

17 January 2022

MAC211432-01LR01V2

Attention: Shane Mellote
Energy Forms
Level 8, 91 William Street
Melbourne VIC 3000

Dear Shane,

Noise Assessment (Addendum) – Battery Energy Storage System

Maryvale Solar Farm, Maryvale, NSW

Muller Acoustic Consulting Pty Ltd (MAC) has been engaged by WIRSOL Energy to complete a Noise Assessment (NA) for the proposed addition of a Battery Energy Storage System (BESS) for the Maryvale Solar Farm near Wellington, NSW (the 'project').

1 Project Background

Energy Forms are proposing to add a Battery Energy Storage System (BESS) to the approved 125 Megawatt (MW) Maryvale Solar Farm project. The project is located at 121 Maryvale Road, Maryvale, NSW and 801 Cobbora Road, Maryvale, NSW approximately 15km north of the Wellington town centre. The BESS is anticipated to have a peak capacity of approximately 125MW and storage capacity of 375MWh.

A Noise Assessment Report was prepared by MAC (ref MAC170553RP1, 9 August 2018) as part of the Environmental Impact Statement (EIS) for the project. The purpose of the EIS NA was to quantify potential environmental noise levels associated with the construction and operation of the project.

This report is an addendum to the 2018 EIS Noise Assessment Report and incorporates the same methodologies for the addition of the BESS to the project.

2 BESS

The BESS will be located either centrally or distributed across the site situated within the project the (refer **Figure 1**) and are connected by underground cables to the existing solar farm. The project would operate 24 hours a day, 7 days a week, with no permanent staff on site. During operation, the PV panels would generate electricity which would be fed into the power grid via the adjacent existing powerline with excess solar energy from the PV system being stored in the BESS for night time usage.

The BESS typically consists of lithium based batteries fitted in a shipping container fitted with relevant switches, controllers providing short terms energy storage services where they are charged and discharged on a regular basis to provide both load shifting (storage of energy for discharge at a later time) and potentially grid support services. As this equipment generates heat, a Heating Ventilation and Air Conditioning (HVAC) system is required to provide cooling and is the significant noise source associated with the BESS. The HVAC system consists of an air conditioner, heat exchanger and ventilation fans.

Two alternative battery storage formats are being considered (refer **Attachment 1**) through the ongoing technical analysis which are described as follows:

Format 1 - Central: a large central “battery” will be positioned adjacent to the proposed substation on site. This will occupy approximately 4 hectares and comprise multiple (approx. 180) shipping container style buildings grouped together that will house the batteries and the ancillary connection and management equipment enabling the batteries to interface with the solar farm substation and the grid.

Format 2 - Distributed: comprises the same number of shipping container style buildings housing batteries distributed across the site, co-located with each of inverter stations located throughout the development adjacent to the photovoltaic arrays (as described in the development application for the project). The distributed batteries will provide for load shifting but will not perform grid support services.

A sound power level (L_w dBA re 10^{-12} Watts) of 77dBA has been adopted to represent the potential noise emission from each BESS ‘container’ and associated HVAC system.

There are no other additional noise sources beyond that required for the addition of the battery storage system BESS (ie HVAC system) from the original project approval.

