

## TECHNICAL NOTE

<b>Title</b>	<b>Flat Rocks Wind Farm Zones of Visual Influence Maps</b>
<b>Client</b>	<b>Moonies Hill Energy</b>
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## History

<b>Issue:</b>	<b>Date:</b>	<b>Summary</b>
A	10/05/2011	First issue.

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## 1 INTRODUCTION

Zones of Visual Influence (ZVI) maps have been calculated for the area surrounding the proposed Flat Rocks Wind Farm, and are presented in Figures 1 to 4.

The ZVI map in Figure 1 shows the number of turbines whose tips are visible by an observer 2 m in height above the ground, while Figure 2 shows the number of turbines whose hubs are visible, out to a distance of 20 km from the wind turbines in each case. Figures 3 and 4 show a close-up view of the number of tips and hubs visible, with the nearby houses identified. The location of the nearby houses is given in Table 1 and was supplied by Moonies Hill Energy (MHE).

## 2 INPUTS

The turbine type modelled in these ZVI maps is the Vestas V112 turbine, with a rotor diameter of 112 m and a hub height of 84 m, giving an overall tip height of 140 m. This has been used in conjunction with a 74 turbine layout, derived in a previous report [1]. All coordinates in this report are in UTM Zone 50 of the WGS84 coordinate system.

A digital topographic model for the site area was created using 2 m and 10 m resolution height contours provided by MHE. The 2 m resolution contours were used to cover the wind farm site and surrounding area, including nearby houses. The 10 m resolution contours were used for the intermediate area outside of this, and out to between 5 to 15 km from the turbines. For areas further away, up to 20 km from the turbines, the topographic data was supplemented with publicly available data obtained during the Shuttle Radar Topography Mission (SRTM) [2].

These digital height contours have been used to create a 25 m resolution digital terrain model (DTM) that covers an area out to at least 20 km from each of the turbines in every direction.

## 3 METHODOLOGY

The ZVI calculation assumes that there is an unobstructed line of sight from each turbine to the viewer, except for blockages caused by terrain, including due to curvature of the earth. It does not take into account viewing obstructions caused by other obstacles such as vegetation, buildings or other structures, weather induced visibility reducers such as fog or haze, physical limitations of the human eye or visual cognition response of the observer. The supplied ZVI map therefore provides a 'worst case' viewing scenario of the wind farm for the area covered by the map.

## 4 OUTPUTS

Image files containing the coloured ZVI zones overlaid on a map of the area are attached as:

- 45392 FlatRocksWF ZVI 74wtg\_20110510 Vestas\_V112 tips.jpg
- 45392 FlatRocksWF ZVI 74wtg\_20110510 Vestas\_V112 hubs.jpg

