Amendment Report

Dunedoo Solar Farm

July 2021

Project Number: 20-764

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Acronyms and abbreviations

AHIMS	Aboriginal Heritage Information Management System
BC Act	*Biodiversity Conservation Act 2016* (NSW)
Cwth	Commonwealth
DAWE	Department of Agriculture, Water and the Environment (Cwth) (formerly DoEE)
DPIE	Department of Planning, Industry and Environment (NSW)
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EES	Environment, Energy and Science (NSW), Division of DPIE (formerly OEH, and, prior, DECCW)
EIS	Environmental impact statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
ha	hectares
Heritage Act	*Heritage Act 1977* (NSW)
km	kilometres
LALC	Local Aboriginal Land Council
LGA	Local Government Area
m	metres
MW	Megawatts
NES	Matters of National Environmental Significance under the EPBC Act (*c.f.*)
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NV Act	*Native Vegetation Act 2003* (NSW)
OEH	(Former) Office of Environment and Heritage (NSW) (now EES)
PCT	Plant Community Type
PV	Photovoltaic
SSD	State Significant Development

1. Introduction

This report has been prepared by NGH Pty Ltd (NGH) on behalf of ib vogt GmbH (The Proponent) to provide additional information to the Department of Planning, Industry and Environment (DPIE) requested via letter on 08 June 2021 (DPIE, 2021), regarding Dunedoo Solar Farm. This report supports the Environmental Impact Statement (EIS) dated September 2020 (NGH, 2020) and subsequent information including:

- Submissions Report dated March 2021 (NGH, 2021a)
- Amendment Report dated March 2021 (NGH, 2021b)
- Additional Information dated June 2021 (NGH, 2021c)

This report addresses the following factors:

- Heritage impacts, including details of consultation with Registered Aboriginal Parties (RAPs)
- Potential noise and visual impacts
- Biodiversity impacts
- Consultation with nearby receivers
- Landowners consent for the additional allotments.

The following sections summarise each factor as per the above order, in relation to the addition of a 3rd Transmission Line option (referred to as Option 3 TL).

1.1 Legislation

This application is made under Clause 55 of the *Environmental Planning and Assessment Regulation 2000*. This Amendment Report describes proposed changes to an SSD application that are considered to be substantially the same as the development described in the EIS. This report considers whether the proposed amendments are comparable to the development described within the EIS, specifically relating to:

- Development size, scale and footprint.
- Intensity, including existing developments.
- Use of the land.
- Project life and hours of operation.
- Extent, duration and severity of impacts.

The proposed safeguards and mitigation measures described in the EIS and the few additional measures outlined in this report would enable impacts to be either avoided, minimised or appropriately managed.

2. Site Layout

Correspondence from DPIE dated 8 June 2021, stated:

"*The Department is aware you are considering an additional western transmission option as part of the project*".

Response

The proposed site layout is substantially the same as Figure 4-1 in the Dunedoo EIS which provided a comprehensive detail of proposed infrastructure. The Proposal's Development Footprint would remain at approximately 79 ha. This amendment proposes a third TL option that would be considered in addition to the two options described in the Dunedoo EIS (NGH, 2020). The amended site layout is presented in Figure 2-1 below.

The options for the three proposed TLs would traverse several lots that include private and Crown land. Refer to Table 2-1 for a summary of the TL's associated lots and Figure 2-2 for the identification of the lots (a resolution version of this figure is also provided in Appendix F).

Table 2-1 Lots associated with the three TL options

Transmission Line	Owner 1	Owner 2	Owner 3	Owner 4	Crown
Option 1	N/A (Solar Array Only)	Lot 80 DP 754309	Lot 37 DP 754309	Lots 181-186 DP 754291 Lots 196-201 DP 754291	Lot 7012 DP 93290 Talbragar River All Weather Rd Reserve
Option 2	N/A (Solar Array Only)	Lot 80 DP 754309	Lot 37 DP 754309	Lots 181-186 DP 754291 Lots 196-201 DP 754291	Lot 7012 DP 93290 Talbragar River All Weather Rd Reserve
Option 3	N/A (Solar Array Only)	Lot 80 DP 754309	N/A	Lots 181-186 DP 754291 Lots 196-201 DP 754291	Lot 7012 DP 93290 Lot 119/ DP754291 Lot 7011/DP 93332 Talbragar River All Weather Rd Reserve

(*) including Essential Energy Dunedoo substation augmentation and extension

All three TL options for the 66 kV TL corridor would require an approximately 40-metre clearing easement.

All three options would require construction of a substation extension within Lots 181 -182 and Lots 200-201 DP754291 adjacent to the existing Essential Energy substation including augmentation within the existing Essential Energy substation (Lots 183-186 DP754291 and 196-199 DP754309) to facilitate the TL as required by Essential Energy.

All three options would require a t-off spur to connect to the substation extension within Lot 7012 DP93290 and Lots 181-182, 200-201 DP754291 via either underground or overhead subject to detailed design.

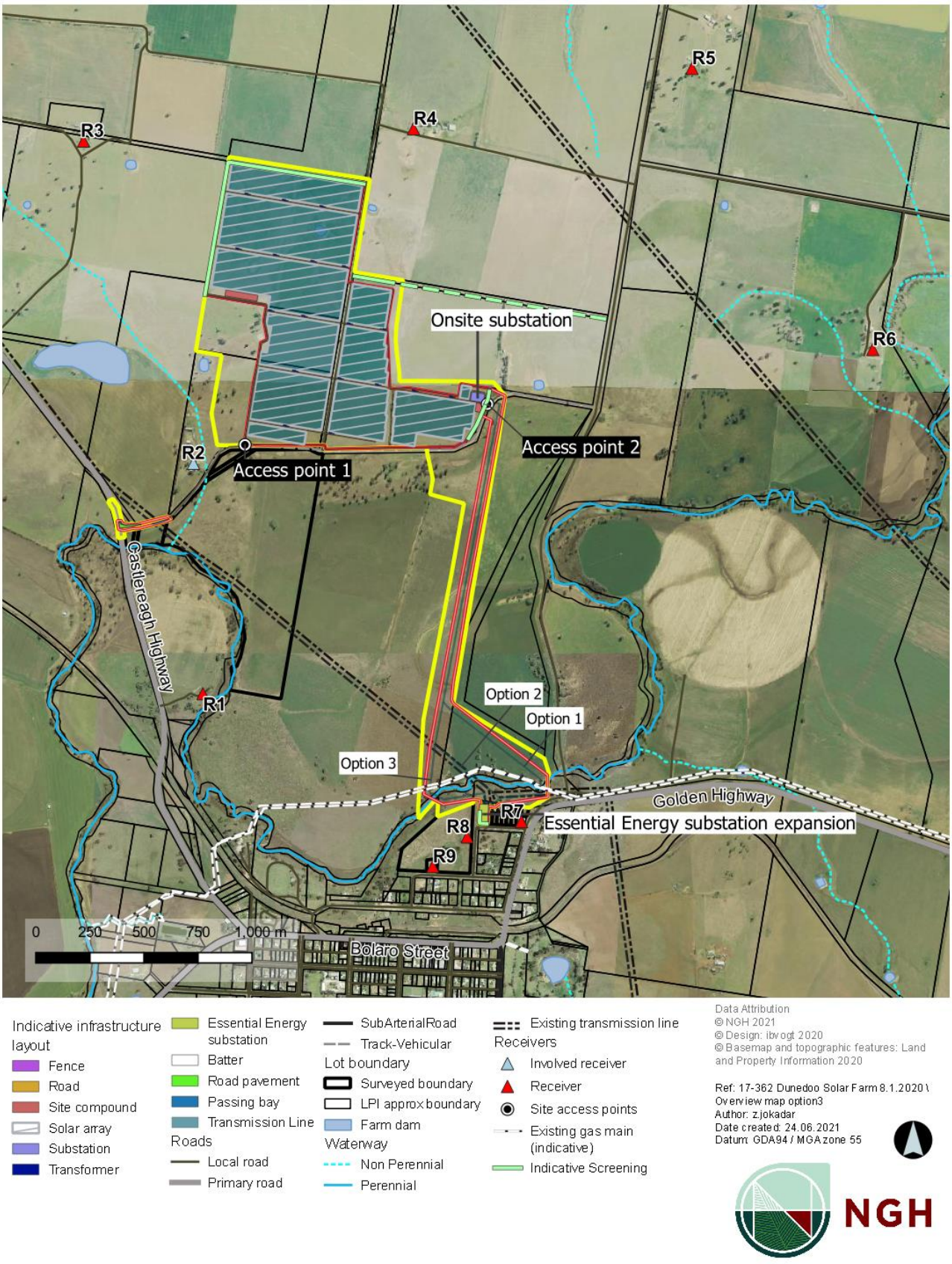


Figure 2-1 Proposal boundaries and surrounding features

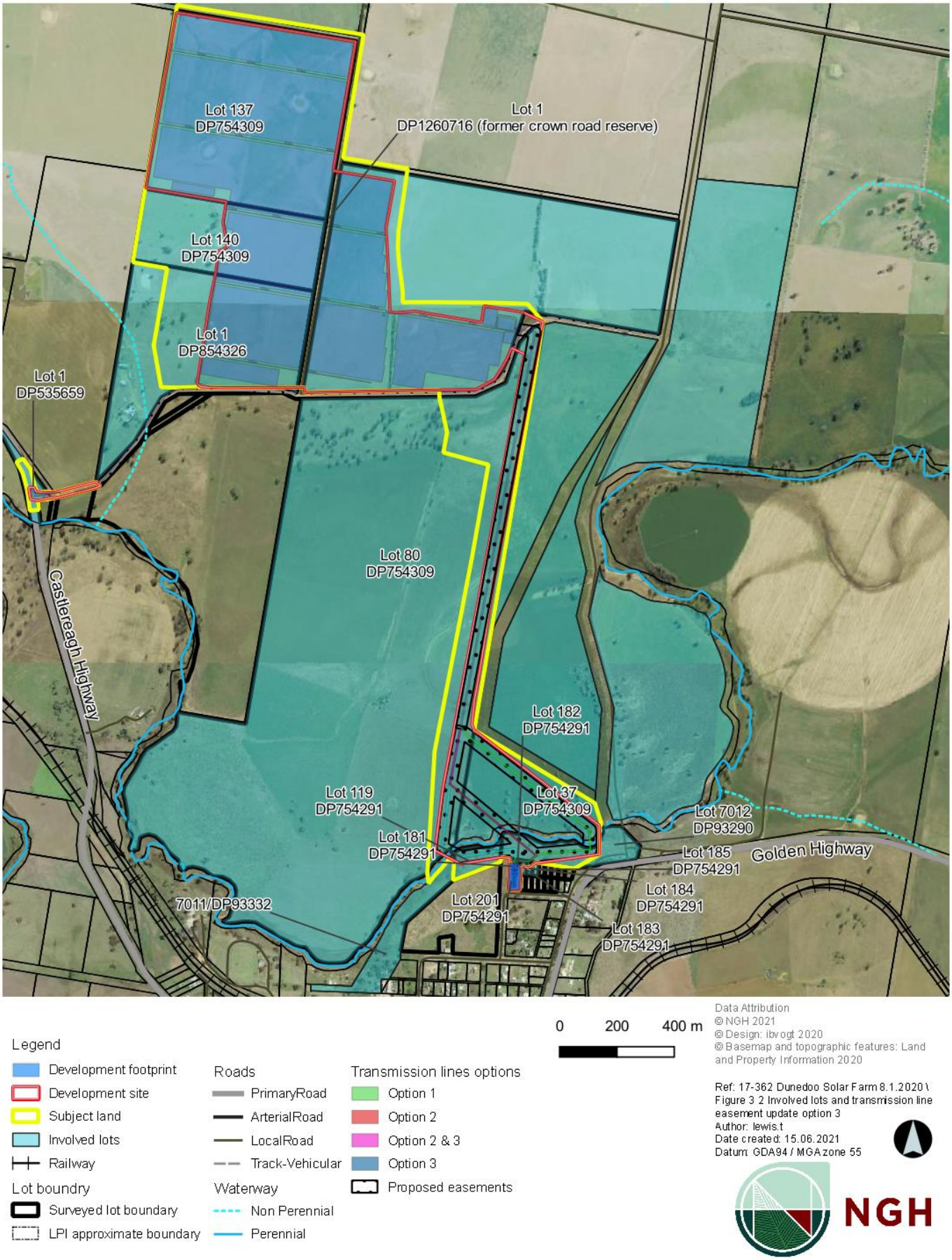


Figure 2-2 Identification of lots associated with the Proposal

3. Potential Environmental Impacts

The following specialist reports for the Proposal, have been updated to include an assessment for the construction of option 3 TL. Table 3-1 summarises the results of the assessment. The updated reports, are provided in the appendices of this report.

Table 3-1 Summary specialist assessment for Option 3 TL

Subject	Assessment Summary	Additional Mitigation required	Appendix in this report
Aboriginal Heritage	The detailed Aboriginal Heritage Information Management System (AHIMS) search conducted by NGH on 25 June 2020, covered an 18 km east-west x 18 km north-south area, which includes the full proposal area and the Option 3 TL. Within this search area, 95 AHIMS were recorded. Of these, AHIMS 36-2-0048, is approximately 350 metres east of the substation and outside the proposal area. As such no further assessment is required. AHIMS 36-2-0049 which is within the proposal area and under 300m east of the substation was previously assessed by OzArk in 2012 for the proposed Beryl to Dunedoo 66kV Transmission Line. This study found that the site 36-2-0049 had been previously legally impacted under two permits issued under the NPW Act and that the field survey confirmed that this site no longer exists. Refer to Figure 1 in Appendix A for the location of these two AHIMS sites. A field survey was undertaken in May 2020 by NGH, of the proposal area which included coverage of Option 3 TL. 76 test pits were excavated across the proposal area and of these, two pits within the footprint of the proposed Essential Energy substation expansion contained a total of 45 artefacts. Based on these results, a subsurface archaeological site associated with Dunedoo AFT 24 (AHIMS 36-2-0513) was confirmed within the impact area of the transmission lines and is shown in Figure 5 in Appendix A. No other sites were identified within the Option 3 TL impact area. The ACHA assessed the archaeological deposit associated with Dunedoo AFT 24 to contain some research potential, and mitigation measures such as an excavation salvage programme were recommended at this location if impacts to the Substation area are unable to be avoided by works.	No	Appendix A

<table>
<tr><th>Subject</th><th>Assessment Summary</th><th>Additional Mitigation required</th><th>Appendix in this report</th></tr>
<tr><td></td><td>This assessment applies to Option 3 TL. As such, the assessment and mitigation measures of the NGH ACHA 2020 remain valid with regard to the additional transmission line option (Option 3 TL).

No additional mitigation measures are required.

RAPs Consultation

An amendment letter was provided to the RAPs on 18/06/2021, accompanied by the original ACHA for reference, with comments requested by 16/07/2021.

Comments received from the RAPs are summarised below:
<table>
<tr><th>RAP</th><th>Comment</th><th>NGH Response</th></tr>
<tr><td>Murong Gialinga</td><td>Would like all Aboriginal objects to be collected and reburied as close to their point of origin as possible. With the attendance of one RAP</td><td>The mitigation measures covering these remarks are already incorporated into the ACHA report (NGH 2020)</td></tr>
<tr><td>Wellington Valley Wiradjuri Aboriginal Corporation/ Gallanggabang Aboriginal Corporation</td><td>Have no issues with either the project amendment or the recommendations</td><td></td></tr>
</table>
As comments from Murong Gialinga RAP specifying mitigation measures are wholly covered by existing measures incorporated in the ACHA report (NGH 2020), no additional mitigation measures are required.</td><td></td><td></td></tr>
<tr><td>Visual</td><td>The closest receivers to Option 3 TL would be:</td><td>No</td><td>Appendix B</td></tr>
</table>

Subject	Assessment Summary	Additional Mitigation required	Appendix in this report
	• Receiver R7 – 1 Evans Street, Dunedoo. Residential property located approximately 1,730m south of the Proposal and approximately 200m east of the Option 3 TL easement • Receiver R8 – Lot 2, DP749515, Dunedoo. Residential property located approximately 1,780m south of the Proposal and approximately 150m south of the Option TL easement • Receiver R9 – 27 Nott Street, Dunedoo. Residential property located approximately 1,900m south of the Proposal and approximately 260m south of the Option 3 TL easement The additional visual impact assessment from the construction and operation of Option 3 TL to these 3 receivers concluded that the visual impact is likely to be negligible for R7 and R9. The Option 3 TL is likely to be visible from Receiver R8, however due to the orientation of the house, existing vegetation and existing transmission lines forming a part of the existing landscape character, the visual impact is likely to be low. Where possible it is recommended that existing vegetation within and around the Option3 TL easement be retained.		
Noise	As with the Visual impact, the closest receivers to Option 3 TL are R7, R8 and R9. Modelling of predicted LAeq (15min) for Option 3 easement construction noise levels shows that Noise Management Levels (NML) would be exceeded at R7 and R8 when a front loader or grader is used; or when up to 3 of the noisiest plant are operating concurrently. It is noted that these results are similar (lower or within 1dBA) to the noise exceedances at the same receivers for Option 1 and 2 TL easements. This difference is considered to be barely perceptible to the average listener. Furthermore, the overall construction activities within the easements would occur for a relatively short period, as such the impact would be short term and temporary. It is also noted that construction noise levels at all receivers are predicted to be less than the highly noise affected level of 75dB(A) for all construction stages of the solar farm Proposal. Potential vibration impacts for identified receivers for construction of Option 3 TL easement would be the same as construction vibration impacts for Option 1 and 2 TL. The potential for adverse	No. The mitigation measures listed in Chapter 9.4.4 of the Dunedoo EIS (NGH, 2020) are considered appropriate to minimise impacts of the Proposal. No additional	Appendix C

Subject	Assessment Summary	Additional Mitigation required	Appendix in this report
	comments to vibration impacts during the construction works was determined to be 'low' to 'very low' due to the large distances between the receiver locations and the construction activities. No additional assessment for operation, vibration and road traffic has been carried out, as the results of those assessments would not change as a result of the construction or operation of the Option 3 TL. Construction noise is the only aspect that warrants further assessment as assessed above and in Appendix C.	mitigation measures are proposed.	
Biodiversity	The addition of Option 3 TL results with an adjustment to the area of the Subject Land, Development Site and Development Footprint, compared to what was assessed in the NGH BDAR 2020. The revised areas and maps are provided in Appendix D. The overall impact of Option 3 TL is equivalent to Option 1 TL and Option 2 TL as presented in the EIS. Below are the main changes. The updated Development Footprint for Option 3 TL is approximately 79.04 ha of which the vast majority is Category-1 Exempt land and does not require assessment under the BAM. Of the 79.04 ha, up to 0.88 ha is native vegetation. This consists of: • 0.63 ha Plant Community Type (PCT) 281 Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion • 0.06 ha PCT 201 Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion • 0.19 ha PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion Of these PCTs, 0.63 ha of PCT 281, is considered to form part of the White Box, Yellow Box, Blakely's Red Gum Grassy Woodland threatened ecological communities (TEC); and 0.06 ha of	No	Appendix D

