DU PLESSIS DAM SOLAR PV1 GRID CONNECTION
Switching Station and 132kV Powerline connecting the Du Plessis Dam Solar PV1 to the Mulilo Cluster 1 Substation, De Aar, Northern Cape Province

EXECUTIVE SUMMARY OF THE DRAFT BASIC ASSESSMENT REPORT

INTRODUCTION AND PURPOSE OF THE PROJECT

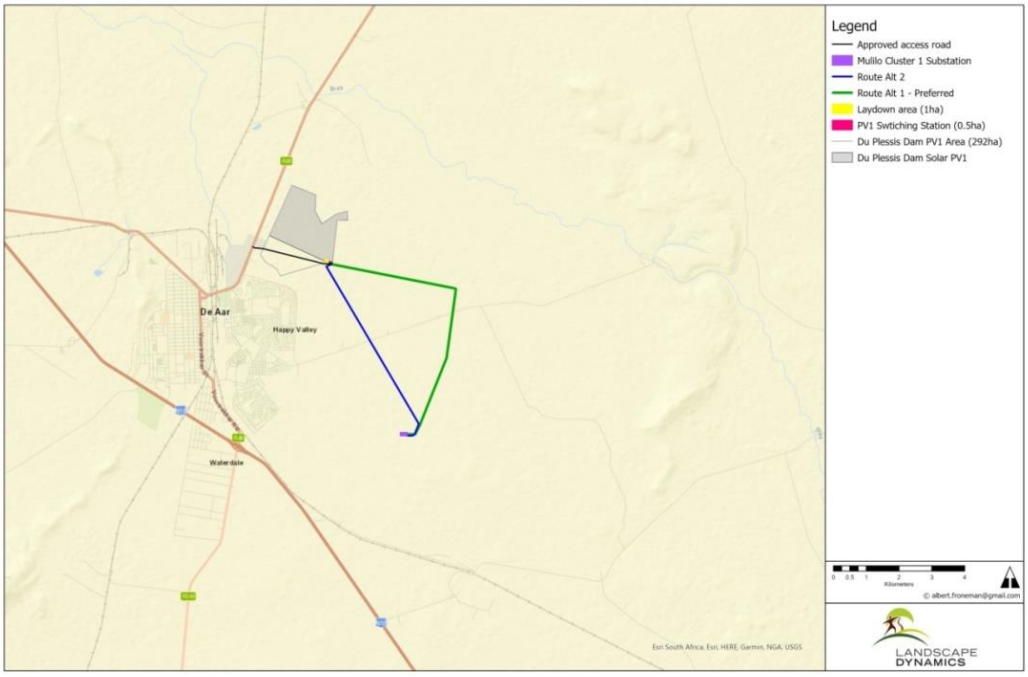
Du Plessis Dam Solar PV1 (Pty) Ltd ('the Applicant") has appointed Landscape Dynamics Environmental Consultants to apply for Environmental Authorisation for the **Du Plessis Dam Solar PV1 Grid Connection** which entails the construction of a switching station at the Du Plessis Solar PV1 as well as an approximate 7,6km 132kV power line that will connect the Du Plessis Dam Solar PV1 facility to the Mulilo Cluster 1 Substation.

The Du Plessis Dam Solar PV1 Project received SIP 10 status in November 2021. It is also confirmed that the project will be submitted as part of the Renewable Energy IPP Procurement Programme Bid Window 5 (REIPP BW5); therefore the Department of Forestry, Fisheries & Environment (DFFE) is the Competent Authority for this project.

LOCALITY

The proposed grid connection (two alternatives have been assessed) is situated east of the town of De Aar, within the jurisdiction of the Emthanjeni Local Municipality, Northern Cape Province, situated between approximately 3 km and 6 km east of centre of De Aar in the Northern Cape Province.

Du Plessis Dam Solar PV 1 Grid Connection - Locality map



The following farms are directly affected by the preferred route:-

- The Remainder of the Farm Du Plessis Dam No 179
- Portions 1 of the Farm De Aar 180
- Portions 4 of the Farm De Aar 180

