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Ms Susanna Nel
Landscape Dynamics
3 Palomino Close
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Somerset West, 7130

Dear Ms Nel

**BADENHORST DAM SOLAR PV2 & PV3 FACILITIES ENVIRONMENTAL AUTHORISATION
AMENDMENT: SPECIALIST IMPACT STATEMENT**

The Badenhorst Dam Solar PV2 and PV3 facilities, to be constructed on the remainder of Portion 1 of the farm De Aar No. 180 outside De Aar in the Northern Cape, received environmental authorization from the then Department of Environmental Affairs on 8 August 2014 and 30 July 2015, respectively.

The project developer, Mulilo Renewable Project Developments (Pty) Ltd, wishes to amend the environmental authorizations for both projects to include the installation of a battery energy storage system (BESS) at each.

The battery energy storage systems (BESS 1 (PV3) and BESS 2 (PV2)) will consist of multiple battery units or modules housed in shipping containers and/or an applicable housing structure which is delivered pre-assembled to the project site. Containers are usually raised slightly off the ground and can be stacked if required. Supplementary infrastructure (up to a maximum height of 25m) and equipment may include substations (132 kV), power cables, transformers, power converters, substation buildings and offices, HV/MV switch gear, inverters and temperature control equipment that may be positioned between the battery containers. The BESS 1 and 2 sites, which will each be less than 20 hectares in extent, will be situated within the previously authorised laydown area for the PV3 and PV2 facilities.

A Basic Assessment for the proposed amendment to the projects is not required. Instead, specialist impact statements are required to accompany the EA amendment application to confirm whether the installation of the BESS will result in additional impacts that were not assessed in the original environmental assessment and to recommend, where necessary, additional mitigation measures for inclusion in the EMP. The specialist impact statements must be accompanied, if required, by new impact ratings, considering the additional BESS component to the authorized project.

The integrated heritage impact assessment (HIA) produced by ACO Associates as part of the Environmental Impact Assessment (EIA) process in 2013 (Orton & Webley 2013b) considered archaeological heritage resources, the historical built environment, cultural landscapes, scenic routes

and sense of place and graves. Palaeontological heritage resources were assessed by an independent specialist and did not form part of the HIA.

The findings of the HIA were:

- **Archaeology:** Archaeological sites and materials, while not abundant, were fairly widespread across Portion 1 of the farm De Aar and with one exception, good in situ sites were absent. The following archaeological resources were noted in the HIA:
 - The most common resource was scatters of highly patinated Middle Stone Age (MSA) artefacts in flat, low-lying areas where erosion has exposed and concentrated them;
 - Two particularly dense scatters of MSA artefacts, overprinted with Late Stone Age (LSA) material;
 - A number of stone-built features along the dolerite ridge crossing the western part of the farm, some of which are pre-colonial while others date from the historical period, possibly associated with the South African War;
 - A 'rock gong' located at the top of a dolerite ridge with a fine-line engraving of an animal on the same slab of rock;
 - A 'scratched rock' of the sort found commonly in the Karoo, located on the ridge crossing the western part of the farm;
 - Extensive historical graffiti on rocks in the southern part of the Alternative 1 study area; and
 - Historical archaeological material was limited, but some glass and metal fragments were recorded in south-western portion of the farm, south of the railway line and probably associated with the nearby ruined house.
- **Built Environment:** One intact historical building was recorded, on the Badenhorst Dam farm werf, and one ruin - previously mentioned along the railway line - was located during the survey for the HIA. Both of these buildings were and are outside of the proposed development footprints and should not be impacted in any way
- **Cultural landscapes:** The landscape around De Aar and on Badenhorst Dam has only been minimally altered by humans. The HIA noted that De Aar lies immediately alongside the proposed PV facility but concluded that although the facility would pose a negative visual impact to the context of the town, including a graveyard, the part of town being impacted is entirely modern.
- **Scenic Routes and Sense of Place:** The landscape around De Aar is one of great natural beauty and has a very distinctive character: wide-open grasslands punctuated by typical flat-topped Karoo hills. Any road traversing the area can be considered a scenic route. The addition of solar panels (with an industrial character) to a predominantly natural/rural landscape will alter the sense of place and result in a loss of context. The HIA found, however, that the presence of other renewable energy facilities in the area – both constructed and planned - will produce a new cultural landscape with an industrial character.
- **Graves:** No graves were found by the HIA. A small stone cairn probably related to historical period activities in the area could be a grave, although the HIA suggests that this is unlikely. The HIA noted that pre-colonial graves are often completely unmarked and can be located anywhere where the soil is suitable for digging a grave.

