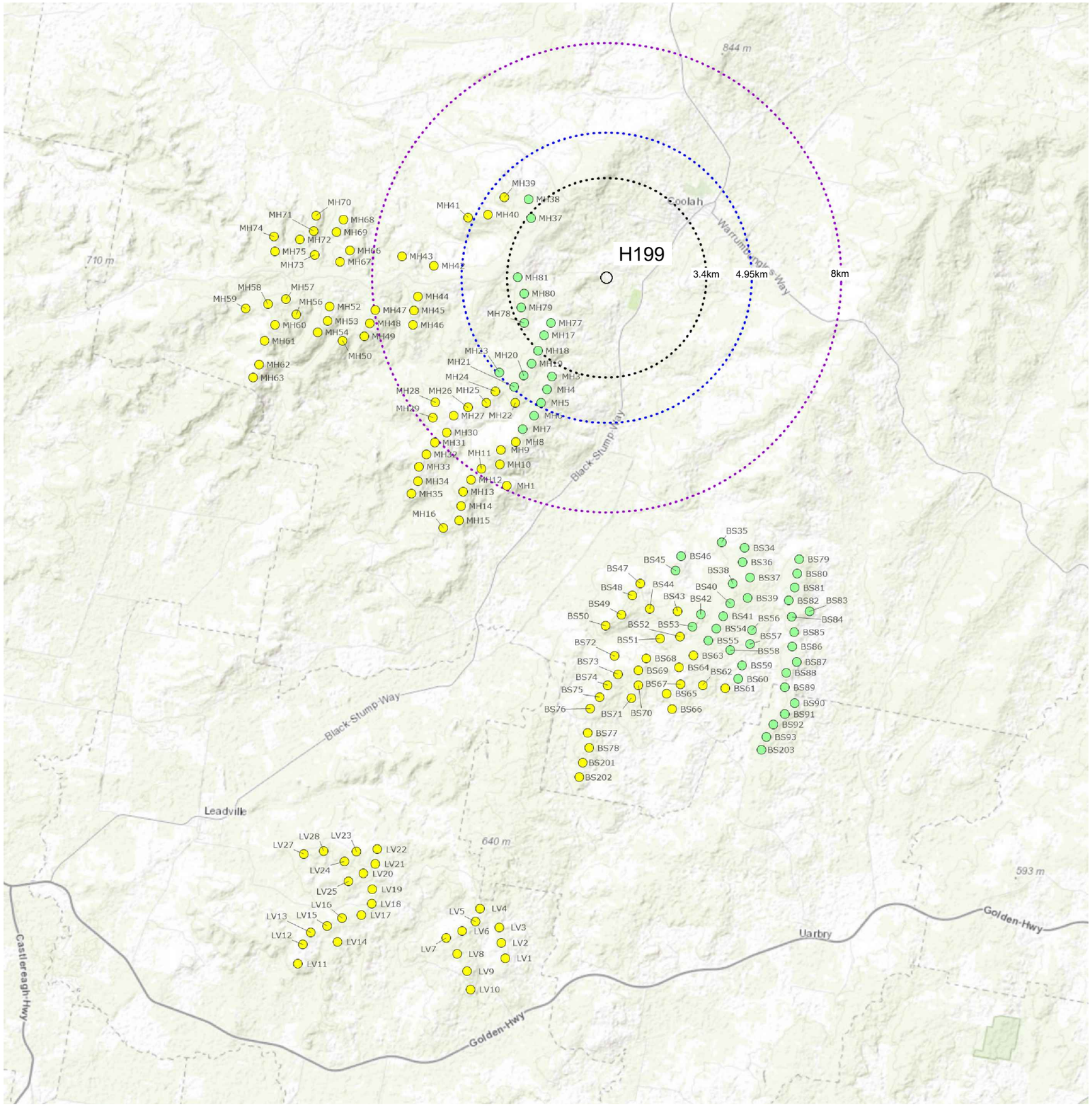


Figure 28
Representative location H190
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

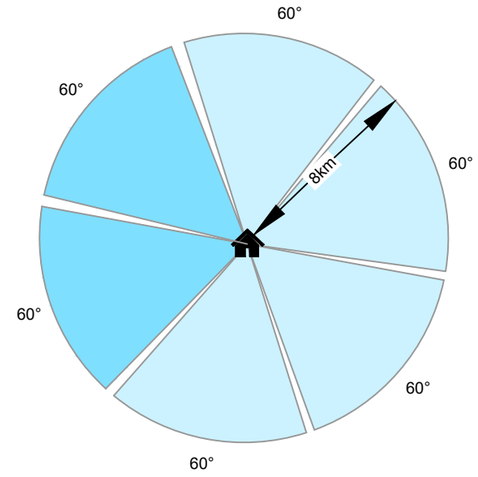
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

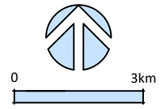
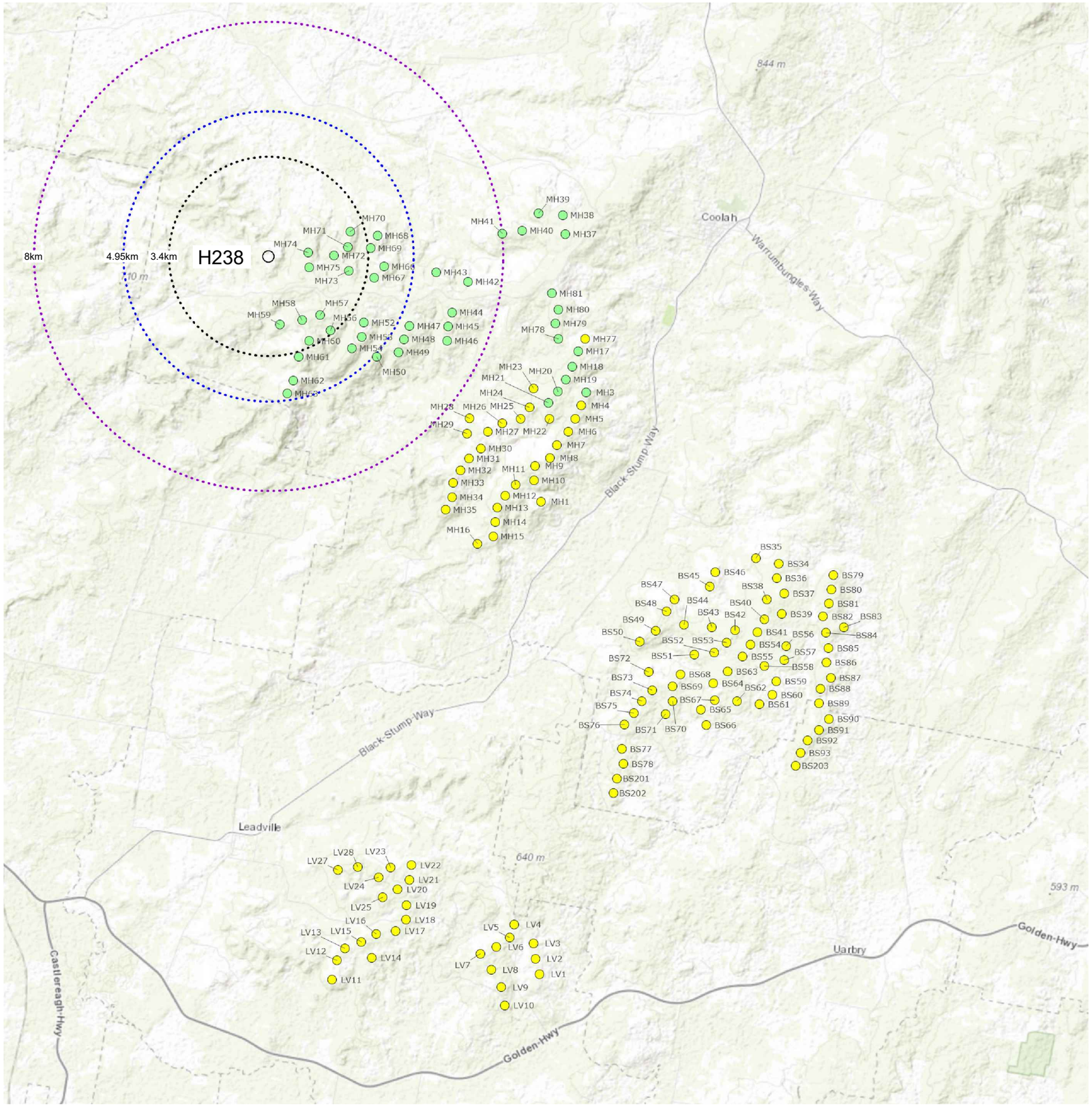