PROJECT COMPONENTS

Infrastructure	Specifications
Powerline (Grid connection)	• 132kV S/C Overhead Power line will connect the Du Plessis Dam Solar PV1 Eskom Switching Station with the Mulilo Cluster 1 Substation • Length/Route is approximately 7.6km • Eskom Servitude width is 31m. • A 300m wide corridor was assessed • Associated infrastructure at the Overhead Power Line Route/Servitude: o Steel monopole structures o ACSR & OPGW Conductors o Foundations and Earthing o Line Hardware and Accessories
Access Roads	• ±2km, 12m wide access road o Starting point at the R48 and ends at the PV1 switching station o This access road is existing but will be widened to 12m o Road was authorised with the Du Plessis Solar PV1 application (DFFE Ref Nr 12/12/16/3/3/2/456) • ±6m wide access road will be constructed along the line route for construction and maintenance purposes – this road will be inside the powerline servitude
Switching Station	• 33/132kV switching yard • ± 0.5 hectares in size (50m x 100m) • Internal access roads of 6m wide Associated infrastructure at the Switching Station o Outdoor Mechanical-Electrical High Voltage Equipment o Indoor Medium Voltage Switchgear and Low Voltage Controlgear o Lighting Protection Equipment o Perimeter and internal Fencing o Buildings required for operation (i.e. ablutions required for maintenance staff)
Laydown area	• A construction site area of ±1 hectares directly adjacent to the PV1 Switching Station is required. • All temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.
Storage of diesel	Diesel storage of less than 80m^3 for the 132kV Switching Station: o During construction, diesel is required for construction vehicles as well as generators for the construction camp and commissioning whilst waiting for the Eskom grid connection works to be completed o During operations, diesel is required for Operations & Maintenance vehicles at the PV plants but also required for backup diesel generators at the substations. The Generators supply auxiliary power to the substation's protection and communications systems, should there be outages on the grid. This is an Eskom requirement together with a battery room at the substations to act as UPS for these critical systems.
Temporary Services	During the construction phase, temporary sanitation facilities will be provided (i.e. chemical toilets) and these toilets will be regularly serviced by a licensed company.

LEGAL REQUIREMENT

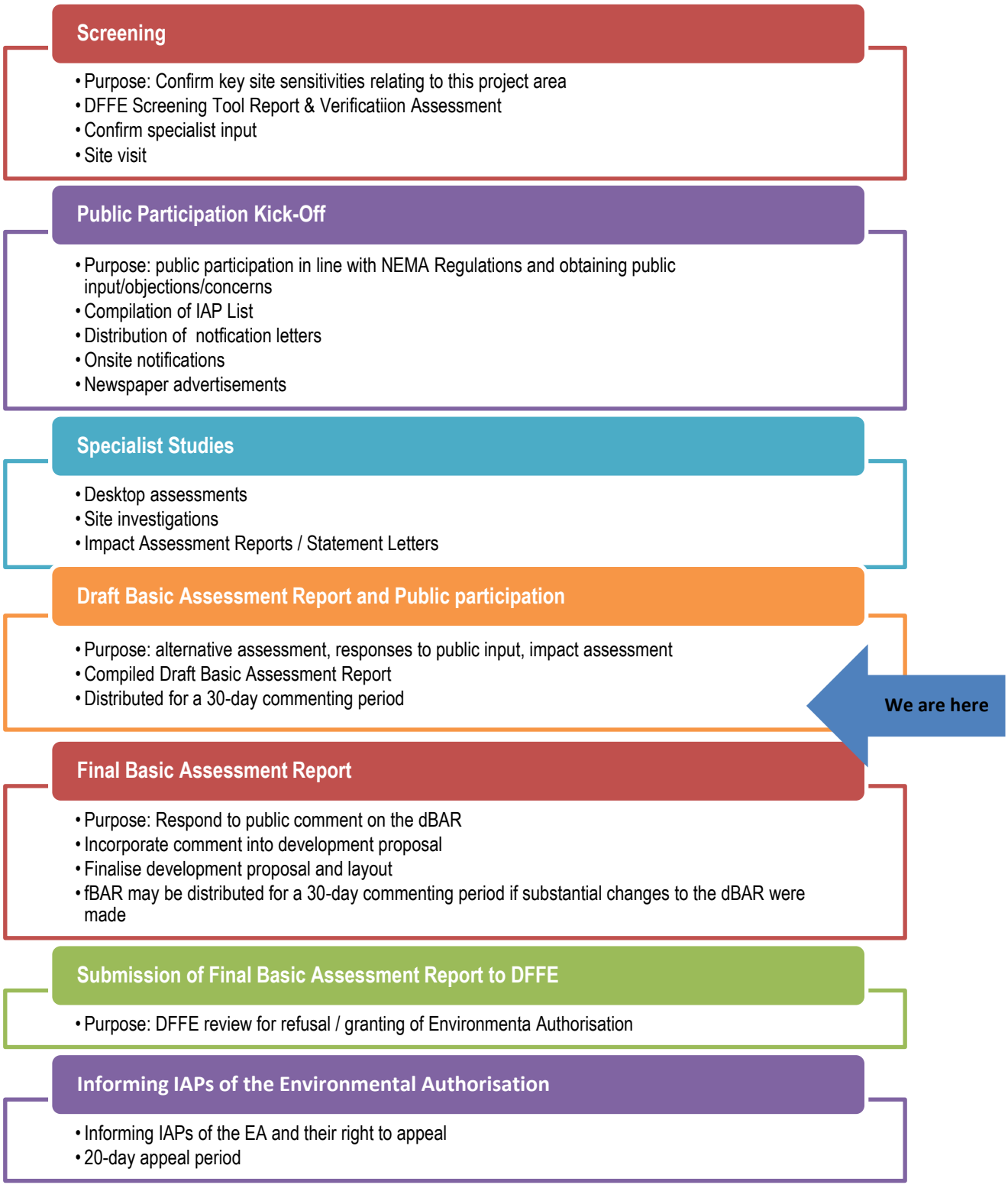
National Environmental Management Act (Act 107 of 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014, as amended in April 2017 (Government Notice Nr 326). Environmental Authorisation is requested for the following listed activities:

Listing Notice 1 (GN R327)		
Nr 11	The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33kV but less than 275 kilovolts.	A 132kV overhead power line will be constructed.
Nr 27	The clearance of an area of 1 hectares of more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for (i) The undertaking of a linear activity (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	The switching station site with the adjacent laydown area will result in the clearing of an area of approximately 1,5ha.
Nr 28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The switching station and grid connection will be constructed on a total area exceeding 1 hectare in extent outside the urban area of De Aar on agricultural land.

Listing Notice 3 (GN R324)		
4	The development of a road wider than 4 meters with a reserve less than 13,5metres in (g) the Northern Cape (ii) outside urban areas in (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; and in (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	• The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2. • There is a protected area, the De Aar Nature Reserve, approximately 4,5km west of the proposed development site.
10	The development and related operation of facilities for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres in (g) the Northern Cape; in (iii) outside urban areas in (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; and in (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.	. • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2. • There is a protected area, the De Aar Nature Reserve, approximately 4,5km west of the proposed development site.
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such vegetation is required for maintenance purposes undertaken in accordance with a management maintenance plan in (g) the Northern Cape within (ii) Critical Biodiversity Areas identified in bioregional plans	• The switching station site with the adjacent laydown area will result in the clearing of an area of approximately 1,5ha. • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2.

A Basic Assessment process is applicable for this application. The process is summarised below.



The National Water Act (Act No 36 of 1998)

All of the proposed activities are located some distance from significant delineated aquatic features and thus do not pose a risk of changing the bed, banks or characteristics of the watercourses or impede or divert flow in the watercourses; which implies that Section 21 (c) and (i) water use activities are not triggered. No water use authorisation is therefore required for the Du Plessis Dam PV1 Grid Connection.

The National Heritage Resources Act (Act 25 of 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act and the applicable activities include the following:

- any development or other activity which will change the character of a site exceeding 5 000m^2 in extent
- linear developments of 300m or longer.

The SA Heritage Resources Agency is the commenting authority in this regard and their comment will be included and addressed in the Final BAR.