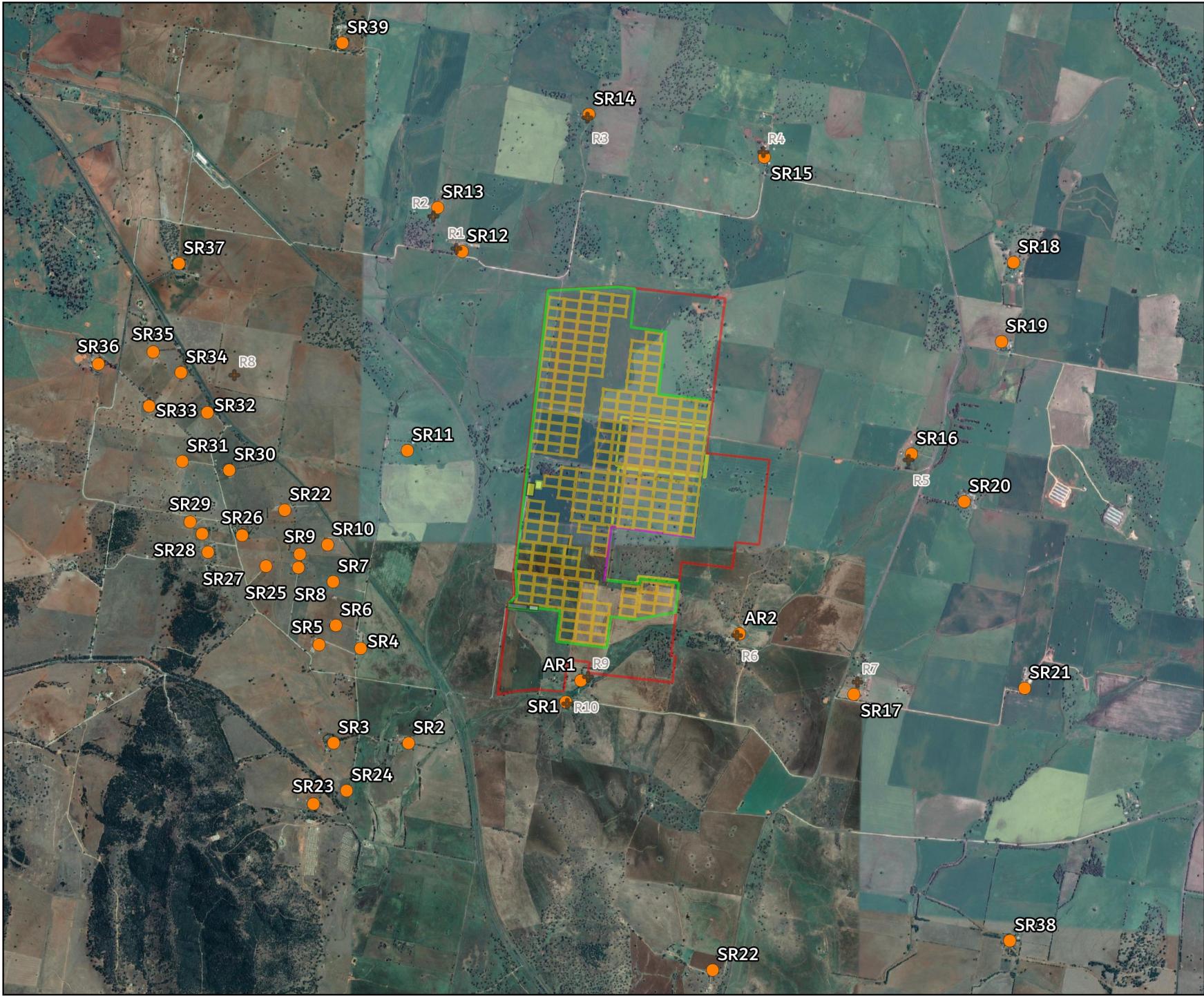
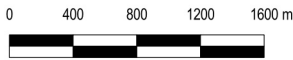


FIGURE 1
PROJECT LAYOUT
MAC211432-01
Maryvale Solar - BESS

KEY

- + Receivers - EIS
- Receivers - Modification
- Project Boundary



3 Revised Operational Assessment

For this assessment, operational noise predictions were modelled for a typical worst case scenario over a 15-minute assessment period based on the assumptions and sound power levels in the EIS NA with the addition of the noise associated with the operation of the BESS. The assessment has included receivers within 3.0km of the project boundary, including Associated Receivers (Project Related).

3.1 Operational Noise Results

Noise levels were predicted at each assessed receiver (refer **Figure 1**) assuming a height of 1.5m above ground level. **Figure 1** also identifies the receivers assessed in the Maryvale Solar Farm Environmental Impact Statement (EIS). **Table 1** summarises the predicted operational noise levels which are demonstrated to comply with the PNTLs at all residential receivers.