Figure 29
Representative location H199
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

○ Non associated residential dwelling

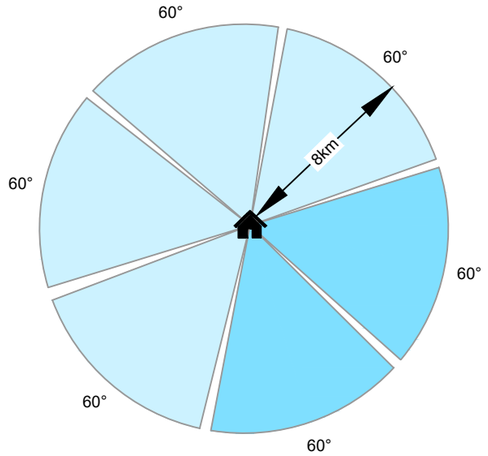
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

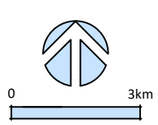
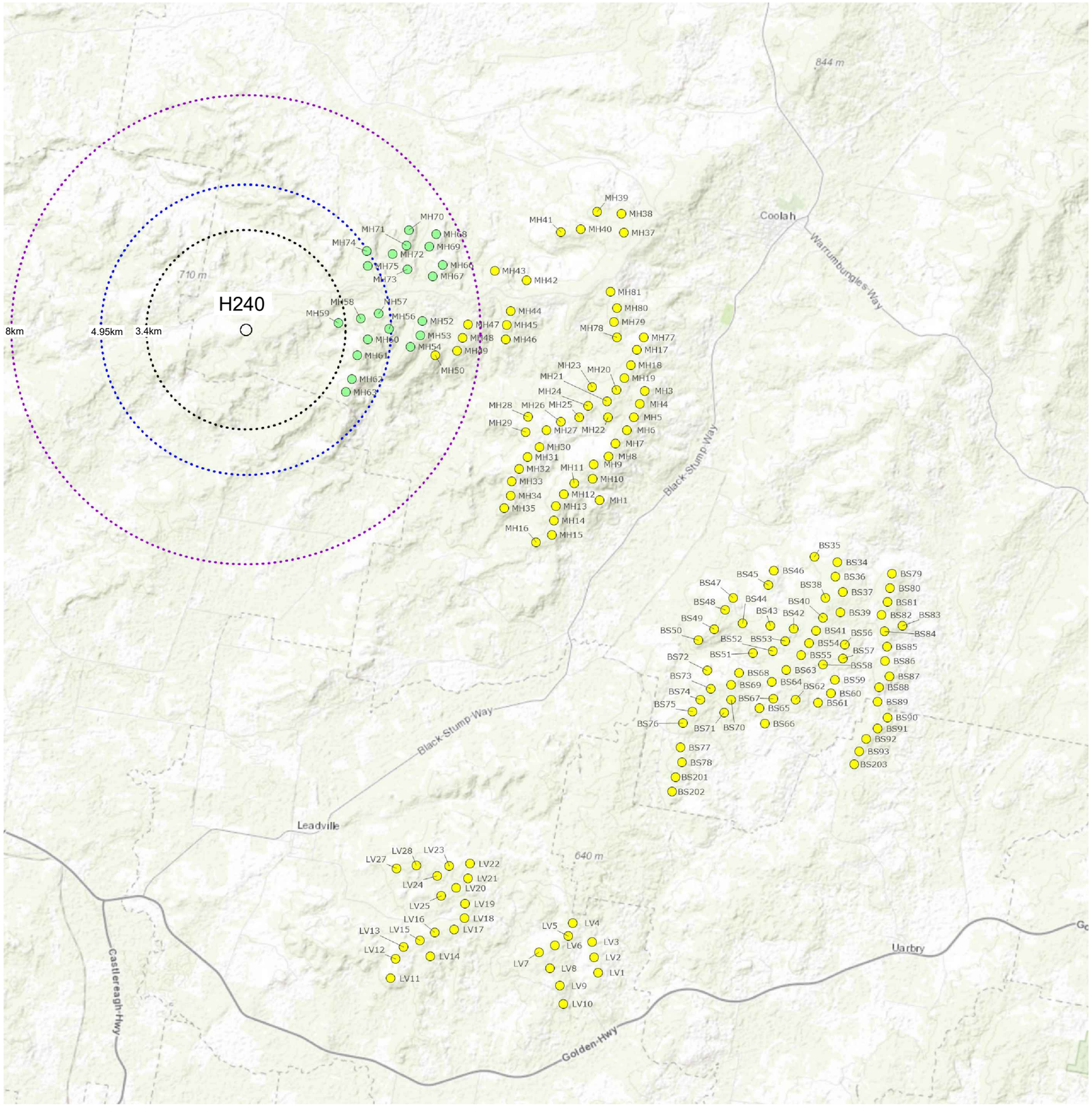


Figure 30
Representative location H238
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

- Non associated residential dwelling

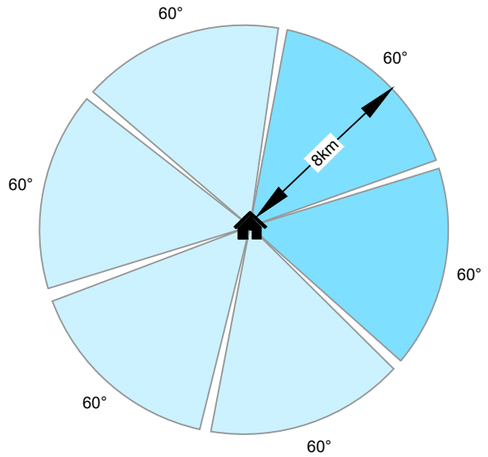
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

