

Cooba Solar Project

Noise Impact Assessment

Prepared for: Venn Energy Pty Ltd

Project No: MEL3057
Date: 18 March 2024
Revision: 02



Project:	Cooba Solar Project
Location:	124 Cornella Church Road Colbinabbin, VIC 3559
Prepared by:	ADP Consulting Pty Ltd Level 13, 55 Collins Street Melbourne VIC 3000
Project No:	MEL3057
Revision:	02
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Project Team	
Client / Principal	Venn Artibir Group Pty Ltd C/o NGH Consulting Pty Ltd

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Contents

1. Introduction	3
1.1 Document purpose.....	3
1.2 Reference drawings, codes, and standards.....	3
1.3 Project summary	3
1.4 Site investigations	3
2. Noise Emission Criteria.....	5
2.1 Criteria - EPA Noise Protocol.....	5
3. Noise Assessment and Recommendations	6
3.1 Equipment Noise Levels.....	6
3.2 Noise Assessment	6
3.3 Recommendations	8
4. Conclusion	Error! Bookmark not defined.

Figures

Figure 1 Cooba Solar Project Site Layout including Noise-Sensitive Receiver locations.	4
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Tables

Table 1 EPA Noise Protocol zone levels, noise-sensitive receivers.....	5
Table 2 Plant and equipment sound power levels.....	6
Table 3 Noise emission assessment, EPA Noise Protocol criteria	7

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1. Introduction

1.1 Document purpose

ADP Consulting has been engaged by Venn Energy Pty Ltd C/o NGH to conduct a noise impact assessment for the proposed Cooba Solar Project to be located at 124 Cornella Church Road in Colbinabbin, Victoria.

This report has been prepared to provide acoustic design advice and addresses the noise impact on nearby noise-sensitive receivers from operational activities.

It is understood this report may be used in support of a planning application lodged to relevant authorities.

It is the responsibility of the relevant contractor to ensure the implementation of the acoustic design intent of this document, including compliance with criteria, codes, standards and other specifications.

1.2 Reference drawings, codes, and standards

The following documents, standards, guidelines, regulatory requirements, and other project-specific information has been referenced in preparing this report:

- > Bright Energy, Cooba Solar Project: Project Layout (Planning), dated 14 March 2024
- > EPA Victoria, Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues (Publication 1826.4), dated 4 May 2021 (EPA Noise Protocol)
- > CFA Design Guidelines and Model Requirements for Renewable Energy Facilities February 2023 V4 (CFA Guideline)
- > Department of Environment, Land, Water and Planning Solar Energy Facilities Design and Development Guidelines October 2022 (DELWP Guideline)

1.3 Project summary

It is understood that the Cooba Solar Project will have a power export capability of 350MW (AC) and include:

- > 500MW solar energy facility and 300MW battery energy storage system (BESS)
- > BESS capacity: 300MW(AC)/1200MWh (for future installation)
- > Approximately 700,000 single-axis tracking PV panels
- > Approximately 100 centralised power conversion stations
- > Battery storage and site facilities areas
- > An operations and maintenance facility

All proposed infrastructure will be set back at least 10m from the title boundary.

