# TOURNÉE 1 SOLAR (RF) (PTY) LTD SOLAR ENERGY FACILITY (DFFE REF: 14/12/16/3/3/2/2339) – FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT EXECUTIVE SUMMARY.

**Tournee 1 Solar (RF) (Pty) Ltd**
Second Floor Cruise Terminal, Duncan Rd, E Berth
Victoria and Alfred Waterfront, Cape Town, 8001
+27 (0)21 418 3940 • info@redrocket.energy
**www.redrocket.energy**



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# 1 INTRODUCTION

Changes made from the Draft Environmental Impact Report (EIR) have been underlined in this Final EIR for ease of reference to the updates made in the reporting.

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Tournée 1 Solar (Pty) Ltd (Tournée 1), to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed 150 megawatt (MW) Tournée 1 Solar Photovoltaic (PV) Facility located near Standerton in the Mpumalanga Province (**Figure 1-1**).

The proposed development is subject to a Scoping and EIA (S&EIA) Process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this S&EIA Process is the national Department of Forestry, Fisheries and Environment (DFFE).

In terms of Section 7(1) of the Infrastructure Development Act, 2014 (Act 23 of 2014), large-scale infrastructure projects, known as Strategic Integrated Projects (SIPs), have been identified across all nine provinces. Thirty-six SIPs have been prioritised as part of the National Infrastructure Plan (NIP). SIPs cover catalytic projects that can fast-track development and growth.

The Tournée 1 Solar PV Facility has applied for as a SIP under SIP 20d – Just Energy Transition Program (JETP): National. The proposed Tournée 1 Solar PV will pave the way for the Just Energy Transition (JET) in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. The proposed Tournée 1 Solar PV Plant aims towards the aforementioned national energy targets of diversification of energy supply and the promotion of clean energy. The proof of request is included in **Appendix K**.

Futhermore, Eskom Holdings SOC (Eskom) has expressed its support for the development of the Tournée Solar PV Facilities due to the purpose of adding new generation capacity to the national grid to aid the National Energy Crisis. The letter from Eskom has been included in **Appendix L**.

The DFFE is requested to consider this as a Priority Project and to reduce their decision making timeframe to 57 days as per the timeframes outlined in the Infrastructure Development Act, as amended (Act 23 of 2014). The official SIP letter will be forwarded to the DFFE upon receipt.

## 1.1 PURPOSE OF THIS REPORT

The Scoping and EIA (S&EIA) process is an interdisciplinary procedure to ensure that environmental and social considerations are included in decisions regarding projects. Simply defined, the process aims to identify the possible environmental and social effects of a proposed activity and how those impacts can be mitigated.

This EIR aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment and key impacts identified in the environmental assessment, and the consultation process undertaken through the EIA process.

## 1.2 BACKGROUND INFORMATION

The proposed project includes the development of the Tournée 1 & 2 Solar PV facilities near Secunda in the Mpumalanga Province (**Figure 1-1**). The Tournée Solar PV facilities will include two 150MW Solar Energy Facilities (SEFs). **This report is specific to the Tournée 1 Solar PV Facility**.

The proposed project will be applied for under a Special Purpose Vehicle and the Project Applicant is therefore Tournée 1 Solar (Pty) Ltd. The proposed Solar PV Facility will connect to a nearby Eskom substation (still to be confirmed) through an up to 132 kV single or double circuit powerline. The powerline will subject to a separate BA process for environmental authorisation.

The facility is being developed in the context of the Renewable Energy Independent Power Producer Procurement Programme (REIPPP), in conjunction with private off-take or wheeling agreements, where possible.

It is understood that Red Rocket has a corporate Environmental and Social Management System (ESMS) which aligns with the Equator Principles, the International Funding Corporation (IFC) Performance Standards (PS) and applicable World Bank/IFC Environmental, Health and Safety (EHS) and Sector specific Guidelines and applicable Good International Industry Practice (GIIP). All Red Rocket's renewable energy projects, from inception, development, construction, operation, and any decommissioning are required to comply with the requirements and expectations of the ESMS. The Tournée 1 Solar PV Facility does not fall within a Renewable Energy Development Zone (REDZ).