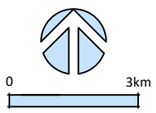
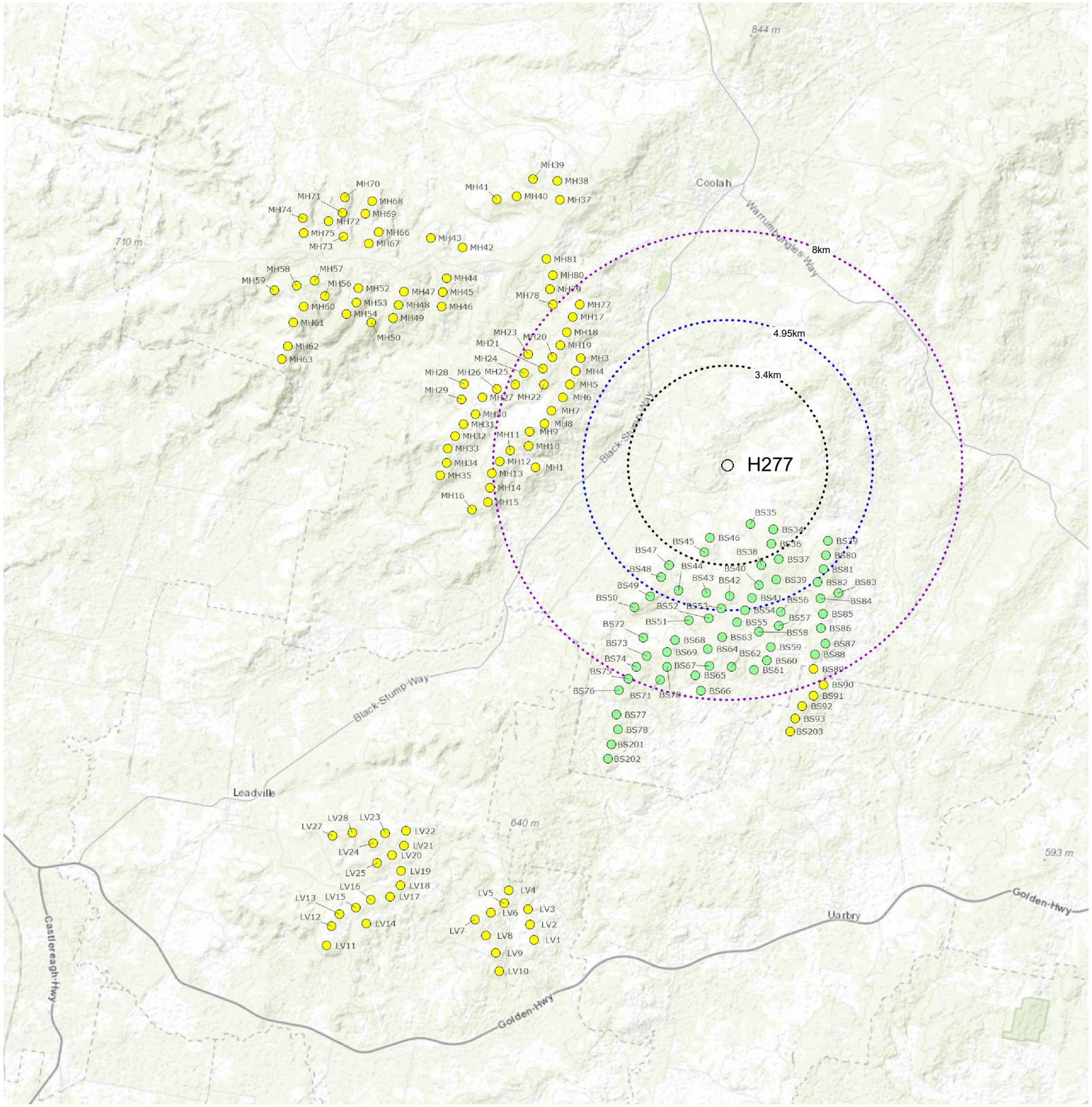


Figure 31
Representative location H240
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA



Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)

Legend

○ Non associated residential dwelling

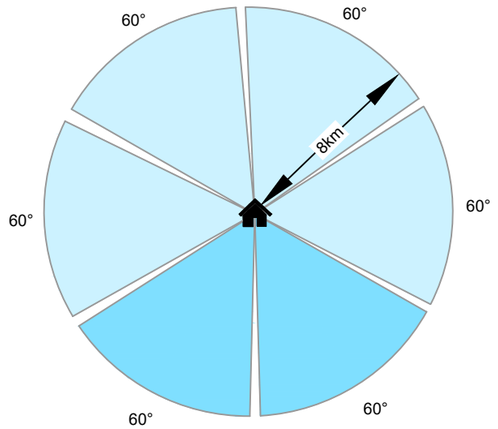
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

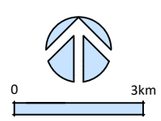
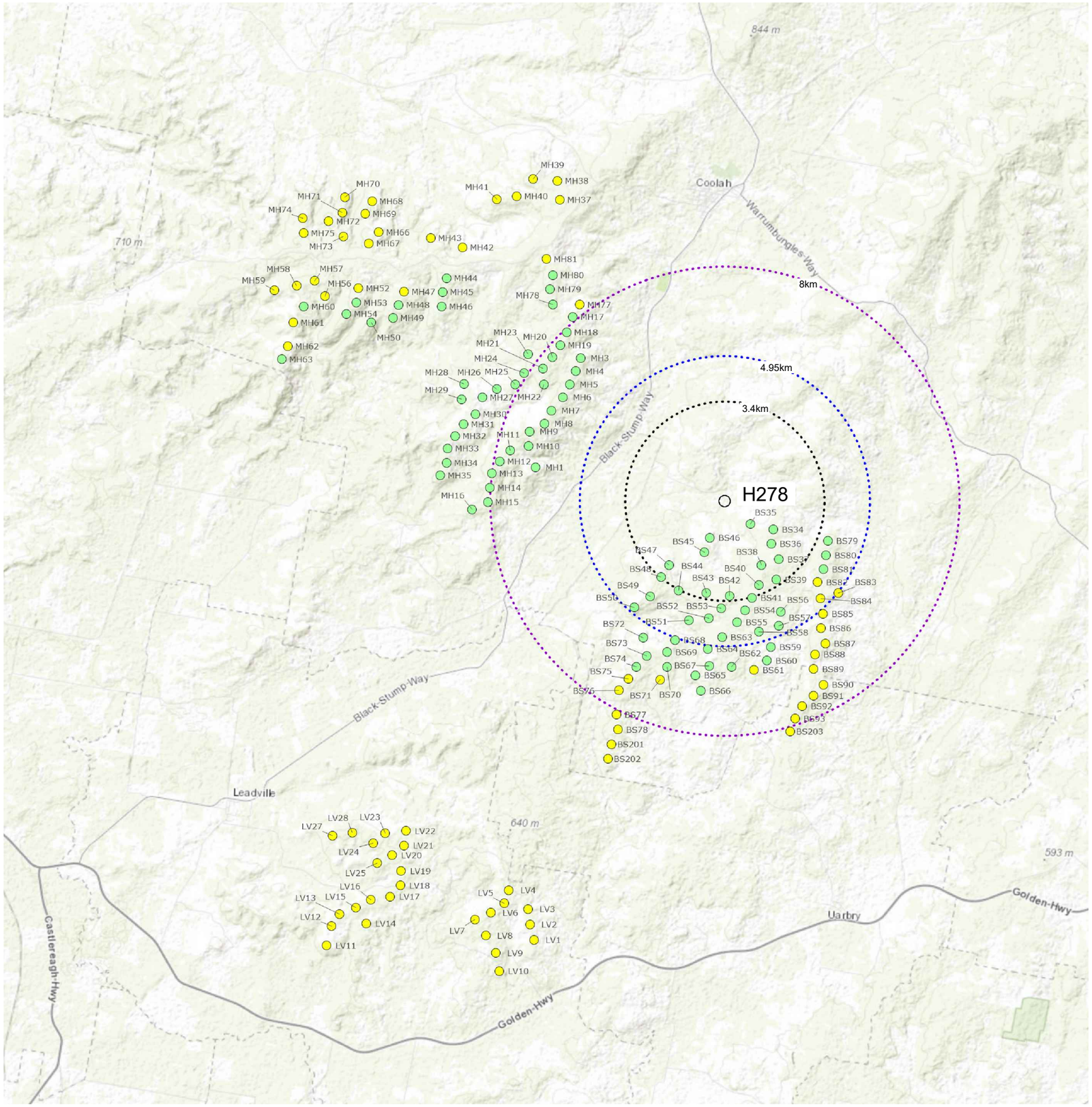


Figure 32
Representative location H277
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

- Non associated residential dwelling

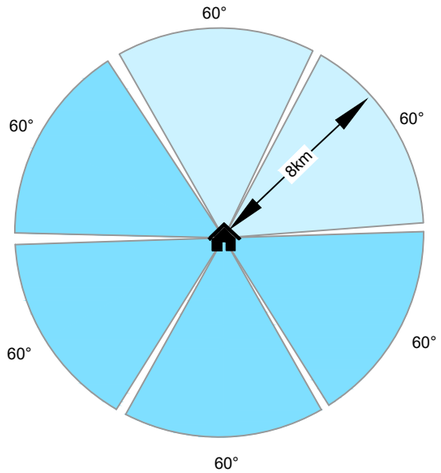
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