Subject	Assessment Summary	Additional Mitigation required	Appendix in this report
	PCT 201 is considered to be consistent with Fuzzy Box Woodland TEC. These TECs are also listed as potential Serious and Irreversible Impact (SAII) entities. Impacts to the Fuzzy Box Woodland TEC remain unchanged as a result of the inclusion of Option 3 TL. However, impacts to the White Box, Yellow Box, Blakely's Red Gum Grassy Woodland increase from 0.58 ha to 0.63 ha as a result of the updated proposal. The revised assessment indicates that that a small, fragmented area of this community in the southern part of the updated Development Site will be impacted. Given there are extensive areas of Box Gum Woodland occurring within 1000 ha and 10,000 ha of the updated Development Site, the impact will be small. One EPBC Act listed community was recorded during the surveys, that of White Box, Yellow Box, Blakely's Red Gum Grassy Woodland (Box Gum Woodland). Approximately, 0.63 ha of this community would be impacted by the construction of Option 3 TL, to the north west of the substation and in proximity to the substation. This is an increased impact of 0.05 ha from Option 1 TL or Option 2 TL. Option 1 TL and Option 2 TL BAM calculator reports were included in the NGH BDAR 2020. The highest potential impact area is 0.89 ha for Option 1 TL. The updated Development Footprint for Option 3 TL has a potential impact area of 0.88 ha and thus has not increased the area of uncertain impacts on biodiversity values. The potential direct impacts on biodiversity values that cannot be avoided through the construction and operational phases of the proposed solar farm are detailed in Table 3 of the Addendum BDAR in Appendix D. The maximum impact by a transmission line option has been used; in this case Option 1 TL has the greatest Development Footprint impact. As such the construction of Option 3 TL would have a reduced impact if chosen. Option 3 TL intersect with canopy trees within the riparian corridor of the Talbragar River and within Lot 119 DP 754291. However tree removal in this area will be minimal, as such connectivity will still be maintained across the landscape. No hollow bearing trees would be removed for the		

Subject	Assessment Summary	Additional Mitigation required	Appendix in this report
	construction of Option 3 TL. No BC Act listed threatened species were recorded during surveys in the area for Option 3 TL. The Dollarbird (*Eurystomus orientalis*) an EPBC Act listed species, was recorded within the 40-metre easement for the proposed Option 3 TL, as indicated in Appendix H of the BDAR Addendum. An assessment of significant impact was completed for the Dollarbird (please refer to Appendix K of the addendum BDAR) and concluded that a significant impact was unlikely. As such, an EPBC referral is not considered necessary. Although Option 3 TL will be constructed over the river, no works within the waterway or disturbance to the bed and banks of the waterway will occur, as such no impact to water quality is anticipated. In addition, the updated proposal is not considered to impact on hydrological processes of the waterway. The PCTs and vegetation zones requiring offset and the ecosystem credits required are documented in Table 7 and mapped in Appendix M of the Addendum BDAR. The full updated Biodiversity Credit Report generated by the BAM Calculator is provided in Appendix N. • 19 Ecosystem Credits within the updated Development Footprint for impacts PCT 281. An increase of 5 credits from the BDAR 2020. • 1 Ecosystem Credit within the updated Development Footprint for impacts to PCT 201. No change from BDAR 2020 • 4 Ecosystem Credits within the updated Development Footprint for impacts to PCT 78. Reduction by 1 credit from BDAR 2020.		
Landowner Consultation	Consultation with the community has been ongoing for some years. This is thoroughly detailed in Section 6.3 of the EIS and subsequent Additional Information and Amendment Report. Specifically, R8 was visited by employees of the Proponent on 31/5/2021 to update them on the	N/A	Appendix E

Subject	Assessment Summary	Additional Mitigation required	Appendix in this report
	Option 3 TL. No one was home at the time of the visit and a letter identifying the changes to the Dunedoo Solar Farm transmission line was left at the residence, as attached at Appendix E. Contact details of the Proponent were also left at the dwelling to allow residents to contact the Proponent to ask any questions they may have. No response or questions have been received to date.		
Landowner's Consent	The Proponent has provided consent from relevant land owners directly to the Department of Planning, Industry and Environment.	N/A	N/A

4. Conclusion

In relation to the matters discussed in this report, NGH has undertaken a review of DPIE's additional information requests and concludes that:

- Further assessment for Aboriginal heritage impacts for the inclusion of Option 3 TL has found that the assessment mitigation measures of the NGH ACHA 2020 remain valid. No additional impacts would occur and no additional mitigation measures are required.
- Further assessment for visual impacts for the inclusion of Option 3 TL has found that this option is likely to be visible from receiver R8. However, however due to the orientation of the house, existing vegetation and existing transmission lines forming a part of the existing landscape character, the visual impact is likely to be low. No additional visual mitigation measures are required.
- Further assessment for Noise impacts for the inclusion of Option 3 TL has found that construction and vibration noise impacts would not change from the assessed impacts in the Dunedoo EIS, and no additional noise mitigation measures are required.
- Further assessment for Biodiversity impacts for the inclusion of Option 3 TL has found the updated Development Footprint for Option 3 TL has a potential impact area of 0.88 ha, while the highest potential impact area is 0.89 ha for Option 1 TL. Ecosystem credit requirements within the updated Development Footprint for the Option 3 TL impacts to PCT 78 are 4, PTC 201 are 1 and PTC281 are 19. The NGH BDAR 2020 has assessed the maximum possible impacts from the construction of the TL options, which is Option 1 TL. As such the construction of the Option 3 TL would have a reduced impact.

Ongoing project consultation has occurred, particularly with receivers R8.

Crown Lands (as crown land manager) can facilitate construction licenses, operation licenses, and establishment of an easement over Lot 119/ DP754291 and Lot 7011/DP 93332 providing statutory application processes are followed.

Cumulative impacts as a result of the updated distances of other proposals in the region with the Dunedoo Solar Farm proposal would remain generally the same as assessed in the EIS and previously submitted additional information and may provide benefits to the region through sequential construction of projects.

Site layout / infrastructure plan has been clearly identified all proposed infrastructure in the EIS and in this response.

5. References

DPIE. (2021, June 8). Dunedoo Solar Farm (SSD 8847). Request for additional information. Sydney, NSW, Australia.

NGH. (2020, September). Dunedoo Solar Farm EIS. Sydney, NSW, Australia.

NGH. (2021a, March). NGH Submissions Report. Sydney, NSW, Australia.

NGH. (2021b, March). NGH Amendment Report. Sydney, NSW, Australia.

NGH. (2021c, March). NGH Additional Information. Sydney, NSW, Australia.

Appendix A Addendum ACHAR

22 July 2021

Hugh Sangster
Senior Development Manager
ib vogt GmBH
Level 6, 201 Kent Street
Sydney NSW 2000

Hugh.sangster@ibvogt.com

Dear Hugh,

Re: 20-764 Dunedoo SF Amendment ACHA Addendum Letter

This addendum letter-report has been prepared by NGH Pty Ltd (NGH) on behalf of ib vogt GmBH (the proponent) to provide additional information to the NSW Department of Planning, Industry and the Environment (DPIE) requested on 08 June 2021 (DPIE 2021) regarding Dunedoo Solar Farm. This report supports the Aboriginal Cultural Heritage Assessment dated September 2020 (NGH 2020) which was prepared to inform the Environmental Impact Statement (EIS) also prepared by NGH (2020). The request for additional information relating to Aboriginal heritage stated:

The Department requests additional information for this option including:

- *Heritage impacts, including details of consultation with Registered Aboriginal Parties (RAPs)*

The purpose of this letter report is to provide a brief summary of the relevant project information, in relation to the addition of a 3rd Transmission Line option (referred to as Option 3 TL), in context of Aboriginal cultural heritage.

This report makes direct reference to the ACHA (NGH 2020) and does not repeat relevant background information which has been used to inform the conclusions, except where necessary.

Site Layout

The proposed site layout is unchanged with the exception of an additional transmission line option, Option 3 TL, as shown in Figure 2-1 of the Amendment Report (NGH 2021) to which this letter is an attachment. Refer to

Table 1 for a summary of the lots associated with Option 3 TL (with reference to Owners as noted in the Amendment Report (NGH 2021). The TL would require approximately a 40 metre clearing easement and construction of a substation extension within Lots 181 -182 and Lots 200-201 DP754291 adjacent to the existing Essential Energy substation including augmentation within the existing Essential Energy substation (Lots 183-186 DP754291 and 196-199 DP754309) to facilitate the TL as required by Essential Energy.

All three options would require a t-off spur poles to connect to the substation extension within Lot 7012 DP93290 and Lots 181-182, 200-201 DP754291 via either underground or overhead subject to detailed design.

Table 1 Lots associated with Option 3 TL

Owner	Lot/s
Owner 1	N/A (Solar Array Only)
Owner 2	Lot 80 DP 754309
Owner 3	N/A
Owner 4	Lots 181-186 DP 754291 Lots 196-201 DP 754291
Crown	Lot 7012 DP 93290 Lot 119/ DP754291 Lot 7011/DP 93332 Talbragar River All Weather Rd Reserve

Consultation

Consultation with Aboriginal community stakeholders was undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010) and details of this can be viewed in the ACHA (NGH 2020:18-23). The draft ACHA was provided to the registered Aboriginal parties (RAPs) for review and comment in July 2020. A series of comments were provided and addressed at that time (NGH 2020: 21).

This amendment letter was provided to the RAPs on 18 June 2021, accompanied by the original ACHA for reference, with comments requested by 16 July 2021. Comments received from the RAPs are provided in Table 2 below.

Table 2 RAP comments on amendment letter

RAP	Comment	NGH Response
Murong Gialinga	Would like all Aboriginal objects to be collected and reburied as close to their point of origin as possible. With the attendance of one RAP	The mitigation measures covering these remarks are already incorporated into the ACHA report (NGH 2020)
Wellington Valley Wiradjuri Aboriginal Corporation/ Gallanggabang Aboriginal Corporation	Have no issues with either the project amendment or the recommendations	

Aboriginal Heritage Information Management System

The ACHA undertaken by NGH (2020) for the Proposal included a search of the Aboriginal Heritage Information Management System (AHIMS) conducted on 25 June 2020 centred on the Proposal Area and covering an 18 km east-west x 18 km north-south area. The AHIMS Client Service Number was: 515668. This search includes the location of Option 3 TL, as assessed in this addendum report.

There were 95 Aboriginal sites and no declared Aboriginal Places recorded in the search area. One AHIMS site, 36-2-0049, was registered within the Proposal Area however a previous assessment by OzArk in 2012 for the proposed Beryl to Dunedoo 66kV Transmission Line noted that the site has been previously legally impacted under two permits issued under the NPW Act and that their field survey confirmed that this site no longer exists. The next closest site was AHIMS 36-2-0048, approximately 350 metres east of the substation. Figure 1 shows the locations of these registered sites in relation to the Proposal Area, including the addition of Option 3 TL and Figure 2 shows the locations of previous studies, including the OzArk 2012 assessment.

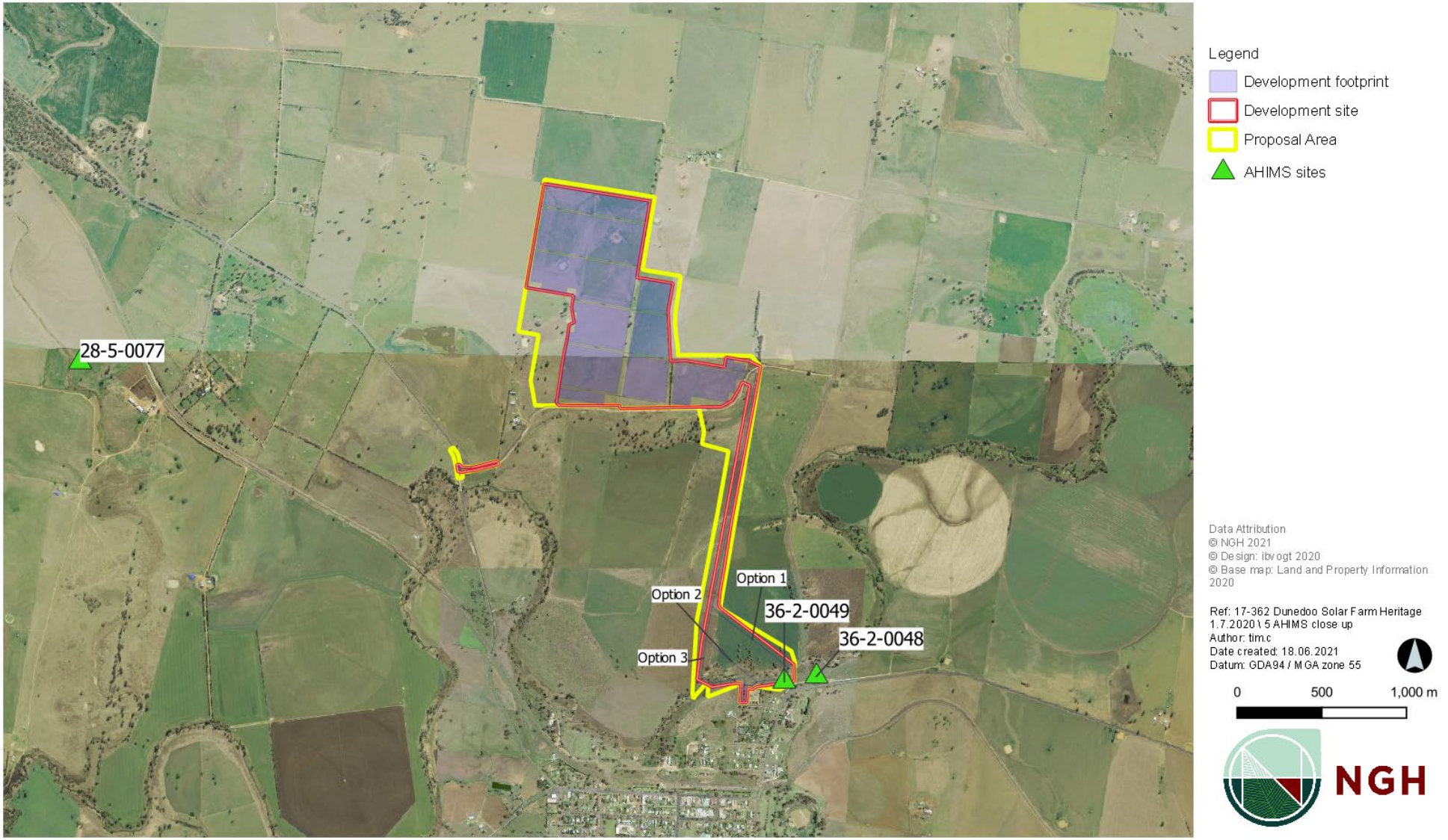


Figure 1 Proposal Area with AHIMS sites

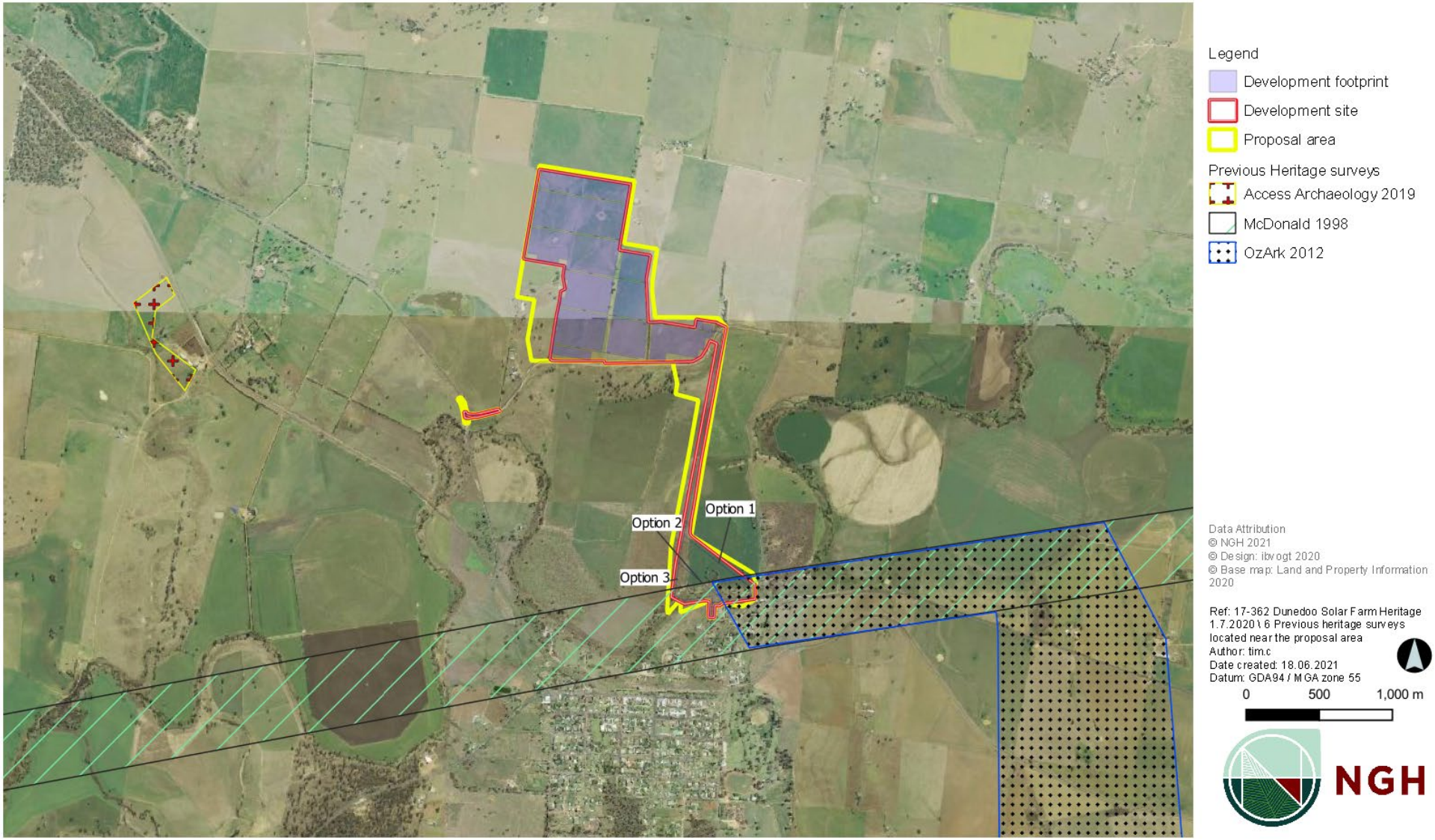


Figure 2 Proposal Area with previous studies

Survey and Test Excavation Results

A field survey was undertaken in May 2020 by NGH, and included coverage of Option 3 TL. The following sites outlined in Table 3 below were recorded within the Proposal Area, and are shown in Figure 3, Figure 4 and Figure 5).