Table 1 Predicted Operational Noise Levels - BESS

Receiver ID ¹	Predicted Noise Level	Predicted Noise Level	Limiting Night time	Comply
	dB LAeq(15min)	dB LAeq(15min)	PNTL	
	Distributed Format	Central Format	dB LAeq(15min)	
SR1	<30	<30	35	Yes
SR2	<30	<30	35	Yes
SR3	<30	<30	35	Yes
SR4	<30	<30	35	Yes
SR5	<30	<30	35	Yes
SR6	<30	<30	35	Yes
SR7	<30	<30	35	Yes
SR8	<30	<30	35	Yes
SR9	<30	<30	35	Yes
SR10	<30	<30	35	Yes
SR11	<30	<30	35	Yes
SR12	<30	<30	35	Yes
SR13	<30	<30	35	Yes
SR14	<30	<30	35	Yes
SR15	<30	<30	35	Yes
SR16	<30	<30	35	Yes
SR17	<30	<30	35	Yes
SR18	<30	<30	35	Yes
SR19	<30	<30	35	Yes
SR20	<30	<30	35	Yes
SR21	<30	<30	35	Yes
SR22	<30	<30	35	Yes

Table 1 Predicted Operational Noise Levels - BESS

Receiver ID ¹	Predicted Noise Level	Predicted Noise Level	Limiting Night time	Comply
	dB LAeq(15min)	dB LAeq(15min)	PNTL	
	Distributed Format	Central Format	dB LAeq(15min)	
SR23	<30	<30	35	Yes
SR24	<30	<30	35	Yes
SR25	<30	<30	35	Yes
SR26	<30	<30	35	Yes
SR27	<30	<30	35	Yes
SR28	<30	<30	35	Yes
SR29	<30	<30	35	Yes
SR30	<30	<30	35	Yes
SR31	<30	<30	35	Yes
SR32	<30	<30	35	Yes
SR33	<30	<30	35	Yes
SR34	<30	<30	35	Yes
SR35	<30	<30	35	Yes
SR36	<30	<30	35	Yes
SR37	<30	<30	35	Yes
SR38	<30	<30	35	Yes
SR39	<30	<30	35	Yes

Note 1: Prefix AR indicates Associated Receiver (Project Related).

3.2 Maximum Noise Level Assessment - Operations

A detailed maximum noise level assessment is not required as predicted noise levels for night time operations do not exceed the maximum noise level trigger level of 40dB LAeq(15min) and/or 52dB L_{Amax}.

4 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Assessment (NA) for the proposed addition of a Battery Energy Storage System (BESS) for the Maryvale Solar Farm near Wellington, NSW.

The results of the Noise Assessment demonstrate that noise emissions from the addition of the BESS will not change significantly compared to the EIS Noise Assessment as the revised project with BESS and associated HVAC system would satisfy the operational PNTLs at all identified receivers within approximately 3.0km.

Furthermore, sleep disturbance is not anticipated, as there are no operational noise sources that generate significant maximum noise events and noise emissions from the project are predicted to satisfy the EPA maximum noise trigger levels.

Based on the Noise Assessment results, there are no noise related issues which would prevent approval of the (revised) project.

