

# Crookwell 3 Wind Farm Telecommunications

## Purpose

Garrad Hassan was engaged to assess impacts to radiocommunications and telecommunication services arising from the proposed Crookwell 3 Wind Farm.

Radiocommunication involves the transfer of information via electromagnetic or radio waves.

Cumulative radiocommunication impacts from the project and the existing Crookwell 1 and approved Crookwell 2 Wind Farms were also assessed.

## Key Findings and Impacts

Wind turbines can potentially cause interference to point-to-point microwave signals through diffraction, scattering or near-field effects. However, it is possible to design the wind farm to avoid interference..

**The interference zone around the point-to-point links was identified and it was found that no turbines from the Crookwell 3 Wind Farm are expected to cause interference to those links.**

It is possible that interference to digital television signals could be experienced by residents in the vicinity of the wind farm, as digital television coverage in the area is expected to be marginal or non-existent. However, there are a range of mitigation options available if interference is encountered, and some residents may be eligible to receive digital television via satellite.

The analysis found 4 radio towers within approximately 50 km of the Crookwell 3 Wind Farm. The report found that it is unlikely that the proposed wind farm would have an impact on AM radio; however FM signals may be susceptible to interference from objects such as wind turbines, resulting in 'hissing and distortion' of the signal.

This can be mitigated by the installation of a high quality antenna. Furthermore, the proposed wind farm is unlikely to have an impact upon signal quality once digital radio is introduced into regional areas.

The proposed Crookwell 3 Wind Farm is not likely have an impact on aviation radar or meteorological radar operations due to the distance of the site from major airports and Bureau of Meteorology radar stations.

A number of dwellings obtain internet access from a wireless internet service provider, Cirrus Communications. A review of the service indicates that it is possible that the turbines could cause some impact to the service if they are located between the communications tower and the customers. Any interference encountered may be ameliorated by the mitigation measures proposed.

No turbine intercepts the line-of-sight of common internet and television satellites likely to be used in the area.

No issues have been raised by emergency services regarding the potential for interference to radiocommunications assets operated by emergency services in the area.



International example of a wind farm

## Response to Findings

In the event that television reception is affected, the following amelioration options for households are recommended:

- realigning the householder's TV antenna directly towards their existing transmitter;
- tuning householder's antenna into alternative sources of the same or suitable TV signal;
- the installation of more directional and/or higher gain antenna at the affected residence;
- relocating the antenna to a less affected position;
- the installation of cable/satellite TV at the affected residences; and
- installation of a TV relay station.

If interference to the wireless internet service is encountered, the proponent should work with Cirrus Communications to resolve any interference problems caused by the wind farm, which may include:

- Installation of improved or higher antenna at affected dwellings; or
- Installation of a new base station to service dwellings in affected areas.

Pre- and post-construction surveys should be conducted to determine the signal strength and quality of the television signal received at dwellings identified as having the potential to experience television interference due to the wind farm.