Table 3 Sites recorded within Proposal Area

AHIMS	Name	Type	Notes
36-2-0049	DTG/OC27 - Dunedoo 1	Artefact scatter	Previously recorded site which has since been impacted and destroyed. AHIMS should be updated to list the site as destroyed. Located within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0081	Dunedoo Solar AFT 1	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0082	Dunedoo Solar AFT 2	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0083	Dunedoo Solar AFT 3	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0084	Dunedoo Solar AFT 4	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0085	Dunedoo Solar AFT 5	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0086	Dunedoo Solar AFT 6	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0087	Dunedoo Solar AFT 7	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0088	Dunedoo Solar AFT 8	Artefact scatter	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0089	Dunedoo Solar AFT 9	Isolated Find	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0090	Dunedoo Solar AFT 10	Isolated Find	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0091	Dunedoo Solar AFT 11	Isolated Find	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0092	Dunedoo Solar AFT 12	Isolated Find	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0093	Dunedoo Solar AFT 13	Isolated Find	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report
28-5-0094	Dunedoo Solar AFT 14	Isolated Find	Within the Final Subject Land for the Dunedoo Solar Farm as assessed in this report

Several areas of subsurface potential were identified across the Proposal Area, and 76 test pits were excavated, 13 of which contained artefacts. Of these, five pits were excavated in the substation area, near Option 3 TL, two of these (Pits 1 and 3) contained a total of 45 artefacts. Based on these results, a subsurface archaeological site associated with Dunedoo AFT 24 (AHIMS 36-2-0513) was confirmed within the impact area of the transmission lines and is shown in Figure 5. It was concluded that the archaeological deposit at this location was relatively high density in comparison to other sites within the Proposal Area.

There were no other sites identified within the Option 3 TL impact area.

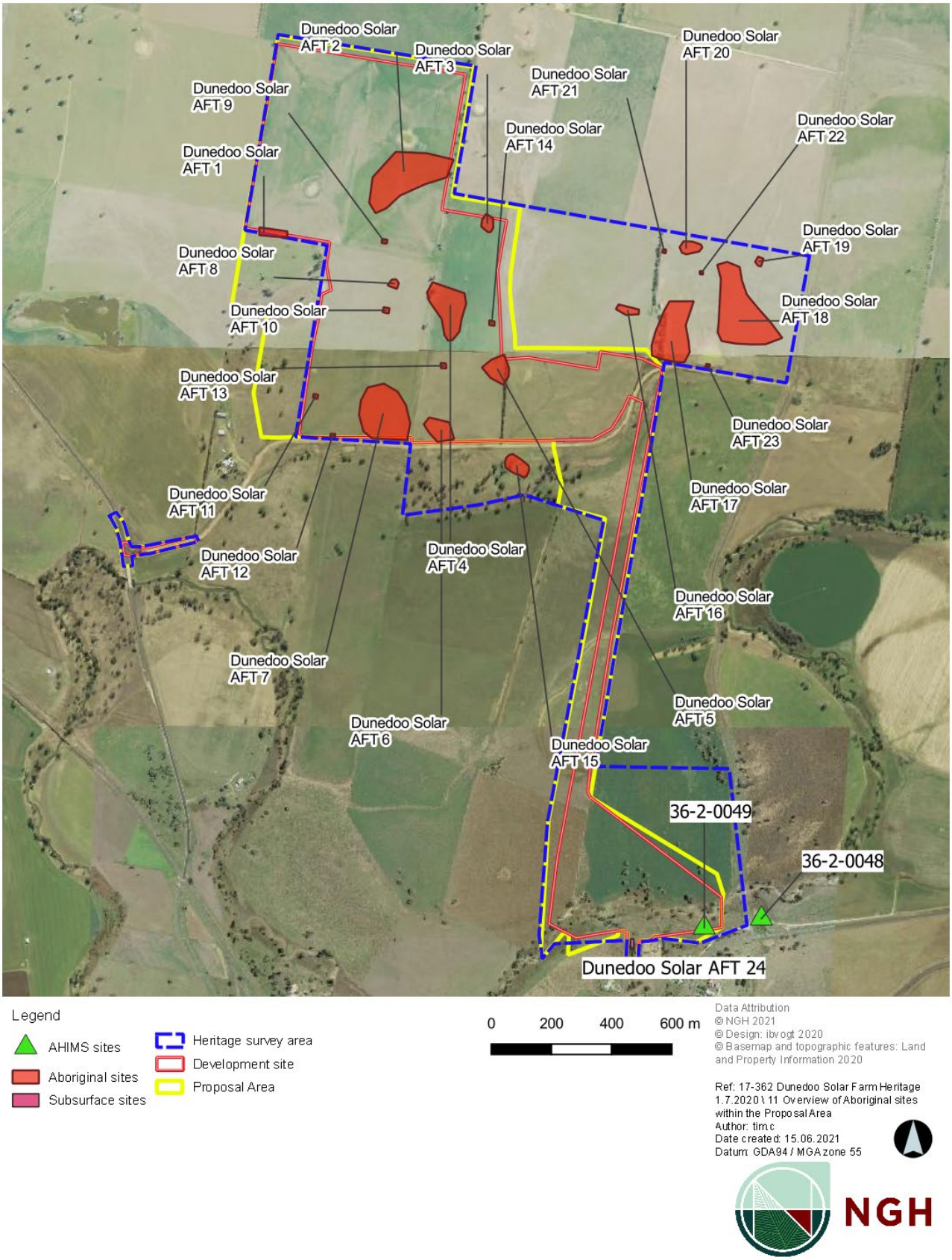


Figure 3 Overview of survey coverage and Aboriginal sites recorded

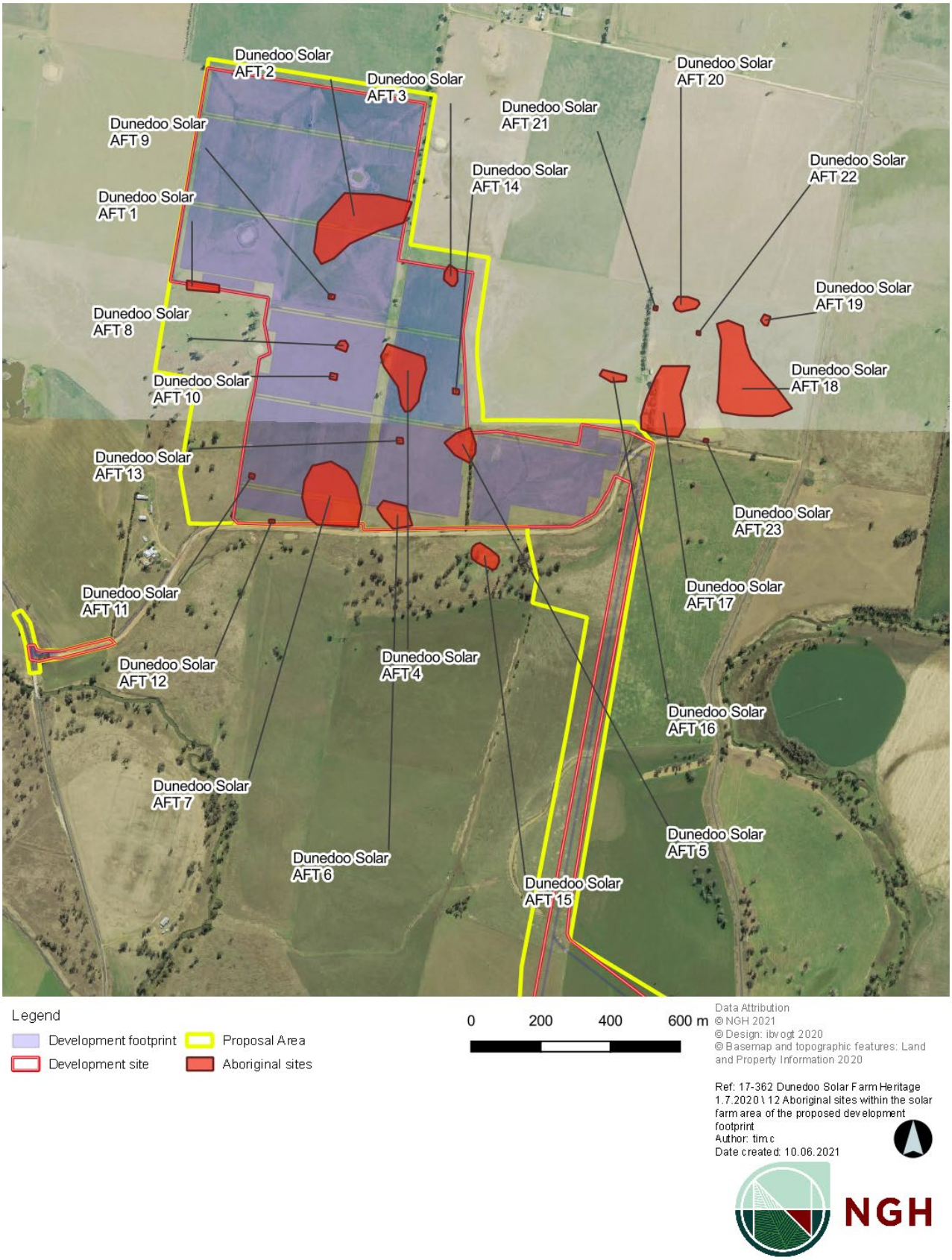


Figure 4 Aboriginal sites within northern portion of the Proposal Area

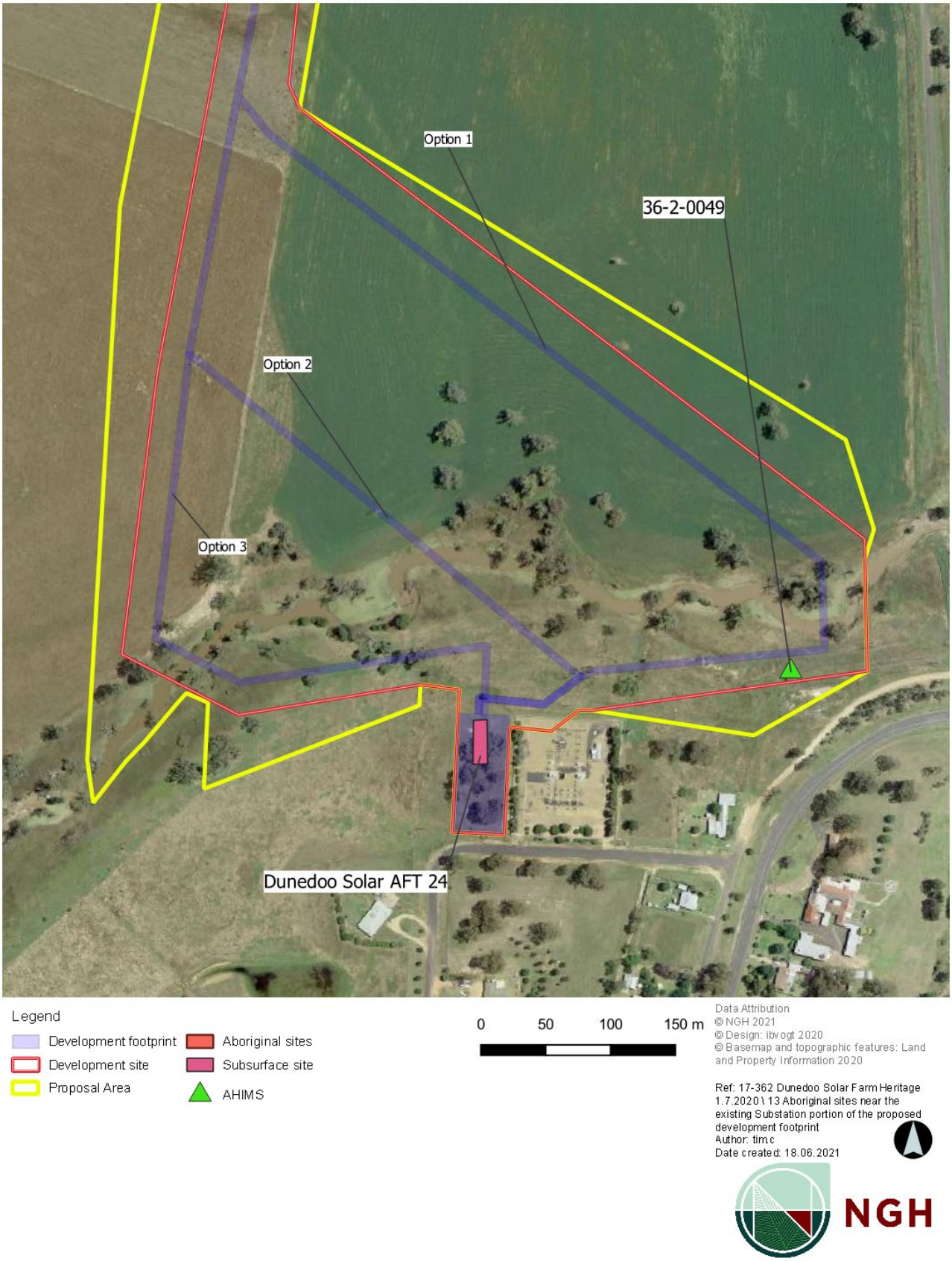


Figure 5 Aboriginal sites within southern portion of Proposal Area

Impact Assessment

The ACHA assessed the archaeological deposit associated with Dunedoo AFT 24 near the substation to contain some research potential, with the high density subsurface material recovered from the Substation area within Pit 1 and Pit 3 suggesting that further mitigation measures such as an excavation salvage programme are warranted at this location if impacts to the Substation area are unable to be avoided by works. This assessment applies to Option 3 TL. A summary of the sites within the Proposal Area likely to be impacted and sites avoided is shown in Table 4.

Table 4 Summary of sites within Proposal Area - impacted and avoided

Sites impacted within Final Subject Land	Sites avoided as outside Final Subject Land
• DTG/OC27 - Dunedoo 1 (Artefact Scatter) • Dunedoo Solar AFT 1 (Artefact Scatter) • Dunedoo Solar AFT 2 (Artefact Scatter) • Dunedoo Solar AFT 3 (Artefact Scatter) • Dunedoo Solar AFT 4 (Artefact Scatter) • Dunedoo Solar AFT 5 (Artefact Scatter) • Dunedoo Solar AFT 6 (Artefact Scatter) • Dunedoo Solar AFT 7 (Artefact Scatter) • Dunedoo Solar AFT 8 (Artefact Scatter) • Dunedoo Solar AFT 9 (Isolated Find) • Dunedoo Solar AFT 10 (Isolated Find) • Dunedoo Solar AFT 11 (Isolated Find) • Dunedoo Solar AFT 12 (Isolated Find) • Dunedoo Solar AFT 13 (Isolated Find) • Dunedoo Solar AFT 14 (Isolated Find) • Dunedoo Solar AFT 24 (Artefact Scatter)	• Dunedoo Solar AFT 15 (Artefact Scatter) • Dunedoo Solar AFT 16 (Artefact Scatter) • Dunedoo Solar AFT 17 (Artefact Scatter) • Dunedoo Solar AFT 18 (Artefact Scatter) • Dunedoo Solar AFT 19 (Artefact Scatter) • Dunedoo Solar AFT 20 (Artefact Scatter) • Dunedoo Solar AFT 21 (Isolated Find) • Dunedoo Solar AFT 22 (Isolated Find) • Dunedoo Solar AFT 23 (Isolated Find)

The above assessment remains valid with regard to the additional transmission line option (Option 3 TL). The site identified within the proposed substation location, Dunedoo AFT 24, will be impacted as a result of the substation and transmission line development, for all options.

Conclusions and Recommendations

The recommendations and mitigation measures as provided in the ACHA (2020:72) therefore remain valid with the inclusion of Option 3 TL with equivalent impact compared to the other powerline options in the EIS, including the following as provided for Dunedoo AFT 24.

- Prior to works commencing adjacent to the existing Essential Energy Dunedoo Substation an excavation salvage programme must be undertaken for the site Dunedoo Solar AFT 24. The areas surrounding the locations of Pit 1 and Pit 3 which had high densities of subsurface artefacts recovered during the testing programme should be focus areas for the excavation salvage programme.
- All other recommendations as provided in the ACHA (NGH 2020: 78-79) remain valid.

If you have any questions, please contact me on (02) 4929 2301. I would be pleased to discuss any aspect of this project with you further.

Yours sincerely,

Ali Byrne
Senior Heritage Consultant
0428 747 615

Appendix B Addendum Visual Impact

18th June 2021

Zeina Jokadar
NGH Consulting
Zeina.j@nghconsulting.com.au

Dear Zeina,

Re: RFI Dunedoo Solar Farm (SSD-8847) – Option 3 Transmission Line

1.0 Introduction

Further to the LVIA prepared in September 2020 and Addendum Report prepared on 3rd June 2021, this letter provides an assessment of the visual impact resulting from an additional (third) transmission line option for Dunedoo Solar Farm.

2.0 Overview of Option 3 Transmission Line (Option 3 TL)

An additional transmission line option has been proposed for consideration (referred to as Option 3 TL). Option 3 TL follows an alignment similar to Option 1 TL and Option 2 TL. Option 3 TL runs from the proposed Essential Energy extension substation in a north direction for approximately 50 metres before heading in a generally west direction for 250 metres, crossing the Talbragar River then continuing north towards the Solar Farm Site.

All three transmission line options are presented in **Figure 1**.

Figure 1. Proposed Transmission Line Routes

3.0 Assessment of Visual Impacts relating to Option 3 TL

There are three (3) non-involved dwellings identified in the LVIA within 300 m of Option 3 TL. An assessment from each of these non-involved dwellings has been provided in **Table 1**.

Dwelling:	Distance to Option 3 TL:	Assessment:
Receiver R7	200 m east	Residential dwelling located approximately 1,730 m south of the Solar Farm and approximately 200 m east of Option 3 TL. This dwelling is orientated to the south towards Evan Street. Views to Option 3 TL will be screened by the existing substation and vegetation. *The visual impact is negligible from R7.*
Receiver R8	150 m south	Residential dwelling located approximately 1,780 m from the Solar Farm and approximately 150 m south of the Option 3 TL. This dwelling appears to be orientated to the north west. Views to Option 3 TL would be available to the north of the dwelling. It is important to note existing transmission lines are visible from the dwelling and are a noticeable element in the existing visual landscape. The proposed Option 3 TL would be in keeping with the scale and character of existing landscape. *The visual impact from this dwelling is likely to be low from R8.*
Receiver R9	260 m south	Residential dwelling located approximately 1,900 m south of the Solar Farm and approximately 260 m south of Option 3 TL. The rear of this dwelling is orientated to the south towards Evan Street. Views to Option 3 TL is unlikely to be visible to the north due to vegetation in the yard and scattered vegetation in the middle ground. *The visual impact is negligible from R9.*

Table 1. Assessment from non-involved Dwellings

Option 3 TL is unlikely to be discernible from dwellings within the northern extent of Dunedoo (associated with Nott Street and Evan Street) due to intervening vegetation and houses. Of the three (3) non-involved dwellings assessed, the Option 3 TL is likely to be visible from Receiver R8, however due to the orientation of the house and existing transmission lines forming apart of the existing land-scape character, the visual impact is likely to be low.

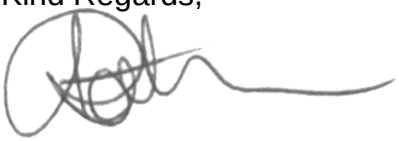
It is understood a small portion of vegetation is likely to require removal to accommodate Option 3 TL. Where possible it is recommended that existing vegetation be retained.

4.0 Conclusion

Option 3 TL is likely to be a visible element in the landscape from some areas to the south. The assessment of Option 3 TL found that the visual impact resulting from the transmission is likely to be negligible from the majority of dwellings associated with Dunedoo. Views to Option 3 TL will be available from one non-involved dwelling (R8), however the visual impact has been rated as low.

