



PO Box 437
Kalamunda WA 6926
+61 08 9257 1625
admin@mattiske.com.au

(ACN 063 507 175, ABN 39 063 507 175)

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Dr Sarah Rankin
Moonies Hill Energy Pty Ltd

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IMPACT FOOTPRINT ASSESSMENT, FLAT ROCKS WIND FARM, KOJONUP WA.

Introduction

Mattiske Consulting Pty Ltd (MCPL) was commissioned in March 2022 by Moonies Hill Energy Pty Ltd to undertake additional targeted survey of the proposed alignment of the cables for the Wind Turbine Footprint area of the proposed Flat Rocks Wind Farm. As such this report supplements earlier summaries supplied on the Flat Rocks Wind Farm area.

The objective of this survey was to undertake a targeted survey of the proposed wind turbine cable alignment areas where it interfaces with road verges or vegetation and to prepare a report summarising the findings.

Regional Context

The Flat Rocks Wind Farm survey area is located within the Southern Jarrah Forest subregion within 5km of the border of the Avon Wheatbelt region. The Southern Jarrah Forest subregion is characterised by Jarrah forest on duricrusted plateaus and loam soils of valleys, with Marri-Wandoo woodlands on laterite-free soils (Beard 1990). Typical vegetation of the Avon Wheatbelt region includes scrub-heath on sandplains, *Acacia-Casuarina* thickets on ironstone gravels, woodlands of *Eucalyptus loxophleba*, *Eucalyptus salmonophloia* and *Eucalyptus wandoo* on varying soil types (Beard 1990). The proximity of Moonies Hill Wind Farm to the border of the Avon Wheatbelt region indicates that characteristics of both regions are likely to be present in the survey area.

Mattiske Consulting Pty Ltd was commissioned in September 2010 by Moonies Hill Energy to undertake a flora and vegetation survey of the proposed wider Flat Rocks Wind Farm. In April 2016, Mattiske Consulting Pty Ltd was commissioned by the Moonies Hill Energy to undertake a review of the flora, vegetation and fauna values on the proposed Flat Rocks Wind Farm location, and update findings from the 2010 assessment. The prepared reports MHE1001/113/2010 and MHE1601/10/16 are available

One Threatened Ecological Community is recorded to occur in the Flat Rocks Wind Farm. This is *Eucalyptus* Woodlands of the Western Australian Wheatbelt Critically Endangered Threatened Ecological Community (TEC) and Priority 3 (iii) Protected Ecological Community (PEC) (DBCA 2021c and DBCA 2021d)

The WA Wheatbelt Woodlands ecological community is a woodland in which the trees typically are spaced and the canopy is relatively open. The understorey is highly variable in structure and composition. There can be localised variation in vegetation structure as a consequence of disturbance, for instance fire, or change in site characteristics that allows for gaps in tree canopy cover, a higher density of trees e.g. dense sapling regrowth, or change in the nature of the understorey (DAWE 2015). The minimum patch size of woodland required is 2 hectares with a condition rating of Pristine/Excellent/Very good (DAWE 2015). As indicated in Photo 13 in Appendix A most remnant areas are degraded as a result of grazing activities.

It is intended that the condition thresholds will exclude degraded patches from any requirement for protection, for instance:

- isolated paddock trees on farms;

- small or narrow stands of trees that serve as windbreaks or shelterbelts on farms and other properties; or
- roadside and other woodland remnants that are too small and narrow, or where the tree canopy has become too patchy and discontinuous (effectively <10% cover), or the understorey has lost considerable elements of its native structure and diversity (DAWE 2015).

Methods

A targeted field assessment of the flora and vegetation of the proposed alignment of the cables for the Flat Rocks Wind Farm was undertaken by Dr Libby Mattiske on 30th March 2022. Dr Mattiske holds a valid collection licence to collect flora for scientific purposes, issued under the BC Act.

