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DRAFT BASIC ASSESSMENT REPORT

for

‘SCUITDRIFT SOLAR PROJECT’

on

A Portion of Farm 426, Skuitdrift, Northern Cape

In terms of the

**National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended &
Environmental Impact Regulations 2010**



Prepared for Applicant: Scuitdrift Solar Project (Pty) Ltd.

By: Cape EAPrac

Report Reference: KHA132/11

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Case Officer: To be confirmed

Date: 19 April 2012

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PURPOSE OF THIS REPORT:

Public Review & Comment

APPLICANT:

Scuitdrift Solar Project (Pty) Ltd.

CAPE EAPRAC REFERENCE NO:

KHA132/11

DEPARTMENT REFERENCE:

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SUBMISSION DATE

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Scuitdrift Solar Project Farm 426, Skuitdrift, Northern Cape

Submitted for:

Stakeholder Review & Comment

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EXECUTIVE SUMMARY

1 INTRODUCTION

Cape EAPrac has been appointed by **Scuitdrift Solar Project (Pty) Ltd.**, hereafter referred to as the Applicant, as independent environmental practitioner, to facilitate the Basic Assessment (BA) process required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for the proposed development of the '**Scuitdrift Solar Project**' near Kakamas, Northern Cape.

Scuitdrift Solar Project (Pty) Ltd. has sub-leased a portion of Farm 426 Skuitdrift from the landowner, Mr Frederik Johannes Nel, for the purposes of developing the proposed solar facility. The total generation capacity of the solar facility will not exceed **10MW** for input into the national Eskom grid.

The purpose of this **Draft Basic Assessment Report** is to describe the environment to be affected, the proposed project, the process followed to date (focussing on the outcome of the public participation process and specialist studies), to present the findings and recommendations presented in the various specialist impact assessment studies, and provide a description of how the development concept has been adjusted to consider the above.

1.1 WHY RENEWABLE ENERGY? WHY NORTHERN CAPE?

South Africa has for several years been experiencing considerable constraints in the availability and stability of electrical supply. Load shedding procedures have been applied since December 2005 due to multi-technical failures, as well as capacity and transmission constraints.

Eskom generates about 95% of South Africa's electricity supply, and has undertaken to increase capacity to meet growing demands. At the moment, the country's power stations are 90% coal-fired, and two huge new facilities are being built to add to this capacity. However, Eskom's plans to increase its national capacity by 40 000 megawatts in the period to 2025 have had to be scaled down due to the global economic recession (Northern Cape Business website).

International best-practice requires a 15% electricity reserve margin to deal with routine maintenance requirements and unexpected shutdowns in electricity supply systems. South Africa has historically enjoyed a large reserve margin (25% in 2002, 20% in 2004 and 16% in 2006), but that has declined over the recent past to 8% - 10%, as a result of robust economic growth and the associated demand for electricity. The spare power available to provide supply at any time of the day is known as the reserve capacity and the spare plant available when the highest demand of the year is recorded is known as the reserve margin (National Response to South Africa's Electricity Shortage, 2008). This has resulted in limited opportunities for maintenance and necessitated that power stations are run harder. This results in station equipment becoming highly stressed and an increase in unplanned outages and generator trips. The expected demand growth will rapidly erode this margin, as well as Eskom's ability to recover after it's already stressed systems shutdown.

This necessitates the additional generation of at least 3 000MW in the shortest possible time, to allow the reserve necessary to bring Eskom's system back into balance (*ibid*). This need can either be addressed from the *supply* or the *demand* side. Where the demand side interventions include short, medium and long term aspects of a national Power Conservation Programme to incentivise the public to use less electricity (as mentioned above), one of the supply side options

(besides Eskom building new plants and returning old plants to service) is to allow **Independent Power Producers** (IPPs) to contribute electricity to the national grid (National Response Document, 2008). **Scuitdrift Solar Project (Pty) Ltd.** is one such body, which intends generating electricity from a renewable energy resource, namely solar.

In March 2011, the Cabinet approved South Africa's Integrated Resource Plan 2010, in terms of which energy from renewable sources will be expected to make up a substantial 42% of all new electricity generation in the country over the next 20 years. The government's New Growth Path for the economy also envisages up to 300 000 jobs being created in the "green" economy by 2020 (South Africa info website).

The Northern Cape is suggested by many to be the ideal location for various forms of alternative energy. This has resulted in a number of feasibility studies being conducted, not least of which an investigation by the Industrial Development Corporation in 2010 (R33-million spent) into potential for photo-voltaic, thermal, solar and wind power (Northern Cape Business website).

The area of the Northern Cape that borders on the Gariep (Orange) River and Namibia boasts the highest solar radiation intensity anywhere in southern Africa. Solar energy is therefore likely to be the most viable alternative energy source for the Northern Cape, although wind-power potential is generally good along the coast (State of the Environment, S.A.)

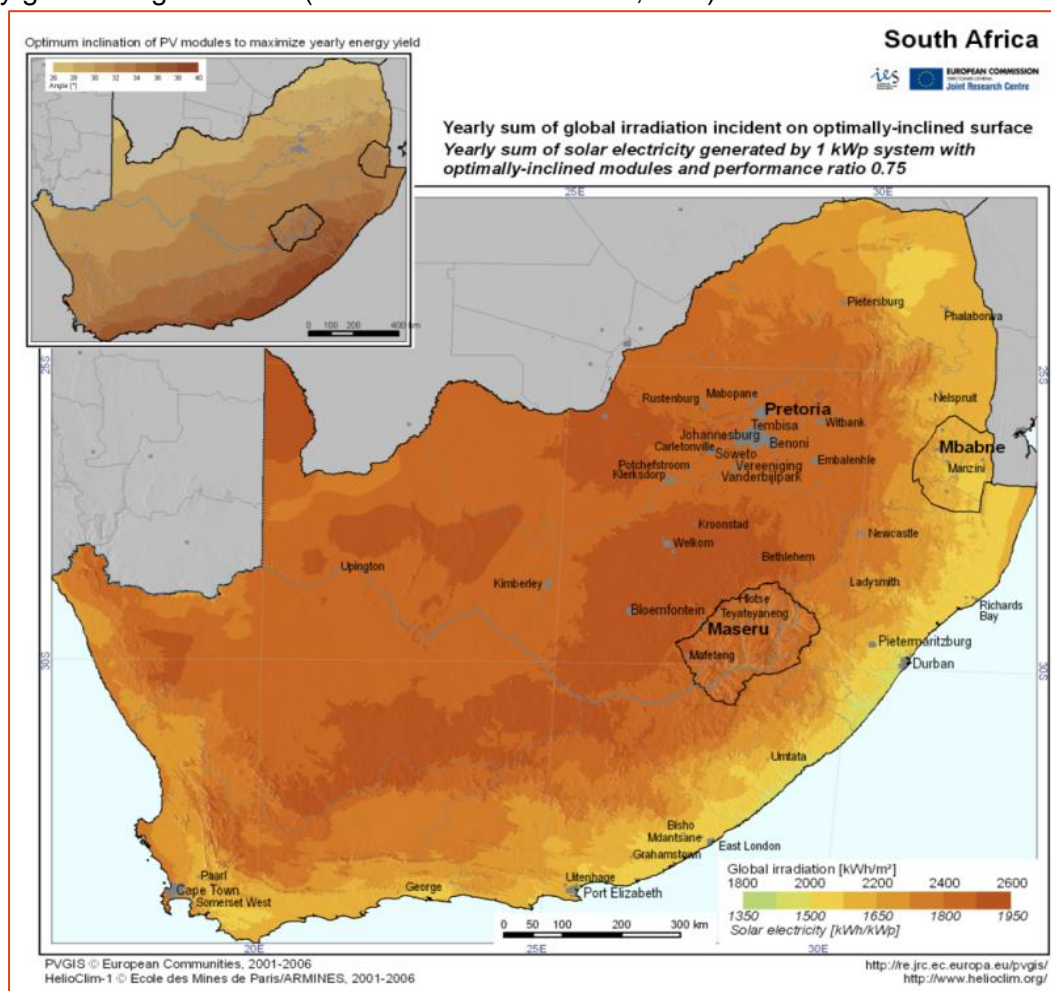


Figure 1: Solar radiation map for South Africa (Source: Solek Engineering Report, 2012).

The Northern Cape area is considered to have extremely favourable solar radiation levels, over the majority of the year, making it ideal for the production of solar-power via Photovoltaic (fixed and tracking panels) and Concentrated (solar thermal) Solar systems. Several solar irradiation maps

have been produced for South Africa, all of which indicate that the Northern Cape area **high solar irradiation**.

A solar-investment conference was held in November 2010 at Upington and was attended by 400 delegates from all over the world. Dipuo Peters, the national Minister of Energy, outlined the competitive advantages of the Northern Cape, over and above its extremely high irradiation levels, amongst others:

- relative closeness to the national power grid compared to other areas with comparable sunshine;
- water from the Orange River;
- access to two airports; and
- good major roads and a flat landscape (Northern Cape Business website – solar power).

The Northern Cape is not too dusty, the land is flat and sparsely populated, and there are little to none geological or climate risks, meaning that the sun can be used year-round (BuaNews online). An advantage that the Northern Cape has over the Sahara Desert is the relatively wind-free environment that prevails in the province. A Clinton Climate Initiative (CCI) pre-feasibility study has found that South Africa has one of the best solar resources on the planet (Northern Cape Business website – solar power).

To take advantage of this potential for the Northern Cape to become a national renewable-energy hub, the groundwork is being done on a mega-project that has the capacity to fundamentally change the structure of South Africa's power sector: to build a massive solar park that will generate an eighth of the country's electricity needs – 5 000MW – in the Northern Cape near Upington. Sixteen square kilometres of land (thousands of hectares) have been identified and Eskom is looking for private partners. The park, which will cost more than R150-billion, will generate 1 000MW in its first phase. A full feasibility study will now be conducted with the support of the Central Energy Fund and the Development Bank of Southern Africa (Northern Cape Business website – solar power). Significant job creation, lucrative private-sector investments, local industry development and a cleaner, more secure power supply are among the benefits of a large-scale park such as this (BuaNews online).

Indeed this potential for solar energy generation plants has resulted in the emergence of smaller solar energy projects throughout the Northern Cape. The Energy Minister, Dipuo Peters announced in February 2012 that 16 of the initial 28 preferred projects identified by the Department of Energy (DoE) under the renewable energy independent power producer (IPP) programme were located in the sun-drenched province (Creamer, Feb. 2012). Mining companies in the Northern Cape are looking to concentrating solar power (CSP) to provide power for their operations. Engineering company Group Five announced in 2011 that they were investigating the construction of a 150MW plant near Kathu. The Industrial Development Corporation (IDC) is supporting a number of projects in the province. These include a 100MW plant conceived by Abengoa Solar, a Spanish company with a global presence, and a Solafrica scheme to spend more than R3-billion on a Concentrated Solar Plant at Groblershoop (Northern Cape Business website – solar power).

Not comparable in size with these larger projects, the Scuitdrift Solar Project (Pty) Ltd. is one such small IPP solar project which intends to generate 10MW of electricity from solar-energy for inclusion into the National grid. The Scuitdrift Solar Project site is considered ideal, primarily due to:

- The flat topography of the proposed development site and it's the availability for use for an alternative energy generation facility; and
- The grid connection potential based in proximity to existing transmission & substation infrastructure.

2 LEGISLATIVE AND POLICY FRAMEWORK

The legislation that is relevant to this study is briefly outlined below. These environmental requirements are not intended to be definitive or exhaustive, but serve to highlight key environmental legislation and responsibilities only.

2.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

2.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)

The current assessment is being undertaken in terms of the **National Environmental Management Act (NEMA, Act 107 of 1998)**¹. This Act makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Environmental Affairs, DEA) based on the findings of an Environmental Assessment.

The proposed scheme entails a number of listed activities, which require a basic environmental impact assessment, which must be conducted by an independent environmental assessment practitioner (EAP). Figure 1 depicts a summary of the Basic Assessment process.

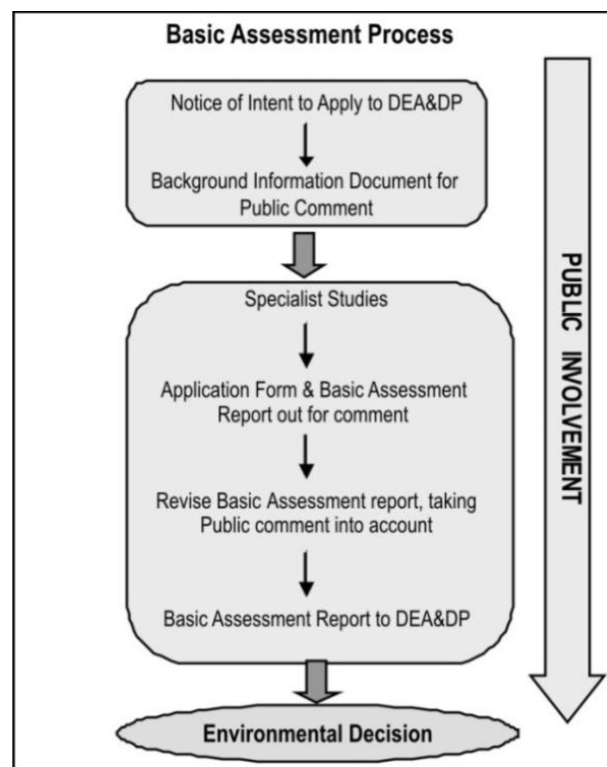


Figure 2: Summary of Basic Assessment Process

¹ On 18 June 2010 the Minister of Water and Environmental Affairs promulgated new regulations in terms of Chapter 5 of the National Environmental Management Act (NEMA, Act 107 of 1998), viz, the Environmental Impact Assessment (EIA) Regulations 2010. These regulations came into effect on 02 August 2010 and replace the EIA regulations promulgated in 2006.

The listed activities associated with the proposed development, as stipulation under 2010 Regulations 544 & 546 are as follows:

Table 1: NEMA 2010 listed activities for the Scuitdrift Solar Project

R544	Listed Activity	Activity Description
1(i)	The construction of facilities or infrastructure for the generation of electricity where the output is more than 10 megawatt but less than 20 megawatt.	Construction of Scuitdrift Solar Project with a maximum capacity of 10MW . The total area to be affected by the development will not exceed 20ha.
10(i)	The construction of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33kV, but less than 275kV.	New overhead power line linking the proposed on-site substation/operation building to the existing Scuitdrift Substation.
22	The construction of a road, outside urban areas, (i) with a reserve wider than 13.5m or, (ii) where no reserve exists where the road is wider than 8m or, (iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.	Construction of access and internal roads for the solar facility for construction and operation phases outside the urban edge of Kai-Garib!.
23	The transformation of undeveloped, vacant or derelict land to (ii) industrial use, outside an urban area and where the total area to be transformed is bigger than 1ha, but less than 20ha.	Development of a solar facility not exceeding 20ha on vacant private land , outside of the Kai-Garib! urban edge.
R546	Listed Activity	Activity Description
4	The construction of a road wider than 4m with a reserve less than 13.5m. All areas outside urban areas.	Construction of access and internal roads wider than 4 metres for solar facility, outside the Kai-Garib! urban edge.
14	The clearance of an area of 5ha or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation. All areas outside urban areas.	Vegetation clearing for the Solar Panels and associated infrastructure: access roads, cable trenches and on-site substation & axillary buildings etc. outside of the Kai-Garib! urban edge . Solar Energy Plant to be constructed over an area not exceeding 20ha on private land. Intact vegetation to be avoided by solar facility as far as possible.

Before any of the above mentioned listed activities can be undertaken, authorisation must be obtained from the relevant authority, in this case the National Department of Environmental Affairs (DEA). Should the Department approve the proposed activity, the Environmental Authorisation does not exclude the need for obtaining relevant approvals from other Authorities who has a legal mandate.

2.3 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY (ACT 10 OF 2004)

This Act controls the management and conservation of South African biodiversity within the framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically make provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

No fine-scale conservation planning has been conducted for this area. In terms of the National Spatial Biodiversity Assessment (NSBA), the Terrestrial Ecosystem Status of the entire property,

Farm 426 Skuitdrift, and thus the 10MW solar development site, is classified as **Least Threatened** (see **Appendix G2 for BGIS LUDS Evaluation**).

The Orange River forms the northern boundary of Farm 426 Skuitdrift and classified in terms of the NSBA River Ecosystem Status (SANBI BGIS), as Critically Endangered (see Appendix G2). The ecosystem has undergone significant transformation and degradation through farming activities in along its banks. A small river drains towards the Orange River across the south western boundary of Farm 426. The name and ecosystem status of this river could not be confirmed.

No sensitive features occur within or in close proximity to the proposed 10MW solar development site. A detailed aerial and Topographical Survey of the solar development site was undertaken, to inform the siting of the proposed solar facility development footprint and associated infrastructure.

2.3.1 National Protected Area Expansion Strategy (NPAES) for S.A. 2008 (2010)

Considering that South Africa's protected area network currently falls far short of sustaining biodiversity and ecological processes, the NPEAS aims to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to Climate Change. Protected areas, recognised by the National Environmental Management: Protected Areas Act (Act 57 of 2003), are considered formal protected areas in the NPAES. The NPAES sets targets for expansion of these protected areas, provides maps of the most important protected area expansion, and makes recommendations on mechanisms for protected area expansion.

The Scuitdrift Solar Project development site is located in proximity to one such formally protected areas namely the Augrabies National Park, located approximately 20km to the east (see Location Plan in **Appendix A** and NPAES maps in **Appendix G, Annexure G2**).

The NPAES identifies 42 focus areas for land-based protected area expansion in South Africa. These are large intact and unfragmented areas suitable for the creation or expansion of large protected areas. Focus Area number **15: Kamiesberg Bushmanland Augrabies**, represents the largest remaining natural area for expansion of the protected area network and forms part of the planned Lower Orange River Trans-frontier Conservation Area (TFCA – extending from Augrabies Falls to the mouth, along the S.A./Namibian border). It provides an opportunity to protect 22 Desert and Succulent Karoo vegetation types, mostly completely unprotected, several river types that are still intact but not protected, and important ecological gradients and centres of endemism.

The **Kamiesberg Bushmanland Augrabies focus area** considers two areas in proximity to Farm 426 Skuitdrift: one as possible expansion areas for the Augrabies National Park (predominantly to the NE and SW of the existing Park) and one delineating the sub-catchment around the river system located approximately 10km to the west of the target property (see NPAES map attached in Annexure G2). This suggests that the solar development property and site itself is unlikely to be highly significant from a biodiversity maintenance perspective, but the broader area is potentially important for the maintenance of biodiversity and broad-scale ecosystem function (patterns and processes). The development is relatively small in extent when considered in light of the overwhelmingly intact nature of the surrounding landscape. Furthermore, the proximity of the development to the existing ESKOM substation and powerlines would decrease the cumulative impact of the development on the connectivity of the landscape (Todd, 2012).

