

**PROPOSED CONSTRUCTION OF THE WATERBERG PHOTOVOLTAIC
PLANT ON A SITE NEAR, VAALWATER, LIMPOPO PROVINCE**

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ACRONYMS

DEA:	Department of Environmental Affairs
EIA:	Environmental Impact Assessment
EMP:	Environmental Management Programme
EPC:	Engineering, Procurement, Construction
HDSA:	Historically Disadvantaged South African
IDP:	Integrated Development Plan
I&AP:	Interested and Affected Party
LM:	Local Municipality
MLM:	Modimolle Local Municipality
PV:	Photovoltaic
SIA:	Social Impact Assessment
SDF:	Strategic Development Framework
StatsSA:	Statistics South Africa
SMME:	Small to Medium Size Enterprise
WDM:	Waterberg District Municipality

1. INTRODUCTION

Thupela Energy appointed Savannah Environmental (Pty) Ltd, as the Environmental Assessment Practitioner (EAP), to conduct an Environmental Impact Assessment (EIA) for the proposed construction of the Waterberg Photovoltaic Plant on a site, near Vaalwater in the Limpopo Province.

Before a project of this nature can proceed an EIA needs to be undertaken. The EIA process consists of two phases, namely the Scoping Phase and a detailed EIA Phase. As part of the EIA process, a Social Impact Assessment (SIA) is required to be undertaken.

The purpose of this report is therefore to provide the findings of the SIA undertaken during the EIA Phase. The report thus aims to assist the project proponent, consultants, and communities to identify social issues that have to be noted, addressed, mitigated, and incorporated as part of the planning process.

1.1 Background to the proposed project

Thupela Energy is proposing the establishment of a commercial photovoltaic solar electricity generating facility and associated infrastructure on Portion 2 of the Farm Goedgevonden KR 104, near Vaalwater in the Limpopo Province. This project is known as the Waterberg Photovoltaic Plant.

The facility is proposed to be established on transformed pasture land. The larger site covers an area of approximately 50 ha, with the development footprint for the proposed facility being approximately 20 ha in size. The location of the facility within the larger site will be informed by the outcomes of the EIA process.

The solar facility is proposed to be comprised of an array of Photovoltaic (PV) panels with a generating capacity of up to 5 MW. The facility is also proposed to have the following associated infrastructure:

- A switching station for the “turn in” into Eskom’s existing Mink Power Line
- An extraction point and low volume water supply pipeline for the extraction of water from existing on-site boreholes
- Access roads within the site (for the purposes of construction and limited maintenance)
- A Visitors Centre

1.2 Construction Process of the proposed PV facility

The construction of the facility will commence with the erection of the security fence around the site and the creation of fire breaks. This would be followed by Eskom's inputs whereby they would determine the tie in point on the existing line. The connection point can then be installed. The other activities listed below would be undertaken in parallel with the work undertaken by Eskom and the entire construction process is expected to be completed within six to nine months after construction has started:

- Cable laying to connect the panels to the switching station;
- Mount installation, as the panel mounts would require assembly on site after which these panels would be secured in place, possibly with concrete mounts or with a pile system. The mount installation would be undertaken during the entire construction phase;
- Once a mount is installed, the panels will be attached one by one;
- In parallel with the above, the inverters and other associated electronics will be installed.

Other issues that would be attended to during the construction process would include lightning protection and the construction of the required buildings such as the office, eating hall and kitchen, crèche facilities, ablutions, the visitors' centre and possibly a small fire prevention facility (Personal communication: Dr. P. Calcott: August 2010).

1.3 Operation and Management of the proposed PV facility

The main operational task will be the manual adjustment of the solar panel mounts. A staff component of approximately forty (40) individuals will be on site from before sunrise until just before sunset. Maintenance would include emergency repairs and routine panel maintenance and cleaning during the night whereby large dusters or compressed air would be used. When necessary the panels would have to be cleaned with water.