1.4 Site investigations

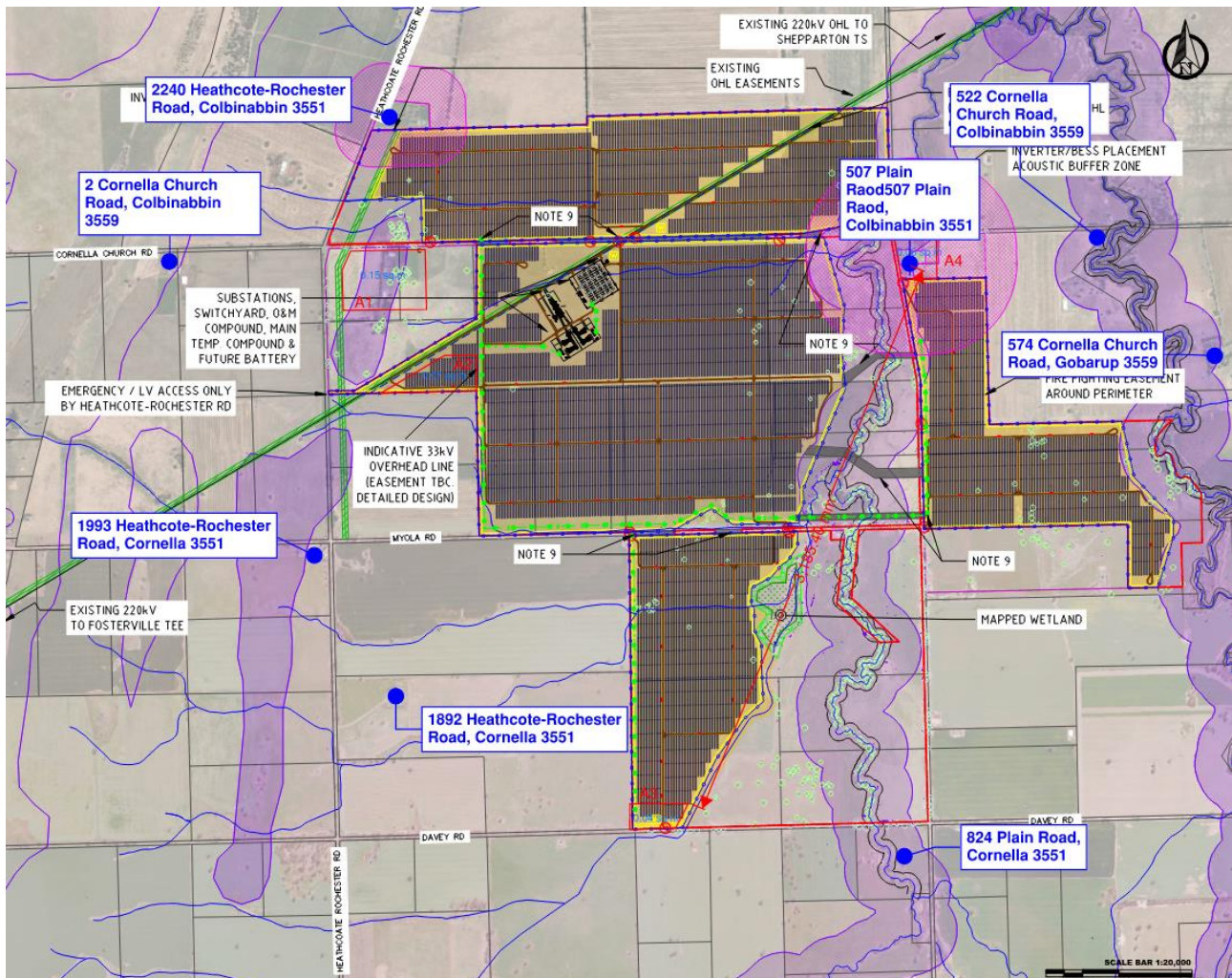
Our site investigations have identified the following as the nearest noise-sensitive residential receivers to the Solar Project:

- > 2240 Heathcote-Rochester Road, Colbinabbin (approx. 50m from Northern boundary)
- > 507 Plain Road, Colbinabbin (approx. 50m from Northeast boundary)

- > 2 Cornella Church Road, Colbinabbin (approx. 850m from Western boundary)
- > 1993 Heathcote-Rochester Road, Colbinabbin (approx. 850m from Western boundary)
- > 1892 Heathcote-Rochester Road, Cornella (approx. 950m from Western boundary)
- > 824 Plain Road, Cornella (approx. 150m from Southern boundary)
- > 574 Cornella Church Road, Gobarup (approx. 200m from Eastern boundary)
- > 522 Cornella Church Road, Colbinabbin (approx. 450m from Eastern boundary)
- > Cornella Catholic Church, 518 Cornella Church Road, Colbinabbin (approx. 650m from adjacent Eastern boundary)

The Cooba Solar Project Layout Plan and nearest noise-sensitive receiver locations are presented in Figure 1 and full drawing is provided in Appendix A for reference.

Figure 1 Cooba Solar Project Site Layout including Noise-Sensitive Receiver locations.



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2. Noise Emission Criteria

2.1 Criteria - EPA Noise Protocol

Noise emission criteria for the Cooba Solar Project have been determined based on the methodology contained in the EPA Noise Protocol for commercial, industrial and trade premises.

The Cooba Solar Project site and the identified nearest noise-sensitive receivers are located contiguously in a Farming (FZ) planning zone. The Noise Protocol noise emission criteria for the nearest noise-sensitive receivers have been determined and are scheduled in Table 1.

It should be noted that the cumulative noise emissions from the operations of the proposed development are to meet the specified noise criteria. Furthermore, the Noise Protocol provides requirements for standby generators, standby boilers and fire pumps for emergency noise emission conditions.