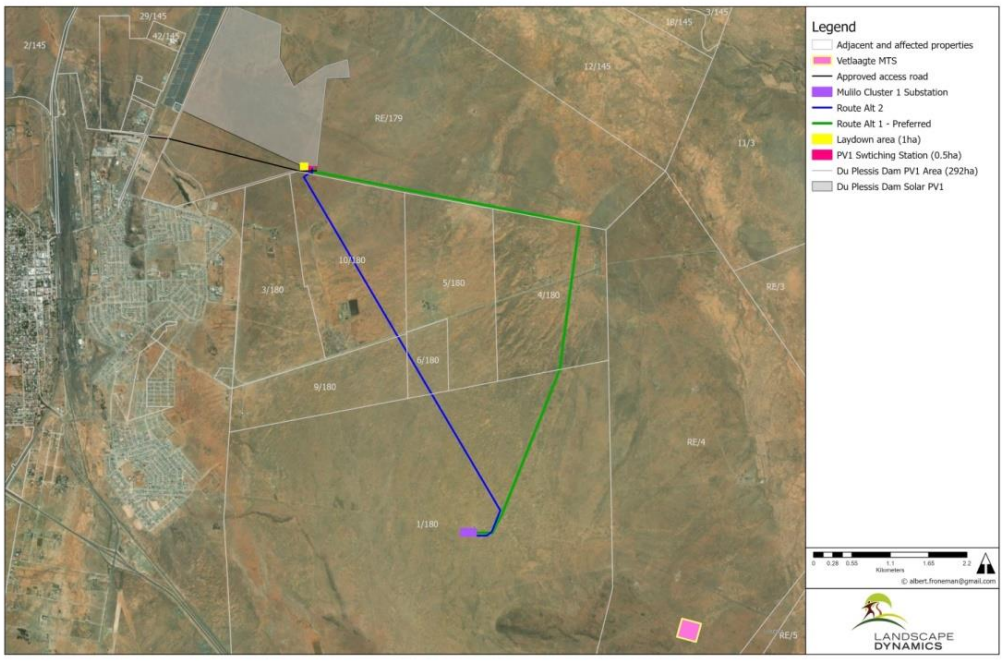
PURPOSE OF THE PROJECT

The need of the project relates directly to the need for renewable energy projects in South Africa. The proposed electrical infrastructure will connect the electricity to be generated by the Du Plessis Solar PV1 to the Mulilo Cluster 1 Substation to ultimately connect to the Eskom national grid.

ALTERNATIVES

The following two 132kV route alternative corridors had been assessed with the green route being the preferred option presented by the Applicant:

Du Plessis Dam Solar PV 1 Grid Connection - Site Map



The following aspects regarding alternatives are applicable to this grid connection :

- *Location*
  The location of the grid connection is embedded in the grand design of the authorised solar Du Plessis Dam Solar PV1, which holds Environmental Authorisation valid until 28 September 2025. Changing the location of the switching station site at this stage would thus mean that the layout of the solar PV facility will have to be amended as well, which is not an option to consider due to unnecessary significant time and cost implications.
  Both route corridors run along existing property boundaries and approved corridors which will necessary result in less impact on the environment. The preferred route has however been identified by Eskom as being their preferred option due to their future planning in the macro area. Note that the Environmental Authorisation will eventually be transferred to Eskom.
  There is thus no justification and/or restrictions from both a technical and environmental point of view to change the position of the switching station site and/or preferred powerline route.

- *Type of activity to be undertaken*
  The energy generated by the Du Plessis Dam Solar PV1 needs to be evacuated and connected to the national grid. The only way of achieving this is by means of a switching station and a power line and no other type of activity could meet the purpose of this project.

- *Design, technology and operational aspects*
  The design, technology and operational aspects of switching stations/substations and power lines are guided strictly by Eskom standards, stipulations and requirements and it is not within the ambit of the Applicant to change Eskom standards.

Summarised table of alternatives – preferences and restrictions
(to be considered with the specialist reports summarised below)

Component	Route Alternative 1	Route Alternative 2
Technical Preference	Preferred	Acceptable
Terrestrial Ecological Impact	Alternative 1 is preferred	Acceptable
Avifauna impact	Alternative 1 is preferred	Acceptable
Aquatic environment	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Heritage Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Palaeontological Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Social Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference

PUBLIC PARTICIPATION

Notification letters were distributed to all Interested & Affected Parties (IAPs) and no objection to date was received. The Draft BAR (this document) is now being distributed for public review and input. Comment/objections received will be carefully assessed and addressed. The responses thereto will be included in the Final BAR. It is however not expected that objections will be received due to the numerous solar farm and associated infrastructure projects in the macro area.

DFFE SCREENING TOOL

The DFFE Screening Tool Report was compiled and site verification was done. Based on this screening report, specialist input and direct relevant experience from the EAPs specifically with regards to electrical infrastructure projects, it was concluded that the following specialist studies had to be undertaken:

- Fauna & Flora Impact Assessment
- Freshwater Impact Assessment
- Bird Impact Assessment
- Cultural Heritage Impact Assessment
- Palaeontological Assessment
- A Social Impact Assessment

SPECIALIST STUDIES

The switching station site, laydown area and a 300m power line route corridor were investigated by the specialist team (fauna & flora, aquatic, bird, social and heritage). These studies concluded that all expected negative impacts can be mitigated to acceptable levels. The preferred alternative is supported by all the specialists. The following is a summary of their key findings.