The NPAES does not deal with the site-scale planning on exactly which sites should be included in the protected area network, nor with detailed implementation planning for expanding protected areas. This responsibility lies with protected area agencies, such as provincial conservation authorities, South African National Parks (SANParks) and World Heritage Site Authorities.

Augrabies National Park (and SANParks head office) and SAHRA are registered as key stakeholders for this environmental process and have been provided with the opportunity to provide comment on this solar energy development in relation to the NPAES for the Skuitdrift area. **No issues** in this regard have been raised to date.

2.3.2 Municipal Biodiversity Summary Project (SANBI BGIS)

No fine-scale conservation planning has been conducted for the Skuitdrift area of the Northern Cape. According to the information provided by the South African National Biodiversity Institute (SANBI) through their Biodiversity GIS (BGIS) system, the environment in the Khai!Garib Local Municipality is mostly untransformed (96% natural areas remaining). The Augrabies National Park covers 45 828ha, which amounts to 6.3% of the municipal area. Two biomes occur within the municipality, which support seven (7) vegetation types, none of which are classified as critically endangered, while one (Lower Gariep Alluvial vegetation) is considered to be Endangered. This vegetation is however restricted to the banks of the Orange River and would not be affected by the Scuitdrift Solar Project development. The Orange River forms the only water management area in the Municipality and has an ecosystem status of Endangered.

2.4 NATIONAL FORESTS ACT (NO. 84 OF 1998):

The National Forests Act provides for the protection of forests as well as specific tree species, quoting directly from the Act: “*no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated*”.

Several protected tree species were observed at the Scuitdrift Solar Project site, including *Acacia erioloba* and *Aloe dichotoma*. Their location and abundance within the site is discussed in Section 4.3 of this Executive Summary and in full in the Ecological Impact Assessment Report in Appendix D, Annexure D1. These individual trees will be avoided as far as possible, however should any of them need to be removed the necessary permits will be applied for from the Permit Office of the Northern Cape Department of Environment and Nature Conservation.

2.5 CONSERVATION OF AGRICULTURAL RESOURCES ACT – CARA (ACT 43 OF 1983):

CARA provides for the regulation of control over the utilisation of the natural agricultural resources in order to promote the conservation of soil, water and vegetation and provides for combating weeds and invader plant species. The Conservation of Agricultural Resources Act defines different categories of alien plants:

- Category 1 - prohibited and must be controlled;
- Category 2 – must be grown within a demarcated area under permit; and
- Category 3 - ornamental plants that may no longer be planted, but existing plants may remain provided that all reasonable steps are taken to prevent the spreading thereof, except within the floodlines of water courses and wetlands.

The abundance of alien plant species on the Scuitdrift Solar Project development site is very low, which can be ascribed firstly to the aridity of the site, as well as the low rainfall in the period preceding the site visit.

2.6 NORTHERN CAPE NATURE CONSERVATION ACT, NO. 9 OF 2009:

The Northern Cape Nature Conservation Act provides inter alia for the sustainable utilisation of wild animals, aquatic biota and plants as well as permitting and trade regulations regarding wild fauna and flora within the province. In terms of this act the following section may be relevant with regards to any security fencing the solar development may require.

Manipulation of boundary fences: 19. No Person may –

(a) erect, alter, remove or partly remove or cause to be erected, altered, removed or partly removed, any fence, whether on a common boundary or on such person's own property, in such a manner that any wild animal which as a result thereof gains access or may gain access to the property or a camp on the property, cannot escape or is likely not to be able to escape therefrom.

The parameter fencing of the Scuitdrift Solar Project will be constructed in a manner which allows for the passage of small and medium sized mammals: i.e. steel palisade fencing (20 cm gaps min), alternatively the lowest strand or bottom of the fence will be elevated to 15 cm above the ground at least at strategic places to allow for fauna to pass under the fence. The most appropriate method will be confirmed during the final design phase in collaboration with the biodiversity specialist. No electrified strands will be placed within 20 cm of the ground – to allow free movement of tortoises and reptiles in particular. During operation, all gates will be kept closed to ensure that no larger fauna enter and become trapped within the fenced-off area.

The Act also lists protected fauna and flora under 3 schedules ranging from Endangered (Schedule 1), Protected (Schedule 2) to Common (Schedule 3). The majority of mammals, reptiles and amphibians are listed under Schedule 2 (common), except for listed species which are under Schedule 1. A permit is required for any activities which involve species listed under schedule 1 or 2.

As mentioned in Section 2.4 above, a permit will be obtained for the removal of the four *A.erioloba* trees found within the proposed solar array footprint. It has been confirmed by the ecological specialist that the removal of this limited number of individual trees would not have a negative effect on the local population, as this species is well represented and protected within the broader landscape. In terms of fauna, a permit will not be necessary for this project as no listed mammal, reptile, amphibian or bird species are to be negatively impacted by the proposed solar development. Overall the Scuitdrift Solar Project site is not viewed as being highly ecologically sensitive and with standard mitigation measures in place, the risk of significant environmental impact or degradation as a result of the development is very low.

2.7 NATURE AND ENVIRONMENTAL CONSERVATION ORDINANCE (19 OF 1974)

This legislation was developed to protect both animal and plant species within the various provinces of the country which warrant protection. These may be species which are under threat or which are already considered to be endangered. The provincial environmental authorities are responsible for implementing the provisions of this legislation, which includes the issuing of permits etc. In the Northern Cape, the Department of Environment and Nature Conservation fulfils this mandate.

No endangered plant species were observed to occur within the proposed Scuitdrift Solar Project development area and there are no listed faunal species with a narrow distribution which occur at the site.

2.8 NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority in the Northern Cape, and is registered as a Stakeholder for this environmental process.

In terms of Section 38 of the National Heritage Resources Act, SAHRA will comment on the detailed Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- *any development or other activity which will change the character of a site exceeding 5 000 m² in extent;*
- *the re-zoning of a site exceeding 10 000m² in extent.*

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority. **No buildings older than 60 years and heritage significance were identified within the solar development site.**

Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). **The grave sites found directly north of the solar development site are not considered to be of cultural significance.**

In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority. **No archaeological occurrences identified to occur with the solar development site (occurrences found outside the site are to be avoided by all activities).**

The on-going environmental process has been informed by inputs from heritage, archaeological and palaeontological specialists. Sites that are considered to be sensitive have been identified and mapped with appropriate buffers on the constraints map. The layout for the Solar Facility itself has been informed by these constraints and **avoids select features.**

The Integrated Heritage Impact Assessment (including the above studies) was submitted to SAHRA for further input, comment and decision-making. The Final Comment / Decision from SAHRA will be included in the Final BAR.

2.9 NATIONAL WATER ACT, NO 36 OF 1998

Section 21c & i of the National Water Act (NWA) requires the Applicant to apply for authorisation from the Department of Water Affairs for an activity in, or in proximity to any watercourse. The Scuitdrift Solar Project and its associated infrastructure are to be constructed well away from any river / major drainage line / wetland, and thus no Application in this regard is required.

Water required for the construction and operation of the Solar Facility is to be sourced from the on-site boreholes, from Southern Farms and from a rainwater collection (off the on-site substation and axillary building roofs) and storage system. An Application will be submitted to the Northern Cape Department of Water Affairs (DWA) for the registration of the on-site boreholes, as well as an Application for General Authorisation for the use of the borehole water for the purposes of the solar facility. DWA have been registered as a stakeholder on this environmental application.

2.10 SUSTAINABILITY IMPERATIVE

The norm implicit to our environmental law is the notion of sustainable development (“SD”). SD and sustainable use and exploitation of natural resources are at the core of the protection of the environment. SD is generally accepted to mean development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The evolving elements of the concept of SD *inter alia* include the right to develop; the pursuit of equity in the use and allocation of natural resources (the principle of intra-generational equity) and the need to preserve natural resources for the benefit of present and future generations. Economic development, social development and the protection of the environment are considered the pillars of SD (the triple bottom line).

“Man-land relationships require a holistic perspective, an ability to appreciate the many aspects that make up the real problems. Sustainable planning has to confront the physical, social, environmental and economic challenges and conflicting aspirations of local communities. The imperative of sustainable planning translates into notions of striking a balance between the many competing interests in the ecological, economic and social fields in a planned manner. The ‘triple bottom line’ objectives of sustainable planning and development should be understood in terms of economic efficiency (employment and economic growth), social equity (human needs) and ecological integrity (ecological capital).”

As was pointed out by the Constitutional Court, SD does not require the cessation of socio-economic development but seeks to regulate the manner in which it takes place. The idea that developmental and environmental protection must be reconciled is central to the concept of SD - it implies the accommodation, reconciliation and (in some instances) integration between economic development, social development and environmental protection. It is regarded as providing a “conceptual bridge” between the right to social and economic development, and the need to protect the environment.

Our Constitutional Court has pointed out that the requirement that environmental authorities must place people and their needs at the forefront of their concern so that environmental management can serve their developmental, cultural and social interests, can be achieved if a development is sustainable. *“The very idea of sustainability implies continuity. It reflects the concern for social and developmental equity between generations, a concern that must logically be extended to equity within each generation. This concern is reflected in the principles of inter-generational and intra-generational equity which are embodied in both section 24 of the Constitution and the principles of environmental management contained in NEMA.”* [Emphasis added.]

In terms of NEMA sustainable development requires the integration of the relevant factors, the purpose of which is *to ensure that development serves present and future generations.*²

It is believed that the proposed 10MW Scuitdrift Solar Project supports the notion of sustainable development by presenting a reasonable and feasible alternative to the existing vacant land use

² See definition of “sustainable development” in section 1 of NEMA.

type, which has limited agricultural potential due the lack of water and infrastructure. Furthermore the proposed alternative energy project (reliant on a natural renewable resource – solar energy) is in line with the national and global goal of reducing reliance on fossil fuels, thereby providing long-term benefits to future generations in a sustainable manner.

3 ACTIVITY

The Applicant intends to develop a **solar energy facility** with a generation capacity not exceeding **10MW** (Megawatt). The proposed Scuitdrift Solar Project is to be located on a development site of approximately 45ha on Farm 426 Skuitdrift, Northern Cape, and will consist of the following:

A **series of Solar Photovoltaic (PV) arrays**, which will cover an approximate footprint of 17 hectares.

Associated infrastructure, with an approximate footprint of 2ha, will include to the following:

- **10 x inverter stations** (built within transporter containers, 25m² in size);
- an **on-site substation** (including a transformer to allow the generated power to be connected to Eskom's electricity grid);
- a short **distribution power line** to distribute the generated electricity from the on-site substation to the existing Schuitdrift Eskom substation;
- **auxiliary buildings**, including:
 - administration / security offices (approximately 10m x 10m),
 - ablution & workshop (approximately 20m x 20m) and
 - storage area (approximately 20m x 10m).
- an **internal electrical reticulation network** (underground cables);
- an **internal road / track network**;
- **10kLt rainwater tanks**; and
- **parameter fencing** around the solar facility.

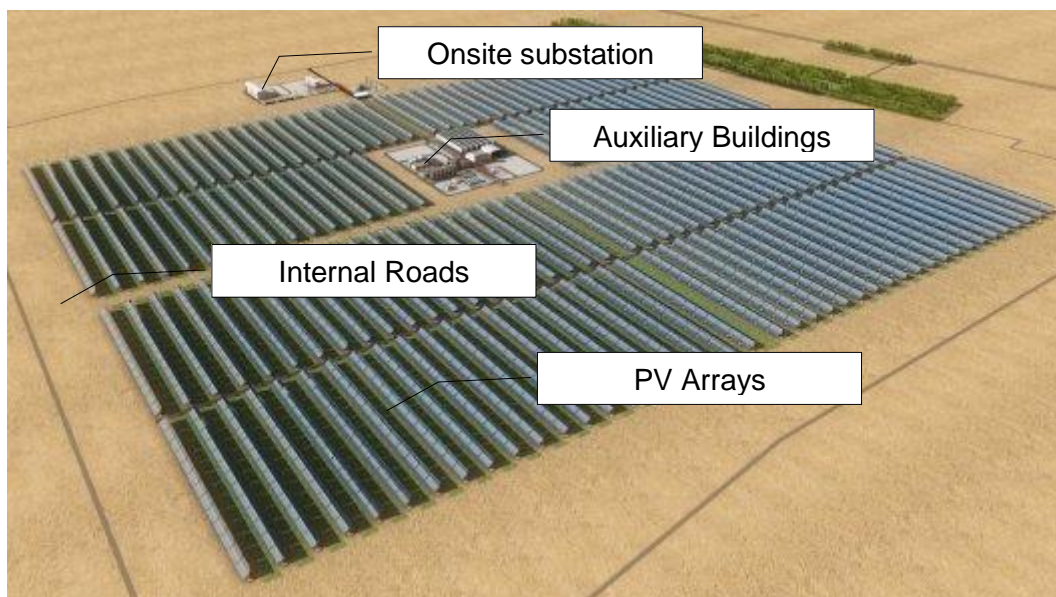


Figure 3: A typical layout of the components of a Solar PV facility (Source: Solek Engineering Report, 2012).

The 10MW Scuitdrift Solar Project will occupy less than 20ha of land – the estimated portion of land each component will typically occupy is summarised in the table below:

Table 2: Component / area summary of Scuitdrift Solar Project

Component	Estimate extent of the 10MW plant	Percentage of selected area (less than 20ha)	Percentage of whole farm (±9000ha)
PV Arrays	17 ha (0.17 km ²)	90%	less than 0.5%
Auxiliary Buildings	1 ha (0.01 km ²)	5%	less than 0.02%
Internal Roads	1 ha (0.01 km ²)	5%	less than 0.02%

3.1 TECHNOLOGICAL ALTERNATIVES

Photovoltaic (PV) solar power technology has been identified as the preferred technology to generate electricity in this project. Several alternate options in terms of this specific solar technology have been considered. These alternatives can be grouped in terms of fixed/tracking, mounting and film alternatives.

3.1.1 Fixed & Tracking Options

Fixed-tilt / stationary solar technology was initially considered for this Project where the Solar PV modules would be fixed to the ground in a specific north facing angle and consist of no moving parts. Although this type of technology is a less expensive option than tracker technology, it has been excluded as it has a much lower energy yield, due to the limited exposure to sun radiation when it is not turning.

Instead **double axis tracking systems** were investigated for this project, due to the high yield and efficient operation of the technology. Systems incorporating this technology are very effective due to sun being tracked in more than one axis. This allows maximum radiation over the entire solar module.



Figures 4 & 5: Double axis PV tracking systems (Solek Layout Report, 2012)

As can be seen from the above figures, a much larger ground area / footprint is required, due to the individual units and the elevated angle combined with the rotational axis, casting very long shadows. The wind loading on this type of structure plays is significant, requiring foundations with steel reinforcing and a significant amount of concrete.

In addition, complexity of the control system required to operate a two-axis PV system like this is not adequately suited to isolated areas, where spare parts and technicians are few and far

between (more spares must be stored to keep the plant in a running condition, which increases capital layout costs and storage area required).

Single axis tracking systems yield maximum available power for a certain period of every day throughout the year, as opposed to stationary / fixed systems which only yield the maximum available power for a certain period of time in a single season.

Considering the above a **single-axis tracking system has been selected as the preferred tracking technology**, as it requires comparatively less capital costs, less land coverage and is suitable to isolated areas such as Skuitdrift.

The preferred technology type for the Scuitdrift Solar Project is known as horizontal tracker technology. This single-axis technology is designed to follow the path of the sun across the sky,



allowing the modules to be **exposed to typically 25% more radiation than fixed PV systems**. The preferred design is extremely robust and contains only a few moving parts, while still having more or less the same footprint and infrastructure requirements than that of fixed-tilt designs.

Figures 6 & 7: Single / horizontal axis PV tracking systems (Source: Solek Engineering Report, 2012).

The tracker requires approximately 1.8 hectares per megawatt and is based on a simple design, allowing this well proven off-the-shelve **technology readily available**. The **maximum height of the trackers is typically less than 2m**.

3.1.2 Founding / Mounting Options

The most common foundation used for anchoring single axis tracking or fixed solar frames is concrete cast foundations. This type of foundation requires a foundation trench, shuttered aboveground, to be filled with concrete and reinforcing steel. Once the concrete has cured, the solar frame could either be welded or bolted to protruding reinforcing steel (or could have been left to cure with the concrete).



Figure 8 & 9: Examples single axis & fixed solar cast foundations.

This technology is much more suitable to European conditions and not for the extremely hard surfaces of the proposed site, unless the concrete is cast onto the surface using shutters. This process poses the risk of concrete spillages which could have long term negative effects.

With reference to the abovementioned option of the surface cast foundations (using removable shutters), another alternative considered for the mounting of the solar frames is pre-cast concrete footing. The pre-cast concrete feet could be manufactured off site, reducing the risk of concrete spillages and the need for exorbitant amounts of water during the construction phase of the project. Drawbacks associated with pre-cast footing include the large physical footprint required to keep the structures stable, in addition to the possible need for them to be bolted or grouted to the ground surface for stability.

In terms of the context, the greatest drawback applicable to the proposed site is the negative influence on surface water flow within the washes (obstruction and diversion) and associated risk of erosion, which cast and pre-cast foundations may pose.

Considering the above, it has been recommended that the Scuitdrift Solar Project be installed by means of driven/rammed piers, earth-screws or rock anchors, as these will have a similarly reduced impact on the environment. **Rammed piers have been selected as the preferred method of installation**, however where earth-screws or rock anchor would be more suitable, the rammed pole would be replaced by either method. The figures below show the equipment required for the ramming process.



Figures 10 & 11: Ramming equipment for solar mounting structures (Source: Solek Layout Report, 2012).