Please do not hesitate to contact me if you have any further questions.

Kind Regards,



Ashley Robertson B.L.Arch RLA
Associate Landscape Architect
Moir Landscape Architecture

Appendix C Addendum Noise Impact

17 June 2021
TJ855-01F02 Addendum - Option 3 Easement (r1)

NGH Environmental
Zeina Jokadar
zeina.j@nghconsulting.com.au

From: Ben Carlyle [Ben.Carlyle@renzotonin.com.au]

Dunedoo Solar Farm - Addendum Construction & Operational Noise & Vibration Assessment - Option 3 Transmission Line

1 Introduction

Renzo Tonin & Associates was engaged to conduct an environmental noise and vibration assessment of the proposed Dunedoo Solar Farm located approximately two kilometre north of the town of Dunedoo in New South Wales as part of the Environmental Impact Statement (EIS) for the Proposal. Noise and vibration impacts from the construction and operation phases of the Proposal were addressed in the report *Dunedoo Solar Farm Construction & Operational Noise & Vibration Assessment* (September 2020 Report)[1] in accordance with relevant Council and EPA requirements and guidelines.

The technical memorandum is an addendum to the September 2020 Report and assesses an additional third Transmission Line (TL) option (Option 3 TL).

1.1 Background

This Addendum is to be read in conjunction with the September 2020 Report. Details pertaining to receiver locations, hours of operation, existing noise environment and Rating Background Levels (RBL), construction noise management levels and plant list, within Sections 2, 3, and 4 of the September 2020 Report, have been used for this assessment.

No additional assessment for operation, vibration and road traffic has been carried out, as the results of those assessments would not change as a result of the construction or operation of the Option 3 TL. Construction noise is the only aspect that warrants further assessment and is addressed in the following sections.

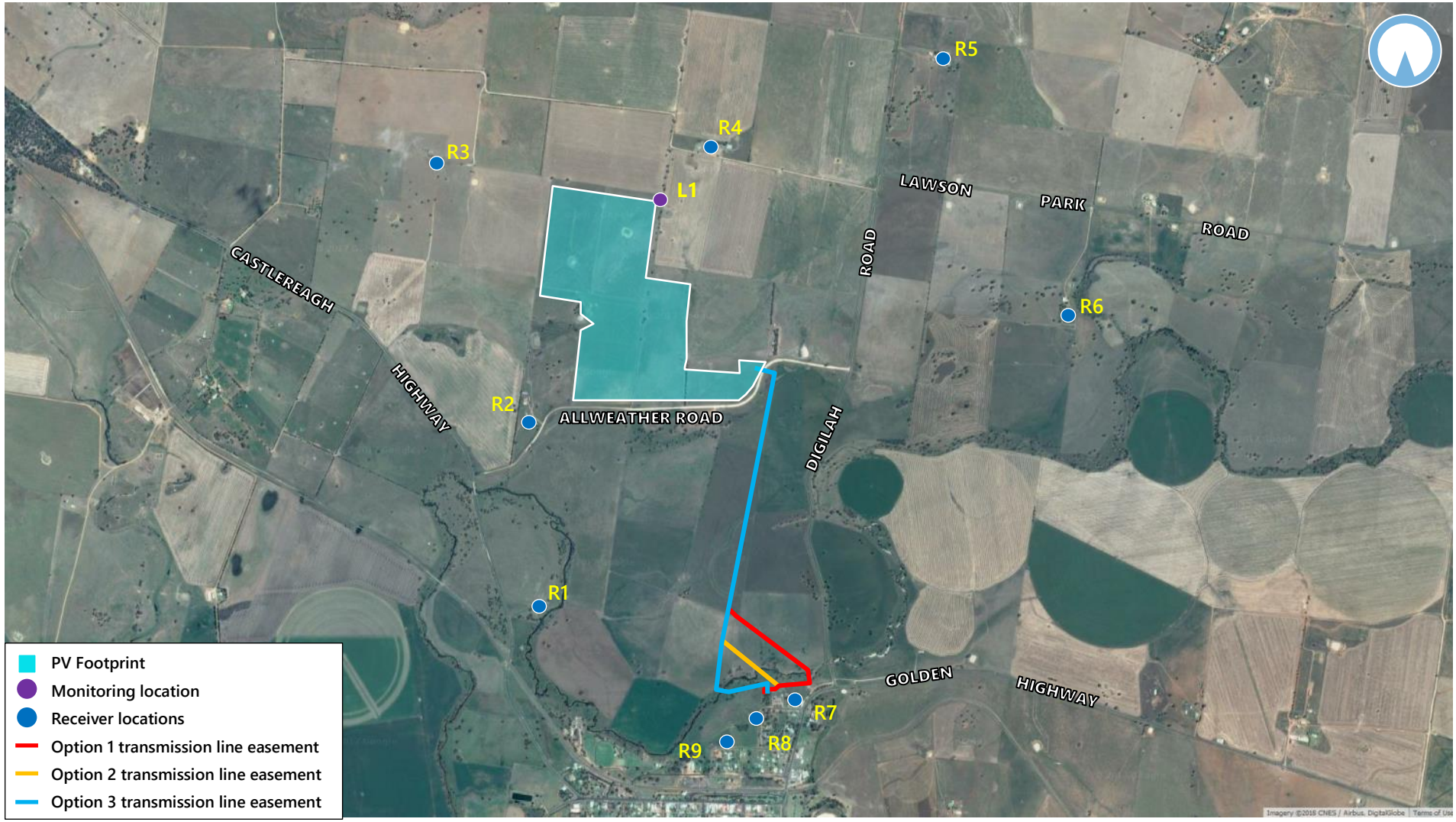
[1] Report TJ855-01F01 Noise Vibration Assessment (r3), dated 3 September 2020

2 Site layout and nearest sensitive receivers

The amended site layout is presented in Figure 1 below. The Option 3 TL mainly follows the same alignment as Option 1 and Option 2 but branches off from Option 2 and continues south over Talbragar River before connecting to the Essential Energy Substation extension. As such the closest sensitive receivers to the Option 3 TL are:

- **Receiver R7 – 1 Evans Street, Dunedoo**
  Residential property located approximately 1,730m south of the Proposal and approximately 200m east of the Option 3 TL easement
- **Receiver R8 – Lot 2, DP749515, Dunedoo**
  Residential property located approximately 1,780m south of the Proposal and approximately 150m south of the Option 3 TL easement
- **Receiver R9 – 27 Nott Street, Dunedoo**
  Residential property located approximately 1,900m south of the Proposal and approximately 260m south of the Option 3 TL easement

Figure 1 – Site, Surrounds and Receiver and Noise Monitoring Location



3 Construction noise assessment

Noise emissions were predicted by modelling the noise sources, receiver locations, topographical features of the intervening area, and possible noise control treatments using CadnaA (version 2018) noise modelling computer program.

Table 3.1 refers to the noise levels likely to be experienced at the nearby affected receivers due to the construction of the easement for the Option 3 TL. The noise level ranges represent the noise source being located at the furthest to the closest proximity to each receiver location.

Table 3.1 – Predicted $L_{Aeq,15min}$ Option 3 TL Easement Construction Noise Levels at Receiver Locations, dB(A)

Plant Item	Plant Description	Predicted $L_{eq(15min)}$ Construction Noise Levels								
		R1	R2	R3	R4	R5	R6	R7	R8	R9
Noise Management Level[1]		*70*[2]	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*
1	Front End Loader	21-28	<20-26	<20-<20	<20-26	<20-22	<20-23	21-**47**	21-**49**	<20-42
2	Grader	<20-25	<20-23	<20-<20	<20-23	<20-<20	<20-<20	<20-44	<20-**46**	<20-39
3	Vibratory Roller	<20-24	<20-22	<20-<20	<20-22	<20-<20	<20-<20	<20-43	<20-45	<20-38
4	Delivery Truck	<20-23	<20-21	<20-<20	<20-21	<20-<20	<20-<20	<20-42	<20-44	<20-37
5	Water Cart	<20-22	<20-<20	<20-<20	<20-20	<20-<20	<20-<20	<20-41	<20-43	<20-36
6	Light vehicles (eg 4WD)	<20-<20	<20-<20	<20-<20	<20-<20	<20-<20	<20-<20	<20-37	<20-39	<20-32
Up to 3 (noisiest) plant operating concurrently		24-31	22-29	<20-22	<20-29	<20-25	<20-25	24-**50**	23-**52**	22-45

Notes:
1. Noise Management Levels for day period (ie. standard construction hours)
1. Noise Management Level for commercial type premises
2. **Bold** font represents exceedance of the relevant NML

For the construction of the Option 3 TL, Table 3.1 indicates that construction noise levels could exceed the noise management levels at Receivers R7 and R8. However, the overall construction activities within the easements would occur for a relatively short period. It is noted that these results are similar (lower or within 1dB) to the noise exceedances at the same receivers for Option 1 and 2 TL easements. This difference is considered to be barely perceptible to the average listener.

It is noted that construction noise levels at all receivers are predicted to be less than the highly noise affected level of 75dB(A).

In light of the predicted construction noise levels above, it is recommended that a feasible and reasonable approach towards noise management measures be applied to reduce noise levels as much as possible to manage the impact from construction noise.

The noise mitigation and management measures detailed in Section 4.4 of the September 2020 Report still apply, no additional measures are required for the construction of Option 3 TL.

4 Conclusion

This technical memorandum is an addendum to the September 2020 Report to review operational and construction noise impacts from the Option 3 TL.

The assessment has found that operation, vibration and road traffic impacts are unchanged from the September 2020 Report and construction noise impacts are consistent with Option 1 TL and Option 2 TL. Noise mitigation and management measures detailed in Section 4.4 of the September 2020 Report are recommended.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
17.06.2021	Issued	0	1	B. Carlyle	M. Chung	

File Path: R:\AssocSydProjects\TJ851-TJ900\TJ855 mch Dunedoo Solar Farm\Task 3\1 Docs\TJ855-01F02 Addendum - Option 3 Easement (r1).docx

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.

L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

Appendix D Addendum Biodiversity

23 June 2021

Nicole Brewer
Director
Energy Assessments
Department of Planning, Industry and Environment
4 Parramatta Square, 12 Darcy Street
Parramatta, NSW 2150

Submitted via NSW Planning Portal at: www.planningportal.nsw.gov.au

Dear Ms Brewer,

Re: 20-764 – Dunedoo Solar Farm

NGH submitted a Biodiversity Development Assessment Report (BDAR) for the Dunedoo 66MW Photovoltaic Solar Farm in September 2020 on behalf of ib vogt GmbH. NGH are writing to request an amendment to this report to include an additional powerline, based on the proposed western transmission line option, between the Dunedoo Solar Farm and Essential Energy's sub-station. Please see the BDAR Amendment at 1.

The additional proposed western transmission line (Option 3 TL) will run between Lot 80 DP 754309 and Lot 37 DP 754309, as previously planned but will cross Talbragar River southwest of Lot 37 DP 754309, run west to east through Lot 7011 DP 93332, Lot 119 DP 754291 and Lot 7012 DP 93290 (Crown land parcels), and then south into Essential Energy's sub-station at its western end.

Please refer to Appendix A which indicates the involved Lots for the Dunedoo Solar Farm and the three proposed positions of the transmission line (Options 1, 2 and 3). Appendix B shows an updated site map, indicating the updated Subject Land area and the updated Development Site.

The Subject Land now covers an area of 158.13 hectares (ha) (the updated Subject Land).

The Development Site is now 117.2 ha (the updated Development Site).

The Development Footprint remains at approximately 79 ha (the updated Development Footprint).

NGH undertook site assessment using the Biodiversity Assessment Method (BAM) from 5th – 7th December 2017 and from 25th – 26th September 2018 within and surrounding the area proposed for Option 3 TL. As this survey work was undertaken less than five years ago, it is still valid for the purposes of this requested BDAR Amendment.

Appendix C shows an updated location map and the native vegetation extent within the 1500m buffer from the Subject Land. The native vegetation extent of 158.23 hectares (ha) has not changed from the Dunedoo 66MW Photovoltaic Solar Farm BDAR submitted in September 2020.

The BAM proposal identification number for the BAM assessment is 00009114/BAAS17051/18/00009115 - **Revision 9** for updated Development Footprint options. The assessment type that was selected is 'Major Project'.

Please note that in the Biodiversity Assessment Methodology (BAM) Calculator Reports, Plant Community Type (PCT) 281 (Rough-Barked Apple - red gum - Yellow Box woodland on alluvial

clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion) is Vegetation Zone 3 whereas in the original BDAR, this BDAR Amendment and on the related maps, PCT 281 is Vegetation Zone 4. This is because Vegetation Zone 3, as described in the original BDAR and this amendment BDAR, is PCT 78 – Scattered trees and these areas are not within the updated Development Footprint and therefore not entered into the BAM Calculator.

Outlined below are the impacts that would result from positioning the transmission line as per Option 3 TL. Please note that only the sections from the Dunedoo 66MW Photovoltaic Solar Farm BDAR submitted in September 2020 that have been changed are included below, in addition to supporting information to confirm that no change was necessary. The relevant heading number from Dunedoo 66MW Photovoltaic Solar Farm BDAR is indicated below the headings in this report.

If you have any questions, please contact Zeina Jokadar on (02) 8202 8333. We would be pleased to discuss any aspect of this project with you further.

Yours sincerely,

Claire Hewitt
Senior Ecologist (BAAS20009)
0481 146 076

1. BDAR AMENDMENT

1.1 Native Vegetation Extent

(Section 3.1)

Approximately 10.73 ha of native vegetation occurs within the updated Development Site. Please refer to Appendix D. This consists of:

- 2.53 ha Plant Community Type (PCT) 281 Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- 1.86 ha PCT 201 Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
- 6.34 ha PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Eight scattered trees occur within the updated Development Site, derived from PCT 78 - River Red Gum riparian tall woodland / open forest. This numbers remains unchanged from the Dunedoo 66MW Photovoltaic Solar Farm BDAR submitted in September 2020.

The updated Development Footprint for Option 3 TL is approximately 79.04 ha of which the vast majority occurs as exotic dominated grassland or cropped areas in poor condition. These areas have been determined as Category-1 Exempt land and do not require assessment under the BAM.

The updated Development Footprint for Option 3 TL contains 0.88 ha of native vegetation. This consists of:

- 0.63 ha Plant Community Type (PCT) 281 Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- 0.06 ha PCT 201 Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
- 0.19 ha PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

1.2 Threatened Ecological Communities

(Section 3.4)

PCTs associated with two (2) threatened ecological communities (TEC) listed under the *Biodiversity Conservation Act 2016* (BC Act) occur within the updated Development Site.

- White Box, Yellow Box, Blakely's Red Gum Grassy Woodland (BC Act and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and
- Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions (BC Act).

A small area of good condition PCT 281 (totalling 0.03 ha) and small areas of moderate condition PCT 281 (totalling 0.60 ha) which is considered to form part of the White Box, Yellow Box, Blakely's Red Gum Grassy Woodland occur within the updated Development Site.

Additionally, a small area of PCT 201 (0.06 ha) is considered to be consistent with Fuzzy Box Woodland TEC and occurs within the updated Development Site. All vegetation zones associated with PCTs 201 and 281 within the updated Development Footprint are considered to constitute TECs within the BAM calculator.

Please refer to Appendix E which show PCTs and TECs within the updated Development Site.

1.3 Vegetation Zones and Survey Effort

(Section 3.5.1)

The three PCTs identified within the updated Development Site have been stratified into zones with a similar broad condition state. These zones, corresponding areas and BAM plot numbers are shown in Appendix F. Survey effort is mapped in Appendix G.

There were eight (8) scattered trees observed within the updated Development Site. This number has not changed from the Dunedoo 66MW Photovoltaic Solar Farm BDAR submitted in September 2020. It is not anticipated that these trees will need to be removed.

Table 1 Vegetation zones at the updated Development Site

Zone ID	PCT ID	Condition	Zone area (ha)	Survey effort (# plots)	Plot numbers	Patch size (ha)
1	201	Moderate	1.86	3	DS15, DS16, DS19	20
2	78	Good	6.21	2	DS1, RRG2	50
3	78	Scattered Tree	0.13	-	-	0
4	281	Moderate	2.53	2	DS5, DS4	20
5	-	Non-Native	106.47	11	DS2, DS3, DS8, DS9, DS10, DS11, DS12, DS13, DS14, DS17, DS18	-

1.4 Vegetation Integrity Assessment Results

(Section 3.5.3)

The vegetation zones that would be impacted by the updated proposal, their condition class, the number of plots undertaken within them and their current integrity score, as determined by the BAM calculator, are provided in Table 2 Current vegetation integrity scores for each vegetation zone within the updated Development Site.

Table 2 Current vegetation integrity scores for each vegetation zone within the updated Development Site

Zone ID	PCT ID	Condition Class	Composition Score	Structure score	Function score	Vegetation integrity score
1	201	Moderate	69.9	61	25.6	47.8
2	78	Good	62.9	54.9	38.1	50.8
3	78		-	-	-	Scattered tree
4 (this is Zone 3 in BAM-C)	281	Moderate	67.1	78.6	20.1	47.3
5	-		-	-	-	Non-native

1.5 Threatened species

(Section 4)

No BC Act listed threatened species were recorded during surveys in the area for Option 3 TL. The Masked Owl was detected during the December 2017 survey in the north western portion of the updated Development Site, however, the survey occurred outside the survey period for determination of Masked Owl and Powerful Owl breeding (May – August).

A second survey was conducted over two nights in August 2018, which replicated the call playback sites and spotlighting surveys conducted in December 2017. The Masked Owl was not detected during the August surveys, which indicates that the species is not utilising the updated Development Site as breeding habitat, and thus Species Credits for the species are not generated.

1.6 Matters of National Environmental Significance

(Section 5)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived native grassland is a critically endangered ecological community under the EPBC Act. 0.63 ha of remnant White Box – Yellow Box – Blakely's Red Gum Grassy Woodland occurs within the updated Development Site. This woodland was considered to form part of the listed national threatened ecological community due to the presence of mature trees and naturally regenerating Blakley's Red Gum (*Eucalyptus blakelyi*). The total 0.63 ha occurs within the updated Development Footprint and would be impacted by the proposal.

One EPBC Act listed migratory marine species, the Dollarbird (*Eurystomus orientalis*), was recorded four (4) times in and adjacent to the updated Development Site, within remnant vegetation adjacent to the updated Development Site to the west, north west and south, and within the updated Development Site in the south, north west of the Essential Energy sub-station. Up to four birds were identified during each sighting of the species, and the individuals appeared to be utilising hollows within the River Red Gum (*Eucalyptus camaldulensis*) along the Talbragar River.

The sightings in the south of the updated Development Site occurred within the 40-metre easement for the proposed Option 3 TL, as indicated in Appendix H.

1.7 Direct Impacts

(Section 7.1)

The potential direct impacts on biodiversity values that cannot be avoided through the construction and operational phases of the proposed solar farm are detailed in Table 3. These direct impacts will be a result of habitat clearance and through the installation and presence of infrastructure. The maximum impact by a transmission line option has been used; in this case Option 1 TL has the greatest Development Footprint impact.

The updated Development Footprint, including Option 3 TL, is detailed in Appendix I. The Development Footprint for the transmission line(s) is six metres in width.