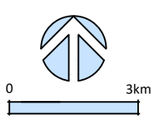
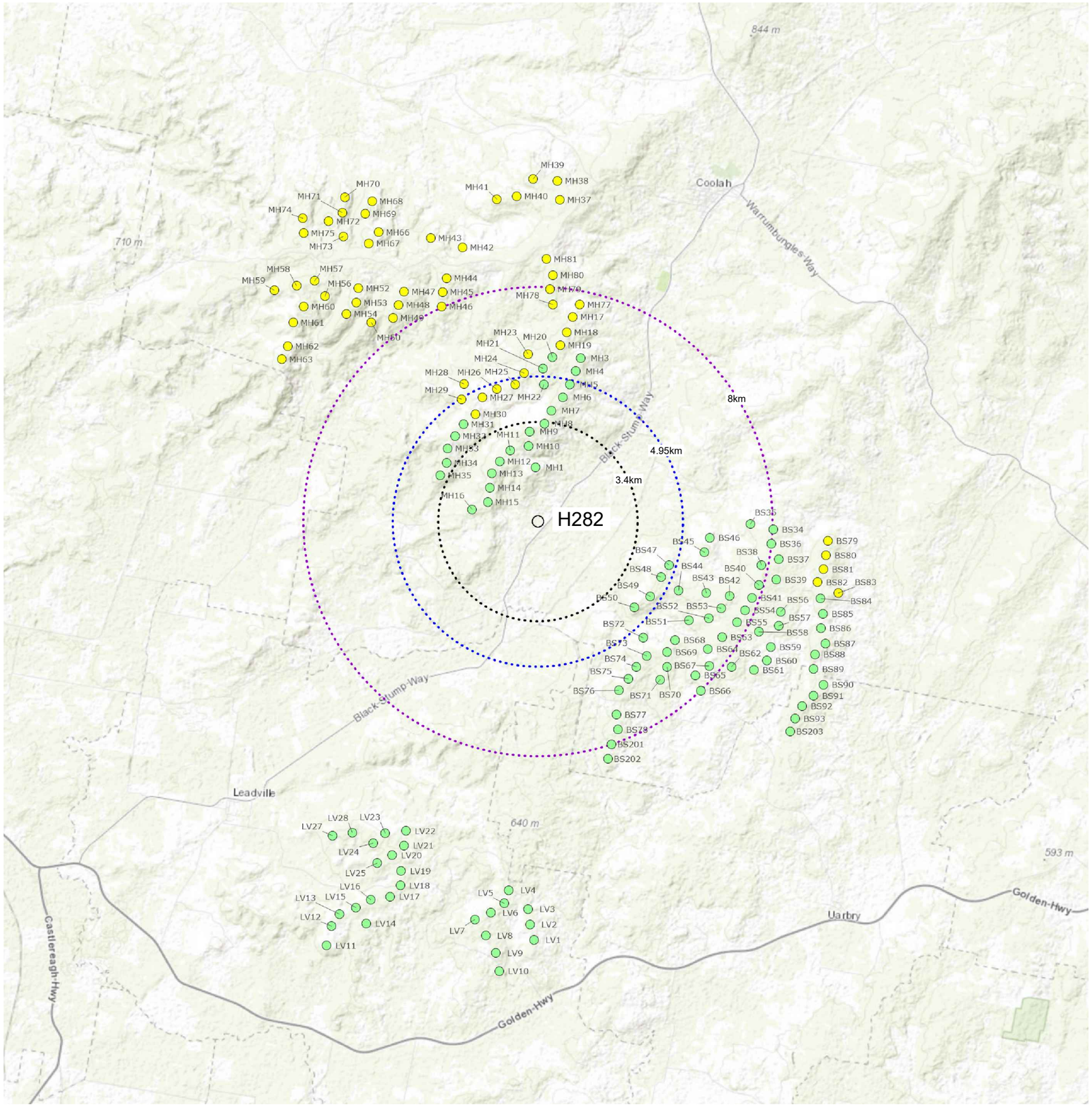


Figure 33
Representative location H278
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

- Non associated residential dwelling

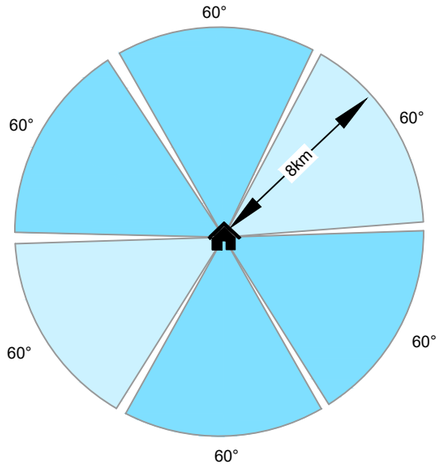
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

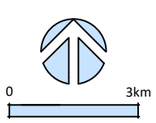
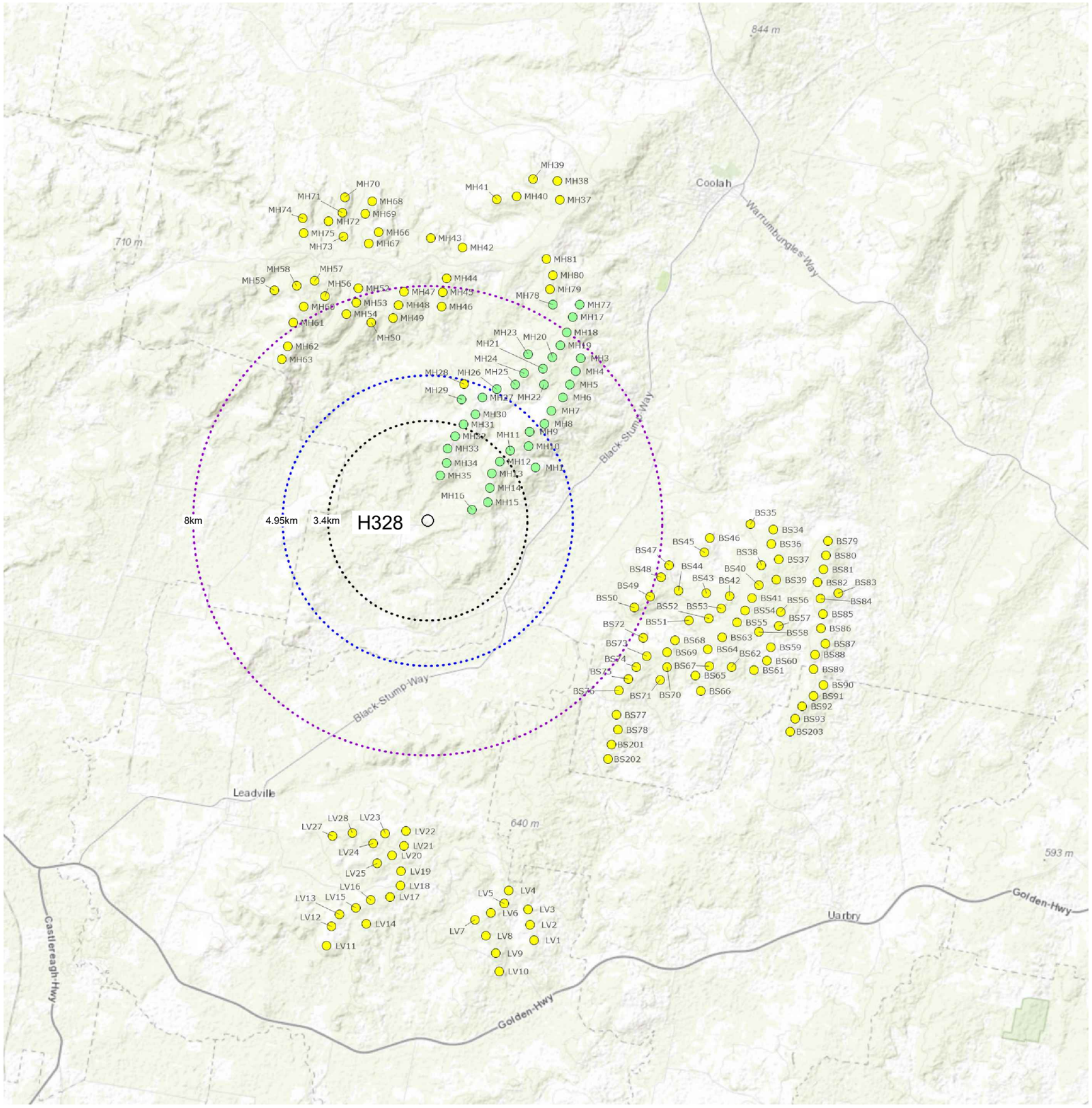