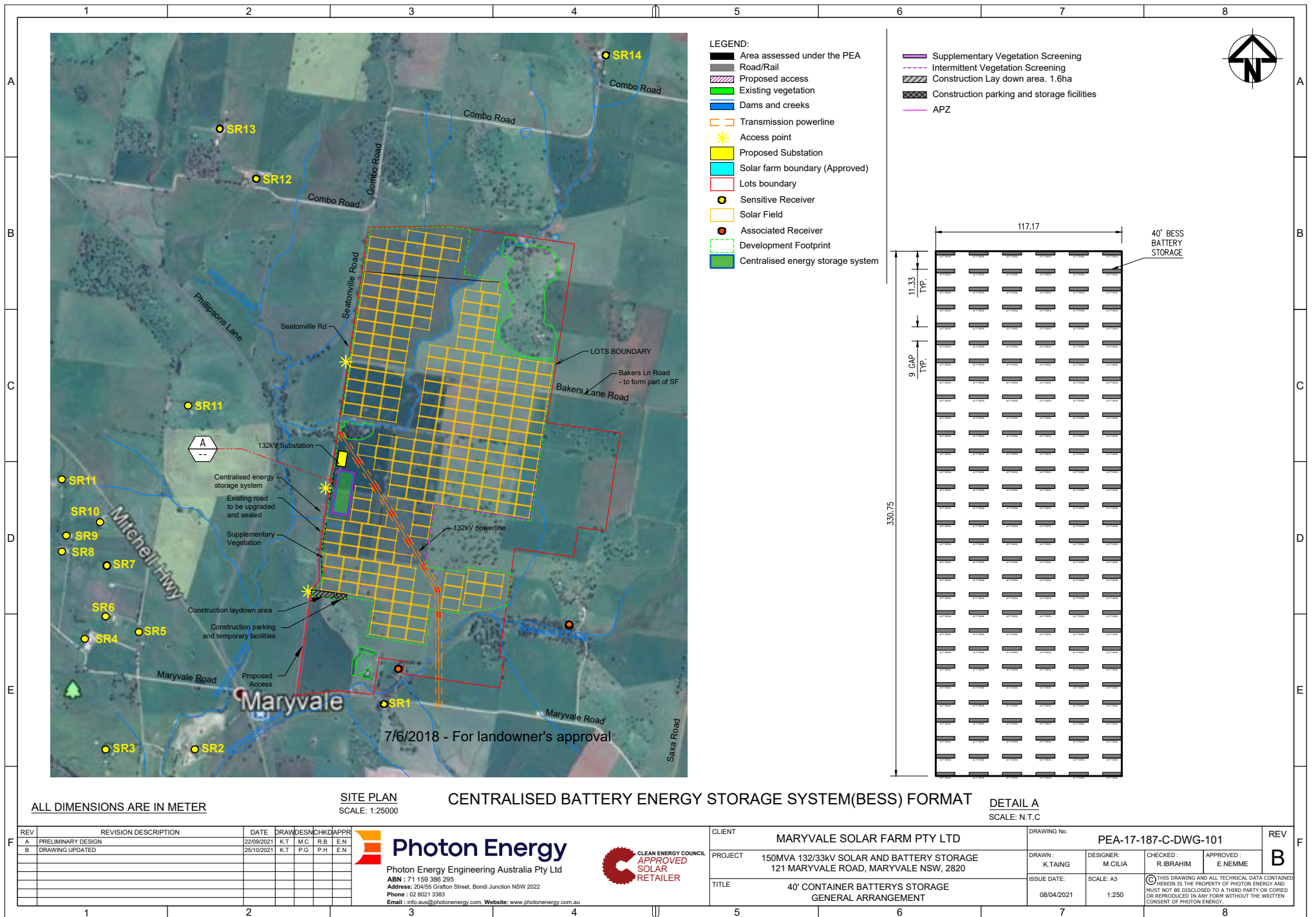
We trust this addendum report is satisfactory for your current requirements. If you have any further questions or would like to discuss, please contact the undersigned.