Table 1 EPA Noise Protocol zone levels, noise-sensitive receivers

Time of Operation	EPA Noise Protocol, Criteria dB(A)	
	Operational	Emergency
Day (7am to 6pm)	46	56
Evening (6pm to 10pm)	41	46
Night (10pm to 7am)	36	41

Furthermore, as the operation of the facility will be 7-days a week, the most stringent criteria of 36 dB(A) (during the night-time period) will be used as the site-specific noise emission criteria for this development.

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3. Noise Assessment and Recommendations

3.1 Equipment Noise Levels

Noise emission from the Solar Project will be dependent on equipment selection and placement on-site. The sound power levels of major plant equipment used in our noise assessment are presented in Table 2 (we note that in some instances these have been estimated). At this stage, some equipment selections have not been finalised and the noise levels below are to be used as a guide only. The major source of noise emission is expected to be from Solar Inverters and Battery Storage equipment.

Table 2 Plant and equipment sound power levels

Equipment	Make / Model	Sound Power Level
Solar Inverter	Sunny Central UP	91 dB(A)
Tracker	NEXTracker Motor*	49 dB(A)
BESS	ST2752UX Liquid Cooling Battery Container System*	97 dB(A)
SVG	Static Var Generator*	88 dB(A)

*ADP is unaware of the equipment selection at this stage, manufacturer data has been chosen to represent typical noise associated with solar power generation and storage.

3.1.1 Adjustments – EPA Noise Protocol

The EPA Noise Protocol requires that a tonality adjustment be applied to noise sources that are considered tonal in character. The adjustment is dependent on octave-band analysis of noise emission from the equipment, to establish an Effective Noise Level (ENL) that can be used in assessment.

Since the equipment selection has not been finalised at this stage, no tonality adjustments have been applied. Once the equipment is selected, further assessment may be required to determine if any tonality adjustments are required.

3.2 Noise Assessment

3.2.1 Noise Emissions – EPA Noise Protocol

A prediction of the noise emission from equipment operating on-site has indicated compliance with the EPA Noise Protocol criteria established in Section 2.1. Predicted noise levels at the noise-sensitive receivers are presented in Table 3. The Solar Inverters are likely to be the dominant source of noise emission from the site.

In our assessment, we have assumed the following:

- > The Solar Inverters are evenly distributed throughout the site facility areas indicated in the Layout Plan.
 - the inverters are located between solar panel arrays, away from the firefighting easement boundary.
 - approximately 100 inverters distributed throughout the site layout and outside of buffer requirement as provided in Table 3.

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- > Sound will travel the shortest distance from the site facilities area to the receivers.
- > Ground areas in the source, middle-ground and receiver zones (based on ISO 9613.2) have been represented as:
 - 30% soft ground at noise sources
 - 0% soft ground in the middle-ground between source and receiver
 - 100% soft ground in the receiver zone (equivalent to standing on grass)
- > Atmospheric effects are to be unfavourable, with an Ambient Temperature of 20 degrees Celsius, and a Relative Humidity of 70%.
- > We have included the night-time period for assessment as equipment may operate in the early morning (particularly in summer) before 7am.

We believe that these assumptions represent a conservative approach to demonstrate compliance.

Table 3 presents the noise levels at the worst affected locations. We note that compliance at these locations would mean compliance with other nearby noise-sensitive receivers.

Table 3 Noise emission assessment, EPA Noise Protocol criteria

Receiver	EPA Noise Protocol, Criteria, dB(A) ¹	Predicted Noise Level	Complies (Y/N)
507 Plain Road, Colbinabbin	36	36	Y ²
	36	34	Y ³
2240 Heathcote-Rochester Road, Colbinabbin	36	35	Y ⁴
	36	33	Y ⁵
2 Cornella Church Road, Colbinabbin	36	24	Y
1993 Heathcote-Rochester Road, Cornella	36	24	Y
1892 Heathcote-Rochester Road, Cornella	36	28	Y
824 Plain Road, Cornella	36	25	Y
574 Cornella Church Road. Gobarup	36	23	Y
522 Cornella Church Road. Colbinabbin	36	30	Y
518 Cornella Church Road, Colbinabbin	36	27	Y

- Notes:
- ¹ We have used the night-time noise limit to assess the Solar Project. This is considered a conservative approach.
 - ² The assessment was done under the assumption that no inverter is within the dwelling boundary radius of 500m.
 - ³ The assessment was done under the assumption that no inverter is within the dwelling boundary radius of 600m.
 - ⁴ The assessment was done under the assumption that no inverter is within the dwelling boundary radius of 200m and each inverter is separated by minimum 200m up to 500m radius from the dwelling boundary.
 - ⁵ The assessment was done under the assumption that no inverter is within the dwelling boundary radius of 300m and each inverter is separated by minimum 200m up to 500m radius from the dwelling boundary.