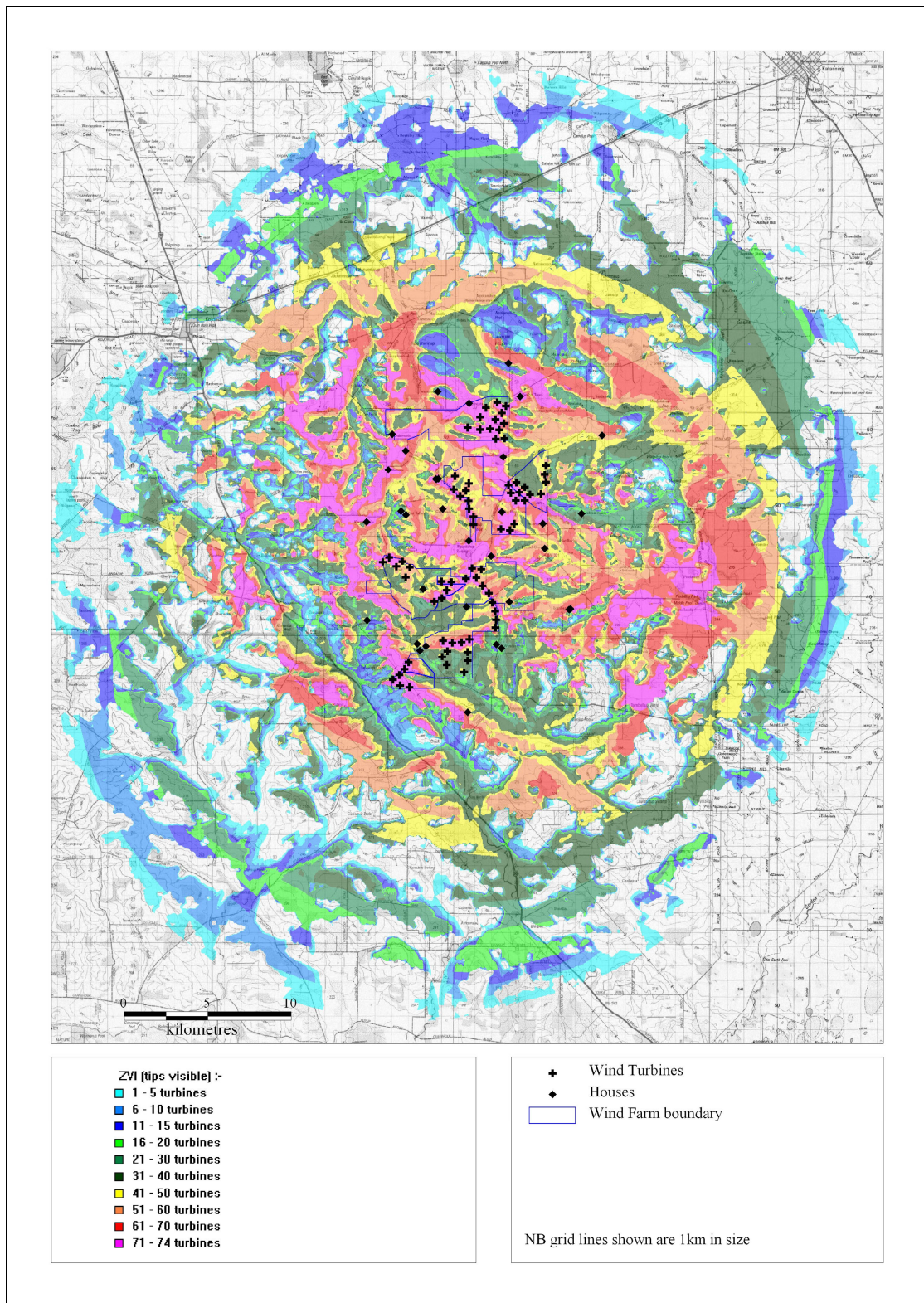
## **5 REFERENCES**

1. “45392PT01B MHE Flat Rocks Wind Farm layout optimisation.pdf, GH document 45392/PT/01 Issue B, 28<sup>th</sup> April 2011.
2. “Shuttle Radar Topography Mission (SRTM)”, NASA JPL, viewed 23<sup>rd</sup> December 2010, <http://www2.jpl.nasa.gov/srtm/>

<b>House ID</b>	<b>Easting (m)</b>	<b>Northing (m)</b>	<b>Stakeholder?</b>
NSH01	529798	6252398	N
NSH02	534034	6254130	N
NSH03	534715	6252104	N
NSH04	533706	6248509	N
NSH05	538397	6245086	N
NSH06	536092	6244487	N
NSH07	536187	6243019	N
NSH08	533602	6237033	N
NSH09	533299	6237262	N
NSH10	527067	6249862	N
NSH11	527858	6248864	N
NSH12	529822	6247171	N
NSH13	530084	6245361	N
NSH14	531650	6243477	N
NSH15	532980	6242569	N
NSH16	527583	6245239	N
NSH17	525526	6244591	N
NSH18	525548	6238704	N
NSH19	528558	6237293	N
NSH20	531581	6233170	N
NSH21	526817	6247723	N
NSH22	529707	6247138	N
NSH23	527880	6245017	N
NSH24	529664	6247150	N
NSH25	539639	6249790	N
SH26	537647	6239337	Y
SH27	534084	6239794	Y
SH28	531662	6251703	Y
SH29	533630	6245183	Y
SH30	528913	6240557	Y
SH31	529077	6237156	Y
SH32	528718	6236883	Y
SH33	537743	6239372	Y
Proposed NSH34	531507	6239494	N