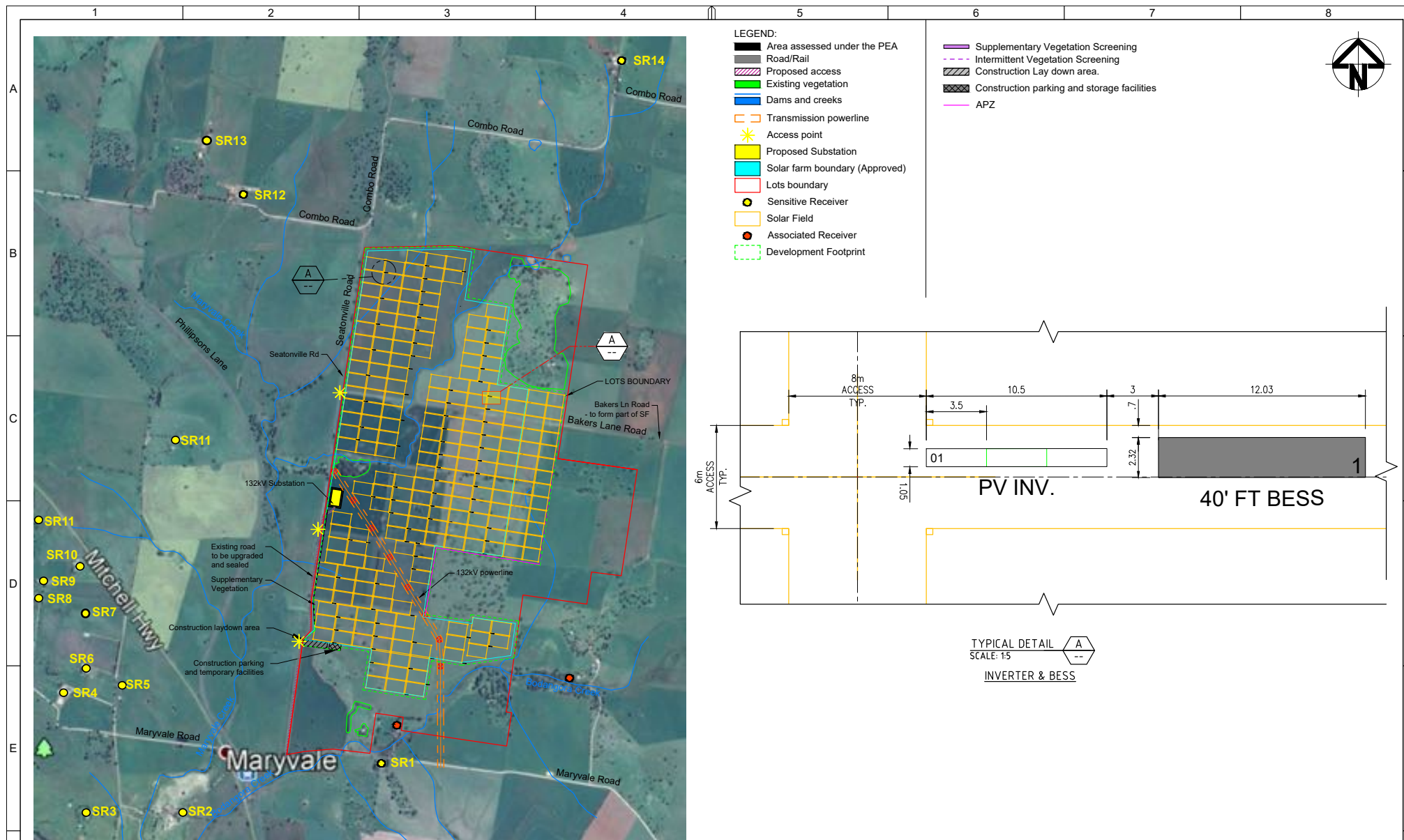
Yours sincerely



Rod Linnett
Senior Acoustic Consultant
MAAS, MIOA
rlinnett@mulleracoustic.com

Attachment 1





ALL DIMENSIONS ARE IN METER

SITE PLAN
SCALE: 1: 25000

DISTRIBUTED BATTERY ENERGY STORAGE SYSTEM(BESS) FORMAT

[illegible]

Photon Energy

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CLIENT	MARYVALE SOLAR FARM PTY LTD	DRAWING No. PEA-17-187-C-DWG-001				REV
PROJECT	150MVA 132/33kV SOLAR AND BATTERY STORAGE 121 MARYVALE ROAD, MARYVALE NSW, 2820	DRAWN : K.TAING	DESIGNER: P.GREEN	CHECKED : R.IBRAHIM	APPROVED : R.IBRAHIM	C
TITLE	40' CONTAINER BATTERY'S STORAGE - DC COUPLED OPTION GENERAL ARRANGEMENT	ISSUE DATE: 12/08/2021	SCALE: A3 1:25, 1:5	☒ THIS DRAWING AND ALL TECHNICAL DATA CONTAINED HEREIN IS THE PROPERTY OF PHOTON ENERGY AND MUST NOT BE DISCLOSED TO A THIRD PARTY OR COPIED OR REPRODUCED IN ANY FORM WITHOUT THE WRITTEN CONSENT OF PHOTON ENERGY		