3.3 Recommendations

The noise levels presented in Table 3 are based on the following recommendations/assumptions:

- > Centralised inverters are distributed evenly throughout the site facilities areas as shown in Figure 1 and as per assumption stated in Section 3.2.1.
- > Where the inverter separations cannot be achieved as per assumptions in Section 3.2.1 and Table 3, it should consider the below:
 - Inverters with acoustic enclosure option are selected, which would reduce the overall sound power level outlined in Table 2 by minimum 5 dB(A) (<86 dB(A))
 - Orientation of the inverters should be determined so that the noisy component is facing away from the residential dwellings where practical
- > Orientation of the BESS and SVG should be determined so that the noisy component is facing away from the residential dwellings where practical.
- > If orientating the BESS and SVG units with the noisy side away from the nearest residence is not possible, then an acoustic barrier will be required. We note that the barriers will need to be constructed as follows:
 - no more than 5m from the BESS and SVG units
 - at the same height of the BESS and SVG units
 - Gap free and solid for their length and may be constructed with materials such as Colourbond or blockwork.
- > Once equipment selection and inverter locations are finalised, further assessment may be required to ensure compliance with EPA Noise Protocol criteria
- > Construction noise mitigation from EPA 1834 section 4.3.3 – 4.3.5 should be followed and the no work should be conducted between 8 pm to 7 am (Monday to Friday); 8 pm to 9am on Saturdays, Sundays and public holidays

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4. Summary

Current standards and regulations associated with the proposed Cooba Solar Project in Colbinabbin, Victoria have been reviewed and assessed.

Noise emissions have been predicted at the nearest noise-sensitive receivers, using a conservative approach, that indicates compliance with the EPA Noise Protocol limits.

We have used distance sound attenuation formulas for major plant and equipment in an unshielded free field (i.e., free from buildings, barriers, mounds or hills etc.). We believe that this is a conservative approach as any shielding between the noise sources and noise-sensitive receivers has not been included.

We expect to be required to produce a further predictive noise assessment based on final layout and equipment as well as noise assessments 1 month and 1 year after the use commences.

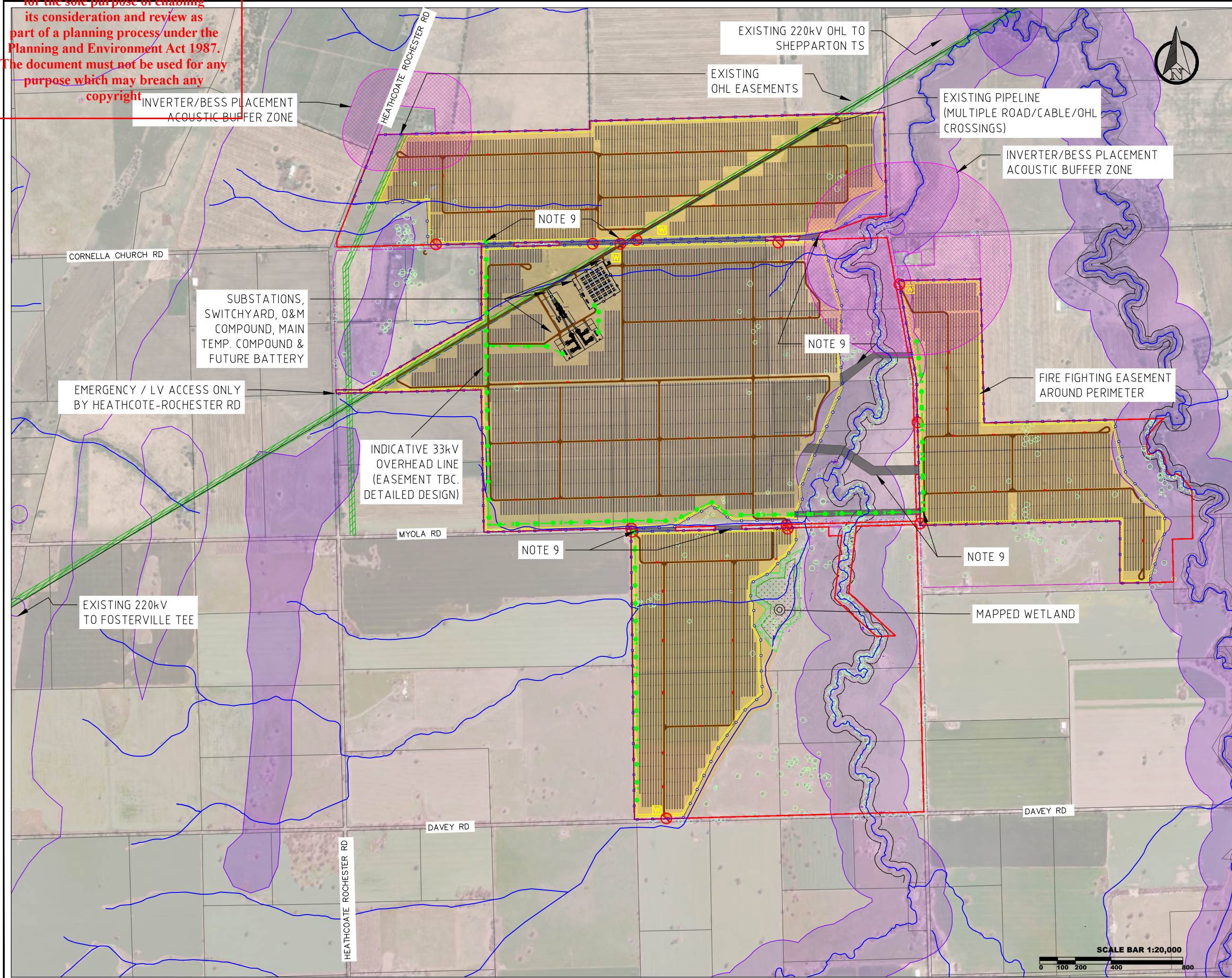
Based on our assessment detailed in Section 3.2, we believe that there are no site conditions or statutory requirements that would preclude this development from complying with the criteria defined in this report.