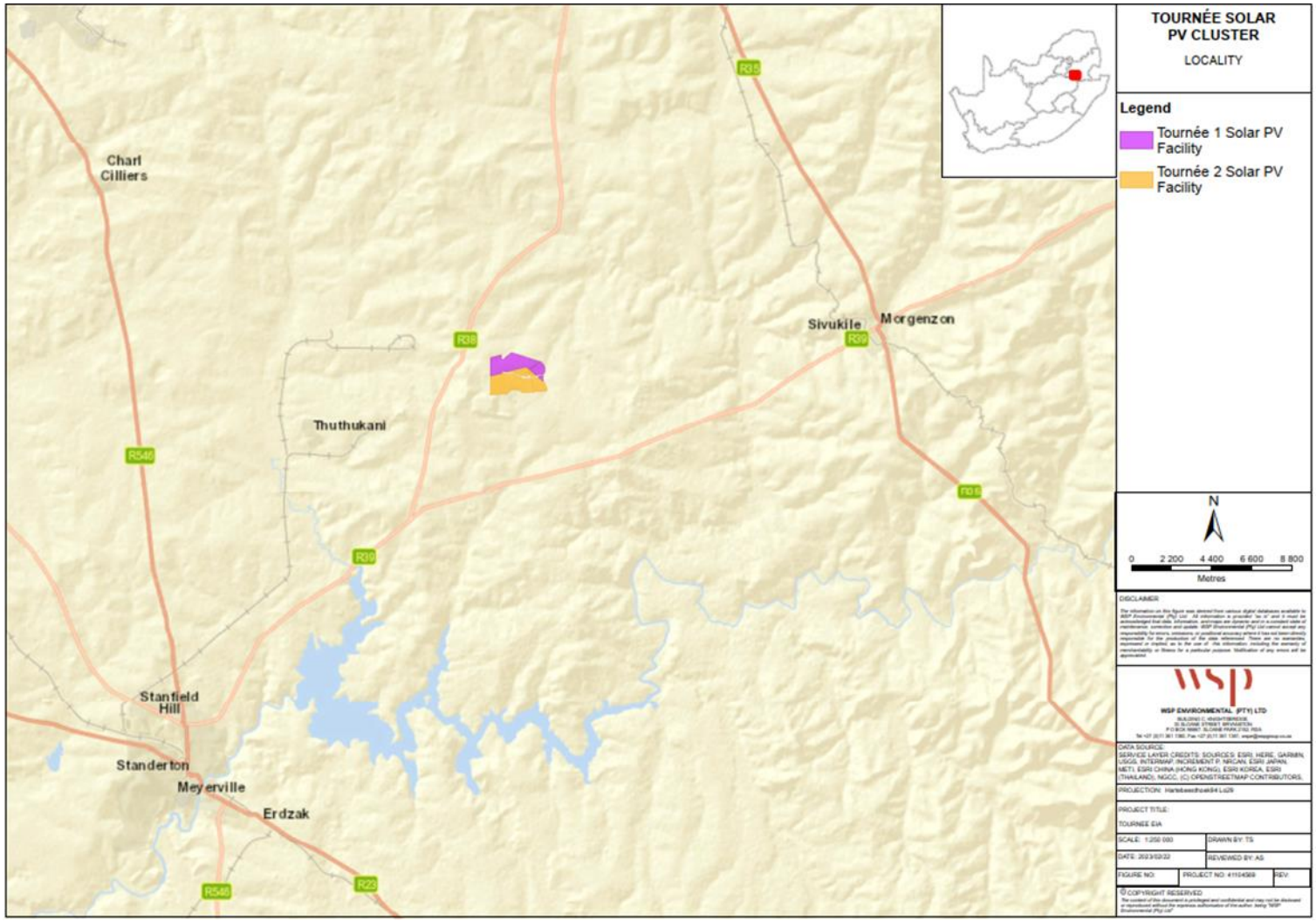


**Figure 1-1 – Regional locality map of Tournée 1 Solar PV Facility**

# 11 ENVIRONMENTAL IMPACT STATEMENT

The essence of any impact assessment process is aimed at ensuring informed decision-making, environmental accountability, and to assist in achieving environmentally sound and sustainable development. In terms of NEMA, the commitment to sustainable development is evident in the provision that "development must be socially, environmentally and economically sustainable…. and requires the consideration of all relevant factors…". NEMA also imposes a duty of care, which places an obligation on any person who has caused, is causing, or is likely to cause damage to the environment to take reasonable steps to prevent such damage. In terms of NEMA's preventative principle, potentially negative impacts on the environment and on people's environmental rights (in terms of the Constitution of the Republic of South Africa, Act No. 108 of 1996) should be anticipated and prevented, and where they cannot be prevented altogether, they must be minimised and remedied in terms of "reasonable measures".

In assessing the environmental feasibility of the proposed construction of the proposed Project, the requirements of all relevant legislation have been considered. The identification and development of appropriate mitigation measures that should be implemented to minimise potentially significant impacts associated with the project, has been informed by best practice principles, past experience, and the relevant legislation (where applicable).

The conclusions of this Final EIA Report are the result of comprehensive assessments. These assessments were based on issues identified through the S&EIA process and public participation undertaken. The Draft EIA was subject to public review, which was undertaken according to the requirements of NEMA with every effort made to include representatives of all stakeholders within the process. The Draft EIA has been updated and finalised, taking into consideration all comments received during the public review period before being submitted to the CA for consideration.

## 11.1 IMPACT SUMMARY

A summary of the identified impacts and corresponding significance ratings for the proposed project is provided in **Table 11-1**.