Personnel at the facility would include supervisors, managers, security personnel, cooks, cleaning and administrative personnel, and panel/mount operators. It is anticipated that approximately eighty (80) employees would be permanently employed, although a maximum of forty (40) personnel would be on site on a daily basis.

Security measures on site would involve CCTV monitoring, infra-red cameras, a minimum of three security personnel on site (full-time) and security back-up from a larger armed security organisation.

The canteen facility proposed would be a small facility where food can be prepared for the personnel.

The visitors centre's main aim would be educational. The following activities are anticipated to form part of the educational experience:

- A tour of the site and the opportunity to experience the operation of the facility;
- An audio visual display focusing on the construction and operation of the facility and solar power and climate change in general, and so forth;
- An opportunity to manipulate a solar panel and experience the generation of electricity; and
- Visitors would have the opportunity to buy and/or even make their own souvenirs which use solar power to take with them.

The initial visitors to the visitors centre would probably be school children who will be brought to site by bus. Visitors could come for a short tour of the above, but visits can also be extended with additional activities. The latter would link with the existing educational tours undertaken in the area. Should these visitors need overnight accommodation, facilities are already available on the farms Goedgevonden KR 104 (Kudu Lodge) and on the farm Naauwpoort KR 106 (Personal communication: Dr. P. Calcott, 2010).

No new power lines will be constructed to link the PV facility into the Eskom grid. The facility will be connected to the grid via a turn in and turn out design into the existing Mink power line which crosses the proposed development site (Minutes of the meeting held with adjacent property owners, 2010).

1.4 Site Location

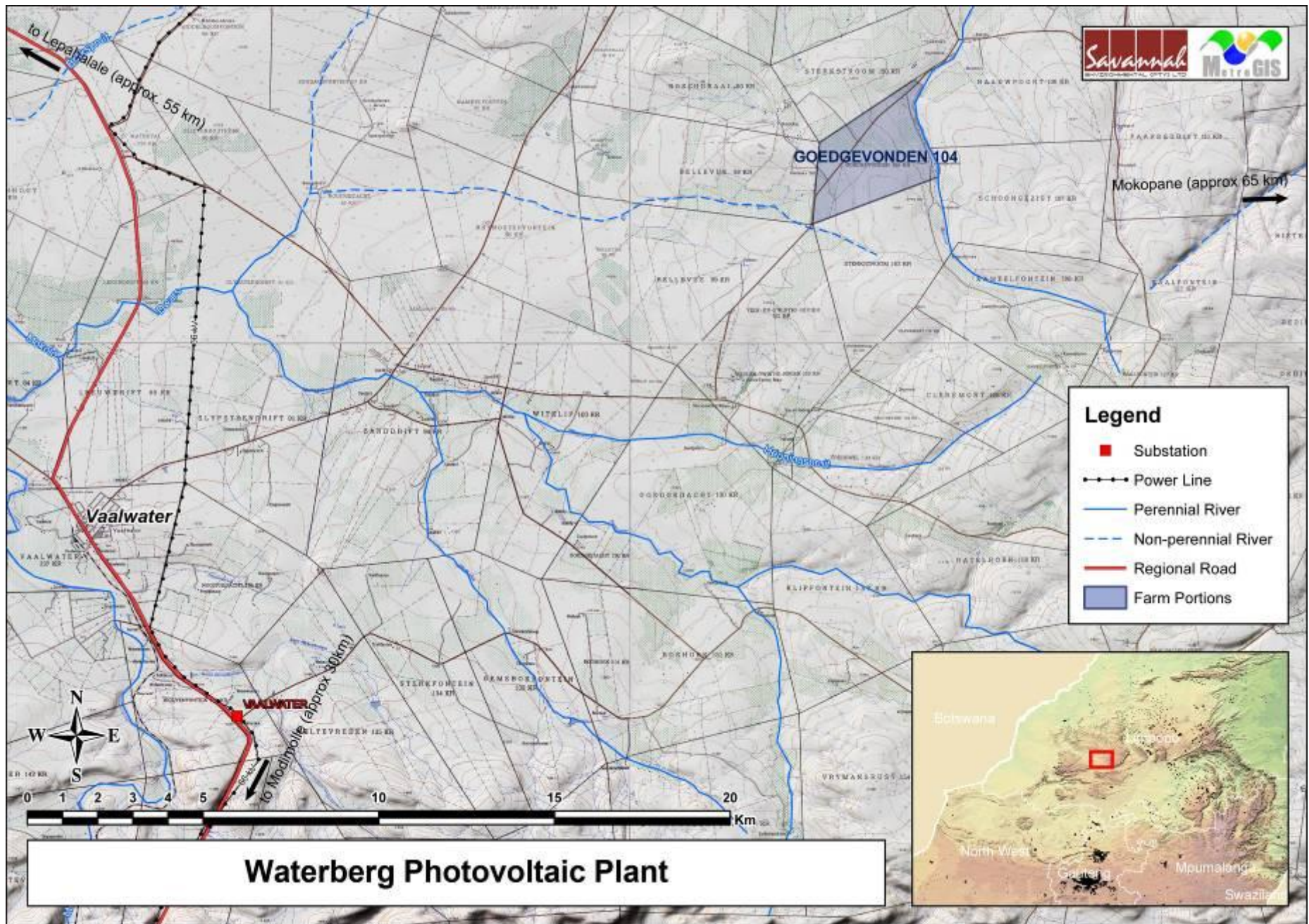
The farm Goedgevonden KR 104 is approximately 24 km north east of the town of Vaalwater in the Limpopo Province. The study area where the plant will be situated falls under the jurisdiction of the Waterberg District Municipality and the Modimolle Local Municipality, Ward 3.