Table 3 Potential impacts to biodiversity during the construction and operational phases

Nature of impact	Extent	Frequency	Duration and timing	TEC, threatened species and habitats likely to be affected	Consequence
Habitat clearance for permanent and temporary construction facilities (e.g., solar infrastructure, transmission lines, compound sites, stockpile sites, access tracks)	Up to 0.89 ha	Regular	Construction	• White Box, Yellow Box, Blakely's Red Gum Grassy Woodland. • Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions. • Dollarbird	• Direct loss of native flora and fauna habitat. • Potential over-clearing of habitat outside updated Development Footprint • Injury and mortality of fauna during clearing of fauna habitat and habitat trees • Disturbance to stags, fallen timber, and bush rock
Displacement of resident fauna	Up to 0.89 ha	Regular	Construction, Operation	• White Box, Yellow Box, Blakely's Red Gum Grassy Woodland. • Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions. • Dollarbird	• Direct loss of native fauna. • Decline in local fauna populations.
Injury or death of fauna	Up to 0.89 ha	Regular	Construction	• Dollarbird	• Direct loss of native fauna. • Decline in local fauna populations.
Removal of habitat features e.g., Hollow bearing tree (HBT)	Up to 0.89 ha including 1 HBT	Regular	Construction	• Dollarbird	• Direct loss of native fauna habitat. • Injury and mortality of fauna during clearing of habitat features.
Shading by solar infrastructure	Up to 0.44 ha	Regular	Operational phase: Long-term	• White Box, Yellow Box, Blakely's Red Gum Grassy Woodland. • Fuzzy Box Woodland on alluvial soils of the	• Modification of native fauna habitat. • Potential loss of ground cover resulting in unstable ground surfaces and

Nature of impact	Extent	Frequency	Duration and timing	TEC, threatened species and habitats likely to be affected	Consequence
				South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions.	sedimentation of adjacent waterways.
Existence of permanent solar infrastructure	Up to 0.89 ha	Regular	Operational Phase: Long-term	• White Box, Yellow Box, Blakely's Red Gum Grassy Woodland. • Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions.	• Modification of habitat beneath array (entirely non-native) • Reduced fauna movements across landscape due to fencing. • Collision risks to birds and microbats (fencing).

1.8 Changes in Vegetation Integrity Scores

(Section 7.1.1)

The updated changes in vegetation integrity scores as a result of the addition of Option 3 TL are detailed in Table 4. These scores have been calculated assuming the complete removal of vegetation within the updated Development Footprint.

Table 4 Current and future vegetation integrity scores for each vegetation zone with the updated Development Site.

Zone ID	PCT / Zone	EEC and. or threatened species habitat?	Area Impacted (ha)			Area Zone (ha)	Current vegetation integrity score	Future vegetation integrity score
			Option 1	Option 2	Option 3			
1	201	EEC	0.06	0.06	0.06	1.86	47.8	0
2	78	No	0.26	0.21	0.19	6.34	50.8	0
4 (Zone 3 in BAM-C)	281	EEC	0.58	0.58	0.63	2.53	47.3	0

1.9 Loss of species credit species habitat or individuals

(Section 7.1.2)

No Species Credit Species are considered impacted by the updated proposal and thus do not generate a credit requirement.

1.10 Loss of hollow-bearing trees

(Section 7.1.3)

Thirty six hollow bearing trees (HBTs) were recorded within the updated Development Site. One of these hollow bearing trees occurs within the Development Footprint of Option 1 TL and would be removed by the proposal. The tree, a River Red Gum (*Eucalyptus camaldulensis*), contains one small and one medium hollow. No hollow bearing trees occur within the updated Development Footprint for Option 3 TL.

1.11 Indirect Impacts

(Section 7.2)

The only changes to indirect impacts as a result of the updated area for the updated Development Site are detailed in Table 5. These include indirect impacts in the 40 metre easement for the transmission line and from access tracks for Option 3 TL. There are hollow bearing trees adjacent to the updated Development Footprint for Option 3 TL but tree removal in the 40 metre easement for transmission line will be avoided. Indirect impact zones are mapped in Appendix J.

Table 5 Updated indirect impacts to biodiversity during the construction and operational phases

Nature of impact	Extent	Frequency	Duration and timing	TEC, threatened species and habitats likely to be affected	Consequence for bioregional persistence
Loss of breeding habitats	1 HBT (in Option 1 TL)	Constant	Construction & Operational Phase: Long-term	• White Box, Yellow Box, Blakely's Red Gum Grassy Woodland. • Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions.	Loss of potential breeding habitat.
Cumulative loss of native vegetation, habitat and competition for remaining resources from other developments including rural land clearing	Up to 1.997 ha (including impacts in the 40 metre easement for the transmission line) 1 HBT to be impacted (in Option 1 TL)	Constant	Construction & Operational Phase: Long-term	• White Box, Yellow Box, Blakely's Red Gum Grassy Woodland. • Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions.	Loss of foraging and potential breeding habitat

1.12 Prescribed Impacts - Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range.

(Section 7.3.1)

Option 3 TL means that an additional area of remnant vegetation is now incorporated into the updated Development Site. Please refer to Appendix B.

However, Option 3 TL has avoided the removal of canopy trees where possible by placing the design in previously cleared areas. The two locations where Option 3 TL intersects with canopy trees are within the riparian corridor of the Talbragar River and within Lot 119 DP 754309. Tree removal in this area will be minimal.

Connectivity will be maintained across the landscape within River Red Gum riparian vegetation along Talbragar River, Fuzzy Box woodland along the western side of the updated Development Site and Rough-Barked Apple - Red gum - Yellow Box woodland to the south of the site which all provide corridors of habitat connectivity for mobile fauna species.

The updated Development Footprint of Option 3 TL intersects with River Red Gum riparian vegetation in the 40 m wide easement for the transmission line across the Talbragar River. There would also be some short-term, indirect disturbance associated with construction. Long-term disturbance would occur as the permanent removal of one hollow bearing tree for the construction of Option 1 TL. Fauna utilising this corridor for movement such as the Masked Owl would be considered unlikely to be impacted as a result of the proposed clearing, due to the already fragmented and degraded nature of the vegetation.

1.13 Impacts of development on the movement of threatened species that maintains their life cycle

(Section 7.3.2)

The only location where the updated Development Site and updated Development Footprint for Option 3 TL intersect with canopy trees is within the riparian corridor of the Talbragar River and within Lot 119 DP 754291, and tree removal in this area will be minimal. Connectivity will still be maintained across the landscape.

The Masked Owl is a highly mobile species with a large home range. Individuals were detected during surveys in December 2017, but not during the breeding period in August 2018, indicating that the individuals on site breed in a location outside of the updated Development Site. The updated proposal would remove one hollow bearing tree, which contains hollows large enough to support the species' breeding. This impact would occur within Development Footprint for Option 1 TL, where an approximate six metre corridor will be cleared for the transmission line. The species and others would continue to utilise the updated Development Site and surrounding habitats as movement corridors.

1.14 Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities

(Section 7.3.4)

The proposed Option 3 TL will be constructed over the river, meaning that there will be no impact to water quality as a result of the works. In addition, the updated proposal is not considered to impact on water quality, water bodies and hydrological processes that sustain threatened species and ecological communities.

No threatened flora or fauna dependent on water bodies were detected within the updated Development Site. The Talbragar River does not form part of any threatened ecological communities, and no threatened species listed under the NSW *Fisheries Management Act* 1994 (FM Act) are considered likely to occur.

1.15 Impacts of vehicle strikes on threatened species or on animals that are part of a TEC

(Section 7.3.5)

The proposed addition of Option 3 TL will not change the risk of impact of vehicle strike as stated in the Dunedoo 66MW Photovoltaic Solar Farm BDAR submitted in September 2020. The risk will remain low.

1.16 Impacts to Biodiversity Values that are Uncertain

(Section 7.4)

As stated in the Dunedoo 66MW Photovoltaic Solar Farm BDAR submitted in September 2020, this amendment to include Option 3 TL assumes that all vegetation within the updated Development Footprint would be removed for the proposal. The updated Development Footprint for Option 3 TL has decreased slightly to 79.04 ha. The costs associated with purchasing and retiring ecosystem and species credits or the need for offset areas, assumes a conservative, 'worst case' scenario and has been calculated using impact areas for Option 1 TL, Option 2 TL and Option 3 TL.

Option 1 TL and Option 2 TL BAM calculator reports were included in the BDAR for the Dunedoo 66MW Photovoltaic Solar Farm submitted in September 2020. The highest potential impact area is 0.89 ha for Option 1 TL. The updated Development Footprint for Option 3 TL has a potential impact area of 0.88 ha and thus has not increased the area of uncertain impacts on biodiversity values.

1.17 Impacts to Matters of National Environmental Significance - Threatened Ecological Communities

(Section 7.5.1)

One EPBC Act listed community was recorded during the surveys, that of White Box, Yellow Box, Blakely's Red Gum Grassy Woodland (Box Gum Woodland). Approximately, 0.63 ha of this community would be impacted by the construction of the Option 3 TL, to the north west of the substation and in proximity to the substation. This is an increased impact of 0.05 ha from Option 1 TL or Option 2 TL. Please refer to Appendix J.

An EPBC assessment of significance was completed for White Box, Yellow Box, Blakely's Red Gum Grassy Woodland (please refer to Appendix K) and concluded that a significant impact was unlikely based on the basis that:

- The amount of habitat to be removed or disturbed by the proposal is relatively small in the context of the greater area of habitat that would remain

- No fragmentation or isolation of habitat would occur
- The proposal would not modify or destroy abiotic factors
- The proposal would not cause a substantial change in the species composition
- The proposal would not cause a substantial reduction in the quality of the ecological community.

No referral is considered necessary to the Commonwealth Department of Agriculture, Water and the Environment (DAWE).

1.18 Migratory Species

(Section 7.5.3)

Refer to Matters of National Environmental Significance of this report (Section 5). One EPBC marine listed species was recorded during the surveys, the Dollarbird.

An assessment of significant impact was completed for the Dollarbird (please refer to Appendix K) and concluded that a significant impact was unlikely. As such, an EPBC referral is not considered necessary. No other EPBC Act listed species were detected or considered likely to occur within the updated Development Site.

1.19 Potential Serious and Irreversible Impact Entities Threatened ecological communities

(Section 9.1.1)

Two threatened ecological communities will be impacted by the updated proposal that are listed as potential Serious and Irreversible Impact (SAII) entities in the *Guidance to assist a decision-maker to determine a serious and irreversible impact* (OEH, 2017). These are:

- White Box, Yellow Box, Blakely's Red Gum Grassy Woodland,
- Fuzzy Box Woodland TEC.

Impacts to the Fuzzy Box Woodland TEC remain unchanged as a result of the inclusion of Option 3 TL. However, impacts to the White Box, Yellow Box, Blakely's red Gum Grassy Woodland increase from 0.58 ha to 0.63 ha as a result of the updated proposal. The revised impact is assessed below.

1.20 Assessment of Serious and Irreversible Impacts - White Box – Yellow Box – Blakely's Red Gum Grassy Woodland (Box Gum Woodland)

(Section 9.2.1)

An assessment of the impacts to Box Gum Woodland was undertaken. Appendix L shows the location of the Box Gum Woodland in relation to the updated Development Site.

a) the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII

The updated Development Site contains approximately 2.53 ha of vegetation which conforms to the listing of Box Gum Woodland. Option 3 TL will run through a patch of this community in the southern part of the updated Development Site where large patches of good condition vegetation are present. A 0.63 ha patch of Box Gum Woodland will be directly impacted;

however, vegetation loss will be minimal due to construction methods and loss of canopy trees will avoided where possible.

b) the area (ha) and condition of the TEC to be impacted directly and indirectly by the proposed development. The condition of the TEC is to be represented by the vegetation integrity score for each vegetation zone

Approximately, 0.63 ha of Box Gum Woodland would be directly impacted by the proposal. Updated indirect impacts are listed in Table 6 (and in Table 9-1 in the Dunedoo Solar Farm BDAR submitted in September 2020). This vegetation is highly modified and generally lacks native understory due to grazing and pasture improvement practices. The vegetation integrity score for this patch is 47.3, as demonstrated in Table 6.

Table 6 Updated Vegetation Integrity Score for PCT 281

Zone ID	Zone Description	Option (TL)	Patch size	Composition score	Structure score	Function score	Vegetation Integrity Score
4 (Zone 3 in BAM-C)	PCT 281	Option 3	0.63	67.1	78.6	20.1	**47.3**

c) a description of the extent to which the impact exceeds the threshold for the potential entity that is specified in the *Guidance to assist a decision-maker to determine a serious and irreversible impact*

No threshold has yet been defined by EES for the extent of Box Gum Woodland to be removed that constitutes a serious and irreversible impact**.**

d) the extent and overall condition of the potential TEC within an area of 1000ha, and then 10,000ha, surrounding the proposed updated Development Footprint

Using GIS and State Vegetation Mapping (VIS_4468 & 4469), it is estimated that 55 ha of Box Gum Woodland occurs within an area of 1000 ha surrounding the proposed updated Development Footprint, and 1627 ha of Box Gum Woodland occurs within an area of 10 000 ha surrounding the proposed updated Development Footprint.

e) an estimate of the extant area and overall condition of the potential TEC remaining in the IBRA subregion before and after the impact of the proposed updated development has been taken into consideration

Using GIS and State Vegetation Mapping (VIS_4468 & 4469), it is estimated that 32,801 ha of Box Gum Woodland occurs within the Lower Slopes IBRA Subregion. Vegetation mapped from aerial imagery is assumed to be in moderate to good condition. Up to 0.63 ha is proposed to be removed by the development, which is less than 0.002% of the estimated extent remaining.

f) an estimate of the area of the potential TEC that is in the reserve system within the IBRA region and the IBRA subregion

In NSW, Box Gum Woodland is known to occur within at least 42 reserve systems. Around 8,000 ha of Box Gum Woodland is estimated to occur in national parks and nature reserves within the NSW South Western Slopes IBRA Region (Benson 2008). Using VIS Vegetation Mapping, it is estimated that 481 ha of Box Gum Woodland occurs in four reserves in the Lower Slopes Subregion.

g) the development, clearing or biodiversity certification proposal's impact on:

i. abiotic factors critical to the long-term survival of the potential TEC; for example, how much the impact will lead to a reduction of groundwater levels or the substantial alteration of surface water patterns

It is predicted that the proposal could have impacts on,

- surface water flows across the ground due to the presence of solar panels,
- change in light levels reaching the ground due to shading of panels,
- modification to ground moisture levels where solar panels may block or concentrate rain over certain areas.

The proposal could potentially benefit the Box Gum Woodland by removing disturbances caused by farming activities such as application of fertilisers and exclusion of stock.

There is little scientific information on the effects of solar farms on these factors. Until sufficient monitoring of solar farms is carried out, it is largely unknown whether solar farms are likely to have a detrimental impact on abiotic factors. A 'worst case' assumption would be that alterations to sunlight reaching the ground and changes to surface water flows due to the large surface area of solar panels over the ground, could modify abiotic factors necessary for survival of the community.

A review of the National Recovery Plan for Box Gum Woodland indicates that:

- Altered hydrological regimes may lead to impacts,
- Prolonged shading may lead to impacts and
- Mowing and slashing associated with managing grasslands may lead to impacts

It therefore must be assumed (without scientific evidence suggesting otherwise) that this proposal may lead to modification and destruction of important abiotic factors for preserving the integrity of Box Gum Woodland onsite.

ii. **characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of understorey species or harvesting of plants**

The proposal would remove 0.63 ha of Box Gum Woodland including moderate condition native canopy and native groundcovers. No introduced fire or flooding regimes would occur and no increase of natural occurrences of these events is anticipated from the development. The harvesting of plants will not occur within the remaining Box Gum woodland.

iii. the quality and integrity of an occurrence of the potential TEC through threats and indirect impacts

Up to 0.63 ha of Box Gum Woodland would be removed reducing the vegetation quality and integrity of this patch. No further impacts would occur to remaining Box Gum Woodland in the locality.

h) direct or indirect fragmentation and isolation of an important area of the potential TEC

The small, fragmented patches of Box Gum Woodland in the updated Development Site are already isolated within the agricultural landscapes. The small, isolated patch to be removed would not cause further fragmentation to areas of Box Gum Woodland in the locality.

i) the measures proposed to contribute to the recovery of the potential TEC in the IBRA subregion.

The 0.63 ha of Box Gum woodland to be removed will be offset by 19 Ecosystem Credits that will be used for management of another area of Box Gum Woodland in the same IBRA region.

Conclusion:

The proposal will impact a small, fragmented area of this community in the southern part of the updated Development Site where large patches of good condition vegetation are present. Extensive areas of Box Gum Woodland occur within 1000 ha and 10,000 ha of the updated Development Site.

1.21 Requirement to offset - Ecosystem Credits

(Section 10.1.1)

The PCTs and vegetation zones requiring offset and the ecosystem credits required are documented in Table 7 and mapped in Appendix M. The full updated Biodiversity Credit Report generated by the BAM Calculator is provided in Appendix N.

Table 7 PCTs and vegetation zones that require offsets

Zone ID	PCT ID	PCT name	Zone area (ha)			Vegetation integrity score	Ecosystem credits required		
			Option 1	Option 2	Option 3		Option 1	Option 2	Option 3
1	201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	0.06	0.06	0.06	47.8	1	1	1
2	78	River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	0.26	0.21	0.19	50.8	5	4	4
4 (Zone 3 in BAM-C)	281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	0.58	0.58	0.63	47.3	14	14	19

1.22 Species credits

(Section 10.1.2)

No species credit species were present on site; the proposal does not generate a species credit offset requirement.

1.23 Offsets required under the EPBC Act

(Section 10.2)

No species listed on the EPBC Act have been identified as having the potential to be significantly impacted by the development. As such, the proposal is not considered to require offsets in accordance with the EPBC Offsets Policy.

1.24 Areas not Requiring Assessment

(Section 10.3)

Areas not requiring assessment in accordance with BAM Section 10.4, i.e., land without native vegetation, are detailed in – Impacts Requiring Offset Appendix M.