**Table 11-1 – Impact Summary**

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| Soil, Land use and Land Capability Assessment | Loss of land capability | P | (-) | High | Low |
| | Soil erosion | P | (-) | Low | Low |
| | Soil contamination | P | (-) | Moderate | Low |
| | Soil compaction | P | (-) | Moderate | Low |
| | Loss of land capability | C | (-) | High | Low |
| | Soil erosion | C | (-) | Moderate | Low |
| | Soil contamination | C | (-) | Moderate | Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Soil compaction | C | (-) | Moderate | Low |
| | Loss of land capability | O | (-) | Moderate | Low |
| | Soil erosion | O | (-) | Low | Low |
| | Soil contamination | O | (-) | Low | Low |
| | Soil compaction | O | (-) | Low | Low |
| Aquatic Biodiversity | Vegetation clearing | C | (-) | Moderate | Very Low |
| | Construction of infrastructure | C | (-) | Moderate | Very Low |
| | Operation and Maintenance | O | (-) | Low | Very Low |
| | Discharge of water from access roads | O | (-) | Moderate | Very Low |
| | Closure of the project and rehabilitation of the footprint area | D | (-) | Very Low | Very Low |
| Plant Species habitat and diversity | Grassland Habitat with PV facility and associated infrastructure | P | (-) | Low | Low |
| | Grassland Habitat with PV facility and surface infrastructure | P | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and linear development | P | (-) | Low | Low |
| | Transformed Habitat with PV facility and associated infrastructure | P | (-) | Low | Very low |
| | Transformed Habitat with PV facility and surface infrastructure | P | (-) | Low | Very low |
| | Transformed Habitat with PV facility and linear development | P | (-) | Low | Very low |
| | Grassland Habitat with PV facility and associated infrastructure | C | (-) | Moderate | Moderate |
| | Grassland Habitat with PV facility and surface infrastructure | C | (-) | High | High |
| | Grassland Habitat with PV facility and linear development | C | (-) | Moderate | Moderate |
| | Transformed Habitat with PV facility and associated infrastructure | C | (-) | Low | Very low |
| | Transformed Habitat with PV facility and | C | (-) | Low | Very low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | surface infrastructure | | | | |
| | Transformed Habitat with PV facility and linear development | C | (-) | Low | Very low |
| | Fresh water ecosystems with PV facility and surface infrastructure | C | (-) | Moderate | Low |
| | Fresh water ecosystems with PV facility and linear development | C | (-) | Moderate | Very Low |
| | Grassland Habitat with PV facility and associated infrastructure | O | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and surface infrastructure | O | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and linear development | O | (-) | Moderate | Moderate |
| | Transformed Habitat with PV facility and associated infrastructure | O | (-) | Very low | Very low |
| | Transformed Habitat with PV facility and surface infrastructure | O | (-) | Very low | Very low |
| | Transformed Habitat with PV facility and linear development | O | (-) | Very low | Very low |
| | Freshwater ecosystems with PV facility and surface infrastructure | O | (-) | Moderate | Low |
| | Freshwater ecosystems with PV facility and linear development | O | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and associated infrastructure | D | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and surface infrastructure | D | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and linear development | D | (-) | Moderate | Low |
| | Transformed Habitat with PV facility and associated infrastructure | D | (-) | Very low | Very low |
| | Transformed Habitat with PV facility and surface infrastructure | D | (-) | Low | Very low |
| | Transformed Habitat with PV facility and linear development | D | (-) | Low | Very low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| Plant SCC | Grassland Habitat Threatened Floral SCC | P | (-) | Moderate | Low |
| | Grassland Habitat Protected Floral SCC | P | (-) | Moderate | Low |
| | Grassland Habitat Threatened Floral SCC | C | (-) | Moderate | Low |
| | Grassland Habitat Protected Floral SCC | C | (-) | Moderate | Low |
| | Freshwater ecosystems Threatened Floral SCC | C | (-) | Moderate | Low |
| | Freshwater ecosystems Protected Floral SCC | C | (-) | Moderate | Moderate |
| | Grassland Habitat Threatened Floral SCC | O | (-) | Moderate | Low |
| | Grassland Habitat Protected Floral SCC | O | (-) | Low | Low |
| | Freshwater ecosystems Threatened Floral SCC | O | (-) | Moderate | Low |
| | Freshwater ecosystems Protected Floral SCC | O | (-) | Low | Low |
| | Grassland Habitat Threatened Floral SCC | D | (-) | Moderate | Low |
| | Grassland Habitat Protected Floral SCC | D | (-) | Low | Very low |
| Animal Species habitat and diversity | Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity | P | (-) | Moderate | Low |
| | Grassland Habitat with linear development faunal habitat and diversity | P | (-) | Low | Low |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | P | (-) | Low | Low |
| | Transformed Habitat with linear development faunal habitat and diversity | P | (-) | Low | Very Low |
| | Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity | C | (-) | High | Moderate |
| | Grassland Habitat with linear development faunal habitat and diversity | C | (-) | High | Moderate |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | C | (-) | Low | Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Transformed Habitat with linear development faunal habitat and diversity | C | (-) | Low | Low |
| | Freshwater ecosystems with linear development | C | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity | O | (-) | Moderate | Moderate |
| | Grassland Habitat with linear development faunal habitat and diversity | O | (-) | Moderate | Low |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | O | (-) | Moderate | Low |
| | Transformed Habitat with linear development faunal habitat and diversity | O | (-) | Moderate | Low |
| | Freshwater ecosystems with linear development | O | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity | D | (-) | Moderate | Low |
| | Grassland Habitat with linear development faunal habitat and diversity | D | (-) | Moderate | Low |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | D | (-) | Moderate | Low |
| | Transformed Habitat with linear development faunal habitat and diversity | D | (-) | Moderate | Low |
| Animal SCC | Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity | P | (-) | Moderate | Low |
| | Grassland Habitat with linear development faunal habitat and diversity | P | (-) | Moderate | Low |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | P | (-) | Low | Low |
| | Transformed Habitat with linear development faunal habitat and diversity | P | (-) | Low | Low |
| | Grassland Habitat with PV facility and associated infrastructure faunal habitat and | C | (-) | Moderate | Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | diversity | | | | |
| | Grassland Habitat with linear development faunal habitat and diversity | C | (-) | Moderate | Low |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | C | (-) | Low | Low |
| | Transformed Habitat with linear development faunal habitat and diversity | C | (-) | Low | Low |
| | Freshwater ecosystems with linear development | C | (-) | Moderate | Low |
| | Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity | O | (-) | Moderate | Low |
| | Grassland Habitat with linear development faunal habitat and diversity | O | (-) | Low | Low |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | O | (-) | Low | Low |
| | Transformed Habitat with linear development faunal habitat and diversity | O | (-) | Low | Low |
| | Freshwater ecosystems with linear development | O | (-) | Low | Low |
| | Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity | D | (-) | Moderate | Low |
| | Grassland Habitat with linear development faunal habitat and diversity | D | (-) | Moderate | Low |
| | Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity | D | (-) | Moderate | Low |
| | Transformed Habitat with linear development faunal habitat and diversity | D | (-) | Moderate | Low |
| Avifauna | Displacement of priority species | C | (-) | Moderate | Moderate |
| | Displacement of priority species | C | (-) | High | Moderate |
| | Mortality of priority species | O | (-) | Low | Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Entrapment of large-bodied birds | O | (-) | Low | Low |
| | Mortality of priority species | O | (-) | Low | Very Low |
| | Mortality of priority species | O | (-) | Low | Low |
| | Displacement of priority species | D | (-) | Moderate | Moderate |
| Archaeological and Cultural Heritage | Possible damage to archaeological resources | C | (-) | High | Very low |
| Palaeontology | Possible damage to palaeontological resources | C | (-) | Low | Very low |
| Traffic | Increase in Development Trips | C | (-) | Moderate | Low |
| | Noise and dust pollution | O | (-) | Low | Very Low |
| | Increase in Development Trips | D | (-) | Moderate | Low |
| Visual | Farmsteads within 2 km radius | C | (-) | Moderate | Moderate |
| | Gravel road | C | (-) | Moderate | Moderate |
| | All receptors within 5 km radius | C | (-) | Moderate | Moderate |
| | Tutuka Power Station Airfield | O | (-) | Low | Low |
| | Farmsteads within 2 km radius | O | (-) | Moderate | Moderate |
| | Gravel road | O | (-) | Moderate | Moderate |
| | All receptors within 5 km radius | O | (-) | Low | Low |
| | Farmsteads within 2 km radius | D | (-) | Moderate | Moderate |
| | Gravel road | D | (-) | Moderate | Moderate |
| | All receptors within 5 km radius | D | (-) | Low | Low |
| Social | Creation of employment and business opportunities | C | (+) | Low | Moderate |
| | Presence of construction workers in the area on local communities | C | (-) | Moderate | Low |
| | Influx of job seekers | C | (-) | Low | Low |
| | Risk to safety, livestock, and damage to farm infrastructure | C | (-) | Low | Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Increased risk of grass fires | C | (-) | Moderate | Very Low |
| | Construction related activities | C | (-) | Moderate | Low |
| | Loss of farmland | C | (-) | Moderate | Low |
| | Improving energy security and support renewable sector | O | (+) | Moderate | High |
| | Creation of employment opportunities | O | (+) | Very Low | Moderate |
| | Benefits associated with socio-economic development contributions | O | (+) | Moderate | Moderate |
| | Visual impact and impact on sense of place | O | (-) | Moderate | Moderate |
| | Impact on property values | O | (-) | Low | Very Low |
| | Tourism | O | (-) | Very Low | Very Low |
| | Social impacts associated with decommissioning | D | (-) | Low | Very Low |
| Geotechnical | Soil erosion | C | (-) | Moderate | Very low |
| | Oil spillages | C | (-) | Moderate | Very low |
| | Disturbance of fauna and flora | C | (-) | Low | Very low |
| | Slope stability | C | (-) | Low | Very low |
| | Seismic activity | C | (-) | Very Low | Very low |
| | Soil Erosion | O | (-) | Low | Very low |
| | Potential Oil Spillages | O | (-) | Moderate | Very low |
| | Soil erosion | D | (-) | Moderate | Very low |
| | Oil spillages | D | (-) | Moderate | Very low |
| | Disturbance of fauna and flora | D | (-) | Low | Very low |
| | Slope stability | D | (-) | Low | Very low |
| High Level Safety, Health and Environmental Risk Assessment | Human Health - chronic exposure to toxic chemical or biological agents | C | (-) | Moderate | Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Human Health - exposure to noise | C | (-) | Moderate | Low |
| | Human Health - exposure to temperature extremes and/or humidity | C | (-) | Low | Very Low |
| | Human Health - exposure to psychological stress | C | (-) | Low | Low |
| | Human Health - exposure to ergonomic stress | C | (-) | Low | Low |
| | Human and Equipment Safety - exposure to fire radiation | C | (-) | Moderate | Low |
| | Human Health - chronic exposure to toxic chemical or biological agents | C | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to explosion over pressures | C | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to acute toxic chemical and biological agents | C | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to acute toxic chemical and biological agents | C | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to violent release of kinetic or potential energy | C | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to electromagnetic waves | C | (-) | Moderate | Low |
| | Environment - emissions to air | C | (-) | Low | Very Low |
| | Environment - emissions to water | C | (-) | Low | Low |
| | Environment - emissions to earth | C | (-) | Low | Low |
| | Environment - waste of resources e.g., water, power etc | C | (-) | Low | Very Low |
| | Public - Aesthetics | C | (-) | Low | Low |
| | Investors - Financial | C | (-) | Moderate | Low |
| | Employees and investors - Security | C | (-) | Moderate | Low |
| | Emergencies | C | (-) | Moderate | Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Investors - Legal | C | (-) | Moderate | Low |
| | Human Health - chronic exposure to toxic chemical or biological agents | O | (-) | Moderate | Low |
| | Human Health - chronic exposure to toxic chemical or biological agents | O | (-) | Moderate | Low |
| | Human Health - exposure to noise | O | (-) | Moderate | Low |
| | Human Health - exposure to temperature extremes and/or humidity | O | (-) | Low | Very Low |
| | Human Health - exposure to psychological stress | O | (-) | Low | Very Low |
| | Human Health - exposure to ergonomic stress | O | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to fire radiation | O | (-) | High | Low |
| | Human and Equipment Safety - exposure to fire radiation | O | (-) | High | Low |
| | Human and Equipment Safety - exposure to explosion over pressures | O | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to acute toxic chemical and biological agents | O | (-) | Low | Low |
| | Human and Equipment Safety - exposure to acute toxic chemical and biological agents | O | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to violent release of kinetic or potential energy | O | (-) | Moderate | Low |
| | Human and Equipment Safety - exposure to electromagnetic waves | O | (-) | Moderate | Low |
| | Environment - emissions to air | O | (-) | Low | Very Low |
| | Environment - emissions to water | O | (-) | Low | Low |
| | Environment - emissions to earth | O | (-) | Low | Very Low |
| | Environment - waste of resources e.g., water, power etc | O | (-) | Low | Very Low |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Public - Aesthetics | O | (-) | Low | Low |
| | Investors - Financial | O | (-) | Moderate | Low |
| | Employees and investors - Security | O | (-) | Moderate | Low |
| | Employees and investors - Security | O | (-) | Moderate | Low |
| | Emergencies | O | (-) | Moderate | Low |
| | Investors - Legal | O | (-) | Moderate | Low |
| | Human Health - chronic exposure to toxic chemical or biological agents | D | (-) | N/A | N/A |
| | Human Health - exposure to noise | D | (-) | N/A | N/A |
| | Human Health - exposure to temperature extremes and/or humidity | D | (-) | N/A | N/A |
| | Human Health - exposure to psychological stress | D | (-) | N/A | N/A |
| | Human Health - exposure to ergonomic stress | D | (-) | N/A | N/A |
| | Human and Equipment Safety - exposure to fire radiation | D | (-) | N/A | N/A |
| | Human and Equipment Safety - exposure to explosion over pressures | D | (-) | N/A | N/A |
| | Human and Equipment Safety - exposure to acute toxic chemical and biological agents | D | (-) | N/A | N/A |
| | Human and Equipment Safety - exposure to violent release of kinetic or potential energy | D | (-) | N/A | N/A |
| | Human and Equipment Safety - exposure to electromagnetic waves | D | (-) | N/A | N/A |
| | Environment - emissions to air | D | (-) | N/A | N/A |
| | Environment - emissions to water | D | (-) | N/A | N/A |
| | Environment - emissions to earth | D | (-) | Moderate | Low |
| | Environment - waste of resources e.g., water, power etc | D | (-) | N/A | N/A |