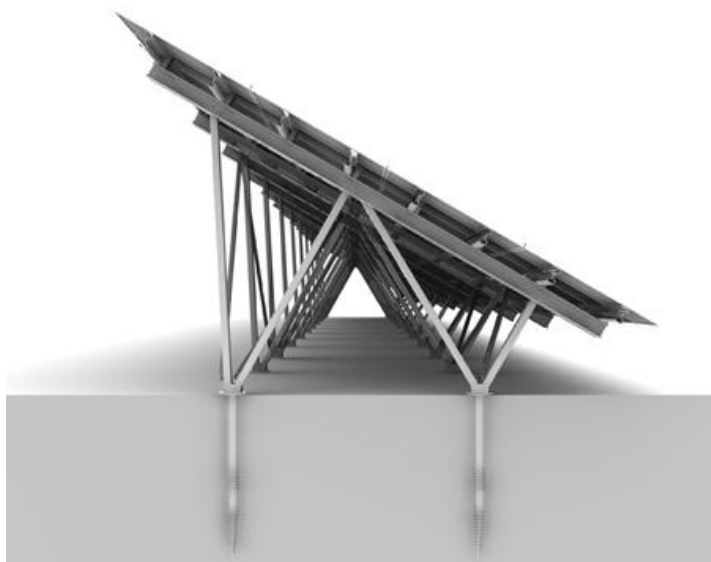


Figure 12: Typical rammed or screwed method with fixed frame (Source: Solek Layout Report, 2012).

This installation technology eliminates the need for the use of cement or polymeric products, and as a result of the very small mounting footprint, has minimal disturbance of the ground cover, substrate or natural water flow (which could have significant long term effects on the ecology of the surrounding area).

3.1.3 Film Options

There are a multitude of different PV film technologies available today. The best options, according to research conducted, are currently either thin-film (amorphous silicon or cadmium telluride) or multi-crystalline cells, depending on the space and irradiance conditions, with the electricity yield and application being the deciding factor.

Thin-film technology is expensive and is not suited to the conditions of the Northern Cape Province, due to its inferior performance at high temperatures. With ambient temperatures regularly exceeding 40 °C in the area, the **proposed multi-crystalline or thick-film technology** easily outperforms the thin-film alternative.

3.2 SOLAR LAYOUT ALTERNATIVES

3.2.1 Alternative 1 – Conceptual Layout

A conceptual layout was initially designed to make use of the entire 45ha study area identified for the Scuitdrift Solar Project. This conceptual design entailed 5 photovoltaic array clusters / groupings, each taking up an area of approximately 4ha.

This initial layout was revised based on the results of the ecological impact assessment (section 4 & 7 below) and the site constraints identified in the ecological study. As this Alternative 1 was **designed without these environmental sensitivities in mind**, it has been **excluded from the on-going environmental process and therefore not assessed further**.

3.2.2 Alternative 2 – Scattered Layouts

These alternative layouts were designed to avoid the sensitive areas identified by the ecological specialist to occur in the development site i.e. the washes, as well as the 5-10m buffers, recommended for their protection. The proposed solar array footprint was shifted to the south of the 45ha development site, to avoid the greatest density of washes found in the northern section and the rocky ridgeline nearby. Two versions of this scattered layout were designed, an 'eastern' and 'western'.

By scattering the solar arrays the modular or bulk engineering principles would essentially be lost, which means that many custom solutions would be required to avoid all buffers. These custom adjustments would significantly reduce the number of panels with the allowable 20ha footprint

area, with a significant increase in the cost of the facility. This would reduce the peak power rating of the plant to fall below the 10MW mark. Further, all the boundaries around the highly sensitive areas would need to be physically demarcated by an ecologist before any construction could begin.

The western layout was shifted towards the west of the development site, which would still have an impact on some of the sensitive wash areas. This increases the risk of erosion and would require more expensive building techniques and equipment. By moving the layout toward the east, and diverting the access road, the array fragmentation is reduced and a significant part of the wash area on the western side of the area is avoided. Although the bulk effect is slightly recovered by the eastern scattered layout, and less customisation is required, the probability of reaching the 10MW peak power value is still significantly reduced. Thus the power produced per square area of land is reduced, lowering the plant efficiency and damping financial viability.

The factor having the single largest influence on these scattered alternatives was the mounting technology proposed. At the time of designing the eastern and western scattered layouts, cast-foundations were being considered. The potential negative impacts associated with this method of founding necessitated that the sensitive washes of site be avoided as far as possible. These potential negative impacts include: disturbance through extension excavations, obstruction / diversion to water flow and associated risk of erosion and contamination from the large quantities of concrete required. In addition, cast-foundations require vast volumes of water for the concrete production.

Considering the **practical and economic unviability** of the abovementioned layout options, as well as the **potential environmental risks**, these **scattered layout options are thus not recommended. This alternative is therefore excluded from further assessment.**

3.2.3 Alternative 3 – Preferred Layout

As with Alternative 2, the solar array footprint has been designed in the southern section of the development site area to avoid the majority of the washes within the northern section and the sensitive rock-outcrop nearby. As with the eastern scattered layout, this preferred layout has avoided the concentration of washes to the western side of the development area. The method of founding / mounting the solar arrays has been changed from the cast-foundation to consider **rammed piers as the preferred mounting technology**. As confirmed by the ecological specialist, this minimalistic method of installation would allow the solar array to be installed over / across the washes, as potential disturbance would be greatly reduced as compared to the concrete cast-foundations.

As far as practically possible the ramming piers / poles will be driven into the ground away from the washes. Some of the ground cover in the plain areas in-between the washes (medium sensitivity) will have to be partially cleared to allow proper installation i.e. access by ramming equipment etc. Although the site is very flat, some minor excavation may be necessary. These excavations will however avoid the washes and will be kept to an absolute minimum. **The vegetation cover under the proposed solar arrays will be left intact to avoid the risk of erosion.** Large brush or trees, high enough to cast shadows, will be kept trimmed, or removed. The layout would require three of the four *Acacia Erioloba* trees within the development area to be removed, and if possible, relocated.

The solar arrays will be arranged side-by-side in two bulk groupings / clusters, placed in such a way as to have the least influence on the washes, avoiding the 132kV Eskom line servitudes and allowing connection proximity to the Schuitdrift Substation. To avoid fragmenting these arrays, the existing access road to the homestead and Eskom substation will be diverted to the immediate

north and around the solar facility, outside the parameter security fence. Three options exist for this road re-alignment:

- following the parameter security fence around the solar facility to link up with the road original alignment between the facility of the Schuitdrift Substation;
- following the parameter fence to the north of the facility to link with and align along the existing Eskom servitude below the 132kV transmission line; and
- following the parameter fence to the north of the facility to link with and align along the existing farm road to the north of the 132kV Eskom transmission line.

The landowner and Eskom have provided consent for the proposed road re-alignment and the preferred alignment option will be confirmed in consultation with Eskom during the final design phase.

The lack of casted cement foundation blocks and limited mounting footprint will allow natural runoff flow within the washes. Runoff management for construction and operation phases of the development (as described in the EMPr) will ensure that these washes are kept clear of any obstructions or diversions and that anti-erosion measures be implemented. Personnel would be trained to identify early signs of erosion and how to mitigate the potential risks.

This layout the solar facility is to be less than 20 hectare and is aimed at having the lowest possible environmental impact while still keeping the project economically viable.

3.3 NO-GO ALTERNATIVE

The **Status Quo Alternative** proposes that the Scuitdrift Solar Project development not go ahead and that the area in proximity to the Schuitdrift Substation remain undeveloped as it is currently. The land on which the proposed project is proposed is currently vacant. It is not used for grazing activities due to a combination of poor soil quality, water scarcity and distance from the major market and has no potential for irrigated crop cultivation. The area in question is also considered too small to generate noteworthy financial benefit from agricultural activities due to its low carrying capacity.

The solar-power generation potential of the Skuitdrift area, particularly in proximity to the Schuitdrift Substation, is significant and will persist should the no-go option be taken. The 'No-go/Status Quo' alternative will limit the potential associated with the land and the area as a whole for ensuring energy security locally, as well as the meeting of renewable energy targets on a provincial and national scale. Should the 'do-nothing' alternative be considered, the positive impacts associated with the solar facility (increased revenue for the farmer, local employment and generation of electricity from a renewable resource) will not be realised.

The no-go alternative is thus not considered a favourable option in light of the benefits associated with the proposed solar facility development, however it has been used as a baseline from which to determine the level and significance of potential impacts.

3.4 PHOTOVOLTAIC SYSTEM OVERVIEW

The following details were drawn from the Engineering Report (van der Merwe, 2012), attached in Appendix D, Annexure D6.

The Scuitdrift Solar Project is to consist of a **Concentrator Photovoltaic System (CPV)**, which uses concentrating optics (lenses) to bundle the sunlight and focus it onto very small solar cells which convert the sunlight into electrical energy. The required active area of the solar cell is

reduced to only a small fraction of the area normally required by conventional solar cells (traditional PV or thin film). The solar cells will be mounted onto a **single-axis tracker module**, which uses a **tracking system** to follow the sun's movement throughout the day. This system ensures that the focus point of the concentrated sunlight is always directly onto the cells.

The **tracker modules are spaces approximately 5m apart** to avoid shading each other, while minimizing the footprint of the facility. The trackers will be **oriented at a tilt, facing approximately North**, to maximize annual solar energy yield. The total solar facility, including tracker spacing and associated infrastructure, will occupy a footprint not exceeding 20ha.

Photovoltaic (PV) panels convert the energy delivered by the sun to direct current (DC) electric energy. The array of panels is connected to an inverter by means of a network of underground cables. The grid-tied inverter inverts the DC power to alternating current (AC) power which can be added to the national electricity network (grid). The voltage at which power generated is stepped-up to the required voltage and frequency of the national grid, by using a transformer. The electricity is distributed from the onsite transformers via distribution lines to the nearest Eskom Substation. From the Eskom substation, the electricity is fed into the Eskom grid.

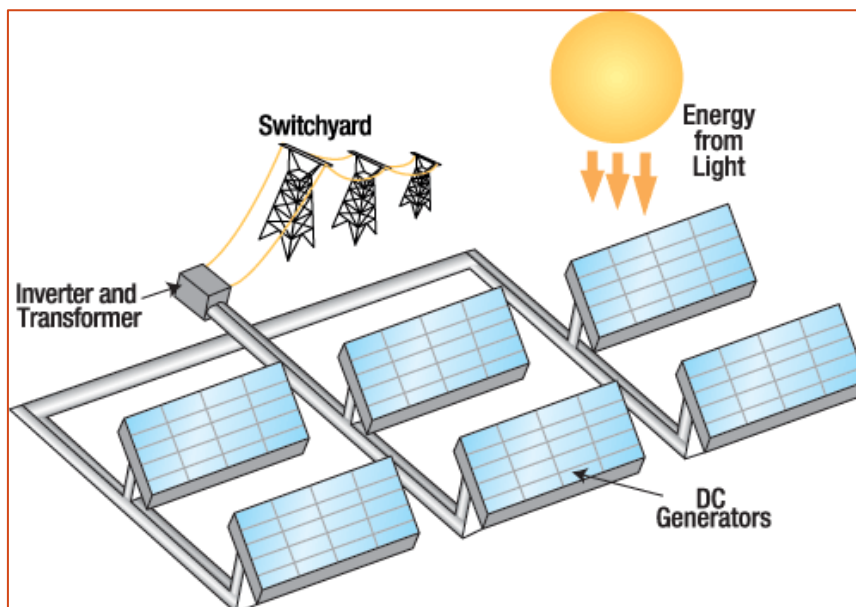


Figure 13: Typical Solar PV Plant diagram (Source: Engineering Report, 2012)

The infrastructure of the facility includes the ground-mounted panels, cables, access roads, auxiliary roads, an onsite substation and a distribution line.

3.4.1 Electrical Infrastructure

The **step-up on-site substation** and its associated infrastructure (transformer etc.) will have a footprint of approximately 0.04 ha (20m x 20m). Note that the 0.04 ha is included in the entire building footprint of <1ha.



Figures 14 & 15: Typical examples of on-site step-up substations (Source: Solek Engineering Report, 2012)

Underground electrical cables will link the inverters / solar array modules with the on-site substation. These cables will be placed in shallow trenches during construction, aligned alongside the internal roads and pathways between the arrays and modules to the on-site substation.



Figures 16, 17 & 18: Photos of typical underground cable trenches (Source: Solek Engineering Report, 2012).

Electricity from the on-site substation will be transmitted via either an **underground cable** or a **short overhead power line** to the existing Eskom Schuitdrift Substation which is located adjacent to and west of the proposed solar site.

3.4.2 Auxiliary Buildings

The infrastructure for the auxiliary buildings should occupy approximately 1ha. The **workshop** will be used for general maintenance of parts, etc. and will typically be 20m x 20m. The **storeroom** will be used for storage of small equipment and parts and will typically be 20m x 10m. The change and **ablution facilities** will be very basic and include toilets, basins and a change area. The **administrative and security building** will be used as an onsite office and will have a footprint of typically 10mx10m.

The final detailed design and exact co-ordinated position of these buildings will be designed and finalised should the facility be approved and awarded a tender as an IPP. The component list above is typical to such projects and may deviate due to engineering requirements, new technologies and regulatory changes from the government's tender process.

3.4.3 Solar Facility CONSTRUCTION

The majority of the proposed solar site is flat and covered with sparse, low vegetation. Therefore accessibility to development areas should be possible with minimal vegetation clearing. The vegetation along the access and internal road network will be trimmed (not removed) to form vegetated tracks (to minimise disturbance and erosion). Road areas with soft soils may however be covered with a gravel layer to avoid vehicles becoming stuck in wet conditions.

The majority of the vegetation clearing and earthworks required for the solar facility will be associated with the construction of the on-site substation, auxiliary buildings. The area to be disturbed for the construction of the solar panel array support / mounting structures will be minimal (in comparison to the surface area to be covered).

The physical footprint of the PV panels on the ground is formed by a network of vertical piers / poles (typically 10cm in diameter) on which the PV panels are mounted (see examples below).



Figure 19: Example of foundation structures – rammed piers/poles.

These piers are rammed / drilled into the ground, which easy removal during de-commissioning of the project. The use of concrete for stabilisation is to be avoided as far as possible.

3.4.4 Water Requirements

It is estimated that **approximately 2000 kl of water in total should be required during the six (6) month construction phase**, while **approximately 3kl of water per day should be required for the cleaning of solar panels and for other operational phase requirements**. No water will be used for cooling purposes as the electricity transformers will make use of dry cooling.

Weather conditions, traffic and general dustiness of the site play a role in the exact amount of ground water required to wash the Solar PV panels. At present it is assumed that each panel should be washed twice a month.

Possible water sources identified at this stage include a nearby water reservoir (fed by on-site boreholes), rainwater capture/storage and/or alternatively via a new pipeline following an existing track from Southern Farms situated along the Orange River (northwest of the site).

- ***Borehole water***

Three existing bore-holes are situated near the proposed site, and are seen as the preferred water sources for the facility. According to the initial drilling test records, the borehole closest to the solar site has a yield of approximately 70kl of water per day, of potable quality. This borehole would comfortably supply the solar facility with 3kl per water for cleaning purposes during operation.

The three farm boreholes have not been registered. An application for water use rights and registration of the boreholes has been submitted to the Provincial (Kimberley) Department of Water

Affairs for consideration. The quantity of water required and the nature of water-use for the solar facility qualify as “Small Industrial Use” according to the General Authorisations in terms of Section 39 of the National Water Act, 1998 (Act No.36 of 1998) (see confirmation letter from MBB Consulting Engineers in attached to the Engineering Report in **Appendix D, Annexure D6**). This section states the applicant may use up to 20 kl bore-hole water per day. The necessary documentation to apply for such **General Authorisation water use** will be submitted to the Department of Waters Affairs who will consider it once the environmental process is included.

- ***Southern Farms pipeline***

An alternative source of water for the solar facility is Southern Farms, situated 7km directly north of the proposed solar site, on the banks of the Orange River. Should the on-site bore-holes not prove to be a reliable water source, a water use agreement would be sought from Southern Farms Management. A formal letter, confirming their legal water rights and consent for use of the water for the solar facility has been requested by the Applicant to secure this option. The water would be transported via a new pipeline, to be installed within or directly adjacent to the existing track between Southern Farms and the current Skuitdrift farmstead / Scuitdrift Solar Project.

- ***Rainwater***

As an additional measure, 10 000lt rainwater tanks will be placed alongside the on-site maintenance/administration, workshop and storage buildings to collect the rainwater runoff from their roofs. This rainwater will be used to supplement the water sources mentioned above.

3.4.5 Transportation of Solar Equipment

All solar plant components and equipment are to be transported to the solar development site by road via container trucks. Construction is likely to extend over a period of approximately 4-6 months, during which time the majority of the solar PV panels and construction components will be transported by utilising **2 x 40ft container trucks**.

Less than 30 containers required per installed MW, which typically includes all solar PV components and additional construction equipment. **Over the period of 6 months, approximately 300 containers** will therefore be transported to the proposed site, which amounts to one 2x40ft container truck per day. Normal construction traffic will also need to be taken into account. The usual civil engineering construction equipment will need to be transported to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.), as well as components required for the establishment of the onsite substation power line. Some of this power station equipment may be defined as abnormal loads in terms of the Road Traffic Act (Act No.29 of 1989). Input and approval are to be sought from the relevant road authorities for this purpose.

Transport to the site will be along appropriate national, provincial and local roads. The access roads to the site will be from Pofafdder or Kakamas, along the N14. This is a tarred national road and no alterations should be necessary to handle construction traffic and traffic involved in the operation phase. The access road to the Scuitdrift facility from the N14 has been confirmed as two divisional roads, the R359 and DR3256 which fall under the Siyanda District Municipality. It is unlikely that any upgrades will be required for these roads, as they are in good condition.

- ***Access and internal road network***

In some instances, the existing farm road to the solar site may require minor alterations (e.g. widening of corners etc.), due to the dimensional requirements of the loads to be transported during the construction phase (i.e. transformers of the onsite substation). Permission from the local authorities will be sought obtained in this regard if required.

Internal maintenance roads (less than 4m width around the solar array periphery) and tracks (in-between the solar modules to be used for maintenance and cleaning of solar cells) will be constructed on the solar site. Where necessary, gravel may be used to service sections of the existing road on the farm itself.



Figures 20 & 21: Typical internal road and track examples (Source: Solek Engineering Report, 2012).

The farm access road (to be diverted around the solar facility footprint), as well as the internal road network within the facility will either be comprised of gravel tracks or of compacted rock-fill with layer of higher quality surface stone on top. The preferred alternative will be confirmed during the final design phase. If compacted rock-fill is to be used, a geotechnical survey will be completed to assess the strength and durability properties of the rock strata at the site. It might be necessary to strip off some of the existing vegetation and level the exposed ground surface, in order to form an access track surface.

- ***Temporary layout area***

A temporary laydown area will be required for the temporary placement/storage and assembly of the PV panels and associated equipment during construction. This laydown area will be approximately 1ha in size and located away from the sensitive washes. This area will either be used as part of the auxiliary building footprint or be rehabilitated after construction.