Figure 34
Representative location H282
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

- ○ Non associated residential dwelling

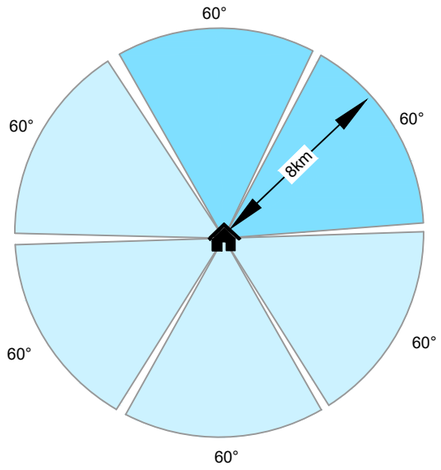
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

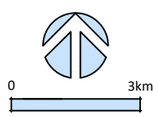
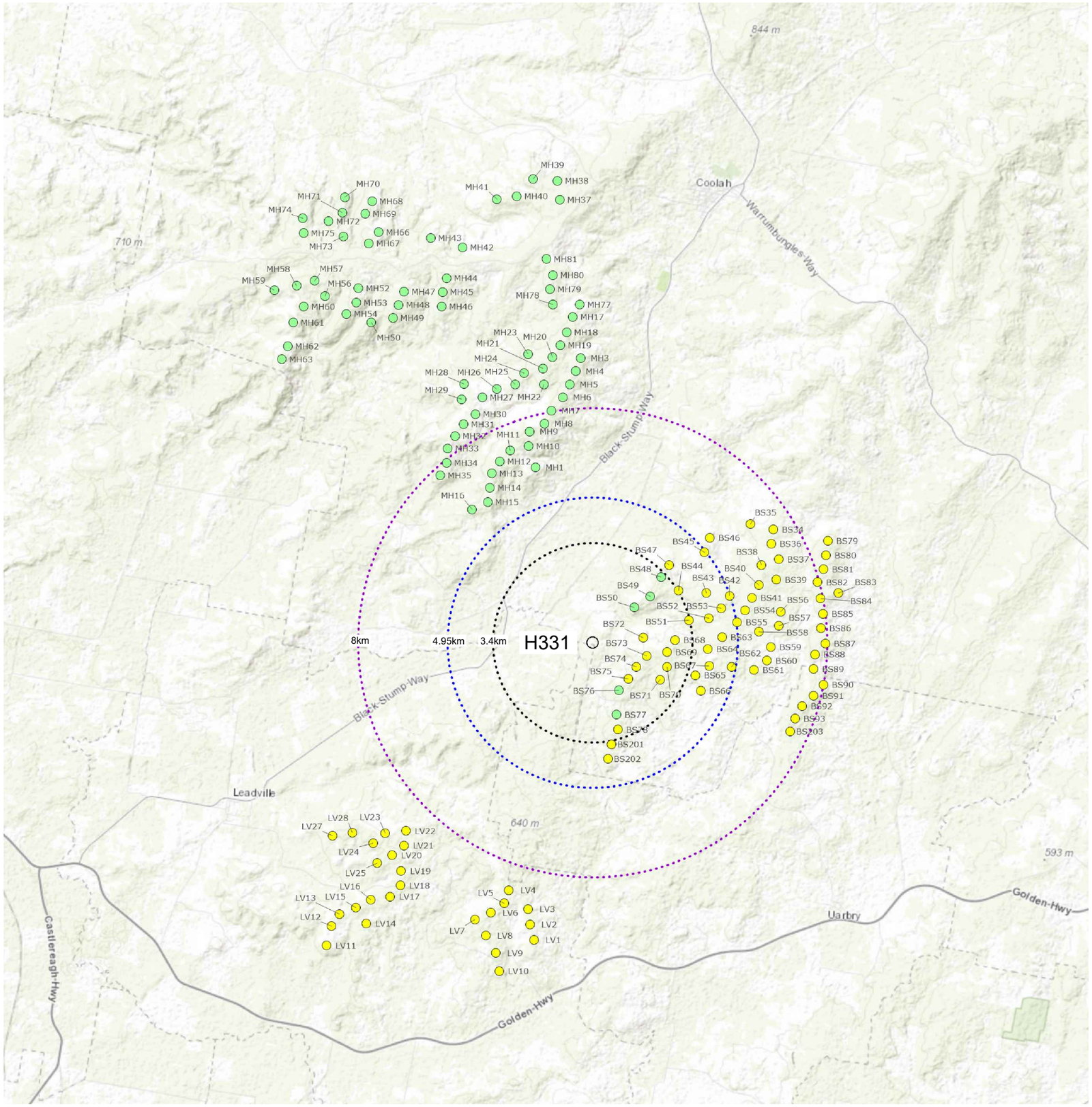


Figure 35
Representative location H328
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

- ○ Non associated residential dwelling

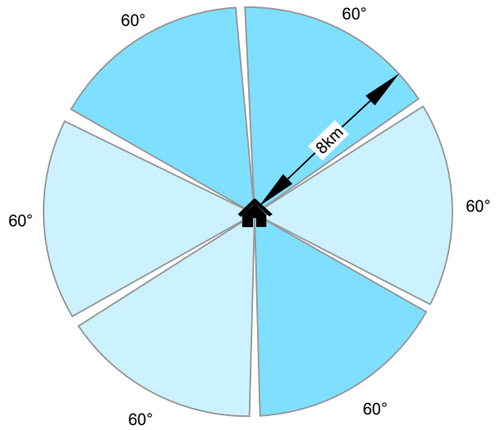
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