1.25 Conclusion

(Section 11)

NGH has prepared this BDAR amendment on behalf of IbVogt for the 66MW Dunedoo Photovoltaic Solar Farm in Dunedoo, NSW. The purpose of this BDAR amendment was to address the requirements of the BAM, developed for Major Projects, and to address the biodiversity matters raised in the SEARs, particularly in relation to the proposed Option 3 TL. In this amendment to the BDAR, biodiversity impacts have been assessed through:

- Comprehensive mapping and assessment completed in accordance with the BAM
- Updated mitigation measures which have been outlined to reduce the impacts to biodiversity
- The generation of up to 19 Ecosystem Credits within the updated Development Footprint for impacts to Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion (PCT 281)
- The generation of 1 Ecosystem Credit within the updated Development Footprint for impacts to Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion (PCT 201)
- The generation of up to 4 Ecosystem Credits within the updated Development Footprint for impacts to River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (PCT 78).
- EPBC referral is not required
- Overall impact of Option 3 TL is equivalent to Option 1 TL and Option 2 TL presented in the EIS

The retirement of these credits will be carried out in accordance with the NSW Biodiversity Offsets Policy for Major Proposals, and will be achieved by either:

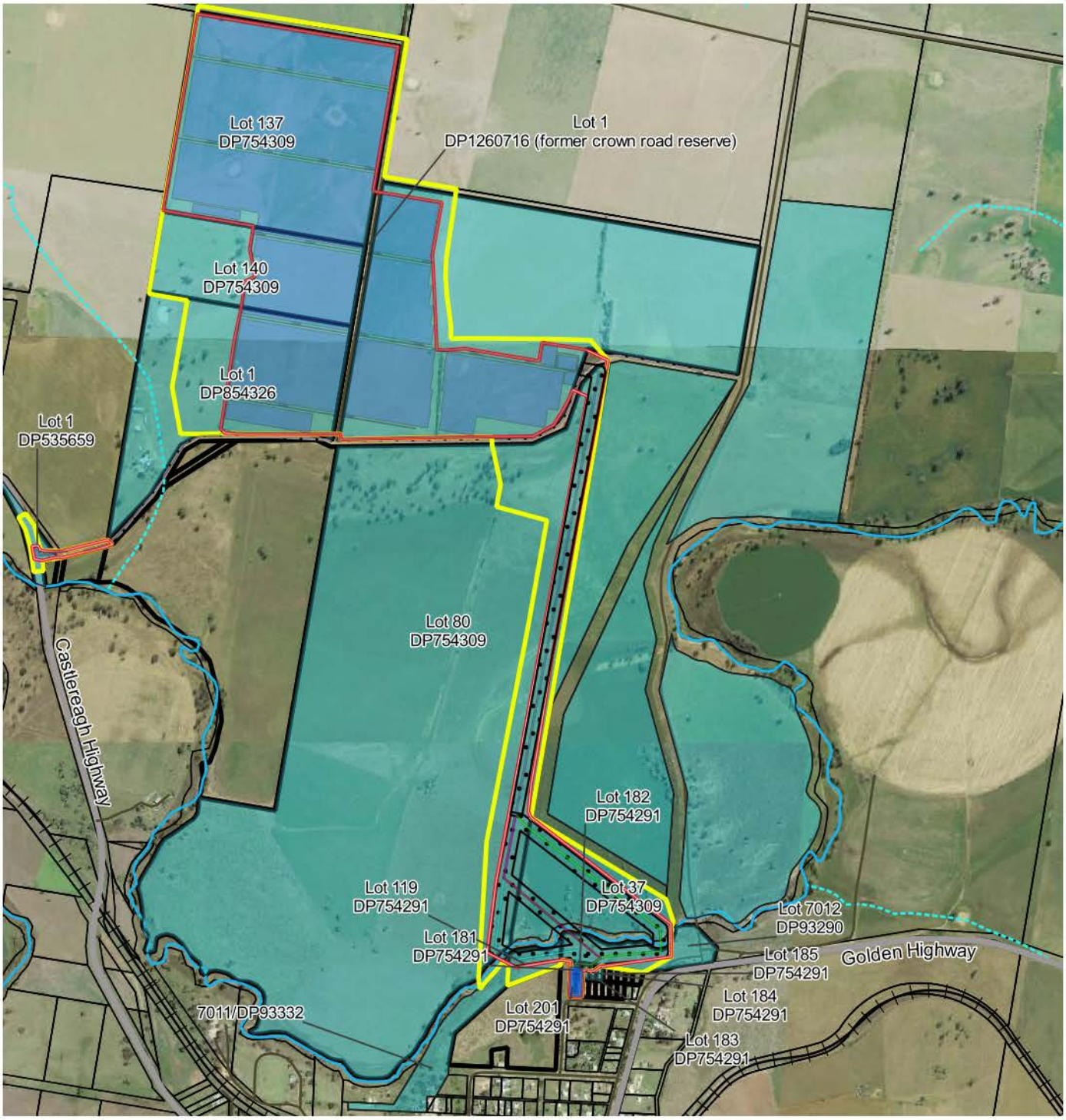
(a) retiring credits under the Biodiversity Offsets Scheme
(b) making payments into the Biodiversity Conservation Fund
(c) funding a biodiversity action.

1.26 References

Benson JS (2008) *New South Wales Vegetation Classification and Assessment: Part 2 Plant communities of the NSW South-western Slopes Bioregion and update of NSW Western Plains plant communities, Version 2 of the NSWVCA database*. Cunninghamia 10: 599- 673.

State of New South Wales (2017), *Guidance to assist a decision-maker to determine a serious and irreversible impact,* Published by the Office of Environment and Heritage on behalf of the NSW Government.

Appendix A – Identification of Lots and Options for the Transmission Line



Legend

- Development footprint
- Development site
- Subject land
- Involved lots
- Railway

Lot boundry

- Surveyed lot boundary
- LPI approximate boundary

Roads

- PrimaryRoad
- ArterialRoad
- LocalRoad
- Track-Vehicular

Waterway

- Non Perennial
- Perennial

Transmission lines options

- Option 1
- Option 2
- Option 2 & 3
- Option 3
- Proposed easements

0 200 400 m

Ref: 17-362 Dunedoo Solar Farm 8.1.2020 \ Involved lots and transmission line easement update option 3
Author: lewis.t
Date created: 15.06.2021
Datum: GDA94 / MGA zone 55

NGH

Appendix B - Updated Subject Land and Development Site

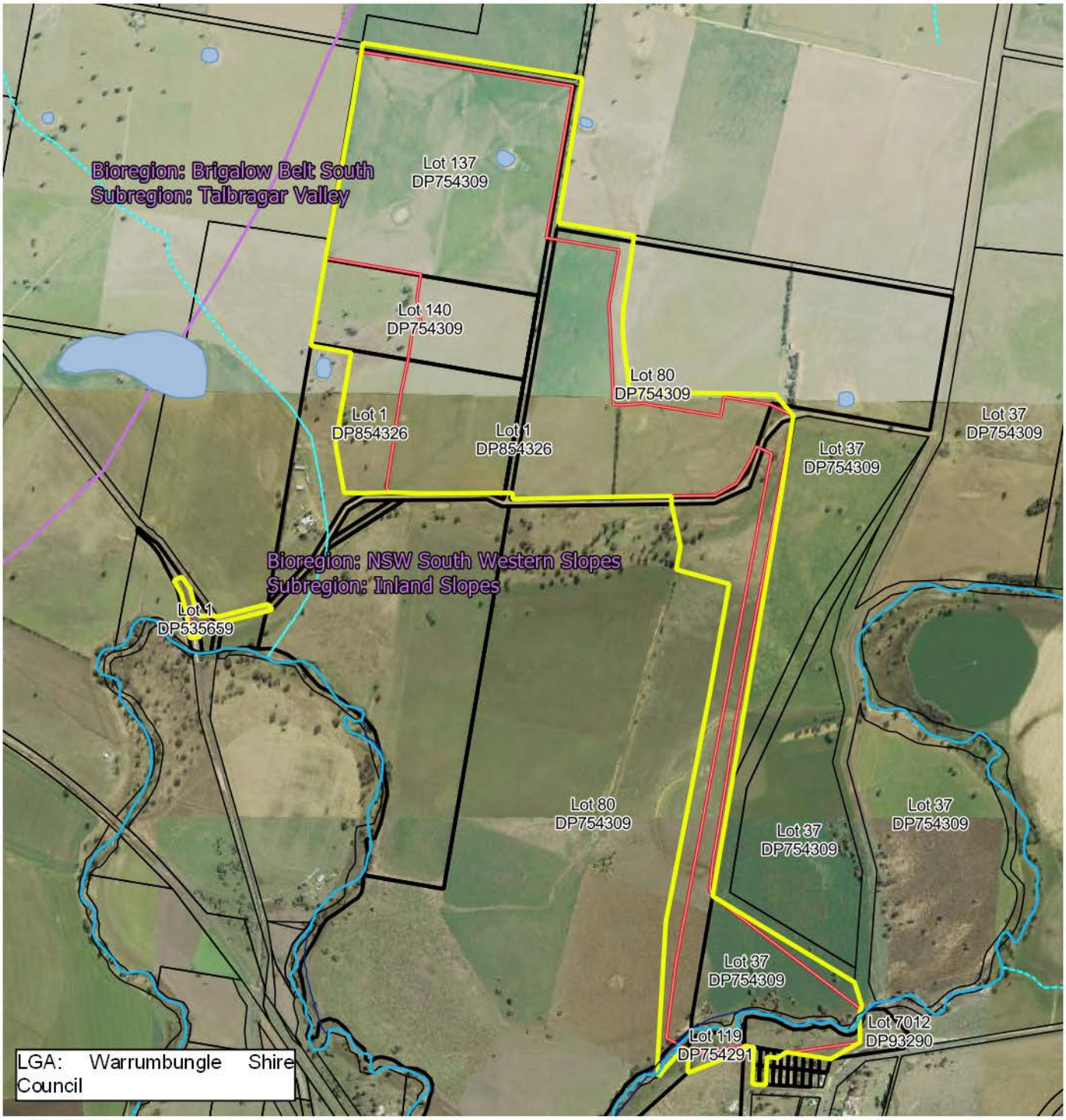


Figure 1-1 Site map

Legend

- Development site
- Subject land
- IBRA Subregion
- Farm dam
- Waterway
  - Non Perennial
  - Perennial
- Lot boundaries
  - Surveyed lot boundary
  - LPI approximate boundary

0 100 200 300 400 m

Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 1-1 Site map
Author: tim.c
Date created: 15.06.2021
Datum: GDA94 / MGA zone 55

NGH

Appendix C – Location Map

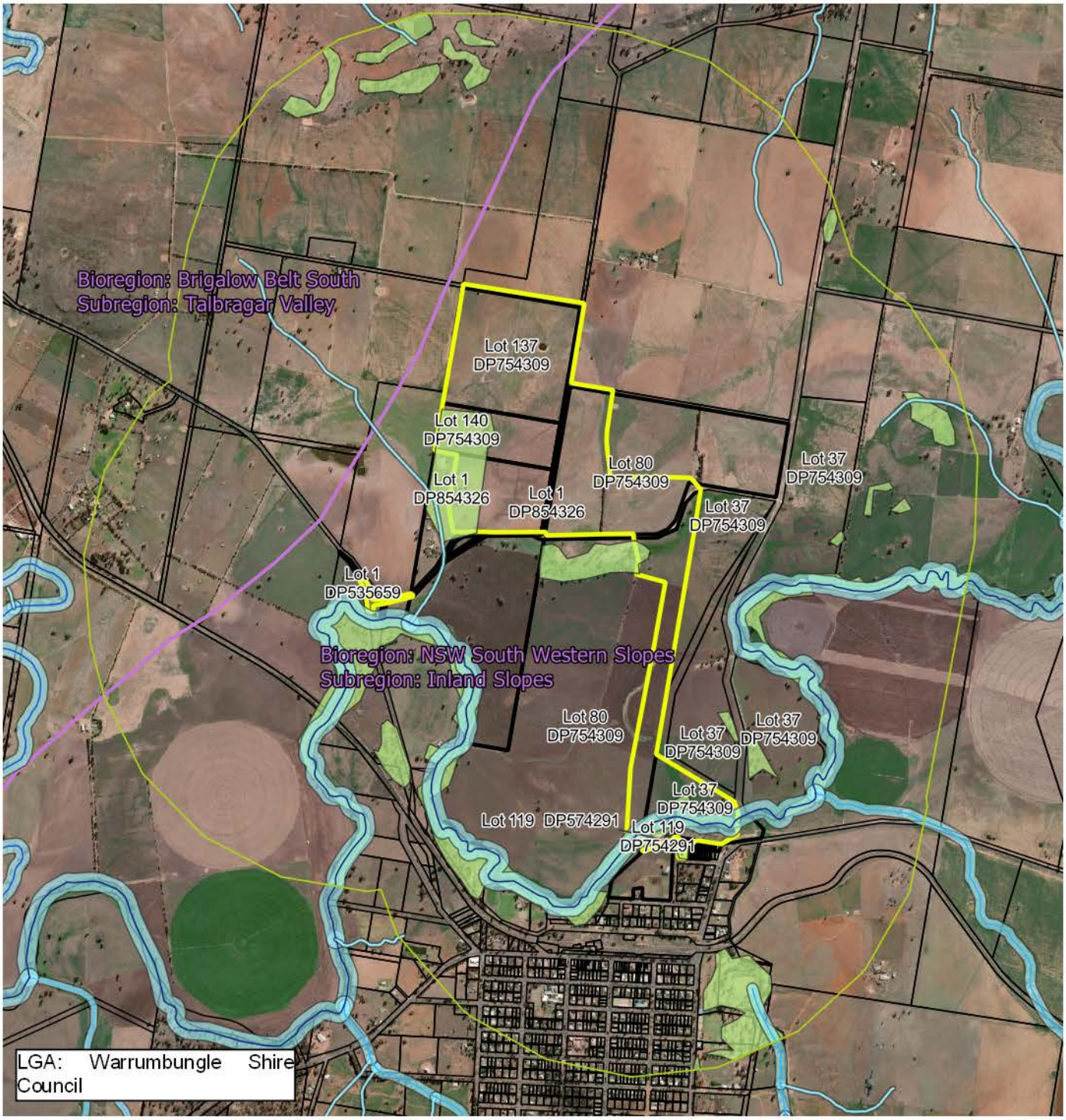


Figure 2-1 Location map

Legend

- Subject land
- 1500m buffer
- 1500 m Native vegetation extent
- IBRA Subregion
- Strahler buffers
- Farm dam

Waterway

- Non Perennial
- Perennial

Lot boundaries

- Surveyed lot boundary
- LPI approximate boundary

0 250 500 750 1,000 m

Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 2-1 Location map
Author: tim.c
Date created: 15.06.2021
Datum: GDA94 / MGA zone 55

NGH

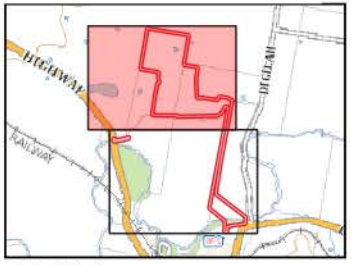
Appendix D - Native Vegetation Extent North and South

Legend

Vegetation zones
- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Paddock trees
- Zone 4 PCT 281
- Zone 5 Non native
- Development site
- Subject land

Lot boundaries
- Surveyed boundary
- LPI approx boundary

Waterway
- Perennial
- Non Perennial



Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 3-1 Native vegetation extent within the development site
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

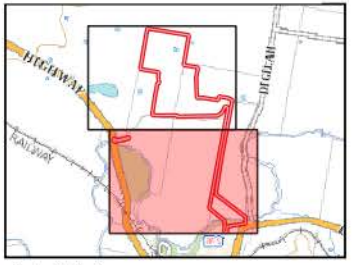
NGH

Legend

Vegetation zones
- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Paddock trees
- Zone 4 PCT 281
- Zone 5 Non native
- Development site
- Subject land

Lot boundaries
- Surveyed boundary
- LPI approx boundary

Waterway
- Perennial
- Non Perennial



Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 3-1 Native vegetation extent within the development site
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Appendix E – PCTs and TECs at the Development Site North and South

Legend

Vegetation zones

- Zone 1 EEC: Fuzzy box woodland
- Zone 2 PCT 78 not TEC
- Zone 3 PCT 78 Paddock tree not TEC
- Zone 4 CEEC: White box grassy woodland
- Zone 5 Non native
- Development site
- Subject land
- Lot boundaries

Lot boundaries

- Surveyed boundary
- LPI approx boundary

Waterway

- Perennial
- Non Perennial

Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 3-2 PCTs and TECs at the development site
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Legend

Vegetation zones

- Zone 1 EEC: Fuzzy box woodland
- Zone 2 PCT 78 not TEC
- Zone 3 PCT 78 Paddock tree not TEC
- Zone 4 CEEC: White box grassy woodland
- Zone 5 Non native
- Development site
- Subject land
- Lot boundaries

Lot boundaries

- Surveyed boundary
- LPI approx boundary

Waterway

- Perennial
- Non Perennial

Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 3-2 PCTs and TECs at the development site
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Appendix F – Vegetation Zones and Plot Locations North and South

Legend

- BAM plot

Vegetation zones

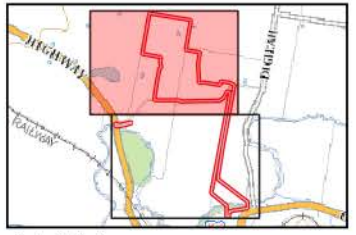
- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Paddock trees
- Zone 4 PCT 281
- Zone 5 Non native
- Development site
- Subject land

Lot boundaries

- Surveyed boundary
- LPI approx boundary

Waterway

- Perennial
- Non Perennial



Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 3-3 Vegetation zones and plot locations
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Legend

- BAM plot

Vegetation zones

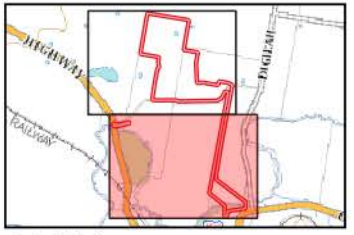
- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Paddock trees
- Zone 4 PCT 281
- Zone 5 Non native
- Development site
- Subject land

Lot boundaries

- Surveyed boundary
- LPI approx boundary

Waterway

- Perennial
- Non Perennial

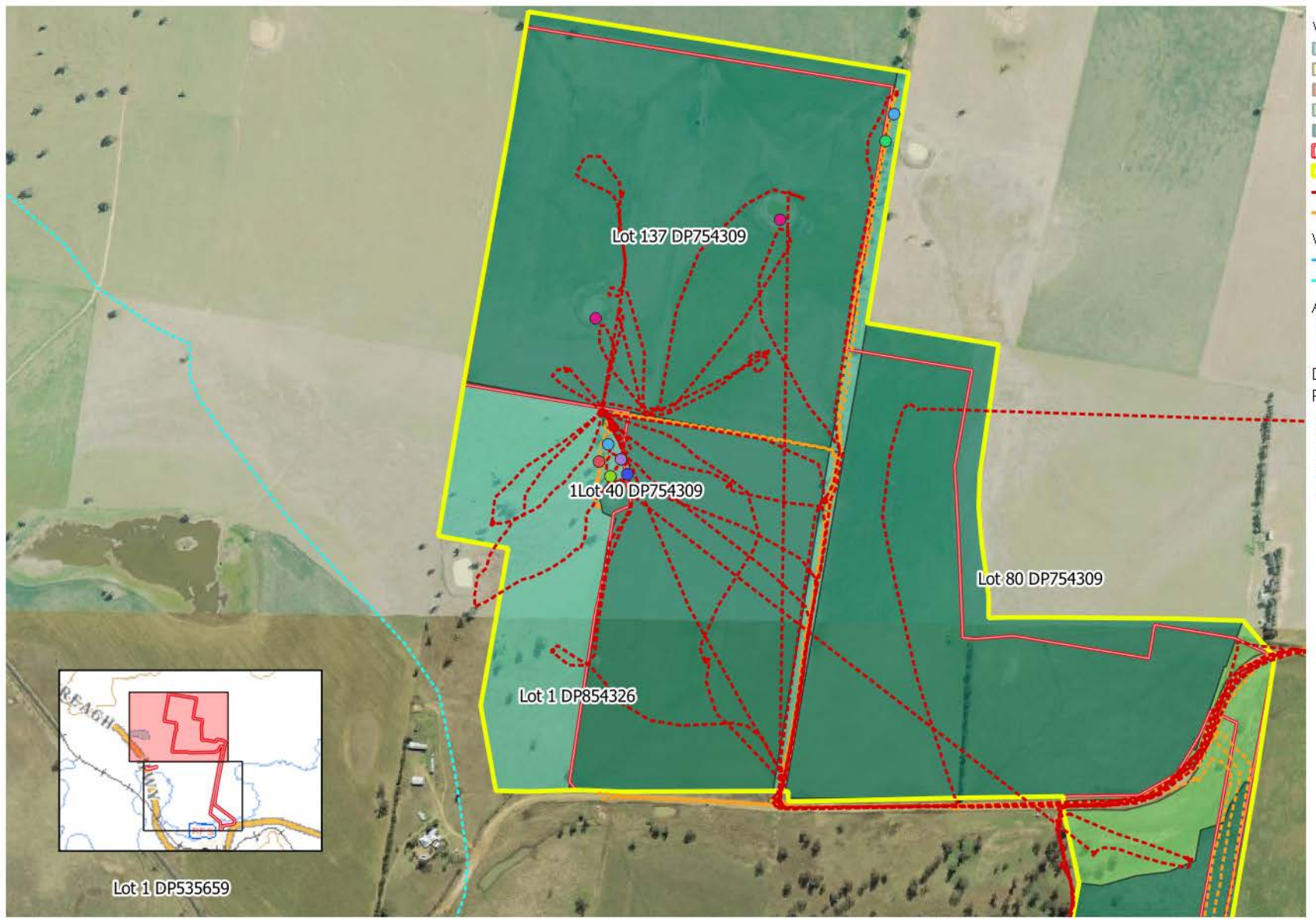


Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 3-3 Vegetation zones and plot locations
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Appendix G - Survey Effort North and South