3.4.6 Waste Management

- ***Solid Waste***

During the construction phase, an estimated amount of **less than 5m³ non-hazardous solid construction waste will be produced per month**, for the expected 6 month construction period. All construction waste will be safely stored in containers and be removed from site on an ad hoc basis by the appointed construction contractor, as and when deemed necessary. The construction waste will be **disposed of at an appropriately licenced Municipal landfill site**.

No solid wastes will be generated during the operational phase.

- ***Sewerage effluent***

Sewage from the on-site ablution facility is to be treated onsite by means of a **septic tank system**. Sewage cannot be disposed in a municipal sewage system, due to the isolated nature / locality of the farm.

3.4.7 OPERATION & Maintenance Phase

The solar facility will be operational during daylight hours, except during maintenance, poor weather conditions or breakdowns. Regular maintenance will typically include periodic cleaning,

greasing of bearings and inspection. The solar panels will be cleaned with water or compressed air.

An estimated total of **six full-time staff members** will typically be required during the operation phase of the project, which includes technicians, maintenance and security personnel. Approximately **three unskilled labourers will be needed for maintenance purposes and two security personnel will be deployed on a shift basis. One skilled staff member will be needed to manage and oversee the operations.** From time to time additional contract staff (+/- 30) may be required for ad hoc ground cleaning or special panel cleaning. Therefore a **total of between 10 and 40 people will be employed during operation.** Staff can be transported around the site using utility vehicles and a typical mini bus to transport staff from nearby towns of Kakamas and surrounding community.

3.4.8 Project DECOMMISSIONING

The proposed solar energy facility is expected to have a **lifespan of approximately 30 years** if the specified periodic maintenance is performed. Once the facility has reached the end of its economic life, the infrastructure is to be disassembled and replaced with appropriate or more advanced technology. Should replacement not be deemed necessary, then the facility would be completely decommissioned i.e. all infrastructure will be disassembled and removed from site. Site decommissioning activities will ensure integrity of access to the site and well as rehabilitation as necessary.

4 SITE DESCRIPTION AND ATTRIBUTES

The following sections provide a description of the environmental and built context of Farm 426 Skuitdrift, with particular focus of the proposed Scuitdrift Solar Project development site.

4.1 LOCATION & BUILT ENVIRONMENT

Farm 426 Skuitdrift³ is located in the Kenhardt district and jurisdiction area of the Khai!Garib Local Municipality, Siyanda District Municipality and has a surface area of approximately 8019ha. The property is directly south of the Orange River and west of the Augrabies National Park. The subject site which is not being used by the land owner for farming (comprising approximately 45ha) is located on the southern portion of this farm (see Location Plan as Appendix A). Via road, the subject site is approximately 106km northeast of the town of Pofadder and 115km northwest of Kakamas respectively. Access to the site is off the N14 National road (Nous turn-off 60km east of Pofadder; 70km west of Kakamas) via a 46km long gravel track.

The proposed development site is located within a flat, arid landscape bound by a series of low granite hills to the northeast. Soils were found to be sandy, covered with sparse vegetation - grass interspersed with low-growing shrubs. A narrow gravel road traverses the site - following a cadastral boundary and continuing further eastward. The existing Schuitdrift substation and a cellular mast are directly southwest of the site. From the substation a 33kV overhead line leads to the west while a 132kV overhead line leads to the east (Blouputs).

³ Variations of spelling include "Skuitdrift"(Farm), "Schuitdrift"(Substation) and "Scuitdrift"



Figure 22: Existing Schuitdrift Substation



Figure 23: Existing 132kV power line, north of solar site.

A small building complex, including a much-altered farmstead, outbuildings older than 60 years, a modern labourer's cottage and agricultural building (most likely older than 60 years) are located directly east of the site (i.e. outside proposed development site boundary). The farmstead consists of a pitch-roofed core with modest mono-pitch extensions to side and rear and interesting gabled extension to other side. Outbuildings to the rear of the farmstead as well as an agricultural outbuilding (with stonewalled kraal to side) just east of the farmstead are both considered older than 60 years. A small mono-pitched labourer's just northeast of the farmstead is not older than 60 years (de Kock, 2012).

4.2 GEOLOGY & TOPOGRAPHY

The following description of the geological context of the site was drawn from the Paleontological Statement (Almond, 2012). See Appendix D, Annexure D5.

The proposed solar plant study area (28° 36' 47"S, 19° 46' 48" E) is situated some 12 km south of the Orange River on arid, gravelly to sandy terrain at c. 670-690 m amsl, sloping gently towards the Orange River. A rocky ridge projects through the superficial alluvial fan deposits about 1.4 km to the west of the proposed development site.

The geology of the study area northeast of Pofadder is shown on the 1: 250 000 geology map 2818 Pofadder (Council for Geoscience, Pretoria). A comprehensive sheet explanation for this map has been published by Moen and Toogood (2007). The proposed solar plant and associated infrastructure are underlain by ancient Precambrian basement rocks – the **Schuitdrift Gneiss (Nsc)** – that belong to the **Namaqua-Natal Province** of Mid Proterozoic (Mokolian) age (Cornell *et al.* 2006, Moen 2007). These basement rocks are approximately two to one billion years old and entirely unfossiliferous (Almond & Pether 2008).

The Precambrian basement rocks within the study area are mantled with a spectrum of other coarse to fine-grained **superficial deposits** such as rocky soils, downwasted gravels, colluvium (slope deposits), sheet wash, and alluvium of intermittently flowing streams. These deposits are generally young (Quaternary to Recent) and largely unfossiliferous. It is considered unlikely that significant deposits of Late Tertiary **Orange River alluvial gravels** are present within this area, and none are mapped here on the 1: 250 000 Pofadder geology sheet

4.3 VEGETATION

Mr. Simon Todd, of Simon Todd Consulting, conducted an Ecological Impact Assessment of the proposed Scuitdrift Solar Project development site (see **Appendix D, Annexure D1** for full report), from which the following is drawn.

According to the national vegetation map (Mucina & Rutherford 2006), the Scuitdrift Solar Project development site lies within the **Blouputs Karroid Thornveld** vegetation type, which occurs as a belt of irregular flat areas from the vicinity of Augrabies Falls in the east to Kotie se Laagte and Samoep se Laagte in the west. The vegetation type is listed as **Least Threatened and less than 1% has been transformed**. It is **well conserved (27%) within Augrabies Falls National Park**. Other vegetation types which occur in the vicinity of the site include: Lower Gariep Broken Veld, Bushmanland Arid Grassland and along the banks of the Orange River, Lower Gariep Alluvial Vegetation. Lower Gariep Broken Veld and Bushmanland Arid Grassland are also classified as Least Threatened and have been little impacted by transformation. Lower Gariep Alluvial Vegetation is however classified as Endangered on account of the high degree of transformation it has experienced. This vegetation is however restricted to the banks of the Orange River and would not be affected by the development.

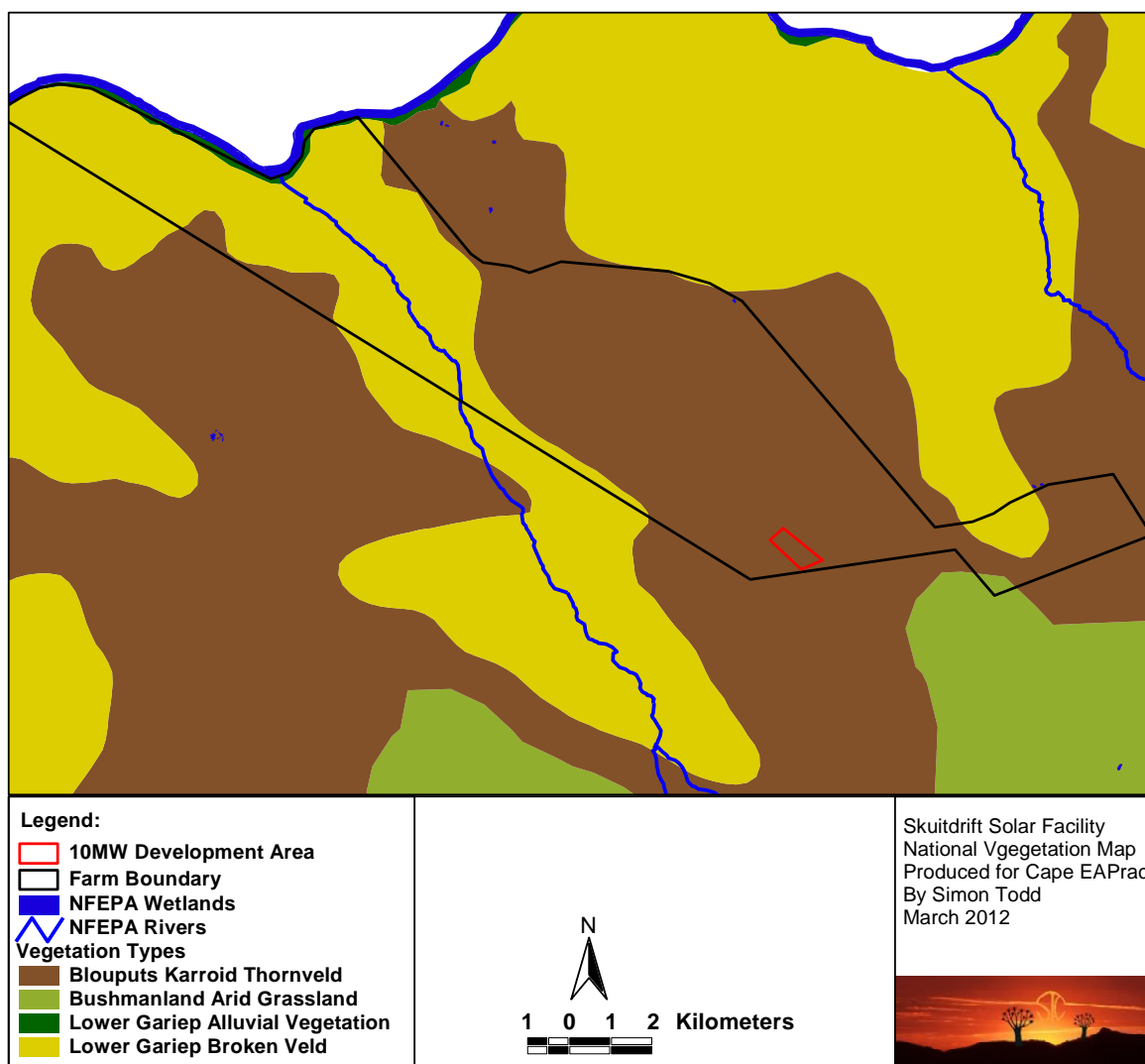


Figure 24: The broad-scale vegetation in and around the proposed Scuitdrift Solar Facility. The vegetation map is an extract of the national vegetation map as produced by Mucina & Rutherford (2006), and also includes rivers and wetlands delineated by the National Freshwater Ecosystem Priority Areas assessment (Nel et al. 2011).

Several different habitats and plant communities occur at the site, including plant communities associated with rocky plains, sandy plains, drainage lines and rocky outcrops. Within the area earmarked for the solar development, the vegetation was however homogenous and apart from several small washes, there was **little differentiation of the vegetation**. Consequently, only two communities are recognized, that of the **washes and that of the adjacent plains**. The plains within the development area are generally open with occasional scattered trees of *Acacia erioloba*, *Acacia mellifera* and *Boscia foetida*. The plains are dominated by the grasses *Stipagrostis uniplumis*, *S.ciliata* and *Schmidtia kalahariensis* with occasional shrubs such as *Rhigozum trichotomum*, *Phaeoptilum spinosum* and *Salsola rabieana*.

The washes contained a higher abundance of trees, mostly *Acacia mellifera* and *Boscia foetida*, as well as shrubs such as *Phaeoptilum spinosum* and *Monechma spartioides*.

Apart from the washes there were **no other specialized habitats within the proposed development area**. The **adjacent rocky outcrops are a sensitive habitat** but the development is sufficiently distant from these that they would not be directly impacted by the development.

According to the SANBI SIBIS database, only one endangered species *Caesalpinia bracteata* is known from the area, and is classified as Vulnerable. This species has a highly restricted distribution and is known from a total population of about 1000 adult plants (Threatened Species Programme, Red List of South African Plants (2011)), but as it occurs on rocky outcrops, it would not occur within the proposed development area and was not observed. A number of protected species were observed at the site including *Hoodia gordonii*, *Aloe dichotoma* and *Acacia erioloba*. Within the proposed development area only *Acacia erioloba* was observed. Four individuals of ***Acacia erioloba*** were within the proposed development area and an additional two in close proximity to the development. In terms of the preferred solar layout (Alternative 3), **a permit would be required for the destruction or translocation of three of these trees** within the development footprint.

The site was relatively **free of alien species** and no alien species were observed within the study area. Disturbance at the site would however potentially increase the risk of alien invasion at the site if not managed appropriately.



Figure 25: Photo of the vegetation within the proposed development area. The large shrubs in the middle ground are *Phaeoptilum spinosum* and *Acacia mellifera*, while the grass layer is dominated by *Stipagrostis uniplumis* and *Schmidtia kalahariensis*. The 132 KV transmission line which traverses the site can also be seen in the background.

4.4 HYDROLOGICAL FEATURES

Within the broader area of the proposed Scuitdrift Solar site a distinction is made between washes and drainage lines, both of which occur in the area. Drainage lines are defined in terms of the National Water Act, in which the presence of characteristic vegetation is a defining feature of riparian areas, quoting directly from the Act “*‘riparian habitat’ includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas*” The National Water Act requires a 32 m setback distance from the edge of such drainage lines.

Washes are defined in terms of the current study as those areas which show **visible signs of occasional water movement and sediment transport**, but which do **not receive sufficient runoff to develop characteristic soils or vegetation** associated with wetlands or drainage lines. Washes are a characteristic feature of arid and semi-arid environments and are related to the occurrence of occasional intense rainfall events within areas of low total rainfall. Although development within the washes themselves should be avoided, a large buffer is not deemed necessary in the current context. The appropriate buffer around these areas is to some extent dependent on the manner in which the PV panel support structures will be constructed. If **vegetation clearing of the ground layer is required prior to construction, then 5-10 m buffers would be suitable**. However, if, as the developer proposes, the **support structures are piled into the ground and vegetation disturbance and clearing is not required, then construction over the washes would be acceptable** provided that care is taken to ensure that the washes themselves are not obstructed.

It is important to understand the dynamic nature of the washes; they are not heavily incised and due to the homogenous slope and substrate of the site, they are fairly dynamic in nature and frequently move back and forth across the slope over time as active channels become vegetated or filled with sediment. These patterns are evident in the satellite image of the site where distinct active and indistinct or diffuse abandoned washes can be seen. In terms of mitigation, the important consideration is to **prevent the service roads at the site from capturing the flow from the washes and directing it down the roads**. This problem is evident along the current access road. In order to **maintain the natural pattern of water movement across the site, diversion structures should be present along the roads the divert flow off of the roads**.

4.5 FAUNA

Mr. Simon Todd, of Simon Todd Consulting, conducted an Ecological Impact Assessment of the proposed Scuitdrift Solar Project development site (see **Appendix D, Annexure D1** for full report), from which the following is drawn.

4.5.1 **Mammals**

The site falls within the distribution range of 46 terrestrial mammals, indicating the mammalian diversity at the site is potentially quite high. In terms of important mammalian habitats in the vicinity of the development, the rocky outcrops and drainage lines can be singled out as being the

most significant. Compared to the adjacent plains the rocky habitats are likely to harbour far greater species richness, particularly of small mammals. **No listed faunal species with a narrow distribution which occur at the site.** The medium to larger sized mammals which occur at the site all have home ranges which are likely to exceed the extent of the study site. The erection of fencing which prevents the movement of such animals is therefore a concern regarding the development of the site and specific mitigation measures to reduce these impacts may be required (Todd, 2012).

4.5.2 Reptiles

The site lies in or near the distribution range of at least 45 reptile species (Appendix 3), indicating that the reptile diversity at the site is likely to be quite high. Based on distribution maps and habitat requirements, the composition of the reptile fauna is likely to comprise 1 tortoise, 17 snakes, 18 lizards and skinks, one chameleon and 8 geckos. **No listed reptile species are known from the area.** As with small mammals, the rocky areas are likely to contain the greatest reptile diversity and the majority of Skinks, Girdled Lizards and Geckos which occur at the site are likely to be associated with rocky areas. **The plains are likely to contain fast moving species such as Sand Lizards and nocturnal species such as Barking Geckos** (Todd, 2012).

Apart from a relatively small direct loss of habitat, the shading of the soil by the solar panels is likely to affect reptile composition, as the shading is likely to alter soil temperatures which will have implications for the activity patterns of cold-blooded animals. Most reptiles are also sensitive to the amount of plant cover which is also likely to be affected by the arrays. The presence of the arrays and electrical infrastructure would however create additional habitat for species which utilise such structures such as tubercled geckos (*Chondrodactylus* spp) and agamas (*Agama* spp). Depending on the management of the vegetation beneath the panels, **reptile abundance in the development area could increase as a result of increased habitat diversity as well as a protective effect of the panels on reptiles from avian predators** (Todd, 2012).

4.5.3 Amphibians

The site lies within the distribution range of six amphibian species. However, given the paucity of surface water at the site, only those species able to persist away from perennial water are likely to occur at the site. Given the **overall lack of specialized natural amphibian habitats** present at the site, amphibians are not likely to be highly sensitive to the development. The greatest risk associated with the development in terms of amphibians is pollution spills which may occur during the construction phase and which could affect amphibians in downstream areas (Todd, 2012).

4.5.4 Birds

According to the bird data sets which are available on the SANBI SIBIS data portal which includes the SABAP 1 and SAFRING data sets, 130 bird species are known from the broad area surrounding the Scuitdrift site. The area has however been poorly sampled and the list is probably not comprehensive, particularly with regards to birds that may occur as a result of the proximity of the Orange River.

Of the recorded species only Ludwig's Bustard *Neotis ludwigii* (Vulnerable) and Sclater's Lark *Spizocorys sclateri* (Near Threatened) are listed species. Both species are nomadic and would potentially use the site at times, but would also be able to avoid the area when developed. Sclater's Lark would be affected by a very small amount of habitat loss, while Ludwig's Bustard would be potentially more severely impacted due to the possibility of **collisions with new transmission lines**. However, the planned transmission line for the development is less than 150 m and occurs in very close proximity to the existing substation as well as a large amount of existing

transmission infrastructure. The area is therefore likely to already be avoided to some extent and the **impact is likely to very low**.