| Aspect | Impact Description | Phase | Character | Without Mitigation | With Mitigation |
|---|---|---|---|---|---|
| | Public - Aesthetics | D | (-) | N/A | N/A |
| | Investors - Financial | D | (-) | N/A | N/A |
| | Employees and investors - Security | D | (-) | N/A | N/A |
| | Emergencies | D | (-) | N/A | N/A |
| | Investors - Legal | D | (-) | Moderate | Low |

## 11.2 SPECIALIST CONCLUSIONS

### 11.2.1 AGRICULTURAL POTENTIAL

The landscape largely resembles a Vertic and Melanic topographical sequence where the soils are characterised by black coloured, strongly to very strongly structured (topsoil and subsoil) of varying depths. These soils have high clay content, displaying a high water-holding capacity and mostly containing a high percentage of swelling clay minerals. The catena of the landscape in which the wetland is situated largely resembles a Vertic and Melanic topo sequence where the soils are characterised by melanic, strongly to very strongly structured (topsoil and subsoil) of varying depths. These soils have high clay content, displaying a high water-holding capacity and mostly containing a high percentage of swelling clay minerals. The recharge mechanism of the occurring soils is classified as responsive shallow. The high clay content of these soils leads to surface sealing once the soil becomes saturated which can occur after limited rainfall, resulting in the generation of overland flow after rain events. Shallow responsive soils lead to a rapid runoff response time during intense rainfall events attributed to their clayey nature which inhibits infiltration.

The construction phase will only entail light excavation as part of infrastructure development. The post development scenario will not lead to any significant loss of hydro-pedological process, however a change in hydrological patterns is anticipated. The project will likely lead to a No-Net Loss of interflow recharge if mitigation measures are carefully implemented. The surface runoff would still be delivered into the wetlands through stormwater management systems, although the pattern, timing and duration of the hydrograph would change to some degree. A change in the Present Ecological State (PES) category is however not deemed likely, provided that all mitigation measures contained in this report and the freshwater ecological report are implemented.

It is the opinion of the specialist that the study undertaken (**Appendix H.3**) provides the relevant information required for this Environmental Impact Assessment phase of the project to ensure that appropriate consideration of the agricultural resources in the study area will be made in support of the principles of Integrated Environmental Management (IEM) and sustainable development.

### 11.2.2 AQUATIC BIODIVERSITY

Scientific Aquatic Services (SAS) was appointed to conduct a freshwater ecosystem assessment as part of the Environmental Authorisation (EA) and Water Use Application (WUA) processes for the proposed Tournée 1 Solar photovoltaic (PV) Park and associated infrastructure, near the Thuthukani Settlement, Mpumalanga Province.