Neighbouring farms include the following:

- Boschdraai KR 60/1;
- Sterkstroom KR 105;
- Sterkstroom KR 103;
- Naauwpoort KR 106;
- Schoongezigt KR 107;
- Bellevue KR 98 and Bellevue KR 99; and
- Vier-en-Twintig-Rivier KR 102

1.5 Map of study area

Herewith a map of the study area:



2. DEFINITION OF A SOCIAL IMPACT ASSESSMENT

Burdge (1995) describes a Social Impact Assessment as the "...systematic analysis in advance of the likely impacts a development event (or project) will have on the day-to-day life (environmental) of persons and communities." An SIA therefore attempts to predict the probable impact of a development (before the development actually takes place) on people's way of life (how they live, work, play, and interact with one another on a daily basis), their culture (their shared beliefs, customs, and values) and their community (its cohesion, stability, character, services, and facilities), by:

- Appraising the social impacts resulting from the proposed project;
- Relating the assessed social impacts of the project to future changes in the socio-economic environments that are not associated with it. This would serve to place the impacts of the project into context;
- Using the measurements (rating) to determine whether the impacts would be negative, neutral or positive;
- Determining the significance of the impacts; and
- Proposing mitigation measurements.

An SIA is thus concerned with the human dimensions of the environment, as it aims to balance social, economic, and environmental objectives and seeks to predict, anticipate, and understand the potential impacts of development.

The usefulness of an SIA as a planning tool is immediately clear, in that it can assist the project proponent to conceptualise and implement a project in a manner which would see the identified negative social impacts addressed through avoidance or mitigation and the positive impacts realised and optimised. It would also allow the community to anticipate, plan for, and deal with the social changes once they come into effect. In this sense then, the SIA is an indispensable part of the EIA process, the Environmental Management Plan (EMP), and any participative activity (e.g. community involvement in mitigation and monitoring during planning and implementation).

3. PURPOSE OF THE SOCIAL IMPACT ASSESSMENT REPORT

The aim of the SIA report is to:

- Determine the current socio-economic status of the area and the social characteristics of the receiving environment;
- Indicate the anticipated core impact categories and impact areas (possible hot spots);

- Identify anticipated positive socio-economic impacts of the proposed project, including positive impacts and provide management measures for these impacts;
- Identify and highlight negative socio-economic impacts (social hot spots) of the proposed project and indicate mitigation measures to deal with these impacts;
- Present the findings, recommendations, and conclusions of the social study.