Bird species that were observed to be common at the site include Sociable Weaver *Philetairus socius*, Dusky Sunbird *Cinnyris fuscus*, Capped Wheatear *Oenanthe pileata* and Verreaux's Eagle *Aquila verreauxii*. Verreaux's Eagle is potentially impacted by habitat loss as it may avoid the vicinity of the development and is also vulnerable to electrocution with transmission lines. However, the extent of the development is very small in relation to the home range of this species and the impact on this species is likely to be negligible. In terms of **general impacts on avifauna, these are likely to be relatively low** as the area does not fall within any of Birdlife South Africa's Important Bird Areas, indicating that the area is **not within the range of any range-restricted or globally threatened species** (Todd, 2012).

5 PLANNING CONTEXT

Bennie Scheepers of Macroplan Town and Regional Planners (Upington) compiled a Planning Statement (see **Appendix D, Annexure D7** for full statement), from which the following was drawn:

Macroplan Town & Regional Planners are to handle the following components regarding the project:

- A **land use change application** for the rezoning of 45ha, from **Agricultural Zone I to Special Zone**, will be lodged at the Kai!Garib Local Municipality, in accordance with the Northern Cape Planning and Development Act (Act 7 of 1998).
- Where applicable, the consent of SANRAL, Civil Aviation Authority (CAA) and the bondholder will be obtained as part of the rezoning application.
- If there are restrictive Title Deed conditions burdening the proposed development, an application for the removal thereof will be lodged at the Government of the Northern Cape Province, Department: Corporate Governance and Traditional Affairs, in accordance with the Removal of Title Deed Restriction Act (Act 84 of 1967).
- Parallel to the rezoning application, a **long term lease application will be lodged at the National Department of Agriculture**, in accordance with the Subdivision of Agricultural Land Act (Act 70 of 1970).
- Relevant planning documents, on all spheres of Government, will be evaluated before any land use change application is launched. These documents include, but are not limited to the following: **NSDP** (National Spatial Development Perspective); **PGDS NC** (Provincial Growth and Development Strategy), Northern Cape Province; **IDP** (Integrated Development Plan); **SDF** (Spatial Development Framework).

The following sections discuss the potential impacts associated with development of the 45ha solar site as a whole, as well as the Preferred Layout – Alternative 3. The Conceptual (Alternative 1) and Scattered (Alternative 2) layouts have been eliminated from the environmental process and were therefore not assessed any further.

6 AGRICULTURAL POTENTIAL STATEMENT

Mr. Hendri Beukes, of Solek Renewable Energy Engineers, compiled an Agricultural Potential report of the proposed Scuitdrift Solar Project development site, based on of his knowledge and

experience of farming in the Northern Cape (see **Appendix D, Annexure D2** for full report), from which the following is drawn:

6.1.1 Agricultural Potential Context

The proposed development site consists mainly of dune sand and rocky outcrops and is not fit for the extensive cultivation of crops and grains. The soil is shallow, generally less than 450mm, on weathering rock. The soil is mainly calcareous, typical of arid climates, and contains less than 15% clay. Calcareous soils develop in regions of low rainfall and usually only become productive under irrigation. The soil surface is covered with rocks and stones, and rocky outcrops are plentiful. The geology of the area would make the cultivation of crops very difficult.

The Kakamas area is a summer rainfall district and classified as a semi-desert area with arid conditions. Average annual precipitation amounts to approximately 100 mm, considered to be highly variable and extremely low. Day temperatures are known to become extremely high and range on average between 21°C and 36°C. In winter months, it can become very cold, with frost occurring regularly. These climatic conditions are not favourable for intensive agriculture, due to the low rainfall and the extreme temperatures that characterises the region.

The farm is situated within the Nama Karoo biome, with the dominant vegetation type on the proposed solar development site being Blouputs Karroid Thornveld. The dominant plant species found within the proposed site are annual grasses. Annual grass types such as *Schmidtia kalahariensis* and *Stipagrostis uniplumis* are commonly found in areas with low rainfall and are known to be an indicator of veld deterioration. The grazing value of these plant types is relatively poor.

According to the Department of Agriculture, the prescribed carrying capacity of the farm is 60ha per unit of cattle or 15ha per sheep. The proposed 10MW solar site of under 20ha is too small to house even a single one unit of cattle or more than one sheep. The proposed solar site does thus not have any significant value in terms of agricultural potential and the proposed development will result in a **VERY LOW** impact affecting agricultural potential. The lifespan of the project is 30 years, as such the limited impact is of a **MEDIUM TERM** nature and since the ground cover underneath the solar plant will be maintained, the potential for recovery post decommissioning is **HIGH**.

6.1.2 Existing Land Use & Infrastructure

The remainder of the farm not under consideration for the solar project is currently utilised for stock farming. The farm (+/- 8 019ha) is under indigenous vegetation used as natural grazing for some 800 ewes and 80 heads of cattle. Although the area is very dry, there is no need to provide extra feed to the livestock as the carrying capacity is not exceeded and since there is ample vegetation along the riverbanks.

The built infrastructure on the farm includes a homestead, a windpump, cement reservoirs, dams, an Eskom Substation and two transmission lines. There is a small network of roads on the farm, but the majority of the farm is inaccessible without the use of four wheel drive vehicles or motorcycles. The farm is undivided into camps and the border fences are well maintained. There are cattle handling facilities on the farm, but not on the proposed solar development site. The access roads to the farm are in superb condition, both from the N14 to the south and Augrabies to the east. This facilitates comfortable transportation of livestock and other agricultural necessities and supplies to and from the farm. However, the farm is very far from the primary markets, which complicates the economical export of agricultural products from the farm.

There are two primary water sources on the farm, namely rainwater and groundwater. Groundwater is readily available from three boreholes (and windpumps) and of high quality, perfect for human and animal consumption. The water is currently accumulated in two small reservoirs and is mainly used to supply the livestock of drinking water.

The farm is surrounded by other livestock farms and Southern Farms, a farm that cultivates vineyards under irrigation, along the north-eastern border of the farm (the Orange River).

6.1.3 Potential Land Use Options

The combination of poor soil quality, water scarcity and distance from the major market hinders the possibility of the commercial production of grain, vegetables and horticultural products. Irrigation on this arid area is excluded due to low availability of water and shallow soils. It is possible to consider game farming in the area, especially Springbok and Gemsbok, but the capital expenditure would be extremely high. **The proposed solar development site does not have any significant agricultural value and has not been utilized for any extensive agricultural purposes for many years.** The site is too small to generate noteworthy financial benefit from agricultural activities. The development of the proposed solar facility would constitute the loss of 45ha of the overall approximate 8 019ha area, which will **not have a significant impact on the agricultural potential of the farm.** **The economic benefits that the proposed solar development holds cannot be recovered from the current or potential agricultural activities.**

7 ECOLOGICAL IMPACT ASSESSMENT

Mr. Simon Todd, of Simon Todd Consulting, conducted an Ecological Impact Assessment of the proposed Scuitdrift Solar Project development site (see **Appendix D, Annexure D1** for full report), from which the following is drawn:

There are no highly sensitive ecosystems present within the proposed solar development area. The washes are more sensitive than the surrounding plains as a result of their associated erosion risk. Cover of the ground layer is generally not significantly higher within the washes and is in fact often lower. As a result, these **small washes are not highly significant** from an ecological and biodiversity perspective, but should not be impacted as they regulate water movement across the site.

Within the proposed development area, almost 38 ha is classified as Medium Sensitivity and the remaining 7 ha forms the washes which are classified as High Sensitivity. Those areas classified as Medium Sensitivity are suitable for the location of the panels and other infrastructure associated with the development. **The risk of significant ecological impact associated with development within those areas classified as Medium Sensitivity is LOW.** The washes receive significant runoff during intense rainfall events and the risk of erosion in these areas would be high if they are highly disturbed. Therefore if panels are to traverse the washes, then construction should ensure that the **plant cover of the ground layer is maintained.** In this regard, although vehicles should not be allowed to drive all over the site, **only the major access roads should be cleared and the smaller service roads within the development should remain vegetated as far as possible.** The **preferred layout is restricted to the south-eastern section of the proposed development area as this area contains the lowest density and smallest washes.** The majority of *Acacia erioloba* trees would also be avoided under this configuration

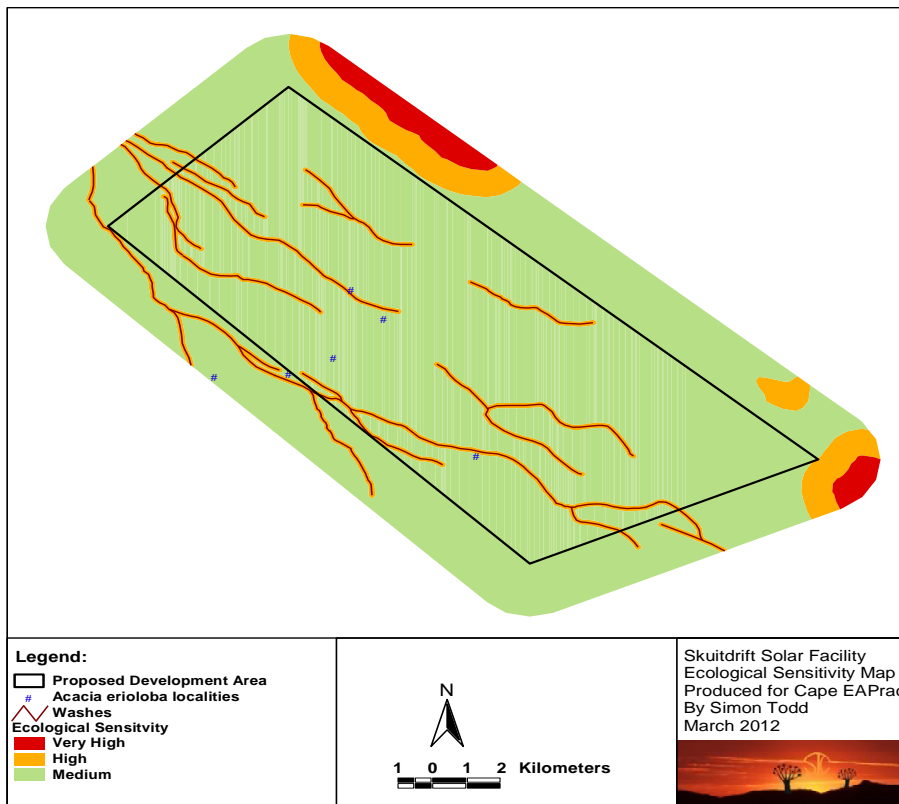


Figure 26: Ecological Sensitivity map of the proposed Scuitdrift 10 MW Solar Facility site, including the localities of *Acacia erioloba*. Those areas classified as Medium Sensitivity are suitable for the construction of the facility.

Given the relatively flat nature of the site and the coarse sandy nature of the substrate, **erosion risk is likely to be LOW and provided that vegetation clearing is kept to a minimum**, few measures to combat erosion will need to be implemented. **Very few alien species** were observed at the site which can be ascribed to the arid nature of the area combined with nutrient-poor soils. As a result, the risk of alien plant invasion should be relatively low. Alien plants are however likely to become an issue if the site is highly disturbed during construction or if water runoff is not properly managed.

The proposed development area is **floristically homogenous and is not locally significant from a faunal perspective** as this habitat is widely available in the area. Faunal disturbance during the construction phase is inevitable and cannot be fully mitigated. The impact is however restricted to the construction phase and fauna are likely to return to the area during the operational phase of the project.

Six major risk factors associated with the development were identified. These are:

- Disturbance and loss of vegetation and sensitive plant communities;
- Increased risk of alien plant invasion;
- Increased soil erosion risk;
- Faunal habitat loss and disturbance;
- Loss of landscape connectivity; and
- Negative impacts on avifauna.

The majority of potential impacts associated with the development can be **mitigated to a LOW level** (summary impact table below). Some permanent vegetation loss and faunal disturbance during the construction phase are inevitable and cannot be fully mitigated. However, **the disturbance of the fauna will be TEMPORARY and the loss of vegetation will amount to less than 20 ha and is NOT SIGNIFICANT at the landscape scale given the overwhelming intact nature of the**

receiving environment. Mitigation measures during the construction phase should focus on ensuring that disturbance at the site is kept to a minimum, particularly with regards to vegetation clearing which can difficult to reverse in arid areas (Todd, 2012). The mitigation measures outlined in the Ecological Report are listed below and have been included in the Environmental Management Programme (EMPr) for implementation and are considered to be sufficient to ensure that the risk of significant environmental impact or degradation as a result of the development is minimized.

Table 3: List of mitigation measure recommended by the ecological specialist (Todd, 2012)

Soil disturbance and vegetation clearing should be kept to minimum i.e. only rammed / screwed or rock anchor foundations may be used for the installation of the solar array structures.	No dogs should be allowed on site. No fuel wood collection should be allowed on-site.
Cleared areas that are not required for construction activities or no longer required during operation should be re-vegetated with locally-collected seed of suitable indigenous species . Bare areas can also be packed with brush removed from other parts of the site to encourage natural vegetation regeneration and limit erosion .	All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.
Regular monitoring must be undertaken to ensure that alien plants are not increasing as a result of the disturbance that has taken place.	No unauthorized persons should be allowed onto the site.
All alien plants present at the site should be controlled annually using the best practice methods for the species present.	Staff present during the operational phase should receive environmental education so as to ensure that that no hunting, killing or harvesting of plants and animals occurs.
Bare soil should be kept to a minimum, and at least some grass or low shrub cover should be encouraged under the panels .	Should the site need to be fenced, the fencing should be constructed in manner which allows for the passage of small and medium sized mammals . Steel palisade fencing (20 cm gaps min) is a good option in this regard as it allows most medium-sized mammals to pass between the bars, but remains an effective obstacle for humans. Alternatively the lowest strand or bottom of the fence should be elevated to 15 cm above the ground at least at strategic places to allow for fauna to pass under the fence.
Wherever possible, roads and tracks should be constructed to run along the contours . All roads and tracks running down the slope must have water diversion structures present. All maintenance / operation vehicles to remain on the demarcated road/track network .	If electrified strands on fencing are to be used, there should be no strands within 20cm of the ground because tortoises retreat into their shells when electrocuted and eventually succumb from repeated shocks.
All construction vehicles should remain on properly demarcated roads . No construction vehicles should be allowed to drive over the vegetation, except where no cleared roads are available. In such cases a single track should be used and multiple paths should not be formed.	Ensure that no larger fauna enter and become trapped within the fenced-off area , either by leaving a gate open so that animals can move freely between the site and the adjacent farm or by keeping all gates closed to ensure that they are excluded.
Runoff management should be undertaken throughout construction and operation to ensure risk of erosion.	The length of any new power lines that need to be installed should be kept to a minimum .
Regular monitoring for erosion should be undertaken to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. All erosion problems observed should be rectified as soon as possible.	Ensure that all new lines are marked with bird flight diverters along their entire length. If the new lines were to run parallel to existing unmarked lines this would potentially create a net benefit as this could reduce the collision risk posed by the older line.
The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden . The rocky outcrops are particularly sensitive in this regard and construction personnel should not be allowed off of	All new power line infrastructure should be bird-friendly in configuration and adequately insulated (Lehman et al. 2007). These activities should be supervised by someone with experience

the construction site and onto these areas.	in this field.
Any fauna directly threatened by the construction activities should be relocated to a safe location by the ECO	Ensure that any maintenance on the transmission infrastructure of the site retains the bird-friendly design features.
The Solar footprint and all activities must remain within the specified development area, and avoid koppie areas.	Any bird electrocution and collision events that occur should be recorded , including the species affected and the date. If repeated collisions occur within the same area, then further mitigation and avoidance measures may need to be implemented.
Fires should only be allowed within fire-safe demarcated areas.	All construction and operation staff must be made aware of the sensitivity of the offsite ‘koppie’ / rocky out-crop , considered as a no-go area. Construction staff must avoid quartz scatter areas during the period of construction, so as to prevent any destruction of the sites. The dense scatters of white quartz stand out, so they are easily recognisable, even to the non-specialist.

Should the abovementioned mitigation measures be implemented during the construction, operation and decommissioning phases, the significant / extent of the potential impacts on the biophysical environment will be **LOW** overall.

Table 4. Summary assessment of the pre- and post-mitigation impacts associated with the construction and operation phases of the project.

Impact	Project Phase	Pre Mitigation	Post Mitigation
Disturbance of sensitive plant communities	Construction	Moderate	Low
	Operation	Low	Low
Increased alien plant invasion risk	Construction	Moderate	Low
	Operation	Moderate	Low
Increased erosion risk	Construction	Moderate	Low
	Operation	Low	Low
Faunal habitat loss and disturbance	Construction	Moderate	Moderate
	Operation	Low	Low
Loss of landscape connectivity	Construction	Moderate	Low
	Operation	Moderate	Low
Negative impacts on avifauna	Construction	Low	Low
	Operation	Low	Low

As a general mitigation strategy, an **Environmental Control Officer (ECO)** should be present for the site preparation and initial clearing activities to ensure the correct demarcation of no-go areas, facilitate environmental induction with construction staff and supervise any flora relocation and faunal rescue activities that may need to take place during the site clearing. Thereafter weekly site compliance inspections would be sufficient.

7.1 CUMULATIVE IMPACTS

Cumulative impacts arise from the combined presence of several similar developments within an area which affect ecological processes operating at broader scales or which each have a small impact which becomes significant when combined. At this point, the only other known other solar development in the vicinity of the Scuitdrift site is a proposed 75 MW solar facility which is also adjacent to the substation, but to the northeast of the current site. The **limited nature of the current development and the proximity to existing infrastructure and human disturbance suggests that the contribution of the current development to cumulative habitat loss or landscape fragmentation impacts would be low** (Todd, 2012).

8 HERITAGE IMPACT ASSESSMENT

An Integrated Heritage Impact Assessment (HIA) compiled for the proposed Scuitdrift Solar Project development site and includes inputs from the following specialist reports sanctioned as part of the HIA:

- Archaeological Impact Assessment (Pre-colonial, Historical) – Prof. Andrew Smith
- Historical background report – SE de Kock
- Recommendation for Mitigation from further paleaontological studies and mitigation (Desktop) – Natura Viva (Dr. John Almond)

This Integrated HIA has been submitted to the SAHRA, as the competent heritage authority, for consideration.

8.1 HERITAGE IMPACT

Mr. Stefan de Kock, of Perception Heritage Planning, conducted an Integrated Heritage Impact Assessment of the proposed Scuitdrift Solar Project development site (see **Appendix D, Annexure D3** for full report), from which the following is drawn:

Based on the historical research, the Schuitdrift area, and more particularly areas within relative close proximity to the Orange River, are of high historical cultural significance due to association with:

- Pre-colonial history and indigenous inhabitants;
- History pertaining to border crossing at Schuitdrift;
- Various conflicts such as Anglo – German but also border wars with local tribes (including Nama Wars);
- Early mining activities.