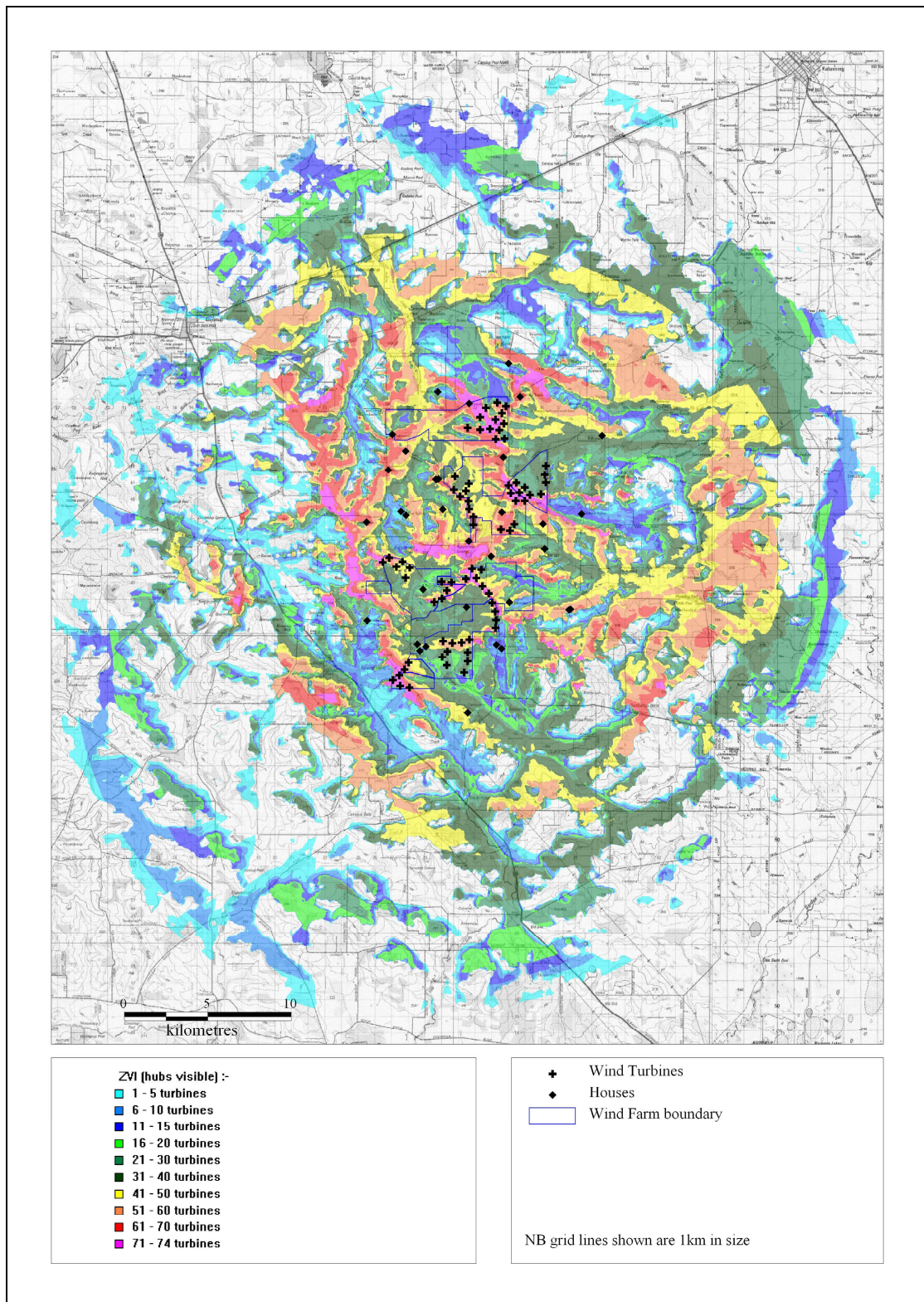
Co-ordinate system is UTM zone 50H, WGS84 datum.