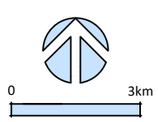
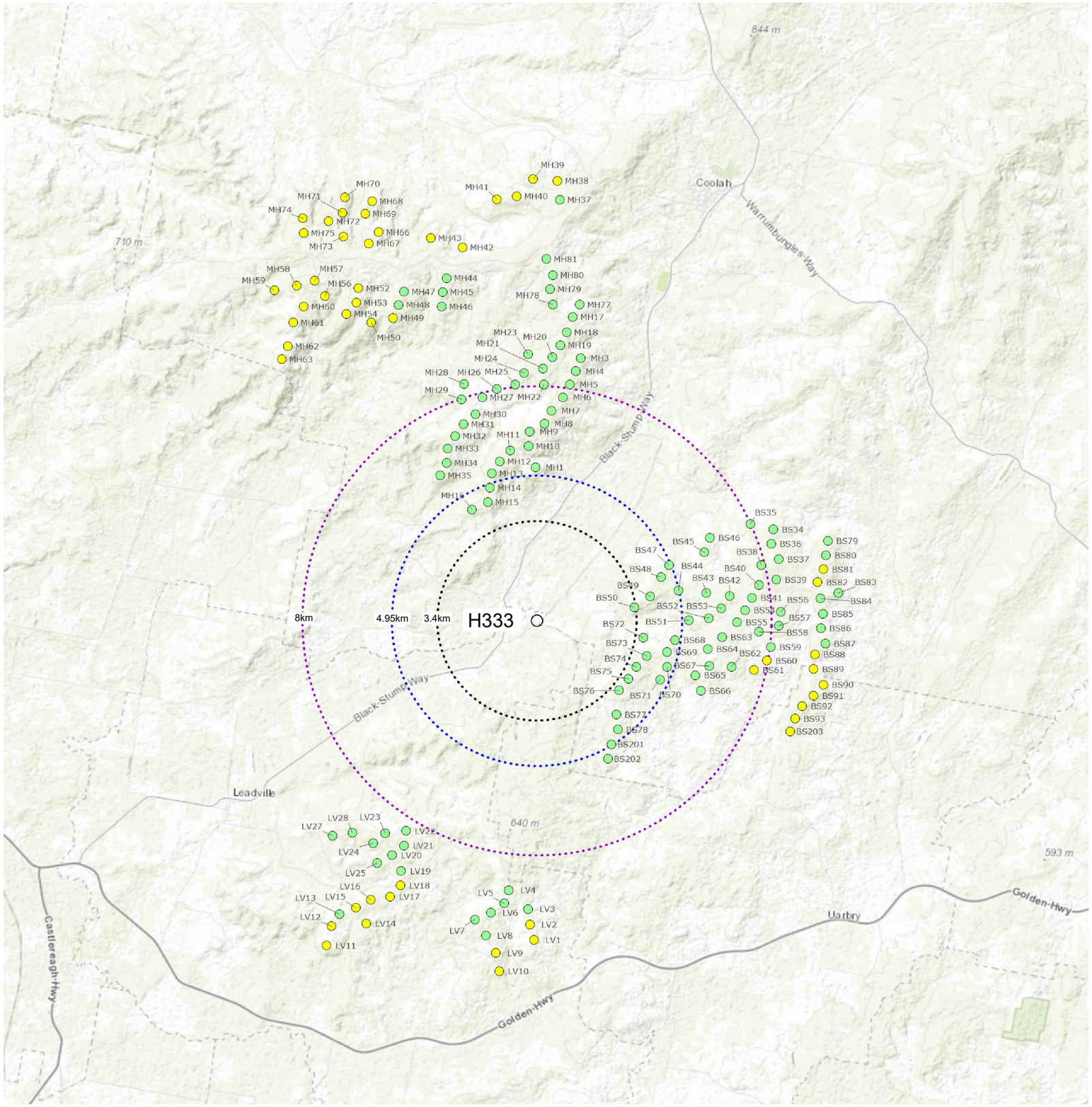


Figure 36
Representative location H331
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Legend

○ Non associated residential dwelling

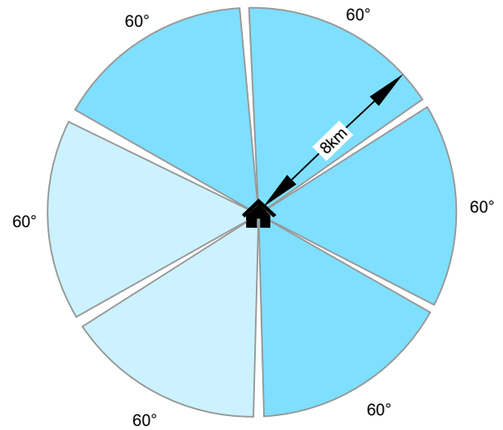
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

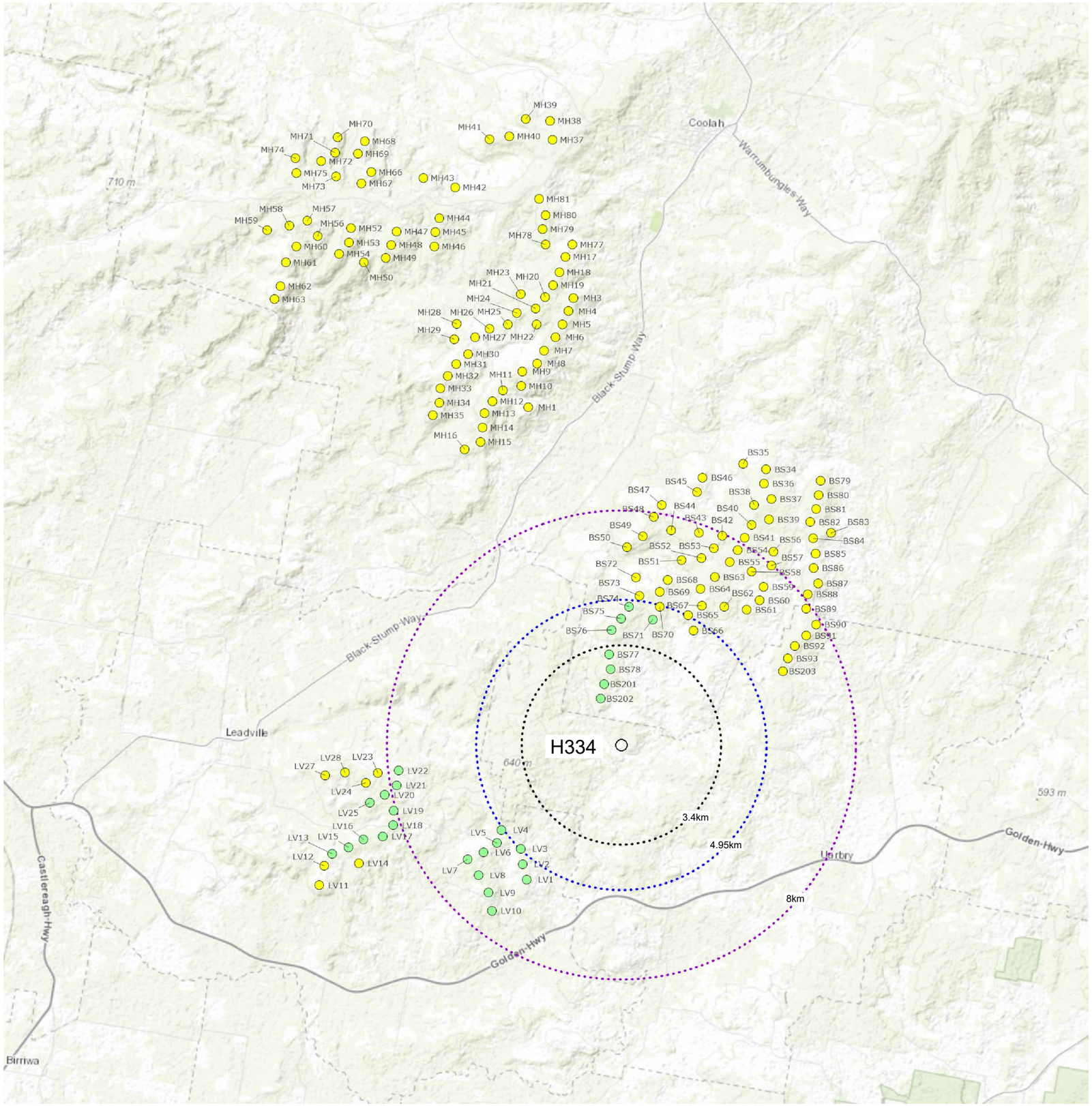
60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

Figure 37
Representative location H333
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects



Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Legend

- Non associated residential dwelling

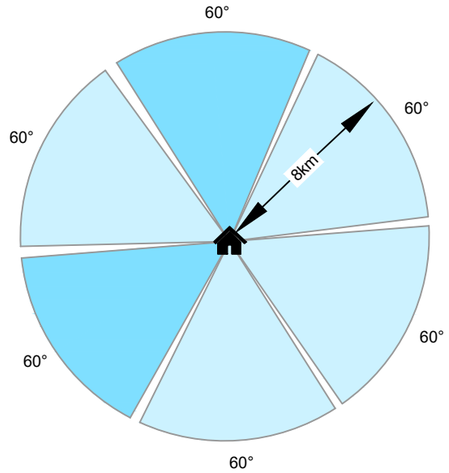
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

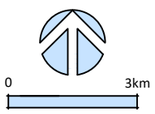
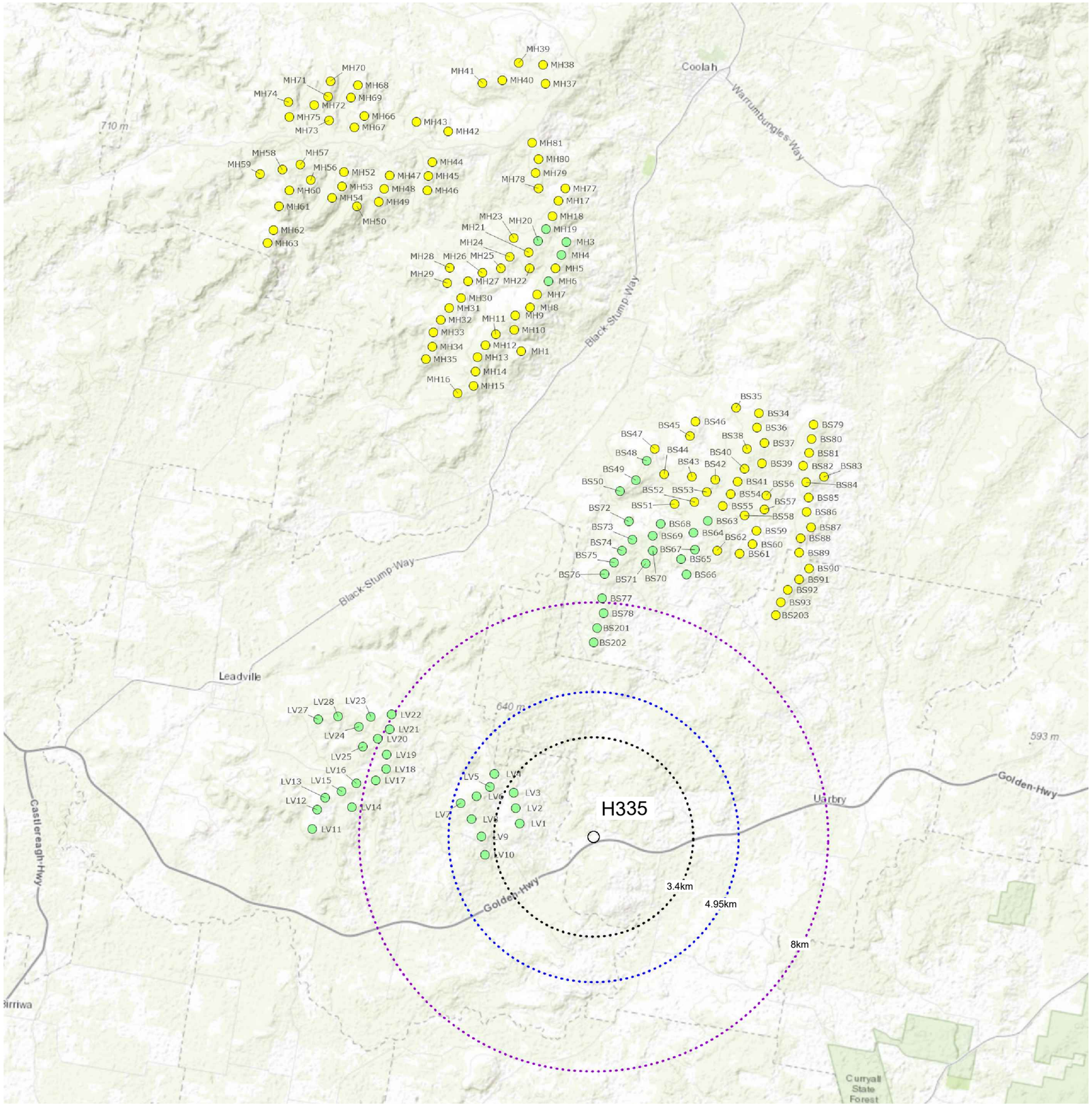


Figure 38
Representative location H334
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

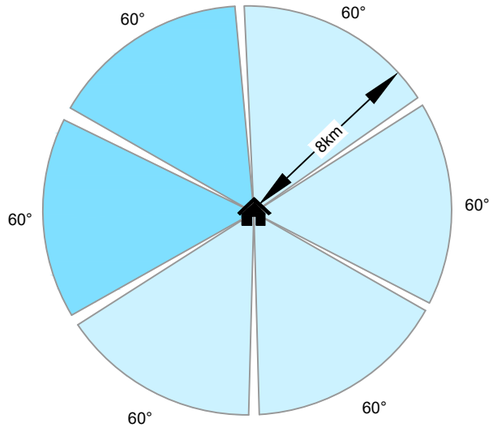
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

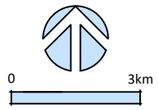
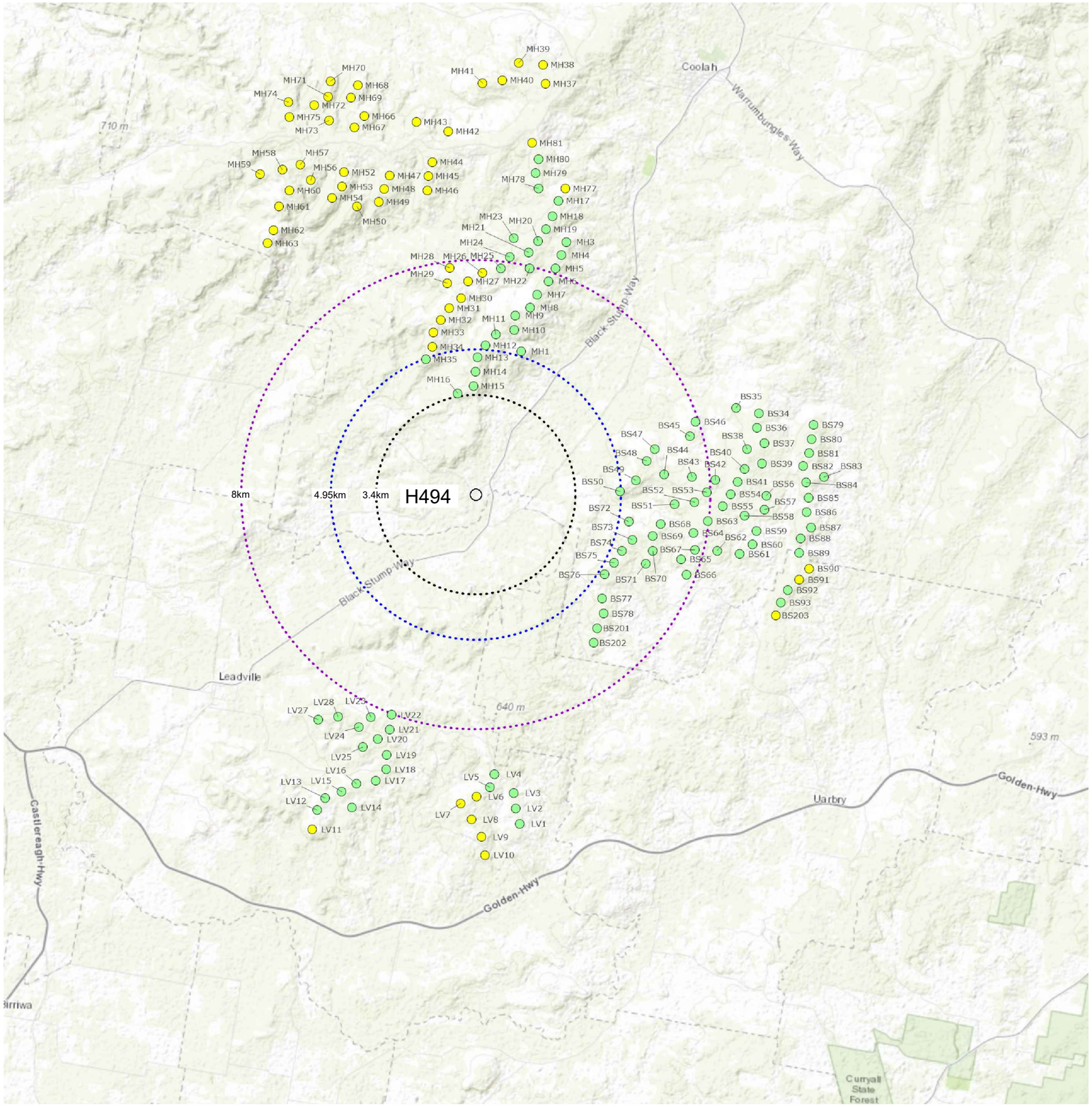