The proposed Tournée 1 Solar PV Facility forms part of the larger Tournée Solar PV Cluster which will include two (2) 150 Megawatts (MW) Solar Energy Facilities (SEFs). The proposed Tournée 1 Solar PV Facility will have a generating capacity of no more than 150 Megawatts (MW) and battery energy storage systems (BESS) of 600 megawatt-hours (MWh).

The site assessment confirmed the presence of two (2) Channelled Valley Bottom (CVB) wetlands and a depression wetland associated with the proposed Tournée 1 Solar PV Facility and investigation area.

Results for the EAP provided Impact Assessment indicates that the construction and operational activities associated with the proposed Tournée 1 Solar PV Facility pose a medium impact significance prior to the implementation of mitigation measures and a very low impact significance post the implementation of mitigation measures. The activities associated with the decommissioning phase pose a very low impact significance pre and post implementation of mitigation measures.

Assuming that strict enforcement of cogent, well-developed mitigation measures takes place, the significance of impacts arising from the proposed solar energy facility are likely to be reduced during the construction and operational phases assuming that a high level of mitigation takes place.

Based on the findings of this study it is the opinion of the freshwater ecologist that the proposed Tournée 1 Solar PV Facility, from a freshwater resource management perspective, be considered for development provided that all mitigation measures as defined in this report are implemented.

### 11.2.3 TERRESTRIAL BIODIVERSITY

It is the opinion of the ecologists that several aspects of the proposed Tournée 1 Solar PV Facility development (especially the developable areas) will result in moderate-high impacts to the receiving environment. However, with adequate implementation of the suggested mitigation measures and avoiding development within the recommended SCC buffers, the impacts associated with the Tournée 1 Solar PV Facility development can be reduced to acceptable levels, taking into consideration the aim of the Decommissioning phase and subsequent rehabilitation of the Tournée 1 Solar PV Facility development. The specialist assessment undertaken is deemed to provide the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the Tournée 1 Solar PV Facility will be made in support of the principle of sustainable development.

### 11.2.4 PLANT SPECIES

All the habitat units (i.e., Grassland Habitat and Freshwater Ecosystems Habitat), except Transformed habitat, are considered to comprise of indigenous vegetation.

The Freshwater Ecosystem is considered to be an important component of the reference VU vegetation type (i.e., Soweto Highveld Grassland), i.e., the Freshwater Ecosystems contribute to the ecological integrity and functioning of the larger Soweto Highveld Grassland ecosystem. Transformed Habitat of low sensitivity (within the proposed project footprint); Grassland Habitat of intermediate sensitivity (within the proposed project footprint) and Freshwater Ecosystems of moderately high sensitivity (will not directly be impacted by the proposed activities).

The proposed activities will largely occur within Transformed habitat (approximately 99,21 ha); the remaining developments will occur within the Grassland Habitat (approximately 129,25 ha). The Grassland Habitat is somewhat modified (e.g., by long term grazing) and as such has a lowered

habitat integrity; however, the Grassland Habitat still provides suitable habitat for threatened floral SCC and have several confirmed occurrences of provincially protected floral SCC present. The proposed project activities will directly and indirectly impact on floral habitat and will infringe upon habitat where floral SCC were observed during the site assessments.

The significance of biodiversity impacts varied depending on the floral habitat and proposed activities; however, with mitigation measures effectively implemented, the impacts on floral habitat, diversity, protected flora, and threatened floral can be acceptably reduced. Prior to construction, Once the approved EMPr and layout is received, a floral walkdown of the authorised footprint is required to obtain exact numbers and localities of floral SCC and protected species that will be impacted.

Should this development be approved, the following should be taken into consideration:

- A high diversity of AIPs was present within the Tournée 1 Solar PV Facility of which NEMBA category 1b, NEMBA category 3, as well as several non-listed species, are. The NEMBA regulations require Category 1b Listed Invasive Species to be managed. Category 2 species include plants used Commercially that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread. See section 3.3 of the specialist study for a complete list of AIPs encountered on site.
- A floral monitoring plan must be designed and implemented (by the proponent) during the Operational and Maintenance Phase as well as post-decommissioning and rehabilitation of the project (should the project be approved). The following points aim to guide the design of the monitoring plan, and it must be noted that the monitoring plan must be continually updated and refined for site-specific requirements:
- Alien vegetation monitoring should take place across the Tournée 1 Solar PV Facility to identify sites that should be prioritised for AIP control. The clearing and management of AIP priority areas should be monitored for re-emerging alien vegetation. Follow-up work can be undertaken on a three (3) to six (6) monthly basis, depending on the rate of re-growth;
- Threatened floral SCC and protected floral SCC that have been relocated (if applicable) must be monitored.
- Monitoring of all the natural areas surrounding the projects footprint should continue throughout the Operational and Maintenance phase to ensure these areas are not adversely affected by the proposed project activities, especially with regards to edge effect impacts that can stem from AIP proliferation or from a fragmented landscape.
- The method of monitoring must be designed to be subjective and repeatable to ensure consistent results.
- A pre-construction walkdown is suggested before any development takes place to account for the presence of any nationally or provincially protected plant species. Should any floral species protected under NEMBA, MNCA, or NFA be encountered within the Tournée 1 Solar PV Facility and proposed development footprint areas, authorisation to relocate such species must be obtained from the DFFE and the MTPA.

It is the opinion of the ecologists that the study undertaken study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the Tournée 1 Solar PV Facility will be made in support of the principle of sustainable development.

### 11.2.5 ANIMAL SPECIES

Impacts stemming from the construction of the proposed Tournée 1 Solar PV Facility will vary from high to low impacts on faunal biodiversity. Through the implementation of mitigation measures as stipulated in this report, along with sound environmental management, impacts can be reduced.

Although the proposed development will likely impact on faunal species as a result of habitat loss, the habitats within the proposed Tournée 1 Solar PV Facility is not deemed to be of increased sensitivity for fauna, nor does it contain niche / unique habitat types or features that support range restricted SCC. From an IFC perspective the habitat on site cannot be defined as critical habitat except for the Freshwater Ecosystem habitat which has been avoided as part of the proposed development. Although several SCC faunal species are likely to occur within (permanently or temporarily) the proposed Tournée 1 Solar PV Facility, they are equally likely to be found in the same abundance in the surrounding natural areas.

Vegetation clearance activities and earth works will place many SCC at risk, not only from a loss of habitat but also potential mortalities. This is of increased importance when considering invertebrate SCC, as many of these species are slow moving and live in burrows and under rocks. As such, these species are unlikely to be able to escape ahead of ground clearing activities. As such, it is essential that these species be actively searched for ahead of earth works. Where this is not feasible, as species are observed when vegetation clearance takes place, they are to be appropriately rescued and relocated. Provided that mitigation measures are implemented, the overall impact to faunal SCC as a result of the construction and operation activities is unlikely to significantly impact SCC populations in the region.