4. METHODOLOGY

The broad steps followed as part of the SIA are discussed below.

4.1 Scope of the Assessment

Based on information received from Thupela Energy and Savannah Environmental, the scope of the assessment was determined. A site visit was undertaken on 11 May 2010 to enable the consultants to familiarise themselves with the area and the social characteristics of the receiving environment.

4.2 Literature Review, Analysis and Desktop Studies

The literature review and desktop studies assisted the consultants in establishing the social setting and characteristics of the study area, as well as the key economic activities.

4.3 Data Gathering

4.3.1 Primary Data

Primary data assisted the consultants in establishing the social setting and characteristics of the study area, as well as the key economic activities. Interviewing of 'key' persons also formed part of the research process. This included telephonic and personal interviews with e.g. property owners, businesses, tourism office, representatives of the Modimolle Local Municipality, Waterberg District Municipality, and so forth.

4.3.2 Secondary Data

Secondary data, which was not originally generated for the specific purpose of the study, were gathered and analysed for the purposes of the study. Such data included the census data, project maps, local histories, planning documentation such as the draft Integrated Development Plan (IDP) and the Strategic Development Framework (SDF) of the Modimolle Local Municipality.

4.3.3 Consultation

Information gathered and social issues identified and verified during the public participation process (focused on the host community) undertaken as part of the detailed EIA, also served as key input to the social assessment.

In addition to the above, specific focused consultation sessions were held with the surrounding residents (host community). The aim of this consultation was to further explore and verify issues thus enabling a more detailed social analysis. These Interested and Affected Parties (I&APs) were also consulted to determine their perceptions and attitudes regarding the proposed development in general and anticipated changes associated with it. Refer to Section 10.3 for a list of the individuals contacted.

4.4 Profiling

Profiling serves to build on information generated during the Scoping phase. It involves a description of the social characteristics and history of the area being assessed, an analysis of demographic data, changes in the local population, and the land-use pattern in the study area, as well as any other significant developments in the area and thus social character over time. The profiling process is a combination of secondary and primary research, site visits, and consultation. This could include information on:

- Historical background;
- Social characteristics;
- Culture, attitudes and socio-psychological conditions;
- Population characteristics;
- Community and institutional structures;
- Community resources; and
- Broad economic impacts.

The broad profiling will typically include descriptions regarding the following:

- The social trends and current conditions;
- The land-use in the area;
- The demographical profile and social characteristics of the host community;
- Other potential developments in the area;
- The local and regional economy; and

- Potential economic links between the proposed project and its environs.

4.5 Projection and Estimation of effects

A baseline assessment indicates the current reality in the social and related aspects of the affected environment. A baseline assessment is necessary to enable a logical and theoretically sound analysis of social impacts. It forms part of the process of identifying important cause-and-effect relationships and a comparative framework for anticipated changes and impacts.

The output of this phase is the impact matrix and mitigation measures.

4.6 Variables

The following variables are typically assessed (Burdge, 1995) as part of the SIA:

- Population impacts;
- Community/institutional arrangements;
- Conflicts between local residents and newcomers;
- Individual and Family level impacts;
- Community infrastructure needs; and
- Intrusion impacts.

For the purpose of assessing the impacts associated with the proposed project, the above variables were adapted to allow the assessment of the full range of social impacts relevant to the specific project. These variables would relate to the construction and operational phases of the proposed project.