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Appendix A Project Layout

Planning

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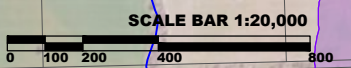
- NOTES:**
1. NOT FOR CONSTRUCTION. PRELIMINARY DRAWING FOR DEVELOPMENT SIZING PURPOSES ONLY.
 2. LAYOUT SUBJECT TO CHANGE AFTER PV MODULE SELECTION.
 3. REFER CULTURAL HERITAGE AREA STUDIES FOR SITE SPECIFIC FINDS.
 4. REFER LANDSCAPING DESIGN FOR NEW VEGETATION SCREENING.
 5. FINAL ACCESS TRACK LOCATION SUBJECT TO DETAILED DESIGN AFTER EQUIPMENT SELECTION.
 6. ALL BURIED SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF DETAILED DESIGN.
 7. POWERLINE EASEMENTS AND COMPOUND LOCATIONS INDICATIVE ONLY. SUBSTATION, SWITCHYARD AND BATTERY COMPOUND LOCATION TO BE FINALISED DURING DETAILED DESIGN. BESS FACILITY, BESS SUBSTATION AND SOLAR SUBSTATION MAY BE CO-LOCATED OR SEPARATE.
 8. SOLAR ARRAY INFRASTRUCTURE AREA INCLUDES SEVERAL TEMPORARY COMPOUNDS AND CONSTRUCTION FACILITIES.
 9. OHL AND BURIED CROSSING LOCATIONS BETWEEN LAND PARCELS.

- LEGEND:**
- PROJECT BOUNDARY
 - LOT BOUNDARIES
 - SUBJECT SITE
 - SOLAR ARRAY AREA
 - EXISTING OHL EASEMENTS
 - MV CABLE/OHL CROSSING
 - WATERCOURSE/EASEMENT
 - SITE ENTRY/EXIT
 - CULTURAL HERITAGE AREA
 - NEW 33kV POWERLINE
 - TREE
 - FIREFIGHTING EASEMENT
 - DWELLING
 - SOLAR ARRAY FIRE WATER
 - EXISTING WATER PIPELINE
 - INDICATIVE SECURITY FENCE
 - POSSIBLE 33kV OHL POLE
 - DISTRIBUTED INVERTER/BESS (INDICATIVE)

V	ADDED INV/BESS TO LEGEND	ABC	14.03.2024
U	DETAIL CHANGES	TCMM	13.03.2024
T	UPDATED SUBSTATION ARRGMT.	ABC	29.01.2024
REV:	DESCRIPTION:	BY:	DATE:
STATUS: NOT FOR CONSTRUCTION			

VENN ENERGY
Level 22, 120 Spencer St
Melbourne, VIC, AUS

PROJECT: COOBA SOLAR FARM			
TITLE: PROJECT LAYOUT (PLANNING) PRELIMINARY			
SCALE AT A3: 1:20,000	DATE: 14.03.2024	DRAWN: ABC	CHECKED: -
PROJECT NO: VEN02	DRAWING NO: CLB-GA-01-DA-01	REVISION:	V



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