**Table 1 Houses within 2 km of the Flat Rocks Wind Farm site.**



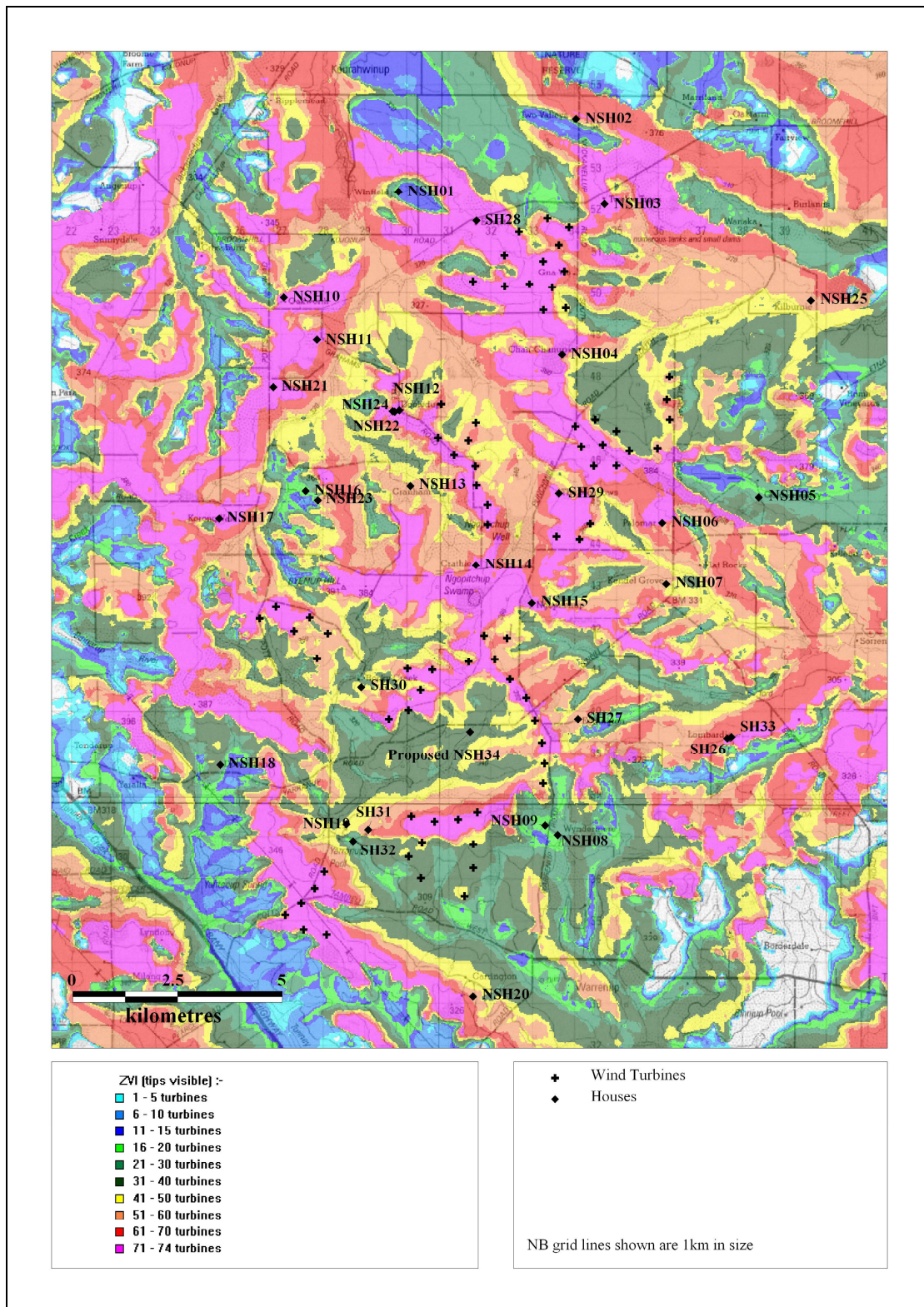
**Figure 1** Zones of Visual Influence map (blade tips) of the area surrounding the proposed Flat Rocks Wind Farm.