Vegetation zones
- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Paddock trees
- Zone 4 PCT 281
- Zone 5 Non native
- Development site
- Subject land
- Survey tracks December 2017
- Survey tracks September 2018

Waterway
- Perennial
- Non Perennial

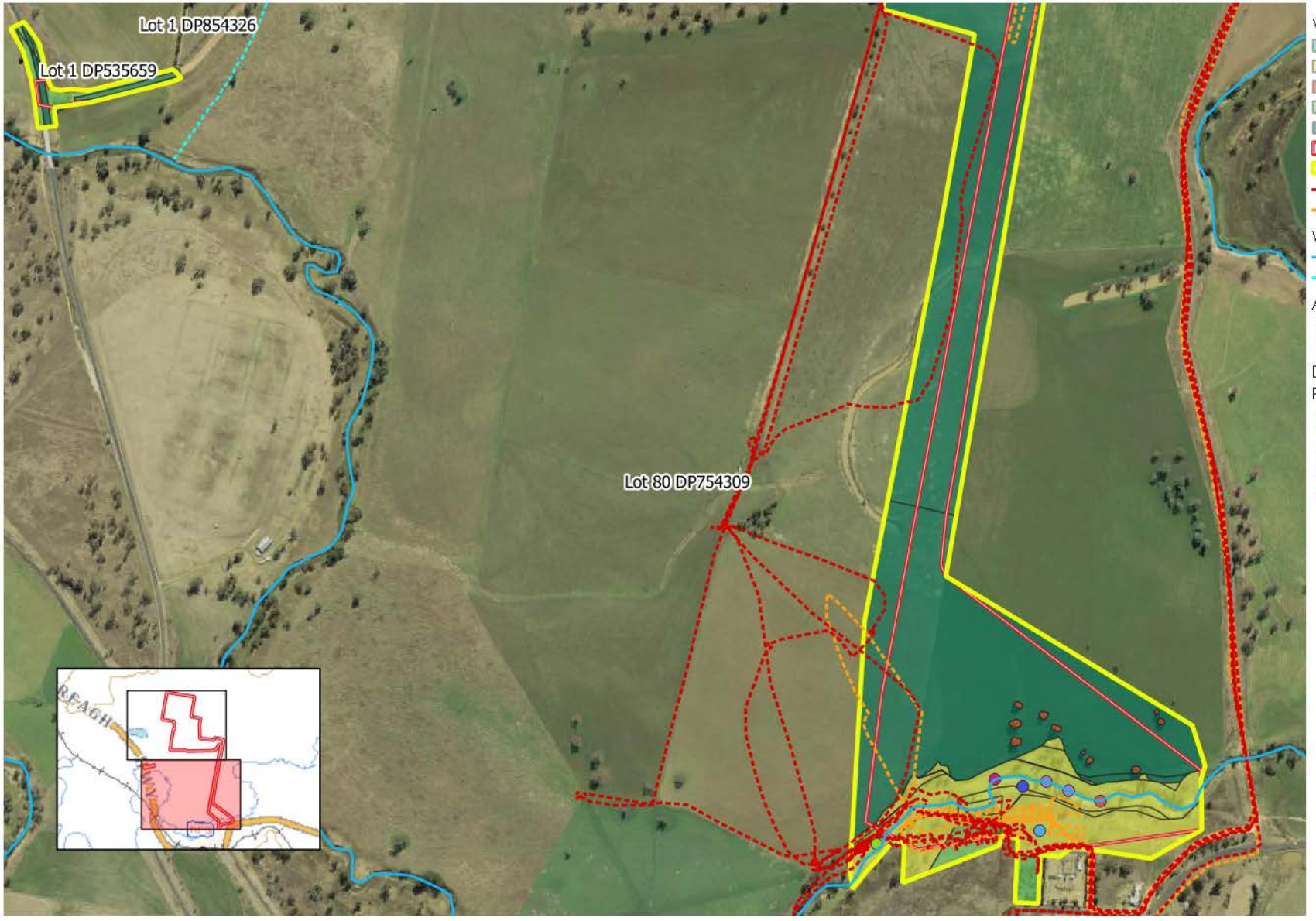
August 2018 Fauna Survey Points
- Call Playback
- Diurnal Bird Census

December 2017 Fauna Survey Points
- Active Search
- Anabat
- Call Playback
- Diurnal Bird Census
- Spotlighting

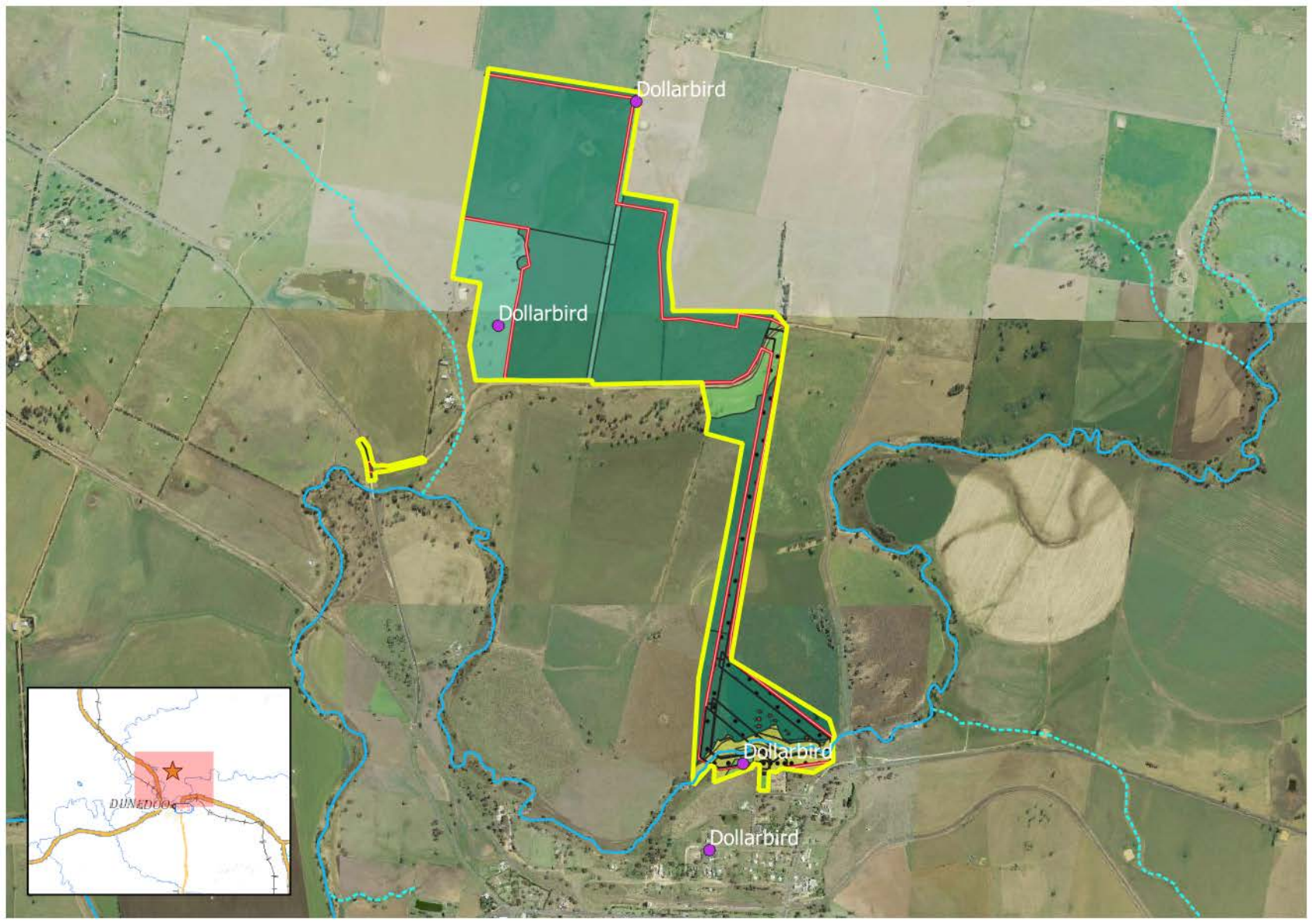
Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 4-1 Threatened species polygons and targeted survey locations
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH


Lot 1 DP854326
Lot 1 DP535659
Lot 80 DP754309
Vegetation zones
Zone 1 PCT 201
Zone 2 PCT 78
Zone 3 PCT 78 Paddock trees
Zone 4 PCT 281
Zone 5 Non native
Development site
Subject land
Survey tracks December 2017
Survey tracks September 2018
Waterway
Perennial
Non Perennial
August 2018 Fauna Survey Points
Call Playback
Diurnal Bird Census
December 2017 Fauna Survey Points
Active Search
Anabat
Call Playback
Diurnal Bird Census
Spotlighting
Data Attribution
© NGH 2021
© ib vogt 2020
© Base map: Department of Customer Service 2020, topographic information: Spatial Services NSW 2020
Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 4-1 Threatened species polygons and targeted survey locations
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55
0
100
200
300 m
NGH

Appendix H – EPBC Act Listed Fauna Sightings



Appendix J EPBC Act Listed Fauna Sightings

Legend

- Development site
- Subject land
- Proposed easements
- Dollarbird

Vegetation Zones

- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Scattered trees
- Zone 4 PCT 281
- Zone 5 Non native

Waterway

- Perennial
- Non Perennial

Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Appendix J EPBC Act Listed Fauna Sightings
Author: Claire Hewitt
Date created: 16.06.2021
Datum: GDA94 / MGA zone 55

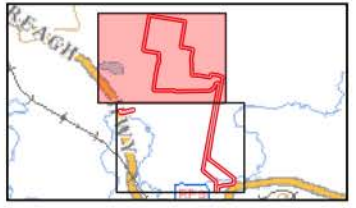
0 0.5 1 km

NGH

Appendix I – Updated Development Footprint North and South

Vegetation zones
- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Paddock trees
- Zone 4 PCT 281
- Zone 5 Non native
- Development footprint
- Development site
- Subject land

Waterway
- Perennial
- Non Perennial



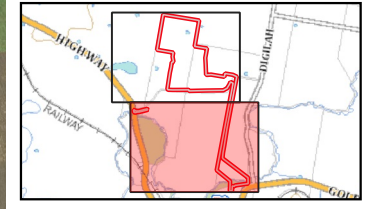
Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 6-1 Final proposal footprint
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Vegetation zones
- Zone 1 PCT 201
- Zone 2 PCT 78
- Zone 3 PCT 78 Paddock trees
- Zone 4 PCT 281
- Zone 5 Non native
- Development footprint
- Development site
- Subject land

Waterway
- Perennial
- Non Perennial

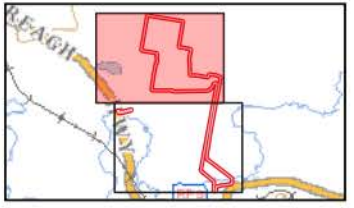


Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 6-1 Final proposal footprint
Author: tim.c
Date created: 23.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Appendix J – Estimated Zones of Indirect Impact North and South



Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 7-1 Estimated zones of indirect impact for the proposal
Author: tim.c
Date created: 15.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

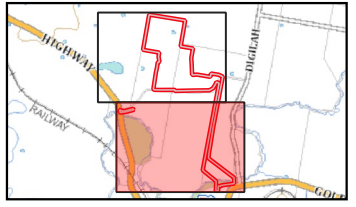
NGH

Area of indirect impact
Development layout option
Development site
Subject land

Waterway
Perennial
Non Perennial

Vegetation zones
Zone 1 PCT 201
Zone 2 PCT 78
Zone 3 PCT 78

Paddock trees
Zone 4 PCT 281
Zone 5 Non native



Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 7-1 Estimated zones of indirect impact for the proposal
Author: tim.c
Date created: 23.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Appendix K - EPBC Act Assessment of Significant Impact

The *Environment Protection and Biodiversity Conservation Act 1999* specifies whether a development is likely to significantly impact federally listed TECs, threatened species, or migratory species. The following assessments consider the significance of the likely impacts associated with the proposed works on:

- White Box, Yellow Box, Blakely's Red Gum Grassy Woodland CEEC, and
- Dollarbird (*Eurystomus orientalis*).

White Box, Yellow Box, Blakely's Red Gum Grassy Woodland

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

a) reduce the extent of an ecological community
The updated Development Site contains approximately 2.53 ha of vegetation which conforms to the EPBC listed form of White Box, Yellow Box, Blakely's Red Gum Grassy Woodland. Approximately 0.63 ha of this community would be impacted near the substation by the construction of Option Three TL. Tree removal will be minimal in the southern part of the updated Development Site where large patches of intact canopy are present. The amount of vegetation to be impacted is relatively small in the context of the remaining community within the locality. The 0.63 ha of vegetation to be impacted does not occur at the edge of the community's range and will not reduce the extent of the community.
b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines; or adversely affect habitat critical to the survival of an ecological community
The proposal has been designed to avoid impacts to the highest quality and most intact areas of native vegetation within the updated Development Site. No further fragmentation or isolation of habitat is considered likely as a result of the proposal. The White Box, Yellow Box, Blakely's Red Gum Grassy Woodland within the updated Development Footprint is highly disturbed and modified by historical clearing and agricultural land management practices. This vegetation is not considered habitat critical to the survival of the community.
c) Will modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns

a) reduce the extent of an ecological community
It is predicted that the proposal could have impacts on, - surface water flows across the ground due to the presence of solar panels, - change in light levels reaching the ground due to shading of panels, - modification to ground moisture levels where solar panels may block or concentrate rain over certain areas. There is little scientific information on the effects of solar farms on these factors. Until sufficient monitoring of solar farms is carried out, it is largely unknown whether solar farms are likely to have a detrimental impact on abiotic factors. A 'worst case' assumption would be that alterations to sunlight reaching the ground and changes to surface water flows due to the large surface area of solar panels over the ground, could modify abiotic factors. necessary for survival of the community.
d) cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting?
The proposal will impact approximately 0.63 ha of poor condition White Box, Yellow Box, Blakely's Red Gum Grassy Woodland which involves a reduction of native species composition within that area. Tree removal will be minimal in the southern part of the updated Development Site where large patches of intact canopy are present. This is considered necessary to ensure that the species complexity and composition of the community remains similar within the subject site and within the locality. As such, the proposal would not cause a substantial change in the species composition of White Box, Yellow Box, Blakely's Red Gum Grassy Woodland.
e) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: **assisting invasive species, that are harmful to the listed ecological community, to become established, or** **causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or** **interfere with the recovery of an ecological community**
The proposal is not considered likely to generate an increase in invasive species harmful to the ecological community. The community occurs in a poor-moderate condition form throughout much of its extent within the subject site as a result of adjacent agricultural land use and historical clearing, which has denuded the native seedbank and increased the number of exotic invasive weeds within the subject site. The proposal is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the community within the subject site. The proposal is not considered likely to interfere with the recovery of the community as a larger and higher quality remnant will be avoided and retained. Additionally, the area surrounding the transmission line will be avoided and retained, ensuring that the recovery of the community within the subject site continues.

Conclusion

Though the proposal will generate a net decrease of 0.63 ha in the extent of the White Box, Yellow Box, Blakely's Red Gum Grassy Woodland, the extent of removal is not considered likely to generate a significant impact to the community such that it would no longer remain viable within the

subject site or locality. The proposal will minimise loss by retaining canopy species in the highest quality portion of the community. A referral under the EPBC Act is not considered necessary.

Dollarbird (*Eurystomus orientalis*)

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

a) substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species
The Dollarbird (*Eurystomus orientalis)* arrives in northern and eastern Australia in September each year to breed. In March or April, the birds return to New Guinea and adjacent islands to over-winter. During breeding season, eggs are laid in an unlined tree hollow and are incubated by both adults. Important habitat is defined as: a) habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or b) habitat that is of critical importance to the species at particular life-cycle stages, and/or c) habitat utilised by a migratory species which is at the limit of the species range, and/or d) habitat within an area where the species is declining. The subject site does not contain important habitat for the Dollarbird as the population is spread over much of northern and eastern Australia, no critical breeding or foraging habitat is present, the site is not at the limit of the species' range, and the species conservation status is listed as secure in NSW. The proposal will not substantially modify existing native vegetation that Dollarbirds may rely on for foraging and breeding habitat on occasion. Habitat will remain viable within the subject site and the broader locality, ensuring that the species remains viable.
b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or
The proposal is not considered likely to result in the establishment of any invasive species that area harmful to the species.
c) seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species;
Four individuals of the species are not considered to constitute an ecologically significant proportion of the species. Also, the proposal will not remove hollow bearing River Red-gum (*Eucalyptus camaldulensis)* along the Talbragar River within the updated Development Site which are utilised by the species. As such, the proposal is not considered likely to seriously disrupt the life cycle of an ecologically significant proportion of the Dollarbird population.

Conclusion

The proposal is not considered likely to significantly impact the Dollarbird. The extent of impact to suitable habitat is considered minimal and habitat will be retained within the subject site, ensuring that the species remains viable within the subject site and locality. A referral under the EPBC Act is not considered necessary.