The areas of the cable alignment that may influence the occasional trees and areas of remnant vegetation are summarized on Figure 1 and in the series of Photographs in Appendix A by reference to the details associated with each photograph. At each location discussions were held with the Flat Rocks team about means to minimize the clearing of trees and any native vegetation.

Results

The cable alignment was assessed with particular attention to alignments near any remnant vegetation areas and also road crossings.

The majority of the cable alignment occurs in paddocks or along very narrow and degraded road verges. The results as presented at key points along the alignment are presented in the photographs with notations in Appendix A and in Figure 1 as attached.

As such the results supplement earlier reports by Mattiske (2010, 2016 and 2022) for the wider survey areas. The results present in Appendix A reflect the degraded nature of the road verges, the reduction of impacts by the avoidance of remnant areas and the reduction of disturbance of tree canopies and native vegetation to enable minimal impacts to the native species. The context of the alignment is also apparent in the Mattiske (2022) report, with greater details on minimisation of values and avoidance mechanisms in Appendix A.

Discussion and Conclusion

Every effort has been undertaken to avoid stands of trees and as such the cable alignment has been selected to minimize the impacts on the trees and remnant stands of Eucalypts and Sheoaks. There a few locations where the occasional tree will need to be removed, however some of these have been planted (see Locations 7 and 8) and wherever possible the connectivity of tree canopies have been avoided to reduce impacts. As such the major length of the alignment is located in largely highly degraded narrow road verges or in operational paddocks that have been subjected to grazing and crops for many decades. Therefore the impacts have been minimized and the avoidance strategies have been to select the route with less impacts between West Tambellup Road and the Ngopitchup Road where the alignment enters private property and paddock in the north near Turbine T18..

As indicated above every effort has been made to minimise the environmental impacts and disturbance of trees and shrubs along the cable alignment.

Dr Libby Mattiske

Mattiske Consulting Pty Ltd

Attachments

Figure 1: Overview of Proposed alignment with Photo Location Point (1 to 10 inclusive)

Appendix A: Photographic Record of Proposed Flat Rocks Wind Farm Turbine Cable Impacts, March 2022

References

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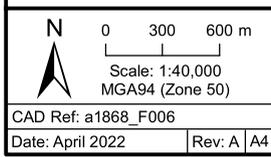
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Mattiske Consulting Pty Ltd
 28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
 Author: E M Mattiske MCPL Ref:
 Drawn: CAD Resources ~ www.cadresources.com.au
 Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Moonies Hill Energy Pty Ltd
Photo Locations

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 1 Location 1: Looking south at crossing of cable of West Tambellup Road to Substation. Note only introduced grasses and **Dittrichia graveolens* (Stinkwort) and cleared paddocks south of road.



Photo 2 Location 2: Looking south at crossing of cable of West Tambellup Road to Substation. Note only introduced grasses and **Dittrichia graveolens* (Stinkwort) and cleared paddocks south of road.

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Photo 3 Location 3: Looking southeast at crossing of Yarranup Road. Note only introduced grasses and occasional *Acacia pulchella* and cleared paddocks south of road. Crossing of cable as proposed avoids the Wandoo (*Eucalyptus wandoo*) trees.



Photo 4 Location 3: Looking northwards at crossing of Yarranup Road. Note only introduced grasses and cleared paddocks north of road. Crossing of cable as proposed avoids the Wandoo (*Eucalyptus wandoo*) trees which occur as isolated trees on narrow road verge.

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 5 Location 4: Near Corner of Yarranup Road and Warrenup Road looking east along Yarranup road past cross intersection. Note only introduced grasses and cleared paddocks north of road. Stand of mixed aged Sheoak (so preference to cut across paddock south of this site where less vegetation). Suggested to avoid stands and head through paddock between T08 and T06 within cleared paddocks.



Photo 6 Location 4: Near Corner of Yarranup Road and Warrenup Road looking north along Warrenup Road with narrow stands of Eucalyptus wandoo and occasional Sheoak (near gravel pit and cleared paddocks). Note only introduced grasses and cleared paddocks north of road. Suggested to avoid stands and head through paddock between T08 and T06 within cleared paddocks.