4.7 Significance Criteria

During the EIA Phase, the anticipated social impacts were rated according to a rating approach used and specified by Savannah Environmental. This rating approach is described below:

CATEGORY	DESCRIPTION
Nature	A description of what causes the effect, what will be affected, and how it will be affected.
Extent	<p>Whether the impact will be local (limited to the immediate area or site of development) or regional.</p> <p>A value between 1 and 5 will be assigned as appropriate (1 = low and 5 = high).</p>
Duration	<p>Where it will be indicated whether:</p> <ul style="list-style-type: none"> • The lifetime of the impact will be of a <i>very short</i> duration of 0 – 1 years: Assigned a score of 1 • The lifetime of the impact will be of a <i>short</i> duration of 2 – 5 years: Assigned a score of 2 • Medium term of 5 – 15 years: Assigned a score of 3 • Long term (> 15 years): Assigned a score of 4 • Permanent: Assigned a score of 5
Magnitude	<p>This is quantified on a scale of 0-10, where</p> <ul style="list-style-type: none"> • 0 is <i>small</i> and will have no effect on the environment; • 2 is <i>minor</i> and will not result in an impact on processes; • 4 is <i>low</i> and will cause a slight impact on processes; • 6 is <i>moderate</i> and will result in processes continuing but in a modified way; • 8 is <i>high</i> where processes are altered to the extent that they temporarily cease; and • 10 is <i>very high</i> and results in complete destruction of patterns and permanent cessation of processes.
Probability	<p>The probability of occurrence describes the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5, where:</p> <ul style="list-style-type: none"> • 1 is <i>very improbable</i> (probably will not happen) • 2 is <i>improbable</i> (some possibility, but low likelihood) • 3 is <i>probable</i> (distinct possibility)

CATEGORY	DESCRIPTION
	<ul style="list-style-type: none"> • 4 is <i>highly probable</i> (most likely) • 5 is <i>definite</i> (impact will occur regardless of any prevention measures)
Significance	<p>The significance shall be determined through a synthesis of the characteristics described above and can be assessed as <i>low, medium or high</i>.</p> <p>The significance weightings for each potential impact are as follows:</p> <ul style="list-style-type: none"> • < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area) • 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated) • > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area) <p>The significance is calculated by combining the criteria in the following formula:</p> $S = (E+D+M)P$ <p>S= Significance weighting E= Extent D= Duration M= Magnitude P= Probability</p>
Status	The Status will be described as <i>positive, negative, or neutral</i> .
Reversibility	The degree to which the impact can be reversed.
Irreplaceable loss of resources?	The degree to which the impact may cause irreplaceable loss of resources.
Can impacts be mitigated?	The degree to which the impact can be mitigated.
Mitigation	Description of mitigation measures.

CATEGORY	DESCRIPTION
Cumulative impacts	Identification of cumulative impacts.
Residual impacts	Identification of residual (remaining) impacts after mitigation.

5. BASELINE DESCRIPTION OF THE RECEIVING ENVIRONMENT

5.1 General Description of the Study Area

The Modimolle Local Municipality is a category B municipality within the Waterberg District. A category B municipality refers to a "local" municipality which shares municipal executive and legislative authority in its area with a category C (district) municipality (www.demarcation.org.za). The Modimolle Local Municipality area consists mainly of agricultural areas with a number of small concentrations of communities scattered over vast distances. Towns and settlements within the municipal boundaries include Alma, Antjiesdrift, Kraalingen, Loubad, Melkrivier, Middelfontein, Modimolle (Nylstroom), Palala, Rankin's Pass, Sondagsloop, Vaalwater and Vier-en-Twintig Riviere.

Vaalwater, the town nearest to the proposed development, is seen as a service centre of the municipality. It is situated in the upper reaches of the Mokolo River, and is the major town in the Waterberg area.

Due to the Waterberg's diversity in plant and animal species, as well as its beauty, various eco-tourism projects such as the Waterberg Biosphere Reserve have been established.

5.2 Municipal profile

5.2.1 Waterberg District Municipality

The Waterberg District Municipality (WDM), located in the western part of the Limpopo Province, comprises six local municipalities, namely the Mogalakwena LM, Lephalale LM, Bela-Bela LM, Modimolle LM, Thabazimbi LM, and Mookgopong LM. Agriculture, tourism, and mining are key sectors within the area and play an important role in the district economy (www.waterberg.gov.za).

The WDM struggles with unemployment, challenges associated with HIV/Aids, especially among the youth, high levels of poverty and poor educational outcomes. The dispersed settlement patterns furthermore makes the provision of infrastructure and services difficult and expensive (WDM IDP, 2010).