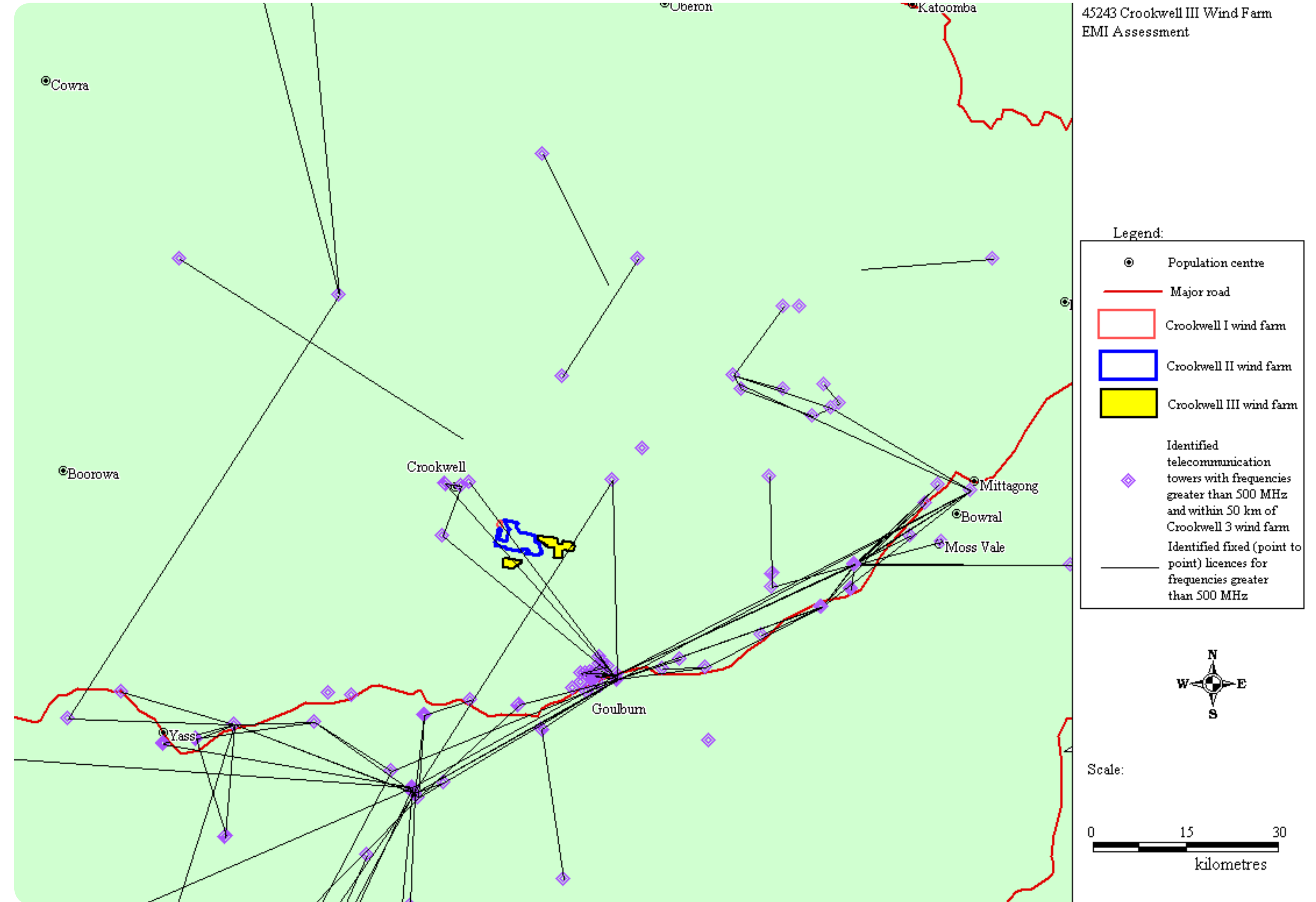


Figure 1: Location of point-to-point transmission vectors for fixed licenses



Figure 2: Location of broadcast transmitters in the vicinity of Crookwell 3 Wind Farm

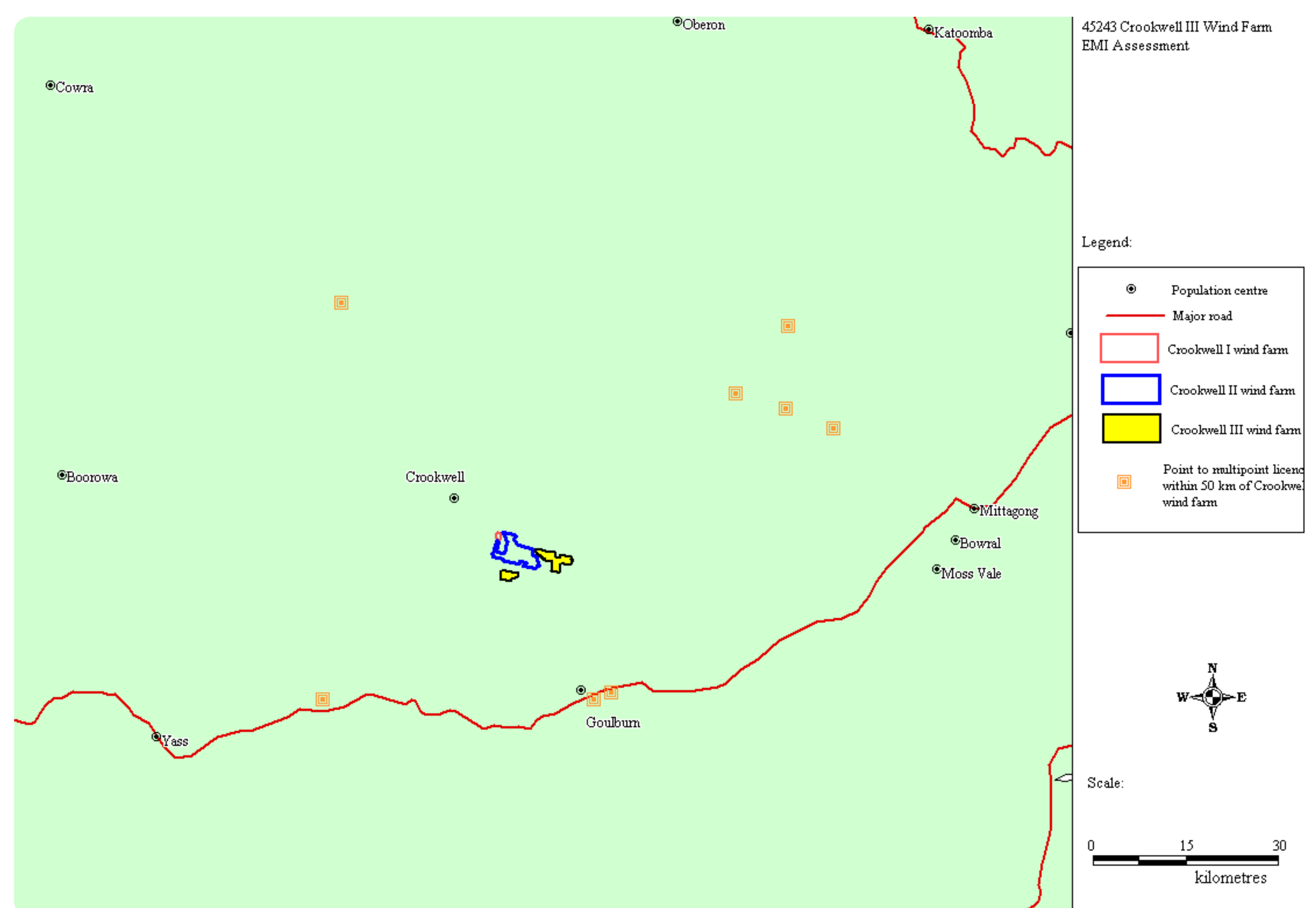


Figure 3: Location of point-to-multipoint stations within 50 km of Crookwell 3 Wind Farm



International example of a wind farm