Appendix L – Location of Serious and Irreversible Impacts

Legend

Threatened ecological communities

- Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions
- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions
- White Box Yellow Box Blakely's Red Gum Woodland
- 10,000 ha buffer
- Development site
- Lot boundaries

Waterway

- Perennial
- Non Perennial

Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 9-1 TEC within 10,000 ha
Author: Claire Hewitt
Date created: 17.06.2021
Datum: GDA94 / MGA zone 55

0 1 2 3 km

NGH

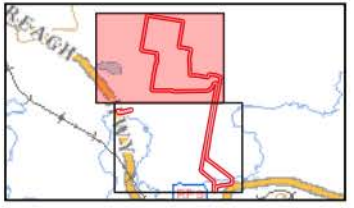
Appendix M – Impacts Requiring Offset North and South

Development site
Subject land

Vegetation offset (option 3)
No offset
Requires offset

Waterway
Perennial
Non Perennial

Lot boundaries
Surveyed boundary
LPI approx boundary



Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 10-1 Impacts requiring offset, not requiring offset and not requiring assessment
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

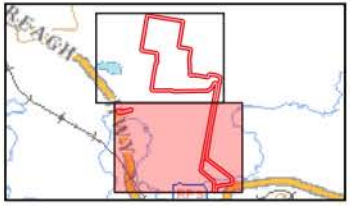
NGH

Development site
Subject land

Vegetation offset (option 3)
No offset
Requires offset

Waterway
Perennial
Non Perennial

Lot boundaries
Surveyed boundary
LPI approx boundary



Ref: 17-362 Dunedoo Solar Farm BDAR Maps 200220 \ Figure 10-1 Impacts requiring offset, not requiring offset and not requiring assessment
Author: tim.c
Date created: 11.06.2021
Datum: GDA94 / MGA zone 55

0 100 200 300 m

NGH

Appendix N – BAM Calculator Reports

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00009114/BAAS20009/17/00009115

Proposal Name
Dunedoo Solar Farm

BAM data last updated *
10/06/2021

Assessor Name
Claire Hewitt

Assessor Number
BAAS20009

BAM Data version *
45

Proponent Names

Report Created
23/06/2021

BAM Case Status
Open

Assessment Revision
9

Assessment Type
Major Projects

Date Finalised
To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion

Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered Ecological Community	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion

Species
Nil

Additional Information for Approval

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	0.1	1	0	1
78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	Not a TEC	0.2	4	0	4
281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	0.6	19	0	19

78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Riverine Forests This includes PCT's: 9, 36, 78, 79, 112, 249, 356, 362	Inland Riverine Forests >=50% and <70%	78_Good	Yes	4	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions This includes PCT's: 201, 202, 1384	-	201_Moderate	Yes	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654,	-	281_Moderate	Yes	19	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698					

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

BAM Candidate Species Report

Proposal Details

Assessment Id 00009114/BAAS20009/17/00009115	Proposal Name Dunedoo Solar Farm	BAM data last updated * 10/06/2021
Assessor Name Claire Hewitt	Report Created 23/06/2021	BAM Data version * 45
Assessor Number BAAS20009	Assessment Type Major Projects	BAM Case Status Open
Assessment Revision 9	Date Finalised To be finalised	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Acacia ausfeldii Ausfeld's Wattle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calyptorhynchus lathami Glossy Black-Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Dichanthium setosum Bluegrass	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?

Diuris tricolor Pine Donkey Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Euphrasia arguta Euphrasia arguta	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Hamirostra melanosternon Black-breasted Buzzard	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria booroolongensis Booroolong Frog	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Lophochroa leadbeateri Major Mitchell's Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?

Petaurus norfolcensis Squirrel Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Phascogale tapoatafa Brush-tailed Phascogale	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Polytelis swainsonii Superb Parrot	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Pomaderris queenslandica Scant Pomaderris	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Prasophyllum sp. Wybong Prasophyllum sp. Wybong	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Swainsona recta Small Purple-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
A spear-grass	Austrostipa wakoolica	Geographic limitations
Grey-headed Flying-fox	Pteropus poliocephalus	Refer to BAR
Large Bent-winged Bat	Miniopterus orianae oceanensis	Refer to BAR
Pink-tailed Legless Lizard	Aprasia parapulchella	Habitat constraints
Regent Honeyeater	Anthochaera phrygia	Refer to BAR
Swift Parrot	Lathamus discolor	Refer to BAR
Tarengo Leek Orchid	Prasophyllum petilum	Geographic limitations

Biodiversity payment summary report

Assessment Id	Payment data version	Assessment Revision	Report created
00009114/BAAS20009/17/00009115		9	23/06/2021

Assessor Name	Assessor Number	Proposal Name	BAM Case Status
Claire Hewitt	BAAS20009	Dunedoo Solar Farm	Open

Assessment Type	Date Finalised
Major Projects	To be finalised

PCT list

Price calculated	PCT common name	Credits
Yes	**281 -** Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	19
Yes	**201 -** Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	1
Yes	**78 -** River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	4

Species list

Price calculated	Species	Credits

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Biodiversity payment summary report

IBRA sub region	PCT common name	Threat status	Offset trading group	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Inland Slopes	**281 -** Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Yes	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	15.97%	$284.50	2.1064	$8,532.95	19	$162,126.12

Inland Slopes	**201 -** Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Yes	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	19.38%	$287.12	2.3389	$8,856.14	1	$8,856.14
Inland Slopes	**78 -** River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	No	Inland Riverine Forests >=50% and <70%	19.12%	$266.02	1.4077	$8,188.19	4	$32,752.78

Subtotal (excl. GST)	**$203,735.04**
GST	**$20,373.50**
Total ecosystem credits (incl. GST)	**$224,108.54**

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price

Biodiversity payment summary report

No species available

Grand total	**$224,108.54**

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00009114/BAAS20009/17/00009115	Dunedoo Solar Farm	10/06/2021
Assessor Name	Report Created	BAM Data version *
Claire Hewitt	23/06/2021	45
Assessor Number	Assessment Type	BAM Case Status
BAAS20009	Major Projects	Open
Assessment Revision		Date Finalised
9		To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australian Painted Snipe	Rostratula australis	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Black Falcon	Falco subniger	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Black-breasted Buzzard	Hamirostra melanosternon	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Black-necked Stork	Ephippiorhynchus asiaticus	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Brolga	Grus rubicunda	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Diamond Firetail	Stagonopleura guttata	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Flame Robin	Petroica phoenicea	281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Freckled Duck	Stictonetta naevosa	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Glossy Black-Cockatoo	Calyptorhynchus lathami	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Grey-headed Flying-fox	Pteropus poliocephalus	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Koala	Phascolarctos cinereus	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Large Bent-winged Bat	Miniopterus orianae oceanensis	281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Little Lorikeet	Glossopsitta pusilla	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Major Mitchell's Cockatoo	Lophochroa leadbeateri	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Regent Honeyeater	Anthochaera phrygia	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Scarlet Robin	Petroica boodang	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Speckled Warbler	Chthonicola sagittata	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Speckled Warbler	Chthonicola sagittata	281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Superb Parrot	Polytelis swainsonii	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Swift Parrot	Lathamus discolor	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion

White-throated Needletail	Hirundapus caudacutus	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00009114/BAAS20009/17/00009115

Assessment name
Dunedoo Solar Farm

BAM data last updated *
10/06/2021

Assessor Name
Claire Hewitt

Report Created
23/06/2021

BAM Data version *
45

Assessor Number
BAAS20009

Assessment Type
Major Projects

BAM Case Status
Open

Assessment Revision
9

Date Finalised
To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	201_Moderate	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Moderate	0.06	1	

2	78_Good	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	Good	0.19	1	
3	281_Moderate	281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate	0.63	1	

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00009114/BAAS20009/17/00009115

Proposal Name
Dunedoo Solar Farm

BAM data last updated *
10/06/2021

Assessor Name
Claire Hewitt

Assessor Number
BAAS20009

BAM Data version *
45

Proponent Name(s)

Report Created
23/06/2021

BAM Case Status
Open

Assessment Revision
9

Assessment Type
Major Projects

Date Finalised
To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered Ecological Community	201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion

Species
Nil

BAM Biodiversity Credit Report (Variations)

Additional Information for Approval

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	0.1	1	0	1.00
78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	Not a TEC	0.2	4	0	4.00
281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	0.6	19	0	19.00

78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Riverine Forests This includes PCT's: 9, 36, 78, 79, 112, 249, 356, 362	Inland Riverine Forests >=50% and <70%	78_Good	Yes	4	Inland Slopes,Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	Zone	HBT	Credits	IBRA region
Forested Wetlands	Tier 3 or higher threat status	78_Good	Yes (including artificial)	4	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

201-Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions This includes PCT's: 201, 202, 1384	-	201_Moderate	Yes	1	Inland Slopes,Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Grassy Woodlands	Tier 1	201_Moderate	Yes (including artificial)	1	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
281-Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	281_Moderate	Yes	19	Inland Slopes,Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Variations)

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like options

Appendix E Consultation

Hugh Sangster
IB Vogt GmbH
Level 6,
201 Kent Street
Sydney NSW 2000

31 May 2020

RE: Dunedoo Solar Farm Proposal – updated powerline

Dear Madam/Sir,

I am writing to you in relation to the Dunedoo Solar Farm.

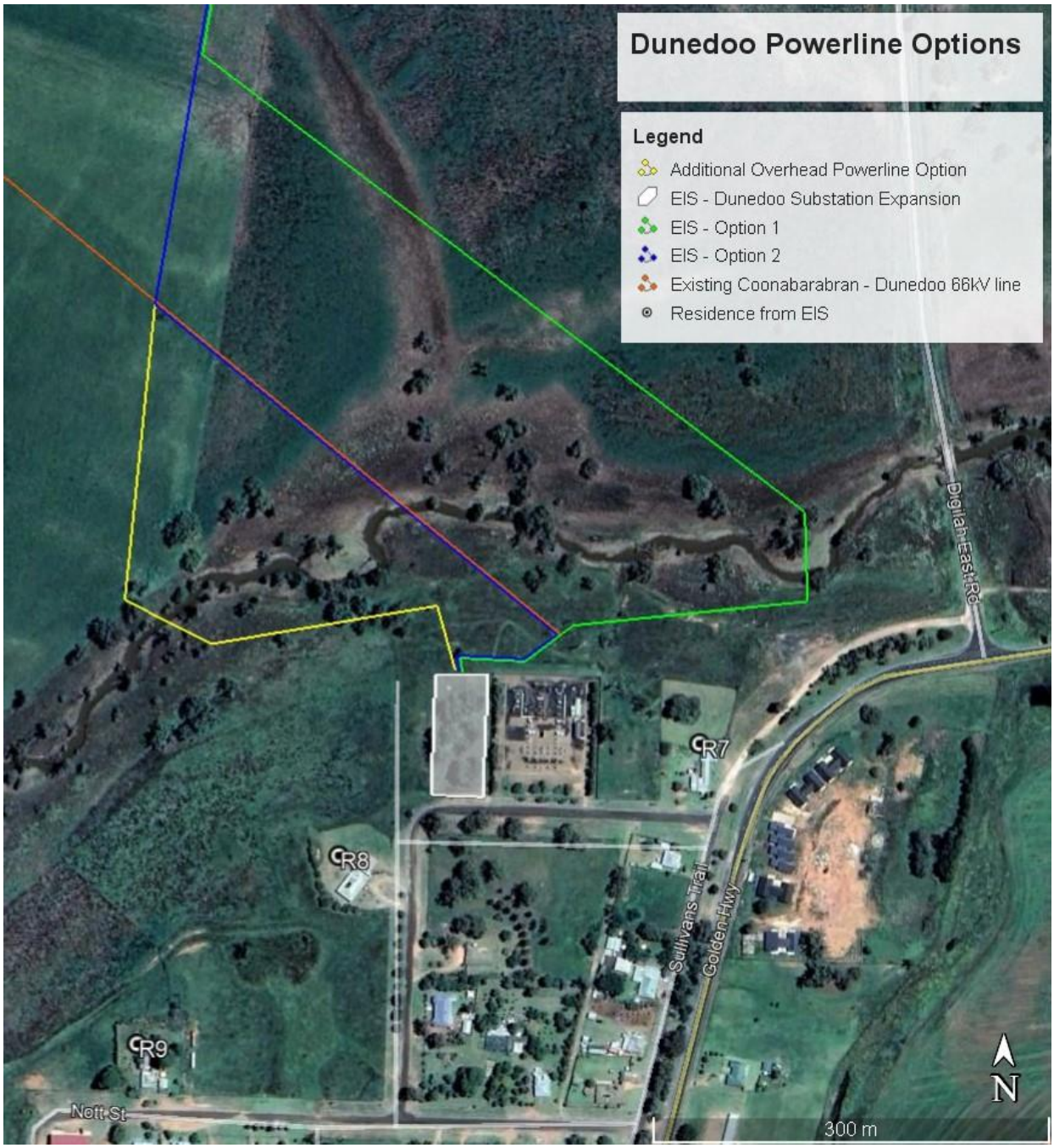
The project, is currently seeking Development Approval from The Department of Planning, Industry & Environment. As part of the Development Approval process, some modifications may be required to the proposal to include an additional powerline option. The additional powerline, as shown indicatively in yellow on the map overleaf for your information.

The additional powerline may be visible from your dwelling. Our landscape and visual expert has determined that the impact of the powerline on your amenity is likely to be low given the existing landscape elements including existing substation, numerous powerlines already installed in close proximity and trees associated with the Talbragar River that break up the view.

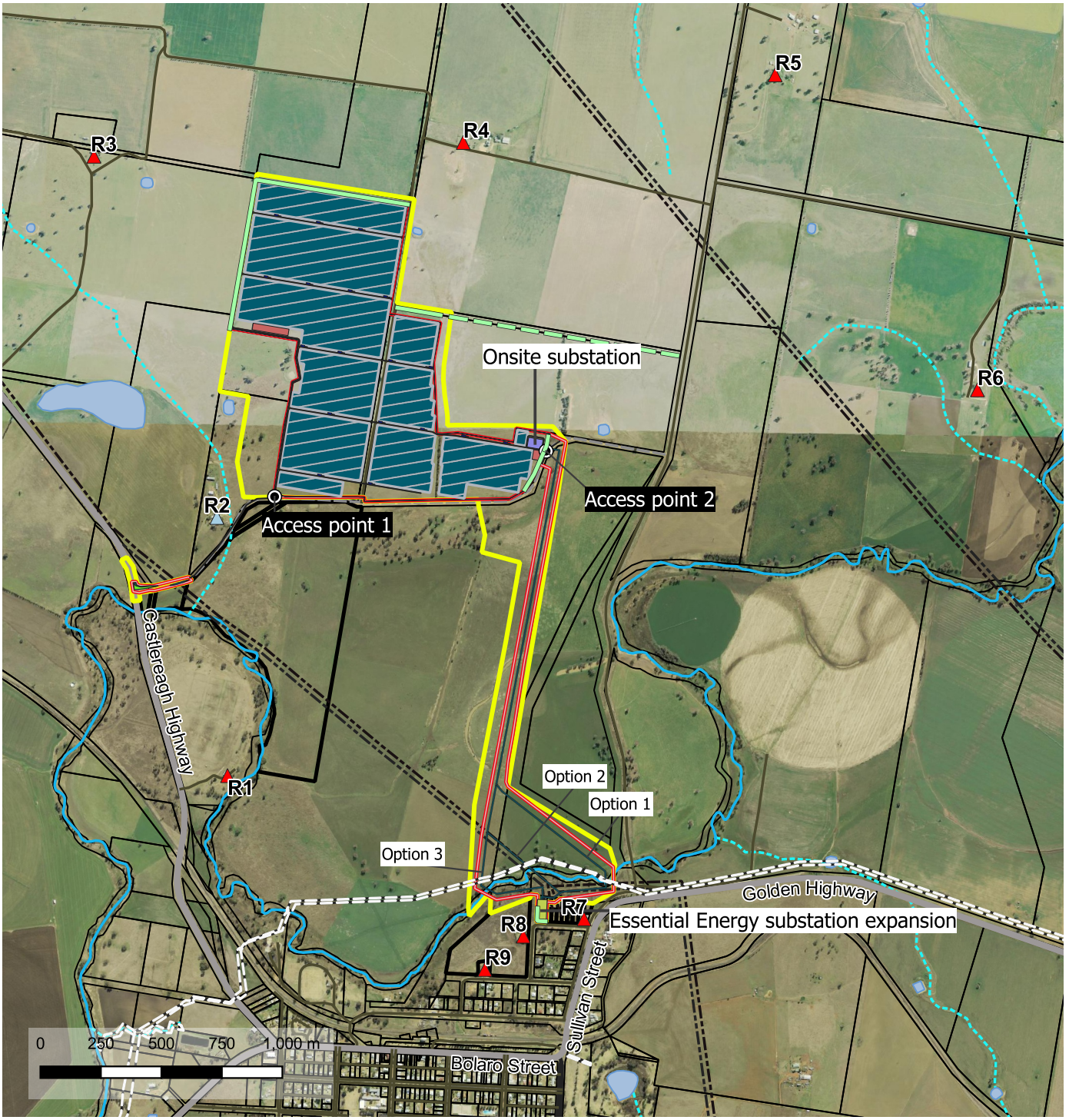
Should you have any queries about the project, including the additional powerline option, feel free to contact me directly on the details below.

Yours faithfully,
Hugh Sangster

Senior Development Manager
Email: hugh.sangster@ibvogt.com
Phone: 0438 803 367


Dunedoo Powerline Options
Legend
Additional Overhead Powerline Option
EIS - Dunedoo Substation Expansion
EIS - Option 1
EIS - Option 2
Existing Coonabarabran - Dunedoo 66kV line
Residence from EIS
Digilah East Rd
R7
R8
R9
Sullivans Trail
Golden Hwy
Nott St
N
300 m

Appendix F Proposal boundaries and surrounding features



Indicative infrastructure layout
- Fence
- Road
- Site compound
- Solar array
- Substation
- Transformer
- Essential Energy substation
- Batter
- Road pavement
- Passing bay
- Transmission Line

Roads
- Local road
- Primary road
- SubArterialRoad
- Track-Vehicular

Lot boundary
- Surveyed boundary
- LPI approx boundary
- Farm dam

Waterway
- Non Perennial
- Perennial
- Existing transmission line

Receivers
- Involved receiver
- Receiver
- Site access points
- Existing gas main (indicative)
- Indicative Screening

Ref: 17-362 Dunedoo Solar Farm 8.1.2020 \ Overview map option3
Author: z.jokadar
Date created: 24.06.2021
Datum: GDA94 / MGA zone 55

NGH

Appendix G DPIE letter request for additional information

Planning, Industry & Environment

Mr Hugh Sangster
Senior Development Manager
ib vogt GmbH
Level 6, 201 Kent Street
Sydney NSW 2000

Via email: hugh.sangster@ibvogt.com

08/06/2021

Dear Mr Sangster

Dunedoo Solar Farm (SSD-8847)
Request for additional information

I refer to the Department's assessment of the Dunedoo Solar Farm (SSD-8847). The Department is aware you are considering an additional western transmission option as part of the project. The Department requests additional information for this option including:

- heritage impacts, including details of consultation with Registered Aboriginal Parties (RAPs);
- potential noise and visual impacts;
- biodiversity impacts;
- consultation with nearby receivers;
- landowners consent for the additional allotments.

Please provide the information, or notify us that the information will not be provided, by Wednesday 30 June 2021. If you cannot meet this deadline, please provide and commit to an alternative timeframe for providing this information.

If you have any questions, please contact Lander Robinson, on 92746052 at Lander.Robinson@planning.nsw.gov.au.

Yours sincerely,

Nicole Brewer
Director
Energy Assessments