From a faunal ecological perspective, provided that all mitigation measures are implemented, and that sound environmental management takes place, the proposed Tournée 1 Solar PV Facility are not expected to pose a significant threat to faunal populations in the region. As such, it is the opinion of the specialists that there is no clear reason why this development should not be authorised.

### 11.2.6 AVIFAUNA

Large sections of the PAOI have already been transformed and consists of agricultural land, used for crops and cattle grazing, with the most sensitive areas for birds identified as the wetlands and farm dams. These damp areas serve as potential roosting areas for Black Harrier, African Marsh Harrier, Montagu's Harrier, Pallid Harrier, and Blue Crane. They are also likely to attract large raptors, storks and bustards which may use these to both bath and drink. Blue Cranes regularly enter farm dams to protect their chicks from terrestrial predators in the evenings.

The more natural grasslands on the PAOI seemed to hold a greater number of priority species such as Blue Korhaan, Secretarybird, and although these species would all be affected by the permanent removal of these grasslands for the construction of the proposed SEF, the surrounding grasslands neighbouring the PAOI should be sufficient to allow for the feeding and breeding of these species.

Currently, with only thirty percent of the potential Priority Species being recorded on both the Tournée 1 Solar PV and Tournée 2 Solar PV facilities, the overall impact on birds based off the seasonal surveys is considered LOW, and we have identified no fatal flaws and all likely risks can be mitigated.

### 11.2.7 HERITAGE

The significant heritage resources identified in the study area relate to the historic farm occupation of the property. These resources include the remnants of an old farm werf as well as burial sites that were identified. In order to ensure that no impact to the identified resources occurs during the construction or operational phases of the development, a number of recommendations are made below.

Based on the fossil record but confirmed by the site visit and walk through there are NO FOSSILS of any significance such as those of recognisable Glossopteris floral elements, 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 below the ground surface in the shales of the Vryheid Formation so a Fossil Chance Find Protocol must be implemented for the duration of excavation activities.

There is no objection to the proposed development from an archaeological perspective on condition that:

- The recommendations in the VIA must be implemented.
- A no development buffer of 50m is implemented around the burial sites identified within the development area.
- Ongoing community access to these burials, as well as their conservation into the future, must be ensured.
- This can be managed through the development of a Heritage Management Plan for the burials to be implemented for the duration of the project.
- The Chance Fossil Finds Procedure must be implemented for the duration of construction activities.
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

### 11.2.8 PALAEONTOLOGY

Based on the fossil record but confirmed by the site visit and walk through there are NO FOSSILS of any significance such as those of recognisable Glossopteris floral elements, 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 below the ground surface in the shales of the Vryheid Formation so a Fossil Chance Find Protocol must be implemented for the duration of excavation activities.

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- This can be managed through the development of a Heritage Management Plan for the burials to be implemented for the duration of the project.
- The Chance Fossil Finds Procedure must be implemented for the duration of construction activities.
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

### 11.2.9 TRAFFIC

The potential traffic and transport related impacts for the construction, operation and decommissioning phases of the proposed Tournée 1 Solar PV Facility were identified and assessed.

The main impact on the external road network will be during the construction phase. This phase is temporary in comparison to the operational period. The number of abnormal loads vehicles was estimated and to be found to be able to be accommodated by the road network.

During operation, it is expected that maintenance and security staff will periodically visit the facility and water be transported to site possibly twice a year for the cleaning of panels. The generated trips can be accommodated by the external road network and the impacts are rated negative very low post-mitigation.

The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be of negative low impact after mitigation.

The traffic generated during the decommissioning phase will be similar to or even less than the construction phase traffic and the impact on the surrounding road network will also be considered to be of negative low impact after mitigation.

For the cumulative impact, it was assumed that all listed developments in a radius of 30 km from the site will be developed at the same time (which will in reality be unlikely). After mitigation, a rating of a negative low impact is given.

The potential mitigation measures mentioned in the construction and decommissioning phases are:

- Dust suppression of internal gravel roads and the access roads.
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network, if available and feasible.
- Staff and general trips should occur outside of peak traffic periods.
- Design and maintenance of the internal gravel roads and maintenance of the access roads.
- If required, any low hanging overhead lines (lower than 5.1m) e.g., Eskom and Telkom lines, along the proposed routes will have to be moved (to be arranged by haulage company) or raised to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a solar power facility are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of these phases is of temporary nature, i.e., the impact of the solar power facility on the external

traffic on the surrounding road network is temporary and solar facilities, when operational, do not add any significant traffic to the road network.

From a transport engineering perspective, the proposed development alternatives (i.e., electrical infrastructure compound location alternatives and the technology options for the BESS) are acceptable as they do not have any impact on the traffic on the surrounding road network and as such the project is supported from a transport engineering perspective.

### 11.2.10 VISUAL

The proposed Tournée 1 Solar PV Facility is situated in a rural area with a relatively low number of sensitive receptors comprising mostly of farmsteads. Based on the field assessment, the undulating topography and dense vegetation associated with the farmsteads partially obscures the view towards the Tournée 1 Solar PV Facility, therefore the visual impact for the Tournée 1 Solar PV Facility is considered moderately low as the visual intrusion on the receiving environment will be low to moderate depending on the location of the vantage point.

According to the Strategic Environmental Assessment (SEA) Project (2019) the Tournée 1 Solar PV Facility does not fall within any Renewable Energy Development Zones (REDZ) nor within any corridor for Electrical Grid Infrastructure (EGI). According to South African Renewable Energy EIA Application Database (REEA) there is one approved application for a renewable energy facility (solar) within a 30 km radius of the Tournée 1 Solar PV Facility. This indicates that the larger region may be earmarked for renewable energy facilities in the foreseeable future, which may alter the landscape character on a broader scale. With the Tournée 1 Solar PV Facility and surroundings being dominated by grasses interspersed with freshwater ecosystems and cultivated fields, the vegetative component will not be able to substantially assist in screening the Tournée 1 Solar PV Facility. The farmsteads do however have existing dense tree lines which may partially or completely obscure the view towards Tournée 1 Solar PV Facility. The local topography of the Tournée 1 Solar PV Facility is relatively flat to gently sloping with the surrounding landscape displaying undulating terrain. With the local topography of the Tournée 1 Solar Facility being relatively flat, it is unlikely to assist in absorbing and/ or screening the Tournée 1 Solar PV Facility. The field assessment did however indicate the undulating terrain of the surrounding area affecting the degree of visibility from various vantage points. The Tutuka ash dump will assist in screening and/ or absorbing the Tournée 1 Solar PV Facility, especially to receptors located to the south and north.