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 7 Location 5: Near Dam to west of Warrenup Road on western road verge (looking south) as less vegetation between Locations 5 and 6, only occasional Jam (*Acacia acuminata*), Sheoak and *Corymbia calophylla* (Marri) and Wandoo. Cable to be located on western side of Warrenup Road.



Photo 8 Location 5: Near Dam to west of Warrenup Road on western road verge (looking north) as less vegetation between Locations 5 and 6, only occasional Jam (*Acacia acuminata*), *Acacia microbotrya*, Sheoak and *Corymbia calophylla* (Marri) and Wandoo. Cable to be located on western side of Warrenup Road.

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 9 Location 6: Looking south to less vegetation on western side of Warrenup Road road verge (only occasional Jam (*Acacia acuminata*), *Acacia microbotrya*, Sheoak and *Corymbia calophylla* (Marri) and Wandoo. Eastern side greater growth of trees. Cable to be located on western side of Warrenup Road.



Photo 10 Location 6: Looking north to less vegetation on western side of Warrenup Road road verge (only occasional Jam (*Acacia acuminata*), *Acacia microbotrya*, Sheoak and *Corymbia calophylla* (Marri) and Wandoo. Eastern side greater growth of trees. Cable to be located on western side of Warrenup Road.

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Photo 11 Location 7: Looking south to bend in Warrenup Road with less vegetation on western side of Warrenup Road verge; only occasional tree. Western road verge very narrow in width and degraded. Cable to be located on western side of Warrenup Road.



Photo 12 Location 8: Looking north with proposed cable route on western side in narrow road verge, mostly planted trees. Eastern road verge abuts a woodland with maintained canopy cover, although heavily disturbed understorey due to grazing and farming infrastructure. Cable to be located on western side of Warrenup Road.

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 13 Location 8: Looking north along eastern road verged into open woodland of Jarrah and Wandoo over grazed paddocks. Area being avoided as proposed alignment on western side of Warrenup Road and hence tree canopy maintained on eastern side. Cable to be located on western side of Warrenup Road.



Photo 14 Location 8: Looking south along Warrenup Road with less vegetation on western side of Warrenup Road verge; only occasional planted trees (even aged and known by locals to be planted). Western road verge very narrow in width and degraded. Cable to be located on western side of Warrenup Road.

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 15 Location 9: Looking South along western side of Warrenup Road road verge where cable will be located; very disturbed and narrow verge prior to road corner and crossing (next two photographs). Cable to be located on western side of Warrenup Road.



Photo 16 Location 9: Looking north along Warrenup Road where Cable will be crossing from western side to eastern side; only occasional Eucalypt seedlings, mostly introduced grasses on narrow road verge on eastern side looking north. Thus avoiding the remnant trees on the eastern side between locations 9 and 10 to the western side of Warrenup Road.

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 17 Location 10: Looking south from intersection of Warrenup Road and Ngopitchup Road to less vegetation on eastern side of Warrenup Road road verge, only occasional *Corymbia calophylla* (Marri). Western side greater growth of trees. Cable to be located on eastern side of Warrenup Road.



Photo 18 Location 10: Looking north over intersection of Warrenup Road and Ngopitchup Road showing only occasional tree seedling on eastern side of Warrenup Road in foreground and then into paddock as in next photograph. Cable to be located on eastern side of Warrenup Road and crossing northwards into paddock past Ngopitchup Road.

APPENDIX A: PHOTOGRAPHIC RECORD OF PROPOSED FLAT ROCKS WIND FARM TURBINE CABLE IMPACTS, MARCH 2022



Photo 19 Location 10: Looking north from intersection of Warrenup Road and Ngopitchup Road to cleared paddocks towards T18 on private property through cleared paddocks. Cable to be located on eastern side of Warrenup Road and crossing northwards into paddock north of Ngoptichup Road and east of Warrenup Road.