The tourism potential of the district is high due to its rich history and cultural heritage resources as well as bio-physical features. Tourism activities are well developed and the main destinations and activities are concentrated within and around the Waterberg Biosphere Reserve, the Makapan Caves (Valley) and the Nylsvlei wetland (WDM IDP 2010).

5.2.2 Modimolle Local Municipality

The Modimolle Local Municipality (MLM) is situated in the WDM within the Limpopo Province. The MLM is at the centre of the WDM and therefore functions as the administrative capital of this district municipality (DM).

The MLM consists of towns, smaller settlements, informal settlements and farms and can therefore be classified as predominantly rural in nature, with vast areas of land either under cultivation or being utilised for game farming purposes. Most of the land is privately owned which leaves little room for development. Modimolle/Phahameng is the nodal growth point of the municipality, while Vaalwater (Mabatlane) and Alma (Mabaleng) act as service points (MLM IDP, 2010).

The proposed study area falls within Ward 3, although attention would also be given to Ward 1 (Vaalwater and Leseding) due to its close proximity to the site and possible source of local labour.

Ward 3 consists mainly of farm areas which include WitKlip (Vier-en-Twintig-Riviere), Boschdraai (Tretson/Melkrivier farms), Doorfontein (Driefontein farms), and Loubad (Nylstene factory area). Due to the characteristics of the ward, most agricultural projects are concentrated within its boundaries. This ward is thus predominantly rural in nature, and is characterised by gravel roads and extraction of water from boreholes. According to the MLM IDP (2009) Ward 3 has been identified as an agricultural hub in the Spatial Development Framework (SDF) of Modimolle.

Ward 1 includes Leseding extension 1, 2 and 3. Extension 1 and 2 are more formalised than Extension 3 as the first two do have a formal township layout with brick and cement dwellings. Extension 3 can be classified as an informal settlement with the majority of dwellings being tin houses (shacks). These settlements are in very close proximity to the Vaalwater landfill site, and lack basic water, electricity and sewage infrastructure and services. Unemployment amongst the Leseding community is high and a large section of this community lives in poor conditions (MLM IDP, 2010).