The sense of place associated with the Tournée 1 Solar PV Facility can be described as calm, tranquil and peaceful, with limited development and movement, with the exception of the shepherds moving with the livestock and the cultivated fields being tilled or harvested. The sense of place is however not unique to the Tournée 1 Solar PV Facility as it extends to the larger region. During the construction phase of the Tournée 1 Solar PV Facility, the sense of place will however be affected, shifting the mood to busy and disturbed with construction vehicles and potential need for some earth moving equipment, however, once the panels are operational there will be limited additional vehicular movement in and out of the area, thus returning the area to a calm and tranquil landscape.

The Tournée 1 Solar PV Facility being located in a rural area, results in limited sources of night-time lighting, as such the lighting environment is considered rural with low district brightness.

Development of the Tournée 1 Solar PV Facility may potentially be a source of light pollution during the construction and operational phases, due to security lighting on the perimeter fence and at the

buildings (substation, BESS and O&M Buildings). Overall, the impact significance of potential night-time lighting is expected to be moderately low and will be limited to a local area, as the Tournée 1 Solar PV Facility is not a development that requires a significant amount of lighting. This corresponds with Bortle's Scale – indicating that Tournée 1 Solar PV Facility falls within a Class 4 area (rural/suburban transition) where the light pollution is low and distant large objects are distinct. As such the introduction of lighting sources in a rural area result in the Tournée 1 Solar PV Facility likely to somewhat contribute to the effects of sky glow and artificial lighting in the region.

From a visual resource aspect, there are no fatal flaws associated with the Tournée 1 Solar PV Facility. Hence, it is the professional opinion of the visual specialist that he development of the Tournée 1 Solar PV Facility can be considered for authorisation.

### 11.2.11 SOCIAL

The findings of the SIA indicate that the proposed Tournée 1 PV Facility and associated infrastructure will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. The project will also contribute to local economic development though socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation. The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be Low Negative with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

The establishment of the proposed Tournée 1 PV Facility is supported by the findings of the SIA.

### 11.2.12 DESKTOP GEOTECHNICAL

The completed desktop assessment of the geotechnical conditions at the proposed development site for Tournée 1 PV Facility has shown the site to be generally suitable for the proposed development. A "negative very low to moderate" impact was assessed, from a geotechnical perspective, for the pre-mitigation situation. Post-mitigation, the assessed impact decreases significantly to "negative very low". A geotechnical site investigation must be undertaken to provide detailed geotechnical information for the design of the proposed structures and roads.

The proposed development should, from a geotechnical impact perspective, be authorized. The most significant geotechnical condition that will affect the development is the possibility of hard excavation conditions if shallow rock is present.

Minimal slope stability issues are expected as slope areas are minimal. Access roads can be developed as gravel roads with suitable wearing-course to protect the subgrade likely being obtained from local weathered dolerite deposits.

A detailed intrusive site investigation is recommended to further characterize site conditions, to better understand the key geotechnical risks characteristics and optimise the design of the Solar PV plant.

Based on the current lack of previous geotechnical investigation data, the primary objectives of the proposed intrusive investigation must include:

- Determination of the founding conditions for all structures. The scope of the intrusive investigation should comprise test pitting, the drilling of a representative number of boreholes and laboratory testing.
- Investigation of subgrade conditions for service roads.
- Investigation of materials to be used during construction.
- Non-intrusive investigation techniques, such as geophysical (seismic refraction) surveys, thermal and electrical resistivity for ground earthing requirement.

### 11.2.13 HIGH LEVEL SAFETY, HEALTH AND ENVIRONMENT RISK ASSESSMENT

**General**

The RA has found that with suitable preventative and mitigation measures in place, none of the identified potential risks are excessively high, i.e., from a SHE perspective no fatal flaws were found with the BESS installation at the proposed Tournée 1 PV Facility near Murraysburg.

At a large facility, without installation of the state-of-the art battery technology that includes protective features, there can be significant risks to employees and first responders. The latest battery designs include many preventative and mitigation measures to reduce these risks to tolerable levels. State-of-the-art technology should be used, i.e., not old technology that may have been prone to fire and explosion risks.

The design should be subject to a full HAZOP prior to commencement of procurement. A HAZOP is a detailed technical systematic study that looks at the intricacies of the design, the control system, the emergency system etc. and how these may fail under abnormal operating conditions. Additional safeguards may be suggested by the team doing the study.

**Lithium Solid State Containerized Batteries**

With lithium solid-state batteries, the most significant hazard with battery units is the possibility of thermal runaway and the generation of toxic and flammable gases. There have been numerous such incidents around the world with batteries at all scales and modern technology providers include many preventative and mitigation features in their designs. This type of event also generates heat which may possibly propagate the thermal runaway event to neighbouring batteries if suitable state of the art technology is not employed.

The flammable gases generated may ignite, leading to a fire which accelerates the runaway process and may spread the fire to other parts of the BESS or other equipment located near-by.

If the flammable gases accumulate within the container before they ignite, they may eventually ignite with explosive force. This type of event is unusual but has happened with an older technology container installed at McMicken in the USA in 2019.

Due to a variety of causes, thermal runaway could happen at any point during transport to the facility, during construction or operation / maintenance at the facility or during decommissioning and safe making for disposal.

Due to the containerized approach as well as the usual good practice of separation between containers, which should be applied on this project, and therefore the likely restriction of events to one container at a time, the main risks are close to the containers i.e., to transport drivers, employees at the facilities and first responders to incidents.

In terms of a worst conceivable case container fires, the significant impact zone is likely to be limited to within 10m of the container and mild impacts to 20m. Based on the current proposed layouts, impacts at the closest isolated farmhouses are not expected.

In terms of a worst conceivable case explosion, the significant impact zone is likely to be limited to with 10m of the container and minor impacts such as debris within 50m. Based on the current proposed layouts, impacts at the closest isolated farmhouses are not expected.

In terms of a worst reasonably conceivable toxic smoke scenario, provided the units are placed suitably far apart to prevent propagation from one unit to another and large external fires are prevented, the amount of material burning should be limited to one container at any one time. In this case, beyond the immediate vicinity of the fire, the concentrations of harmful gases within the smoke should be low. The proposed BESS installation's location is well over 500m from any occupied farmhouse, industrial or commercial activity and therefore the risks posed by the BESS are negligible.