However, no archival references referring to these historic themes, which include the possibility of grave sites/ burial ground on proposed development site and/ or lands directly contiguous to it, could be located.

A single grave (not older than 60 years) and at least two empty graves were noted just off a narrow track, directly north, and outside of the proposed development site. The sides of the two abandoned graves were constructed with mud bricks and cement and have been partly filled in by windblown sand over time. The **single grave (AP Nel, 1962) and two abandoned graves are not considered to be of cultural significance**, are situated outside the proposed development footprint and would not be affected through the proposed development.

Existing structures older than 60 years located within the proximity of the site (**farmstead and two associated outbuildings**) are considered to be of **MODERATE - LOW cultural significance** and are furthermore situated outside the actual development footprint currently proposed. These structures shall be retained. As such we are of the view that the **proposal would not materially impact on these heritage resources**.

8.1.1 Cultural Landscape Context

Given the absence of early aerial photography for the area, identifying any Pre-Modern traditional landscape patterns occur within the direct proximity of the proposed development site has been met with some difficulty. In this case, primary traditional landscape features evident within the current landscape are limited to existing farm tracks, the building complex mentioned in Section 8.1 above, as well as limited agricultural use (kraals), none of which are considered to be of cultural

significance. While significant cultural landscape features occur along the Orange River corridor, this falls well outside the scope of the proposed development.

One of the potential water sources to the proposed facility would be via a **new water pipeline** from Southern Farms/ the Orange River, this pipeline would follow an existing farm track. This route was physically surveyed and would **not impact on any heritage resource(s)** considered to be of cultural significance.

From a regional and natural landscape perspective, the proposed development site forms part of an isolated wilderness area well outside local tourism routes and areas (including the Orange River corridor). While the proposal would relate to a landscape modification, it would **not alter any natural or cultural landscape of cultural significance**.

8.1.2 Visual-spatial Issues

The proposed development site would **not be visible** from any main roads, public vantage points or any other known area or site considered to be of local, provincial or national aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value cultural significance. The proposed solar development will **not negatively impact on any heritage resource**, or the spatial relationships and associations between such resources (not impact on visual-spatial environment).

8.1.3 Eco-tourism

Existing eco-tourism related activities present in the broader region include e.g. walking trails, horseback riding, geological interpretive excursions, bird watching and river rafting. The Augrabies National Park – approximately 54km east of the proposed development site – is an important formal conservation area in the region. Given the isolated location of the site in relation to important tourism routes and formal conservation areas; as well as the relative low density of heritage resources considered of cultural significance noted as part of this assessment, the **proposed development would not offer significant heritage-related eco-tourism opportunities** associated with the development site.

The overall heritage study concluded that the **Preferred Alternative would not negatively affect any heritage resources** on or within the proximity of the proposed solar development site. It was however recommended that the Preferred Alternative site layout be assessed in terms of its adherence to any heritage informants and indicators defined through the heritage report or possible input during the Public Participation Process.

8.2 ARCHAEOLOGICAL IMPACT ASSESSMENT

Prof. Andrew Smith, conducted an Archaeological Impact Assessment (AIA) of the proposed Scuitdrift Solar Project development site (see **Appendix D, Annexure D4** for full report), from which the following is drawn:

A scatter of quartz chips and flakes covering an area of approximately 75 x 130m were noted in the northern section of the 10MW solar site. These are however of **LOW** significance.

Quartz flakes were to be found in considerable quantities below the koppies outside the facility footprint. The reason for this density was made obvious from the source outcrop of the quartz located not far away. These artefacts are probably mostly late, but a few MSA and ESA pieces were also noted.

The road to the Southern Farms was also inspected, as this would be the preferred route of a water pipeline from the Orange River. **No archaeological occurrences considered to be of cultural significance were noted along this pipeline route.**

The artefacts seen across the open veld constitute a low heritage potential. The more sensitive areas are below the koppies that lie immediately outside the footprint of the solar facility. None the solar layout alternatives would affect these archaeological sensitivities, and thus there would appear to be **no inhibitors to the solar installation from an archaeological perspective.** This is subject to the construction of the solar panels staying within the footprint area to avoid any damage to the denser scatters of white quartz, which are clearly visible below the koppies.

Based on results of the archaeological study the following mitigation measure has been recommended:

- Although there are no inhibitors to the installation on the proposed footprint from an archaeological perspective (no significant impact), **instructions should be given to the engineers to avoid these quartz scatter areas during the period of construction** (koppies are just outside the solar facility footprint), so as to prevent any destruction of the sites. The dense scatters of white quartz stand out, so they are easily recognisable, even to the non-specialist.

8.3 PALAEONTOLOGICAL STATEMENT

Dr. John Almond, of Natura Viva, compiled a Paleaontological Statement for the proposed Scuitdrift Solar Project development site (see **Appendix D, Annexure D5** for full report), from which the following is drawn:

The proposed development site is underlain by ancient Precambrian basement rocks (Schuitdrift Gneiss) that are approximately two to one billion years old and entirely unfossiliferous (Almond & Pether 2008). While alluvial gravels of the Orange River of Miocene and younger age are locally highly fossiliferous, these are highly unlikely to be found in the study area. The **palaeontological sensitivity of the Scuitdrift solar plant study area is accordingly assessed as VERY LOW.** As such, it is recommended that **no further palaeontological studies be required** in this instance.

Further to the abovementioned archaeological and palaeontological recommendations, the following mitigation measures are recommended:

- In the event that vegetation clearing and earthmoving activities expose archaeological or paleontological materials, such activities must stop and SAHRA (the heritage authority) must be notified immediately.
- If archaeological materials are exposed through earthmoving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer(s) and/or property owner(s).
- Unmarked human burials may occur anywhere in the landscape and are often exposed during earthmoving activities. Human remains are protected by law and, if older than 60 years, are dealt with by the State Archaeologist at the South African Heritage Resources Agency.

9 SUMMARY OF IMPACTS

The overall impact significance and confidence level of mitigation for the abovementioned aspects of the receiving environment are summarised below:

FLORA: The **loss of vegetation** will amount to considerably less than 20 ha and is **NOT SIGNIFICANT at the landscape scale** given the overwhelming intact nature of the receiving environment. **Erosion risk is likely to be LOW and provided that vegetation clearing is kept to a minimum.**

FAUNA: The **overall disturbance of the fauna will be TEMPORARY** and due to the floristically homogenous nature of the solar development site, is not locally significant from a faunal perspective. The **cumulative habitat loss** or landscape fragmentation impacts associated with the proposed solar development would be **LOW**.

The majority of potential impacts on flora and fauna associated with the development can be **mitigated to a LOW level** should the recommended mitigated measures be implemented.

AGRICULTURAL POTENTIAL: The proposed solar development site does not have any agricultural value and has not been utilized for any extensive agricultural purposes for many years. The development of the proposed solar facility will **NOT have a significant impact** on the agricultural potential of the farm. The **positive economic impacts** associated that the proposed solar development cannot be recovered from the current or potential agricultural activities. Considering the above a **low to medium negative impact** is envisaged should the no-go alternative, viz., where the *status quo* would remain, be implemented.

HERITAGE: The single grave (AP Nel, 1962) and two abandoned graves are **NOT considered to be of cultural significance**, and would not be affected through the proposed development.

Structures older than 60 years (farmstead and two associated outbuildings) are considered to be of **MODERATE – LOW cultural significance**. The solar development proposal will **NOT materially impact** on these heritage resources.

The proposed new water pipeline from Southern Farms / the Orange River to the solar site would **NOT impact on any heritage resource(s)** considered to be of cultural significance.

The solar proposal would relate to a landscape modification, however it would **NOT alter any natural or cultural landscape** of cultural significance. Thus it will **NOT negatively impact** any heritage resource, or the spatial relationships and associations between such resources (**NOT impact on visual-spatial environment**).

Overall, the heritage study concluded that the Preferred Alternative would **NOT negatively affect any heritage resources** on or within the proximity of the proposed solar development site. It was however recommended that the Preferred Alternative site layout be assessed in terms of its adherence to any heritage informants and indicators defined in the heritage report or possible input during the Public Participation Process.

ARCHAEOLOGY: The proposed solar installation will have **NO significant impact** on archaeological occurrences identified during the archaeological study on the development site. It is however recommended that the quartz scatter areas in proximity to the koppies (outside the solar facility footprint) must be demarcated as no-go areas.

PALAEONTOLOGY: The palaeontological sensitivity of the Scuitdrift solar plant study area is considered to be **VERY LOW**. As such, it is recommended that **NO further palaeontological studies** be required in this instance. In addition to the abovementioned recommendations the following mitigation measure must be considered:

In the event that vegetation clearing and earthmoving activities expose archaeological or paleontological materials, such activities must stop and SAHRA (the heritage authority) must be notified immediately.

If archaeological materials are exposed through earthmoving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer(s) and/or property owner(s).

Unmarked human burials may occur anywhere in the landscape and are often exposed during earthmoving activities. Human remains are protected by law and, if older than 60 years, are dealt with by the State Archaeologist at the South African Heritage Resources Agency.

10 PROCESS TO DATE

As part of the public participation process the following steps were taken to ensure compliance with the legislation and to allow ample opportunity for members of the public and key stakeholders to be involved and participate in the environmental process. Please see **Appendix E** for evidence of this Public Participation process. The Public Participation Process has been undertaken according to the requirements of the new NEMA EIA regulations. The following requirements i.t.o the scoping process have been undertaken and complied with in terms of Regulation 56:

Table 5: Summary of Public Participation Process to date.

CHRONOLOGY OF EVENTS	
DATE	ACTION
4 Nov'11	Notification was sent to the Landowner of Farm 426 informing him of the development proposal and the environmental process to be followed.
1 Dec'11	Notifications were sent to neighbouring landowners informing them of the development proposal and the environmental process, and inviting them to register as I&APs.
12 Dec. 2011	The Siyanda District Municipality and the Khai!Garib Local Municipality (which have jurisdiction over the area), as well as other organs of state (including SANParks, Northern Cape Nature Conservation, Department of Agriculture, Forestry & Fisheries, Department of Minerals and Energy, Department of Water Affairs, SAHRA, Eskom, Civil Aviation Authority etc.), were notified and registered as key stakeholders.
25 Nov. 2011	Advertisements were placed in a regional newspaper (<i>Die Plattelander</i>), calling for stakeholders to register as Interested & Affected Parties
31 Jan. 2012	Notice Boards (English & Afrikaans) were placed at the local municipal offices in Pofadder and in Kakamas.
Jan.2012	A Stakeholder Register was opened and the details of all registered stakeholders entered for future correspondence.
April 2012	Hard copies of the Draft Basic Assessment Report (DBAR) have been placed at the Khai!Garib Municipality offices (Kakamas) and the Khai-Ma Municipality offices (Pofadder), to inform the public of the proposal and EIA process, and invite them to review the document and provide comment (from Monday 23 April 2012 to Tuesday 5 June 2012). The DBAR has also been made available on the <i>Cape EAPrac</i> website: www.cape-eaprac.co.za/active
April 2012	Registered Stakeholders and I&APs were sent notifications informing that of the availability of the DBAR for a review and comment period of 40-days, extending from Monday 23 April to Tuesday 5 June 2012.

No issues or concerns have been raised by Interested and Affected Parties thus far in the environmental process. Comments received in response to the Draft Basic Assessment Report will be included in the Final Basic Assessment Report, to be submitted to the Department of Environmental Affairs (DEA) for consideration.

NOTE: The environmental Regulations make provision that as there are no substantive changes between the *Draft* Basic Assessment Report (DBAR) and *Final* Basic Assessment Report, the Final BAR can be submitted to the Department (DEA) without a further public comment period of

21-days (subject to approval by the delegated Authority). The FBAR will then be made available to the public for information purposes whilst the Department considers the report

11 CONCLUSION

Cape EAPrac is of the opinion that the information contained in this Draft Basic Assessment Report and the documentation attached hereto is sufficient to allow the general public and key stakeholders to apply their minds to the potential negative and /or positive impacts associated with the development, in respect of the activities applied for. The Scuitdrift Solar Project has been assessed from Ecological, Agricultural Potential, Heritage (incl. Visual-spatial), Archaeological and Palaeontological perspectives and found to have **medium to negligible negative impacts**, as well as **notable positive impacts**, should the preferred technologies and layout alternative be implemented. Sufficient mitigation has been recommended to reduce potential negative impacts to low levels and enhance positive impacts. We believe that the proposed Scuitdrift Solar Project will be sustainable in the long term and that the proposed development will be an asset to the Skuitdrift area, Northern Cape region and the broader South African society through supplementing the electricity supply for the National Eskom Grid.

This Draft Basic Assessment Report is made available for stakeholder review and comment for a period of 40-days, extending from Monday **23 April 2012 to Tuesday 5 June 2012**. All comments received, will be considered and addressed, and feedback will be provided to registered stakeholders.

Following this comment period, the Final Basic Assessment Report will be prepared. Should the Final BAR include significant amendments to this Draft BAR, it will once again be made available to registered Interested and Affected Parties (I&APs) for comment, for a further 21 day period. Should the amendments include only minor changes to this Draft BAR, the Final BAR will be submitted directly to the Department of Environmental Affairs (DEA) and only be made available for stakeholder information purposes. Whatever the case, all registered stakeholders will be kept informed throughout the remainder of the environmental process.

All stakeholders are requested to review this Draft BAR and the associated appendices, and provide comment, or raise issues of concern, directly to *Cape EAPrac* within the specified 40-day comment period.

Comments must be submitted, in writing, to the following address no later than 5 June 2012

Cape Environmental Assessment Practitioners

Att: **Mrs. Siân Holder**

PO Box 2070, George, 6530

Fax: 044-874 0432 or Email: sian@cape-eaprac.co.za

ABBREVIATIONS

AIA	Archaeological Impact Assessment
BGIS	Biodiversity Geographic Information System
CDSM	Chief Directorate Surveys and Mapping
CEMPr	Construction Environmental Management Programme
DEA	Department of Environmental Affairs
DEA&NC	Department of Environmental Affairs and Nature Conservation
DME	Department of Minerals and Energy
EAP	Environmental Impact Practitioner
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GPS	Global Positioning System
GWh	Giga Watt hour
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
ANP	Augrabies National Park
kV	Kilo Volt
LUDS	Land Use Decision Support
LUPO	Land Use Planning Ordinance
MW	Mega Watt
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
PM	Post Meridiem; "Afternoon"
SACAA	South African Civil Aviation Authority
SAHRA	South African National Heritage Resources Agency
SANBI	South Africa National Biodiversity Institute
SANS	South Africa National Standards
SDF	Spatial Development Framework

**SECTION 1:
BASIC ASSESSMENT
REPORT**



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT FORM

(For official use only)

File Reference Number:

12/12/20/2604

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES	NO
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If YES, please complete the form entitled “Details of specialist and declaration of interest” for appointment of a specialist for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

1 ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail⁴:

The Applicant intends to develop a **solar energy facility** with a generation capacity not exceeding **10MW** (Megawatt). The proposed Scuitdrift Solar Project is to be located on a development site of approximately 45ha on Farm 426 Skuitdrift, Northern Cape, and will consist of the following:

A **series of single-axis tracker Concentrated Photovoltaic (CPV) solar arrays**, which will cover an approximate footprint of 17 hectares.

Associated infrastructure, with an approximate footprint of 2ha, will include to the following:

- **10 x inverter stations** (built within transporter containers, 25m² in size);
- an **on-site substation** (including a transformer to allow the generated power to be connected to Eskom’s electricity grid);
- a short **distribution power line** to distribute the generated electricity from the on-site substation to the existing Schuitdrift Eskom substation;
- **auxiliary buildings**, including:
 - administration / security offices (approximately 10m x 10m),
 - ablution & workshop (approximately 20m x 20m) and
 - storage area (approximately 20m x 10m).
- an **internal electrical reticulation network** (underground cables);
- an **internal road / track network**;
- **10kLt rainwater tanks**; and
- **parameter fencing** around the solar facility.

2 FEASIBLE AND REASONABLE ALTERNATIVES

“**alternatives**”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After

⁴ Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Paragraphs 3 – 13 below should be completed for each alternative.

3 ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

Alternative:

Latitude (S):

Longitude (E):

Alternative S1⁵ (preferred or only site alternative)

28°	36′	46.58″	19°	46′	49.41″
o	′		o	′	
o	′		o	′	

Alternative S2 (if any)

Alternative S3 (if any)

In the case of linear activities:

Alternative:

Latitude (S):

Longitude (E):

Alternative S1 (preferred or only route alternative)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

o	′	o	′
o	′	o	′
o	′	o	′

Alternative S2 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

o	′	o	′
o	′	o	′
o	′	o	′

Alternative S3 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

o	′	o	′
o	′	o	′
o	′	o	′

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

4 PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:

Size of the activity:

Alternative A1⁶ (initial concept)

>20 hectares

Alternative A2 (cast foundations & scattered layout)

>20 hectares

Alternative A3 (preferred activity & layout)

>20 hectares

or, for linear activities:

Alternative:

Length of the activity:

Alternative A1 (preferred activity alternative)

m

Alternative A2 (if any)

m

⁵ “Alternative S..” refer to site alternatives.

⁶ “Alternative A..” refer to activity, process, technology or other alternatives.

Alternative A3 (if any)

m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Size of the site/servitude:

Alternative A1 (initial concept)	45ha
Alternative A2 (cast foundations & scattered layout)	45ha
Alternative A3 (preferred activity & layout)	45ha

5 SITE ACCESS

Does ready access to the site exist?

YES	NO
m	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Access to the site will be via national, provincial and local roads. The access roads to the site will be from Pofafdder or Kakamas, along the N14. This is a tarred national road and no alterations should be necessary to handle construction traffic and traffic involved in the operation phase. The access road to the Scuitdrift Farm 426 from the N14 (Nous turnoff) has been confirmed as two divisional roads, the R359 and DR3256 which fall under the Siyanda District Municipality. It is unlikely that any upgrades will be required for these roads, as they are in good condition.

The existing farm road to the solar site may require some alterations (e.g. widening of corners etc.), due to the dimensional requirements of the loads to be transported during the construction phase (i.e. transformers of the onsite substation). Permission from the local authorities will be sought obtained in this regard if required.

The existing farm access road (less than 4m wide) will be used to access the solar development site. To avoid fragmenting the preferred solar array layout, the existing access road to the homestead and Eskom substation will then be diverted to the immediately north and around the solar facility, outside the parameter security fence. Three options exist for this road realignment:

- following the parameter security fence around the solar facility to link up with the road original alignment between the facility of the Schuitdrift Substation;
- following the parameter fence to the north of the facility to link with and align along the existing Eskom servitude below the 132kV transmission line; and
- following the parameter fence to the north of the facility to link with and align along the existing farm road to the north of the 132kV Eskom transmission line.