Figure 39
Representative location H335
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Valley of the Winds Wind Farm Stage 1 Preliminary LVIA

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

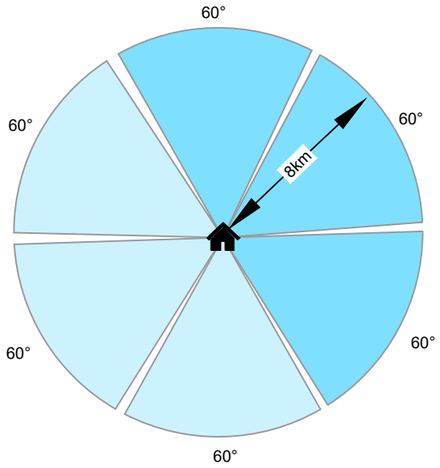
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

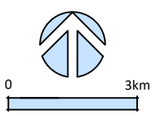
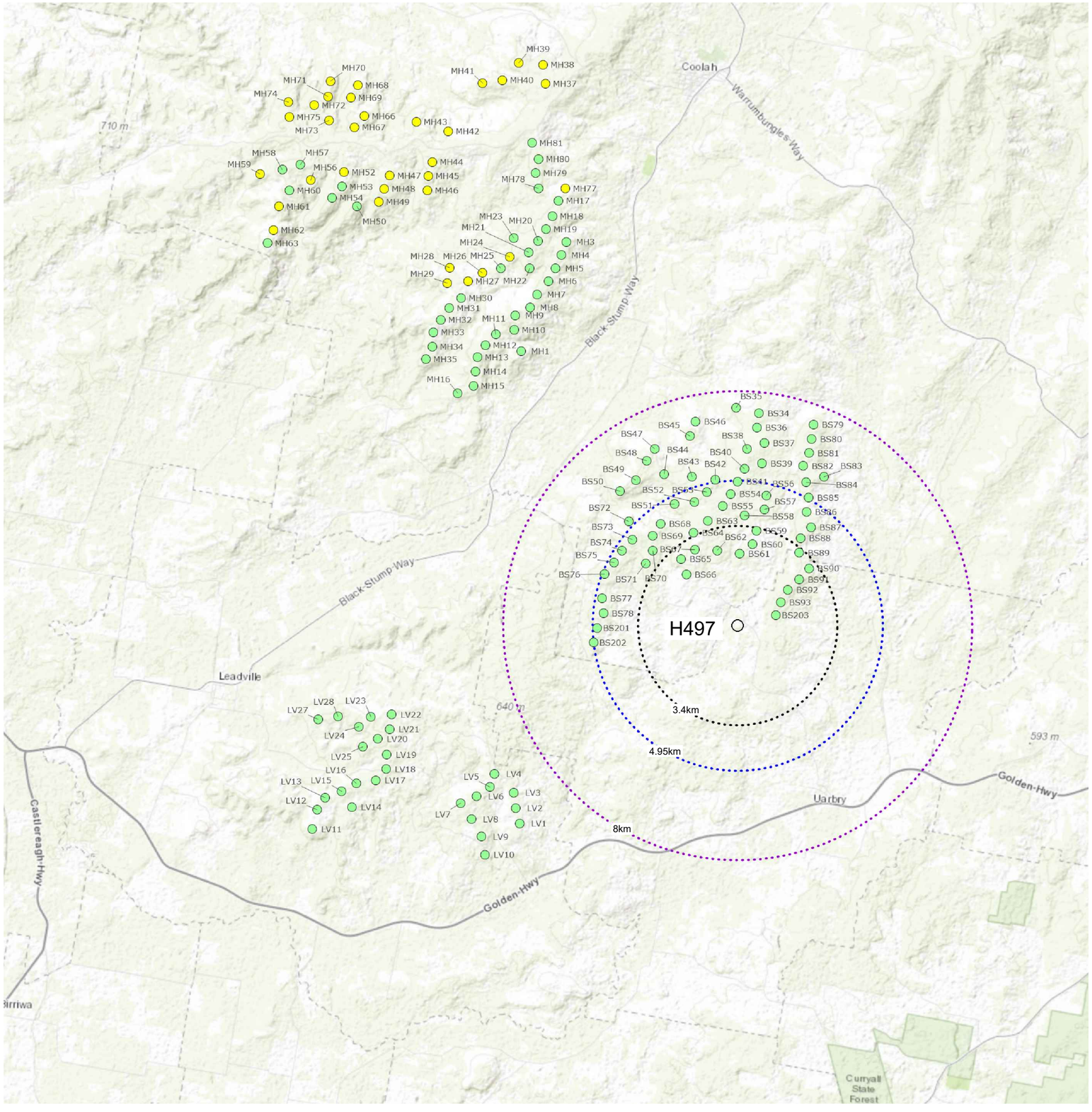


Figure 40
Representative location H494
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects

Background imagery extracted from ESRI World Topographic Map raster.
(Sources: Esri, HERE, Garmin, Intermap, INCREMENT P, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), © OpenStreetMap contributors, GIS User Community.)



Legend

- Non associated residential dwelling

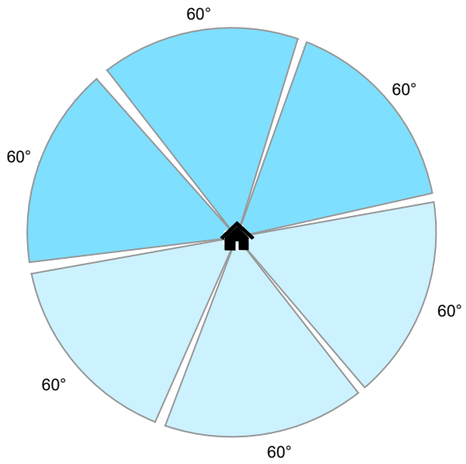
Distance buffer from dwelling

- *3.40 km*
- *4.95 km*
- *8.00 km*

Proposed wind turbine

- *visible*
- *not visible*

Preliminary Assessment Tool 2 Multiple wind turbines



60° sector with no visible wind turbines

60° sector with visible wind turbines

Dwelling

Note: The view toward wind turbines within 60° sectors may include wind turbine structures largely screened by landform with only rotor blades or tips of rotor blades visible above hills or ridgelines. Wind turbine visibility does not account for potential tree screening.

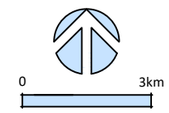


Figure 41
Representative location H497
Residential dwellings -
multiple wind turbine tool

GREEN BEAN DESIGN
landscape architects