The HIA made the following assessment of impacts on heritage resources:

- There will be impacts to archaeological heritage resources and the cultural landscape if the proposed solar energy facilities are constructed;
- The archaeological sites not located on the dolerite ridge (i.e. the artefact scatters) can be easily mitigated if they are not protected and conserved,
- The landscape impacts will be more substantial and cannot easily (if at all) be mitigated. Alternative 2 would result in a very high magnitude of visual impact to the landscape along the N10 scenic route. Alternative 1 was thus strongly favoured, since all impacts would be kept to one side of the road and the landscape to the south would remain free of industrial intrusions.

The following heritage mitigation measures were proposed in the HIA:

- All mitigation-worthy archaeological sites that are avoided by the development and are not mitigated should be protected from incidental damage (for example from vehicles driving over them or through the establishment of power line access tracks);
- Where archaeological sites cannot be avoided, mitigation in the form of excavation and collection of artefacts should be carried out;
- Any dense subsurface concentrations of artefacts found during excavations should be protected in situ immediately reported to an archaeologist for assessment;
- The dolerite ridge on the western side of the farm with all its archaeological features must be avoided and protected so as to minimise unnecessary landscape scarring;
- If any human remains are encountered during the development, they should be cordoned off and protected from further harm until they can be inspected and removed by an archaeologist under a permit issued for that purpose; and
- Once the exact lines have been identified for the linear components of the project, they should be examined from the desktop then subjected to a walk-down if deemed necessary.

Heritage Specialist Impact Statement:

The EA amendment applications for the Badenhorst Dam Solar PV2 and PV3 facilities stem from the proposal to add a BESS to the project components of each facility. BESS 1 and BESS 2 will be installed within the footprint of the area that was subject to a heritage impact assessment as part of the 2013 EIA process for the authorized PV3 and PV2 facilities.

The authorized extent of PV2 and the proposed BESS 2 footprint within the PV2 laydown area include none of the heritage resources identified in the HIA.

The sites on the rocky ridge in the north-eastern corner of the farm lie within the area authorized for the construction of PV3, but no heritage resources identified by the HIA are located within the laydown area proposed for the installation of BESS 1.

It is our reasoned opinion that the installation of BESS 2 and BESS 1 at the locations proposed will occasion no changes to the identified impacts of the Badenhorst Dam Solar PV 2 and PV3 facilities on heritage resources, provided the mitigation measures recommended in the HIA are implemented.

With regard to cultural landscape, scenic routes and sense of place, BESS 2 and BESS 1 will be installed at least 3 km from the eastern edge of De Aar and a similar distance from the N10 at its closest point to their locations. The installation sites are in a flat and largely featureless open area of the landscape, with hills behind them in the distance. Although their distance from the N10 and from De Aar will, to some extent mitigate the impact of 25 m maximum stacked height of the BESS units,

they nevertheless have the potential to have a visually intrusive in the surrounding rural landscape, from both De Aar and the N10.

It is our assessment that the impact significance of the installation of BESS 2 and BESS 1 on cultural landscape, scenic routes and sense of place is medium (negative), as assessed by the HIA. It is recommended that to reduce intrusion in the cultural landscape as far as possible the BESS units are installed without stacking.

From a heritage resources perspective, the proposed amendments the environmental authorisation are considered acceptable.

Yours sincerely

A handwritten signature in black ink, appearing to read 'J. Gribble', written in a cursive style.

John Gribble
Senior Archaeologist and Heritage Consultant

References:

Orton, J & Webley, L. 2013b. *Heritage Impact Assessment for Multiple Proposed Solar Energy Facilities on De Aar 180/1 (Badenhorst Dam Farm), De Aar, Northern Cape*. Unpublished report for Aurecon South Africa (Pty) Ltd. ACO Associates. Cape Town.