The landowner and Eskom have provided consent for the proposed road re-alignment (see Appendix G, Annexure G3), however the preferred alignment option will be confirmed in consultation with Eskom during the final design phase.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

6 SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;

- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8 metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - rivers;
 - the 1:100 year flood line (where available or where it is required by DWA);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.11 the positions from where photographs of the site were taken.

7 SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

8 FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

9 ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

- What is the expected capital value of the activity on completion?
- What is the expected yearly income that will be generated by or as a result of the activity?
- Will the activity contribute to service infrastructure?
- Is the activity a public amenity?
- How many new employment opportunities will be created in the development phase of the activity?
- What is the expected value of the employment opportunities during the development phase?
- What percentage of this will accrue to previously disadvantaged individuals?

CAPEX = R+/- 300 million (dependant on exchange rate, technology alternatives etc.)	
Confidential	
YES	NO
YES	NO
Contractor staff = +/- 100 – 200 people, of which +/- 80 – 100 will be local labour.	
Capital value of construction phase labour = +/- R 10 – 15 million. Approximately half of this amount (5 million) is likely to be invested in locally sourced labour	
Contractor staff = +/- 30 - 40% PDIs. Locally sourced labour = +/- 90% PDIs.	

How many permanent new employment opportunities will be created during the operational phase of the activity?

Between 10 & 40 people will be employed during the operational phase, made up of the following:

- +/- 30PV panel cleaners, one day per month.
- 2 security personnel on site, at all times, working in shifts.
- +/- 2 technical staff who will visit as and when required.

Note: the 2 security staff will be on site on a daily basis (working in shifts). All other personnel will be driven to site from nearby towns & accommodation to conduct any work required.

What is the expected current value of the employment opportunities during the first 10 years? What percentage of this will accrue to previously disadvantaged individuals?

+/- R700 000 per annum = +/- 7 million over ten years.

50 - 70%

9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

NEED:			
1.	Was the relevant provincial planning department involved in the application?	YES	NO
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES	NO
3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation: A land use change application for the rezoning of 45ha will be lodged at the Kai !Garib Local Municipality, in accordance with the Northern Cape Planning and Development Act (Act 7 of 1998). Parallel to the rezoning application, a long term lease application will be lodged at the National Department of Agriculture, in accordance with the Subdivision of Agricultural Land Act (Act 70 of 1970).		

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	YES	NO
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES	NO
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES	NO
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation: The local regional Integrated Development Plan (IDP) and Spatial Development Framework (SDF) call for opportunities for the creation of jobs. Up to 200 employment opportunities will be created during the construction phase (contractors and locally sourced labour), and between 10 and 40 new operational phase job opportunities will be created. Note that the Solar facility and on-site substation are to comprise a partially automated system. As such, all operational phase jobs (e.g. security, technical staff, controllers etc.) will constitute shift-work (no persons will live on site). The landowner currently utilises the larger portion of the farm for extensive grazing of livestock, while the north-western area, bordering the Orange River, is under irrigated vineyards. The south-eastern portion of the farm (on which the proposed solar site is located) is not currently utilised for livestock grazing. As such, no grazing land (that is currently utilised) will be lost due to construction of the proposed solar facility. The benefits to the broader Northern Cape, and broader South African, society of generating much needed		

	electricity, by means of a sustainable energy source (sun), which is fed into the National Electricity Grid, far outweighs any potential negative impacts on the biophysical environment of the property.		
5.	Will the proposed land use / development impact on the sense of place?	YES	NO
6.	Will the proposed land use / development set a precedent?	YES	NO
7.	Will any person's rights be affected by the proposed land use / development?	YES	NO
8.	Will the proposed land use / development compromise the "urban edge"?	YES	NO
9.	<p>If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.</p> <p>This solar facility is proposed in an area which has optimal characteristics for solar developments, i.e.:</p> <ul style="list-style-type: none"> - Availability of land for renewable energy; - Excellent solar irradiation in the Northern Cape; - Flat terrain, with low ecological and heritage sensitivity, as well as poor agricultural potential; - Proximity to an existing substation and transmission line with sufficient capacity to receive electricity to be generated; - Proximity to existing access routes and road networks; - Availability of water. <p>The abovementioned characteristics speak to the significant potential of the land for solar energy facilities, albeit remote. It is therefore likely that similar solar-energy development may be proposed.</p> <p>The proposed development fall outside the urban edge of the nearest urban centre – Kakamas, some 100km away.</p>		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	YES	NO
2.	<p>Explain:</p> <ul style="list-style-type: none"> - This Solar-energy facility will contribute "clean-electricity" to the national electrical grid, which is currently under enormous pressure. The national grid currently relies heavily of coal for electricity generation, has associated pollution and climate-change repercussions. - This renewable energy development will make effective and sustainable use of land, which has a poor agricultural potential and low ecological and heritage sensitivity. <p>In terms of the above, renewable energy projects under the Independent Power Producer (IPP) Procurement Programme, are treated as Strategically Important Developments ("SIDs"), due to their potentially significant contribution to the national economy.</p>		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES	NO
4.	<p>Explain:</p> <ul style="list-style-type: none"> - The owner of Farm 426 Skuitdrift will benefit financially in terms of a lease contract with the Applicant/Developer for the use of a portion of his property (lease agreement for 45ha) for the construction and operation of the proposed solar facility. - Local supply chains should be employed for goods and services required during the construction phase, which have a capital contribution / benefit to the local economy of the region. - A number of temporary jobs may also be provided during the construction phase, and permanent jobs during the long-term operational management phase of the proposed PV plant (e.g. for washing, site security, and for maintenance of the solar panels). - Potential upgrades to existing infrastructure e.g. local roads, transmission lines etc. 		

10 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
United Nations Framework Convention on Climate Change (UNFCC)	United Nations	1994
International Finance Corporation (IFC) Environmental, Health & Safety (EHS) Guidelines – for Transmission lines and distribution.	World Bank	2007
The White Paper on Renewable Energy	Department of Energy	2003
National Climate Change Response Green Paper	Department of Energy	2010
Integrated Resource Plan for Electricity	Department of Energy	2010
NERSA – Rules on selection criteria for renewable energy projects under the REFIT Programme	Department of Energy	
IPP Procurement Programme	Department of Energy	2011
Northern Cape Provincial Spatial Development Framework (PSDF)	Northern Cape Provincial Government	To be confirmed
Kai!Garib Draft Spatial Development Framework (SDF)	Kai!Garib Municipality	To be confirmed
Kai!Garib Municipality Integrated Development Plan (IDP)	Kai!Garib Municipality	To be confirmed
Land Use Planning Ordinance (LUPO)	Kai!Garib Municipality & Department of Agriculture	1985
Subdivision of Agricultural Land Act (Act No.70)	Kai!Garib Municipality & Department of Agriculture	1970
National Environmental Management Act (NEMA, Act 107)	DEA and Northern Cape Ministry of Environmental Affairs & Nature Conservation	1998
National Environmental Management: Biodiversity (NEM:BA, Act 10)	DEA and Northern Cape Ministry of Environmental Affairs & Nature Conservation	2004
National Protected Area Expansion Strategy (NPAES) for South Africa	Northern Cape Ministry of Environmental Affairs & Nature Conservation / SANParks	2010
Biodiversity Summary Project (SANBI BGIS) : Siyanda District Municipality	National Biodiversity Institute Siyanda District Municipality	Unknown
National Heritage Resources Act (NHRA, Act No. 25)	South African Heritage Resource Association (SAHRA)	1999
National Water Act (Act No. 36)	Department of Water Affairs (DWA): Northern Cape	1998
National Forest Act (Act No. 84)	Department of Agricultural, Forestry & Fisheries	1998
Conservation of Agricultural Resources Act (Act No.43)	Department of Agriculture, Forestry & Fisheries (DAFF)	1983
Northern Cape Nature Conservation Act (Act. No.9)	Northern Cape Ministry of Environmental Affairs & Nature Conservation / SANParks	2009
Nature and Environmental Conservation Ordinance (Act. No. 19)	Northern Cape Ministry of Environmental Affairs & Nature Conservation / SANParks	1974
Various DEA and DEA&DP guidelines guiding the Environmental Impact Assessment process (see Section 3.7 & Reference List of Main Report below for details)	DEA and Northern Cape Ministry of Environmental Affairs & Nature Conservation	2005 - 2011
Please refer to Reference List for further Guidelines referred as part of this Application		

11 WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
-----	----

If yes, what estimated quantity will be produced per month?

5m ³ per month = 30m ³ in total (over a 6 month period)

How will the construction solid waste be disposed of (describe)?

All construction waste will be temporarily stored on site in appropriate containers and transported off-site on an ad-hoc basis by the appointed construction contractor/s, as per directives contained in the EMPr (Appendix F).

Where will the construction solid waste be disposed of (describe)?

All construction waste will be transported off-site by the appointed construction contractor(s), and will be disposed of at an appropriately licensed Municipal landfill site (in Kakamas), as per directives contained in the EMPr (Appendix F).
--

Will the activity produce solid waste during its operational phase?

YES	NO
m ³	

If yes, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

--

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

--

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO
-----	----

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
-----	----

If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
-----	----

If yes, what estimated quantity will be produced per month?

m ³

Will the activity produce any effluent that will be treated and/or disposed of on-site?

YES	NO
-----	----

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
-----	----

If yes, provide the particulars of the facility:

Facility name:		
Contact person:		
Postal address:		
Postal code:		
Telephone:	Cell:	
E-mail:	Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

--

The operation & maintenance buildings will be fitted with a rainwater collection and storage system (2 x 10 000lt tanks) to supply water to all the taps and toilets in this building, as well as any outdoor requirements (landscaping, washing etc.). This water will also be used to supplement the cleaning of the solar panels as required.

The toilets to be installed in the operation buildings of the solar facility will be fitted with dual flush systems to save water. All taps to be installed in this building will also be fitted with low-flow faucets, which use aerators to reduce the flow of the water.

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO
YES	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

11(d) Generation of noise

Will the activity generate noise?

YES	NO
YES	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

12 WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	water board	Groundwater Existing boreholes	Orange River Water under water- rights of Southern Farms	Rainwater 2 x 10lt rainwater tanks	the activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

- Approximately 333 kilo litres per month = 6kl for 6month construction period.
- Approximately 3 kilo litres per day during operation for the cleaning of the solar panels.

Does the activity require a water use permit from the Department of Water Affairs?

YES	NO
-----	----

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

An Application for the registration of the existing farm boreholes will be submitted to the Department of Water Affairs.

A motivation for General Authorisation will be submitted for the use of the borehole water for the purposes of the solar facility. Conditions of the General Authorisation Notice No.1199 (18 Dec.2009) will be adhered to for this activity.

The exact amount of groundwater required to wash the solar panels will vary somewhat, according to season, weather. Borehole water for washing the panels will be transported to the solar site using water-trucks. The panels will be washed manually and as such no pollution of surface and/or ground water will occur as a result of such washing of dust off the panels.

The quantity of water required for washing of the panels (and for other operational phase requirements) is well within the General Authorisation in terms of Government Notice No. 399, which was promulgated in terms of the National Water Act, 1998 (NWA) (Act No. 36 of 1998) on 26 March 2004.

The Department of Water Affairs has been registered as a key stakeholder and has been requested to review this report and provide guidance in this regard.

13 ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

It is envisioned that an **air conditioning system** may be installed in the operations/maintenance building. It is recommended that **solar cooling systems**, such as **absorption** or **adsorption** chillers, should be used as opposed to conventional air conditioning units. The appointed electrical and mechanical engineers should give input into this.

Energy saving lighting fixtures be used throughout the entire development. No incandescent lights should be used and all security lights should be controlled with motion sensors. Only **Compact Fluorescent Lights (CFL)**, **Sodium Vapour (SV) lamps** or **Light Emitting Diode (LED)** will be utilised. **NO** external **High Pressure Sodium (HPS)** or **Metal Halide (MH)** spot or floodlights are to be installed.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The entire development is an alternative energy facility.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc.) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?

YES NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property description / physical address:

The proposed Scuitdrift Solar Project is to be located on a portion of **Farm 426, Skuitdrift** in the Northern Cape – approximately 100km west of the town of Kakamas. The farm Skuitdrift is situated approximately 30km northwest of the N14 between Pofadder and Kakamas.

The leasable development site consists of an approximate 45ha portion of the +/- 8019ha farm and is located directly east of the existing Scuitdrift Substation (see Appendix A for location plans). The preferred solar layout is situated within the 45ha envelope, in the southern section of this development area, and covers a footprint of less than 20ha.

The proposed development area is an even, gently sloping plain on coarse red sands, dissected by shallow, anatomising washes. Scattered trees occur across the site, but tend to occur in higher densities along the washes.

According to the national vegetation map (Mucina & Rutherford 2006), the site lies within the **Blouputs Karroid Thornveld vegetation type**. Blouputs Karroid Thornveld occurs as a belt of irregular flat areas from the vicinity of Augrabies Falls in the east to Kotie se Laagte and Samoep se Laagte in the west. The vegetation type is listed as **Least Threatened** and less than 1% has been transformed

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use zoning: **Agriculture**

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

YES	NO
YES	NO

Must a building plan be submitted to the local authority?

Locality map: An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

1 GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

2 LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

- 2.1 Ridgeline
- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- 2.5 Open valley
- 2.6 Plain
- 2.7 Undulating plain / low hills**
- 2.8 Dune
- 2.9 Seafront

3 GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

Note: The geology of the area has been identified as being underlain by ancient Precambrian basement rocks – the **Schuitdrift Gneiss (Nsc)** that belong to the **Namaqua-Natal Province** of Mid Proterozoic (Mokolian) age. The Precambrian basement rocks within the study area are mantled with a spectrum of other coarse to fine-grained **superficial deposits** such as rocky soils, downwasted gravels, colluvium (slope deposits), sheet wash, and alluvium of intermittently flowing streams. These deposits are generally young (Quaternary to Recent) and largely unfossiliferous. It is considered unlikely that significant deposits of Late Tertiary **Orange River alluvial gravels** are present within this area, and none are mapped here on the 1: 250 000 Pofadder geology sheet (Almond, 2012 – See Appendix D, Annexure D5).

4 GROUNDCOVER

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

The site lies within the **Blouputs Karroid Thornveld** vegetation type. Blouputs Karroid Thornveld, which is classified as **Least Threatened**. Several different habitats and plant communities are evident at the site, including plant communities associated with rocky plains, sandy plains, drainage lines and rocky outcrops. Within the development area, however the vegetation is homogenous and apart from several small washes, there was little differentiation of the vegetation (Todd, 2012 – see Appendix D, Annexure D1 for Ecological Impact Assessment).

5 LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area	5.22 Train station or shunting yard ^N
5.2 Low density residential (farm houses)	5.23 Railway line ^N
5.3 Medium density residential	5.24 Major road (4 lanes or more) ^N
5.4 High density residential	5.25 Airport ^N
5.5 Informal residential ^A	5.26 Harbour
5.6 Retail commercial & warehousing	5.27 Sport facilities
5.7 Light industrial	5.28 Golf course
5.8 Medium industrial ^{AN}	5.29 Polo fields
5.9 Heavy industrial ^{AN}	5.30 Filling station ^H
5.10 Power station	5.31 Landfill or waste treatment site
5.11 Office/consulting room	5.32 Plantation
5.12 Military or police base/station/compound	5.33 Agriculture
5.13 Spoil heap or slimes dam ^A	5.34 River, stream or wetland
5.14 Quarry, sand or borrow pit	5.35 Nature conservation area
5.15 Dam or reservoir	5.36 Mountain, koppie or ridge
5.16 Hospital/medical centre	5.37 Museum
5.17 School	5.38 Historical building
5.18 Tertiary education facility	5.39 Protected Area
5.19 Church	5.40 Graveyard
5.20 Old age home	5.41 Archaeological site
5.21 Sewage treatment plant ^A	5.42 Livestock grazing

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:

If YES, specify:

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:

If YES, specify:

6 CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO
	Uncertain	

If YES, explain: **NO significant archaeological occurrences were found on the site, however dense scattered quartz pieces were found outside the development site around the nearby ridgeline / koppie – to be avoided by the solar installation.**

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of specialist: The artefacts seen across the open veld constitute a **low heritage potential**. The more sensitive areas are below the koppies that lie immediately outside the footprint of the solar facility. Thus, there would appear to be **no inhibitors to the solar installation from an archaeological perspective**, but construction of the solar panels should stay within the footprint area to avoid any damage to the denser scatters of white quartz, which are clearly visible below the koppies.

Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

Note: An Integrated Heritage Impact Assessment (Heritage, Archaeology & Palaeontology) has been submitted to SAHRA) as the proposed site exceeds 5000m² in extent (refer to **Appendix D, Annexures D3, 4 &5**).

SECTION C: PUBLIC PARTICIPATION

1 ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;

Refer to Appendix E for photographs of Notices placed in publically accessible places (Kakamas & Pofadder).

- (b) giving written notice to—

- (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
- (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
- (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
- (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
- (v) the municipality which has jurisdiction in the area;
- (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
- (vii) any other party as required by the competent authority;

Refer to Appendix E for copies of Notification Letters sent to relevant Stakeholders.

- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

Refer to Appendix E for proof of advertisements placed in Die Plattelander newspaper (25 Nov. 2011).

- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

2 CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be; applied to the application, in the case of an application for environmental authorisation;
 - (iii) the nature and location of the activity to which the application relates;
 - (iv) where further information on the application or activity can be obtained; and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

Refer to Appendix E for photographs of Notices and proof of Advertisement in Die Plattelander newspaper (25 Nov. 2011).

3 PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which

representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

Refer to Appendix E for photographs of Notices and proof of Advertisement in Die Plattelander newspaper (25 Nov. 2011).