Terrestrial Ecological Specialist Assessment

- The regional vegetation type that occurs on site and in surrounding areas is not listed or of conservation concern.
- The corridors are both partially within a Critical Biodiversity Area 2 and partially within an Ecological Support Area (ESA), the latter of which extends across vast distances in all areas close to De Aar. There are therefore no options outside of this ESA for the project, and the CBA[2] area is the location of the associated solar PV project, which has already been authorised.
- No plant species of concern were found on site. One rare plant species, *Tridentea virescens,* could potentially occur in the general area but was not seen. It occurs across a very wide geographical area and loss of a small area of habitat will not affect the species.
- One protected amphibian, the Giant Bullfrog (*Pyxicephalus adspersus*), was found on site. The observation was within the Alternative 2 corridor in a specific location where it is likely to be resident. Loss of a small area of habitat for the proposed projects will not adversely

affect the species, but it would be preferable to avoid impacts, if possible. From this perspective, Alternative 1 (preferred) is therefore marginally preferred here.
- Impacts of the proposed project components are relatively insignificant in comparison to the variety of approved solar PV projects within the immediate surroundings.

The following recommendations were made to protect and enhance sensitive ecological features on site, which occur outside the proposed footprint areas:

- The small depressions within the Alternative 2 corridor on site should be treated as moderately sensitive. Measures should be implemented to protect these areas from direct impacts.
- Alien invasive species must be strictly managed.

Aquatic Specialist Impact Assessment

The proposed grid connection and switching station for PV1 are located outside of the wider floodplain area of a Brak River Tributary that lies to the north-east and east of the project activities. Some minor watercourses of low ecological sensitivity occur near the route that is of low sensitivity and have poorly defined channels and little associated aquatic habitat and biota. The proposed activities are thus unlikely to have any impact on these aquatic features.

A small dam has been constructed along the eastern side of the proposed PV1 grid connection route corridor that is mapped as a FEPA wetland and has some associated artificial wetland habitat. Considering that the wetland habitat is artificial, associated with a constructed dam and along a gravel farm access road, as well as the fact that the proposed powerline can easily span the feature, no aquatic ecosystem are any significance are likely to be associated with the proposed activity at the dam.

The potential aquatic biodiversity impacts of the proposed activities are likely to be negligible in terms of any potential impact to aquatic habitat, biota, water quality, or flow for all phases of the proposed development.

Both route alternatives assessed would have same potential aquatic ecosystem impacts that are of negligible significance.

Avifauna Specialist Impact Assessment

The total area of habitat destruction associated with the footprint of the grid connection and associated infrastructure is relatively small compared to the proportion of habitat available in the area, and does not represent a fatal flaw that would prevent the proposed development from proceeding. As the majority of the proposed power line corridors assessed run adjacent to existing power lines, which are largely unmarked in terms of bird flight diverters, the impact significance of collision associated with the proposed power line is unlikely to increase beyond that which already exists and could potentially reduce the overall risk to birds.

The proposed project is unlikely to impose significant impacts on the avifauna of the receiving environment. No significant negative impacts have been identified and therefore the project can be authorised from an avifaunal perspective.

Heritage Impact Assessment

Three sites of mixed age scatters of hornfels flaked artefacts were identified – one along the preferred corridor and two along the 2nd corridor alternative. They are however of very low significance and do not require any mitigation.

The landscape was found to be heavily dominated by existing electrical infrastructure which forms a new layer on the landscape. The new developments will thus be in keeping with this land use and will not introduce any new or significant impacts.

It is recommended that the proposed powerlines, switching stations and access roads be authorised (using either alternative in the case of PV1), but subject to the following recommendations which should be included as conditions of authorisation:

- Surface clearance is to be kept to the minimum required for the project; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Palaeontological Impact Assessment

Based on the geology of the area and the palaeontological record, it can be justified that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through in April 2022 confirmed that there are only a few scattered fragments of transported silicified fossil wood. The sands of the Quaternary period would not preserve fossils. It is not known if there are fossils below the ground surface.

Based on the fossil record but confirmed by the site visit and walk through there are only a few scattered pieces of transported silicified fossil wood even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur in below the ground surface in the shales of the Tierberg and the Abrahamskraal Formations so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the environmental officer or other responsible person once excavations and drilling have commenced, it should be rescued and a palaeontologist called to assess and collect a representative sample.

Social Impact Assessment

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in

renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line is therefore supported by key policy and planning documents.

The key positive social impact associated with the project is the creation of employment and business opportunities, as well as the opportunity for skills development and on-site training.