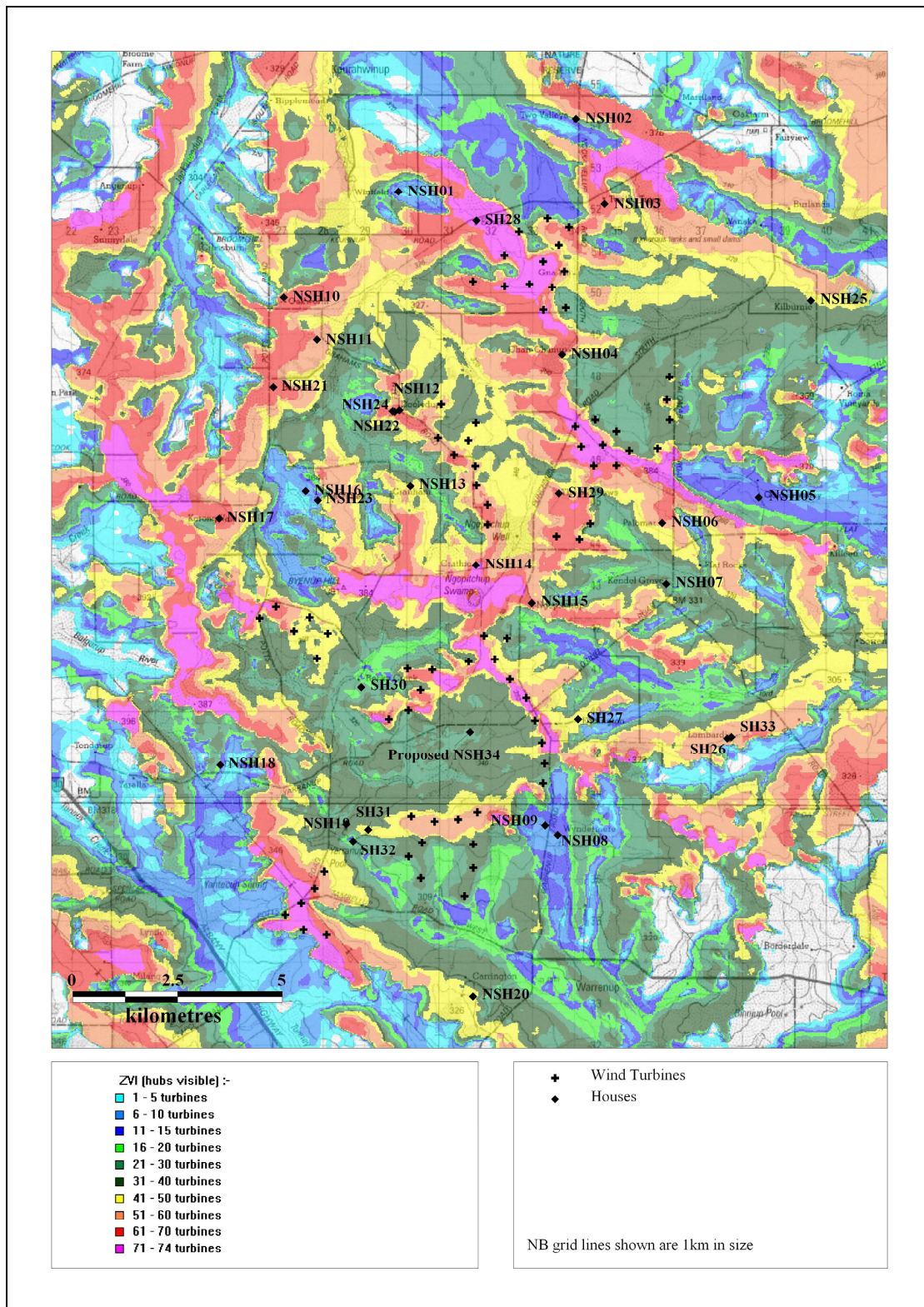
**Figure 2** Zones of Visual Influence map (hubs) of the area surrounding the proposed Flat rocks Wind Farm.





**Figure 3** Close-up view of the Zones of Visual Influence map (blade tips) of the area surrounding the proposed Flat Rocks Wind Farm.





**Figure 4** Close-up view of the Zones of Visual Influence map (hubs) of the area surrounding the proposed Flat rocks Wind Farm.