4 DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5 COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

6 AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

List of authorities informed:

	Department of Environmental Affairs
	Kai!Garib Municipality – Major, Municipal Manager & relevant Ward Councillors
Mariagrazia Galimberti	SAHRA
Nosie Mazwi	Department of Water Affairs: Northern Cape
Anneliza Collet	National Department of Agriculture, Forestry & Fisheries: Land Use & Soil Management Directorate
Cynthia Fortune	Provincial Department of Agriculture
Moleko Deneo	Department of Environmental Affairs & Nature Conservation
Peter Novellie	South African National Parks: Head Office Manager: Conservation Support Services
Elizabeth Mhlango	South African National Parks: Lower Orange Conservation Area
Steven Smit	Augrabies Falls National Park: Park Manager
Rene de Kock	SANRAL - Western Region
Niel Joubert	Provincial Roads
Brian Stander	National Department of Transport & Public Works

Danie Stander	Department of Health
Noma Qase	Department of Minerals & Energy: Director: Renewable Energy
Lisel Stroh	South African Civil Aviation Authority

List of authorities from whom comments have been received:

F. Mokoma	National Dept. of Agriculture, Forestry & Fisheries
Mariagrazia Galimberti	SAHRA
René de Kock	SANRAL

7 CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?

YES **NO**

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

National Dept. of Agriculture, Forestry & Fisheries	Please provide title deed, motivation and layout plan of the property.
SAHRA	Heritage Impact Assessment must be done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation.
SANRAL	No comment with regard the proposed Skuitdrift Solar Energy Facility, on Farm 426, Skuitdrift, Northern Cape, as a national road will not be affected.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1 ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

Heritage resources on site – An integrated Heritage Impact Assessment (incl. heritage, archaeological & palaeontological input) has been undertaken and submitted to SAHRA. Findings of HIA, as follows:
 Heritage – No material impact on heritage resources;
 Visual – Development will not negatively impact on visual-spatial environment;
 Archaeology – no inhibitors to the solar installation from an archaeological perspective;
 Palaeontology - palaeontological sensitivity of the Scuitdrift Solar Project study area is accordingly assessed as VERY LOW.

At this point in the environmental process, of the approximate 30 registered Interested & Affected Parties (I&APS) registered, only SAHRA and SANRAL has provided formal comment, while the Department of Agriculture has requested information (see **Appendix E** for comment and response sheet).

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

Above details included in the Integrated HIA submitted to SAHRA by the Heritage Practitioner.

2 IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

Please Note:

Please refer to **Section 3 of the Executive Summary** above for a detailed description of the technological alternatives considered and how these have informed the design, and exclusion, of layout alternatives. The Preferred Alternative has been designed to be the more economically viable, practical, and environmentally sensitive option.

The Direct, Indirect and Cumulative impacts associated with the Alternative 2 & Preferred solar technological / layout alternatives are the same, with some only varying in terms of intensity / magnitude. The impacts associated with the Preferred Alternative – Alternative 3 are considerably reduced than those associated with Alternative 2, and thus it is considered the favourable development option.

The construction and decommissioning phases will have similar impact in terms of disturbance, as well as associated mitigation measure for avoidance and rehabilitation. It is however unlikely that this solar facility will be completely decommissioned and closed.

Appropriate mitigation measures, which may eliminate, reduce or manage any potential impacts of the construction, operational, and decommissioning phases of the proposed PV plant are included in the EMP_r for the project, which is attached as **Appendix F** to this DBAR

CONSTRUCTION & DECOMMISSIONING PHASES

Layout Alternative 3 – PREFERRED

Direct impacts:

- **Physical Transformation & Agricultural Potential**

Less than 20ha of flat grass and shrub-covered plain, on Farm 426, Skuitdrift will be transformed into a 10MW solar facility.

The proposed solar facility will NOT have a significant impact on the agricultural potential of the farm. The positive economic impacts associated that the proposed solar development cannot be recovered from the current or potential agricultural activities. Considering the above a low to medium negative impact is envisaged should the no-go alternative, viz., where the status quo would remain, be implemented.

- **Heritage**

The Preferred Alternative would NOT negatively affect any heritage resources on or within the proximity of the proposed solar development site.

- **Archaeological**

The proposed solar installation will have NO significant impact on archaeological occurrences identified during the archaeological study on the development site.

- **Palaeontological**

The palaeontological sensitivity of the Scuitdrift solar plant study area is considered to be VERY LOW. As such, it is recommended that NO further palaeontological studies be required in this instance.

- **Ecological**

Loss of plant cover as a result of vegetation clearing for roads, panel support structures and the other infrastructure of the development. The **rammed pier footings** associated with the Preferred Alternative will allow vegetation clearing to be kept to an absolute minimum and ground cover to remain intact - only vegetation trimming and minor clearing along the internal road and tracks. The majority of the vegetation clearing will be required for the step-up substation and auxiliary buildings.

Increased levels of noise, pollution, disturbance and human presence will be detrimental to fauna. Shy mammals would move away from the area particularly during the construction phase as a result of the noise and human activities present. Some mammals and reptiles such as tortoises would be vulnerable to illegal collection or poaching during the construction phase as a result of the large number of construction personnel that are likely to be present.

Direct impact of the development on avifauna would result from habitat loss as well as electrocution and collisions with transmission lines, which is a particular problem for many larger birds such as eagles, flamingos, cranes and bustards.

- **Socio-economic – positive impacts**

Job creation: +/- 100 – 200 employment opportunities will be created during the construction and decommissioning phase, of which +/- 80 – 100 will be locally sourced labour.

Financial gains for the landowner from in terms of the lease agreement, which will benefit the agricultural activities occurring elsewhere on the Farm 426.

Benefit local supply chains should be employed for goods and services required during the construction phase, which have a capital contribution / benefit to the local economy of the region.

Potential upgrades to existing infrastructure e.g. local roads, transmission lines etc.

- **Waste & Contamination**

Potential contamination of soil from concrete spills. The solar array foundations of the Preferred Alternative will require minimal concrete, as opposed to the concrete cast foundation associated with Alternative 2. All concrete will be batched and handled according to the recommendations of the EMPr.

Indirect impacts:

- **Ecological**

Loss of connectivity of the landscape for fauna resulting from vegetation, clearing as well as security fencing. Furthermore, since most such mammals have home ranges which exceed the extent of the site, any mammals trapped within the site would probably not have sufficient resources present to be able to support themselves.

Increased erosion risk as a result of soil disturbance and loss of plant cover.

Increased risk of alien plant invasion resulting from disturbance during construction.

Loss of vegetation cover may impact sensitive plant communities, endangered or protected plant species or result in habitat loss for sensitive fauna.

Indirect impacts of the development on avifauna would result from habitat loss as well as electrocution and collisions with transmission lines, which is a particular problem for many larger birds such as eagles, flamingos, cranes and bustards

Cumulative impacts:

Due to the characteristics of the areas being optimal for solar-electrical generation developments, it is likely that similar project may take advance of this context.

At this point, another solar development (75 MW) is proposed in the vicinity of the Scuitdrift Solar Project site, with the intension of connecting to the Schuitdrift Substation. In terms of the biophysical environment, the limited nature of the current development and the proximity to existing infrastructure and human disturbance suggests that the contribution of the current development to cumulative habitat loss or landscape fragmentation impacts would be low.

Mitigation Measures:

Archaeological & Palaeontological

- The quartz scatter areas in proximity to the koppies (outside the solar facility footprint) must be demarcated as no-go areas.
- In the event that vegetation clearing and earthmoving activities expose archaeological or paleontological materials, such activities must stop and SAHRA (the heritage authority) must be notified immediately.
- If archaeological materials are exposed through earthmoving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer(s) and/or property owner(s).
- Unmarked human burials may occur anywhere in the landscape and are often exposed during earthmoving activities. Human remains are protected by law and, if older than 60 years, are dealt with by the State Archaeologist at the South African Heritage Resources Agency

Ecological:

- Soil disturbance and vegetation clearing to be kept to a minimum. Where possible the ground grass layer must be left intact and only the larger woody plants trimmed or cleared.
- All areas to be cleared should be clearly demarcated.
- Sensitive areas within or near the development area should be demarcated as no-go areas.
- Only those individuals of protected plant species directly affected by the development footprint may be cleared (three *A. erioloba* trees).
- Sensitive areas, such as the washes should be demarcated at the site by an ecologist as part of the pre-construction activities for the site.
- Regular monitoring to ensure that alien plants are not increasing as a result of the disturbance that has taken place.
- Wherever possible, roads and tracks should be constructed so as to run along the contour.
- All roads and tracks running down the slope must have water diversion structures present.
- Any extensive cleared areas that are no longer or not required for construction activities should be re-seeded with locally-sourced seed of suitable species. Bare areas can also be packed with brush removed from other parts of the site, encourage natural vegetation regeneration and limit erosion.
- All construction vehicles should remain on properly demarcated roads. No construction vehicles should be allowed to drive over the vegetation except where no cleared roads are available. In such cases a single track should be used and multiple paths should not be formed.
- Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO.
- The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. The rocky outcrops are particularly sensitive in this regard and construction personnel should not be allowed off of the construction site and onto these areas.
- Fires should only be allowed within fire-safe demarcated areas.
- No fuelwood collection should be allowed on-site.
- No dogs should be allowed on site.
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental cement, chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.

- Fencing should be constructed in manner which allows for the passage of small and medium sized mammals. Steel palisade fencing (20 cm gaps min) is a good option in this regard as it allows most medium-sized mammals to pass between the bars, but remains an effective obstacle for humans. Alternatively the lowest strand or bottom of the fence should be elevated to 15 cm above the ground at least at strategic places to allow for fauna to pass under the fence.
- If electrified strands are to be use, there should be no strands within 20 cm of the ground because tortoises retreat into their shells when electrocuted and eventually succumb from repeated shocks.
- The powerline should be placed underground where possible and it's length of any new power lines that need to be installed should be kept to a minimum.
- Ensure that all new lines are marked with bird flight diverters along their entire length. If the new lines were to run parallel to existing unmarked lines this would potentially create a net benefit as this could reduce the collision risk posed by the older line.
- All new power line infrastructure should be bird-friendly in configuration and adequately insulated (Lehman et al. 2007).

OPERATION PHASE

Layout Alternative 3 – PREFERRED

Direct impacts:

- **Transformation & Agricultural Potential**

Less than 20ha of flat grass and shrub-covered plain, on Farm 426, Skuitdrift will be transformed into a 10MW solar facility.

The proposed solar facility will NOT have a significant impact on the agricultural potential of the farm. The positive economic impacts associated that the solar development cannot be recovered from the current or potential agricultural activities.

- **Heritage**

The Preferred Alternative would NOT negatively affect any heritage resources on or within the proximity of the solar site.

- **Archaeological**

The proposed solar installation will have NO significant impact on archaeological occurrences identified during the archaeological study on the solar site.

- **Palaeontological**

The palaeontological sensitivity of the Scuitdrift solar plant study area is considered to be VERY LOW. As such, it is recommended that NO further palaeontological studies be required in this instance – no impacts.

- **Biophysical**

Reptile abundance in the development area could increase as a result of increased habitat diversity as well as a protective effect of the panels on reptiles from avian predators.

Large and medium mammals becoming trapped within the fenced solar facility area.

Potential electrocution and collision by birds on overhead power line.

Positive impact of electricity supplement to the national grid generated by a renewable resource - solar.

- **Socio-economic**

Job creation: +/- 10 – 40 employment opportunities will be created during the operational phase, for solar panel cleaning, security guards & technical work of which +/- 32 will be locally sourced labour.

Financial gains for the landowner from in terms of the lease agreement, which will benefit the agricultural activities occurring elsewhere on the Farm 426.

Benefit local supply chains should be employed for goods and services for sourcing spares and parts required during the operation phase, which have a capital contribution / benefit to the local economy of the region.

Potential upgrades to existing infrastructure e.g. local roads, transmission lines etc.

Indirect impacts:

Increased risk of alien plant invasion resulting from disturbance from maintenance activities during operation.

Cumulative impacts:

Due to the characteristics of the areas being optimal for solar-electrical generation developments, it is likely that similar project may take advance of this context.

At this point, another solar development (75 MW) is proposed in the vicinity of the Scuitdrift Solar Project site, with the intension of connecting to the Schuitdrift Substation. In terms of the biophysical environment, the limited nature of the current development and the proximity to existing infrastructure and human disturbance suggests that the contribution of the current development to cumulative habitat loss or landscape fragmentation impacts would be low.

Mitigation Measures:

Archaeological & Palaeontological

- The quartz scatter areas in proximity to the koppies (outside the solar facility footprint) must be demarcated as no-go areas.

Ecological

- Any vegetation clearing that needs to take place as part of maintenance activities, should be done in an environmentally friendly manner, including avoiding the use of herbicides and using manual clearing methods wherever possible.
 - All alien plants present at the site should be controlled annually using the best practice methods for the species present.
 - Bare soil should be kept to a minimum and at least some grass or low shrub cover should be encouraged under the panels
 - Regular monitoring for erosion to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. All erosion problems observed should be rectified as soon as possible.
 - All maintenance vehicles to remain on the demarcated roads.
 - No unauthorized persons should be allowed onto the site.
 - Staff present during the operational phase should receive environmental education so as to ensure that that no hunting, killing or harvesting of plants and animals occurs.
 - Ensure that no larger fauna enter and become trapped within the fenced-off area, either by leaving a gate open so that animals can move freely between the site and the adjacent farm or by keeping all gates closed to ensure that they are excluded.
 - The powerline should be placed underground where possible and it's length of any new power lines that need to be installed should be kept to a minimum.
 - Ensure that any maintenance on the transmission infrastructure of the site retains the bird-friendly design features.
 - Any electrocution and collision events that occur should be recorded, including the species affected and the date. If repeated collisions occur within the same area, then further mitigation and avoidance measures may need to be implemented.
-

3 ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative A (preferred alternative)

In terms of the overall significance of the impacts of the proposed establishment of the proposed solar plant, a **medium to high positive impact** is envisaged (taking into account the potential social and economic impacts, viz., potential increased revenue for the landowner, potential construction and operational phase job creation, and the generation of much-needed electricity (from a sustainable carbon-free natural resource), which will feed into the National Grid.

If the recommended mitigation measures mentioned in Section E of the form below and those contained in the attached EMPr (**Appendix F**) are applied, the significance of the majority of the impacts will be **LOW** with no lasting significant negative environmental impacts arising from the development of the solar plant (construction phase) and/or the operational phase management thereof.

No-go alternative (compulsory)

The only significant impact of the no-go alternative would be the opportunity cost. i.e. the loss of potential financial benefits for the landowner, and for society in general, namely:

- In case of the no-go option, the +/-45 ha portion of Farm 426, Skuitdrift (located east of the existing Schuitdrift Substation) would continue to not generate any financial benefits for the landowner or agricultural activities in the area in general.
- The potential (albeit small) for stimulating the local economy (construction phase purchase of goods and services), and the creation of construction, operation and decommissioning phase employment for local labour would also be lost if the no-go option is implemented.
- The benefit to the broader South African society of augmenting the National electricity supply from a renewable/ 'green' resource (albeit to a small degree) will also be lost in the case of the no-go option.

In terms of the above, a **low to medium negative impact** is envisaged should the no-go alternative, viz., where the *status quo* would remain, be implemented.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	NO
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If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

- An **Environmental Control Officer (ECO)** should be present for the site preparation and initial clearing activities to ensure the correct demarcation of no-go areas, facilitate environmental induction with construction staff and supervise any flora relocation and faunal rescue activities that may need to take place during the site clearing. Thereafter weekly site compliance inspections would probably be sufficient.
- **Soil disturbance and vegetation clearing should be kept to minimum i.e. only rammed /**

screwed or rock anchor foundations may be used for the installation of the solar array structures.

- Cleared areas that are not required for construction activities or no longer required during operation should be **re-vegetated with locally-collected seed of suitable indigenous species**. Bare areas can also be packed with brush removed from other parts of the site to **encourage natural vegetation regeneration and limit erosion**.
- **Regular monitoring** must be undertaken to ensure that **alien plants** are not increasing as a result of the disturbance that has taken place.
- All alien plants present at the site should be controlled annually using the best practice methods for the species present.
- Bare soil should be kept to a minimum, and at least some **grass or low shrub cover should be encouraged under the panels**.
- Wherever possible, **roads and tracks should be constructed to run along the contours**.
- All roads and tracks running down the slope must have **water diversion structures** present.
- **All construction vehicles should remain on properly demarcated roads**. No construction vehicles should be allowed to drive over the vegetation, except where no cleared roads are available. In such cases a single track should be used and multiple paths should not be formed.
- All **maintenance / operation vehicles to remain on the demarcated road/track network**.
- **Regular monitoring for erosion** should be undertaken to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. All erosion problems observed should be rectified as soon as possible.
- **Runoff management** should be undertaken throughout construction and operation to ensure risk of erosion.
- **Any fauna directly threatened by the construction activities should be relocated to a safe location by the ECO**.
- The **collection, hunting or harvesting of any plants or animals** at the site should be strictly **forbidden**. The rocky outcrops are particularly sensitive in this regard and construction personnel should not be allowed off of the construction site and onto these areas.
- Fires should only be allowed within **fire-safe demarcated areas**.
- **No fuel wood collection** should be allowed on-site.
- **No dogs** should be allowed on site.
- All **hazardous materials** should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.
- **No unauthorized persons should be allowed onto the site**.
- Staff present during the operational phase should receive **environmental education** so as to ensure that that no hunting, killing or harvesting of plants and animals occurs.
- Should the site need to be fenced, the **fencing should be constructed in manner which allows for the passage of small and medium sized mammals**. Steel palisade fencing (20 cm gaps min) is a good option in this regard as it allows most medium-sized mammals to pass between the bars, but remains an effective obstacle for humans. Alternatively the lowest strand or bottom of the fence should be elevated to 15 cm above the ground at least at strategic places to allow for fauna to pass under the fence.
- If **electrified strands on fencing** are to be used, there should be **no strands within 20 cm of the ground** because tortoises retreat into their shells when electrocuted and eventually succumb from repeated shocks.
- Ensure that **no larger fauna enter and become trapped within the fenced-off area**, either by leaving a gate open so that animals can move freely between the site and the adjacent farm or by keeping all gates closed to ensure that they are excluded.
- The **length of any new power lines that need to be installed should be kept to a minimum**.
- Ensure that **all new lines are marked with bird flight diverters** along their entire length. If the new lines were to run parallel to existing unmarked lines this would potentially create a net benefit as this could reduce the collision risk posed by the older line.
- **All new power line infrastructure should be bird-friendly in configuration and adequately**

insulated (Lehman et al. 2007). These activities should be supervised by someone with experience in this field.

- Ensure that any **maintenance on the transmission infrastructure of the site retains the bird-friendly design features**.
- Any **bird electrocution and collision events that occur should be recorded**, including the species affected and the date. If repeated collisions occur within the same area, then further mitigation and avoidance measures may need to be implemented.
- The Solar footprint and all activities must remain within the specified development area, and avoid koppie areas.
- All construction and operation staff must be made aware of the **sensitivity of the offsite 'koppie' / rocky out-crop**, considered as a no-go area. Construction staff must **avoid quartz scatter areas** during the period of construction, so as to prevent any destruction of the sites. The dense scatters of white quartz stand out, so they are easily recognisable, even to the non-specialist.

Is an EMPr attached?

YES	NO
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The EMPr must be attached as Appendix F.

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