The findings of the study indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Du Plessis Dam Solar PV1 overhead power line is *Low Negative* with mitigation. This applies to both Alternative 1 (Preferred Alternative) and Alternative 2.

The energy security benefits associated with the proposed Du Plessis Dam Solar PV1 are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure. The establishment of proposed 132 kV grid connection for the Du Plessis Dam PV1 is therefore supported by the findings of the Social Impact Assessment.

PUBLIC PARTICIPATION

The public participation process followed was approved by the DFFE on 11 February 2022 and the following actions were taken to date:

- Three A2 laminated onsite notices were placed at strategic places in close proximity to the site on 22 February 2022.
- A newspaper advertisement was placed in a local newspaper on 25 February 2022.
- A notification letter with a request for input was sent to everyone on the IAP Register on 2 March 2022 and a 30-day commenting period (exclusive of official public holidays) applied.
- The Draft BAR (this document) has now been submitted to the DFFE and I&APs on 16 June 2022 for a 30-day commenting period (exclusive of public holidays).

Comment received on this application will be included and addressed in the Final BAR.

IMPACT ASSESSMENT

The main potential negative impacts associated with the project are the following:

Expected Negative Impacts

Planning and Design Phase

- Permanent loss of agricultural land
- Risk of failure of structures
- Risk of erosion
- Impact on terrestrial and aquatic habitat
- Impact on avifauna

Construction Phase

- Impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Impact on heritage resources
- Impact on palaeontological resources
- Risk of groundwater pollution
- Risk of erosion
- Impact of an uncontrolled labour force
- Noise and dust (air quality)

Post- Construction / Operational Phase

- Continuous impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Risk of erosion
- Continuous risk of groundwater pollution

It was concluded in the Environmental Impact Assessment table included in the Draft BAR that, after the application of proposed mitigation measures, all negative impacts can be mitigated to acceptable levels.

Expected positive impacts

- The Du Plessis Solar PV1 Grid Connection will allow the electricity generated by the Du Plessis Dam Solar PV1 to be evacuated into the national grid.
- All the advantages of additional, clean, renewable electrical supply to the national Eskom grid will be realised. An opportunity to reduce South Africa's very high carbon emissions will be utilised.
- Employment and business opportunities with the opportunity for skills development and on-site training will be created through the establishment of the Du Plessis Dam Solar PV1 facility which include the proposed grid connection.

ENVIRONMENTAL IMPACT STATEMENT

The following is concluded:-

- The proposed Du Plessis Dam Solar PV1 Grid Connection is planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account.
- All relevant legal requirement in terms of the Environmental Impact Assessment Regulations published in 2014, as amended were complied with. This Basic Assessment Report includes all relevant proceedings, findings and recommendations which resulted from this study.
- The specialist input obtained is comprehensive and effective in providing an assessment of the

status quo of the study area, identifying potentially sensitive areas and issues of concern as well as identifying impact that require re-consideration of alternatives.

- Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and potentially affected landowners of the project. No objections had been received regarding this project.
- The infrastructure and preferred alternative as motivated and recommended for authorisation in this document will, after the application of mitigation measures, have a minimal and acceptable impact on the environment. This will be accomplished through the implementation of the mitigation measures specified in the Environmental Management Programme (EMPr) that is included as Appendix G of the Basic Assessment Report.
- The EAPs are confident that the infrastructure and preferred route alternative as presented is acceptable and viable. The assessment of additional alternative sites and/or routes is not justified.
- There is no reason from a technical, environmental and social perspective why the preferred powerline corridor could not be authorised.

RECOMMENDATIONS

It is recommended that Environmental Authorisation be granted to the **Du Plessis Dam Solar PV1 (Pty) Ltd** for the preferred route for the **Du Plessis Dam Solar PV1 Grid Connection** which entails the construction of a switching station with associated infrastructure (inclusive of a diesel storage facility) and an approximate 8km 132kV power line that will connect the Du Plessis Dam Solar PV1 facility to the Mulilo Cluster 1 Substation.

It is required that the following be considered for inclusion in the Environmental Authorisation:

- A power line route corridor of 300m was assessed and it is requested that the *corridor* be approved as part of the environmental authorisation and not the servitude only. This will allow for reasonable adjustments within the corridor during the final design phase of this project without having to go through another environmental authorisation process. Only the required 31m wide servitude will be registered within the route corridor, not the entire corridor.
- It is required that the Site-Specific Environmental Management Programme be approved as part of the Environmental Authorisation.
- The Environmental Authorisation must be valid for a period of 10 years.

****