**Recommendations**

The following recommendations have been made:

- There are numerous different battery technologies but using one consistent battery technology system for the proposed Tournée PV BESS installations in the area would allow for ease of training, maintenance, emergency response and could significantly reduce risks.
- Where reasonably practicable, state-of-the-art battery technology should be used with all the necessary protective features e.g., draining of cells during shutdown and standby-mode, full BMS with deviation monitoring and trips, leak detection systems.
- Section 9 of the EIA report contains technical and systems recommendations for managing and reducing risks. Ensure the items listed in these tables under preventative and mitigation measures are included in the design.
- The overall design should be subject to a full HAZOP prior to finalization of the design.
- Prior to bringing any solid-state battery containers into the country, the contractor should ensure that:
    - An Emergency Response Plan is in place that would be applicable for the full route from the ship to the site. This plan would include details of the most appropriate emergency response to fires both while the units are in transit and once they are installed and operating.
    - An End-of-Life plan is in place for the handling, repurposing or disposal of dysfunctional, severely damaged batteries, modules and containers.
- The site layout and spacing between lithium solid-state containers should be such that it mitigates the risk of a fire or explosion event spreading from one container to another.
- Under certain weather conditions, the noxious smoke from a fire in a lithium battery container could travel some distance from the unit. The smoke will most likely be acrid and could cause irritation, coughing, distress etc. Close to the source of the smoke, the concentration of toxic gases may be high enough to cause irreversible harmful effects. The BESS needs to be located at a suitable distance from public facilities/residences etc. The proposed BESS must be located more than 500m from isolated farmhouses. None of the dwellings/industrial or commercial activities in the area is within 500m of the proposed BESS location and therefore the location is suitable.

- Where there is a choice of alternative locations for the BESS, those that are further from water courses would be preferred. Solid-state systems may experience fires that may result in loss of containment of liquids or the use of large amounts of fire water which could be contaminated. The size of the buffer between water bodies and the BESS containing chemicals should be set in consultation with a water specialist and is therefore not specified in this SHE RA.
- Finally, it is suggested once the exact battery technology has been chosen and more details of the actual design are available, the necessary updated Risk Assessments should be in place.

## 11.3 ALTERNATIVES ASSESSMENT

Project alternatives in terms of activity, technology, location and layout were considered as part of this EIAR process. The revised layout avoids sensitivities as much as possible.

**Table 11-2** outlines the preferred alternatives considered feasible and preferred from an environmental perspective (that is, as per the input from the Specialists).

**Table 11-2 – Preferred Site Alternatives**

| Alternative | Preferred | Comment |
|---|---|---|
| Technology – Solar | The Tournée 1 Solar PV Facility will utilise solar PV technology to generate power. Therefore, no other technology alternatives were considered for this project. | Motivation for the use of solar PV technology includes:<br>■ Availability of solar resource in the Mpumalanga region; and<br>■ PV technology is more competitive from a cost perspective. |
| Technology – BESS | The Tournée 1 Solar PV Facility will utilise Lithium-Ion batteries or similar solid-state technology for the BESS. No other BESS technology was considered by the developer as from an environmental and design perspective it was the most favourable | Motivation for the use of Lithium-Ion batteries or similar solid-state technology for the BESS includes:<br>■ This technology is mature and safe technology with regard to potential impacts on the environment in a solar facility farm; and<br>■ They work well as energy storage systems for solar facilities. The design of the cells are completely sealed in the factories when they are manufactured, and no electrolytic liquids are thus handled on site. |
| Location Alternatives | There is no site alternative for the Tournée 1 Solar PV Facility. The location of the proposed project is based on the site awarded to the applicant in response to an Eskom RFP. The investigation of an | The Tournée 1 Solar PV Facility was selected because it meets the requirements outlined by the Eskom RfP, which includes:<br>■ The selected location must be |

| Alternative | Preferred | Comment |
|---|---|---|
| | alternative site is not currently proposed within this S&EIA.<br><br>Tournée 1 Solar PV Facility area is located on Portion 7 (Portion of Portion 3) of Farm Dwars-in-die-Weg 350 IS and Portion 6 of Farm Dwars-in-die-Weg 350 IS. | in close proximity to the existing Eskom infrastructure and interconnection points including substations;<br>▪ The site must be suitable open land for Solar PV development;<br>▪ The screening process for the selected location must not identify exceedances of environmental sensitivities; and<br>▪ The selected site must contribute to the JET Programme. |
| Layout Alternatives | The location of the project infrastructure (i.e., layout) was determined based on initial environmental and technical screening which considered the infrastructure locations feasible from a constructability perspective. This included several key aspects including environmental constraints and opportunities, distance to grid connection, topography, site accessibility.<br><br>The conceptual layout was taken forward for assessment by the various Specialists during this EIA Phase.<br><br>The project layout has been optimised based on specialist sensitivities and therefore the current layout is considered most suitable. | The conceptual layout was optimised based on the following:<br>▪ Repositioning of the internal road crossing to avoid bisecting the CVB wetland;<br>▪ Repositioning of the powerline to ensure that the pylons will be located outside of the wetlands; and<br>▪ Repositioning of the BESS so it is further away from the office/workshop area.<br><br>The optimised and finalised layout is included in **Figure 11-1**. |

### 11.3.1 NO-GO ALTERNATIVE

In the “no project” alternative, the proposed project will not be developed. In this scenario, there could be a missed opportunity to address the need for increase in renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale. Conversely, negative environmental impacts of the project (as outlined in Section 9) associated with the development of the Tournée 1 Solar PV Facility would be avoided, and the current status quo will continue. This includes continued use of the land for agriculture.

Specialists have considered the no-go alternative and the following has been concluded:

- Traffic:
  - The no-go alternative implies that the proposed Tournée 1 Solar PV Facility as well as the associated infrastructure do not proceed. This would mean that there will be no negative environmental impacts and no traffic impact on the surrounding network during the construction and decommissioning phases. However, this would also mean that there would be no socio-economic benefits to the surrounding communities, and it will not assist government in meeting its targets for renewable energy. Hence, the no-go alternative is not a preferred alternative.
- Social:
  - The aim of the project is to produce renewable energy for the mining and industrial sector in the area. This will assist to reduce South Africa's carbon footprint. South Africa relies on coal-powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions.
  - The No-Development option would represent a lost opportunity for South Africa to produce renewable energy and reduce its carbon footprint. This would represent a significant negative social cost.

## 11.4 FINALISED LAYOUT

The final layout is provided in **Figure 11-1**. The sensitivities provided by the specialists have been overlaid on the layout map and is indicated in **Figure 11-2**.

Legislated "no go" areas or setbacks are areas or features that are considered of such significance that impacting them may be regarded as fatal flaw or strongly influence the project impact significance profile. Therefore areas or features that are considered to have a high sensitivity or where project infrastructure would be highly constrained and should be avoided as far as possible are referred to as "no-go" areas. Infrastructure located in these areas are likely to drive up impact significance ratings and mitigations. The assumption is that the overhead lines could span these areas, but the towers/pylons should adhere to the buffer distances as indicated as far as possible where areas are too large to span (buffers) then these tower positions must be evaluated on a case by case basis prior to construction. A "no-go" map has been included in **Figure 11-3**.

This map includes a 30 m visual buffer specifically for solar panels to mitigate the glint and glare impact to road users. The solar panels are to be constructed outside of the visual buffer. All other ancillary infrastructure including roads, overhead powerlines and cabling will be allowed in this area.

**It is recommended that the final layout for the Tournée 1 Solar PV Facility is approved.**