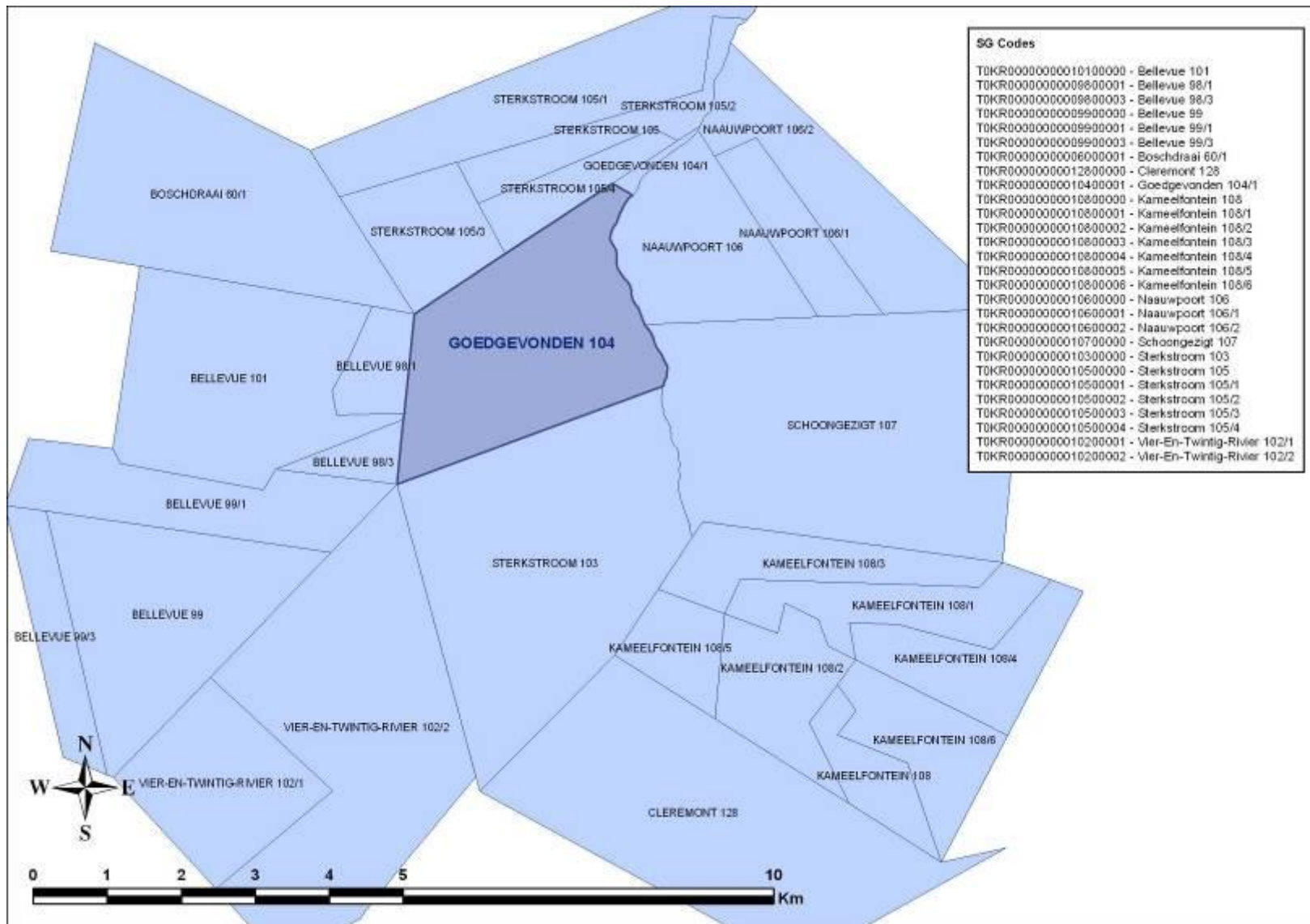
Crime in the MLM area, as well as the study area is said to be low, which creates an encouraging environment for economic growth, especially concerning tourism facilities and recreational activities (MLM IDP, 2010).

5.3 Site Profile and neighbouring property owners

The proposed site for the development of the proposed PV facility is located on the farm Goedgevonden KR 104, approximately 24 km north east of the town of Vaalwater in the

Limpopo Province. The site and surrounds are characterised by rural bushveld. Farms surrounding the site are mainly used for agricultural and game farming activities.

Find herewith a map of the surrounding properties:



5.4 Social Profile

5.4.1 Population Figures

The MLM has a total population of approximately 52 605 people according to the Community Survey undertaken in 2007 (MLM IDP, 2009). The figures from the Department of Local Government and Housing's (DLGH) Settlement Database, however, indicated the total population as 80 043 individuals which varies slightly from the Statistics South Africa's (StatsSA) data of 2001 where the MLM's population was estimated at 72 810 (MLM IDP 2010).

The MLM is currently undertaking a data verification process while the data of the 2001 census are being used for their planning and budgeting purposes (MLM IDP, 2010).

According to Stats SA's Census undertaken in 2001, Ward 3 has a total population of 8 883 individuals and Ward 1 (Vaalwater and Leseding) houses a population count of 9 217.

5.4.2 Age Groups and Gender

There is a balance between males (49%) and females (51%) in the MLM area. Gender distribution is important as it provides an indication of the availability of jobs and employment opportunities or the extent of migrant labour (where males left an area in search of work elsewhere).

Based on a settlement database compiled for the Waterberg District Municipality in 2008, the age groupings in the MLM area are as follows (MLM SDF, 2010):

Table 1: Age groupings

Age groupings in the MLM area				
Pre- and Primary	Secondary	Young adult	Adult	Elderly
33%	11%	27%	24%	5%

The large sectors which make up the youth indicates the critical need for sufficient educational facilities, future infrastructure and services, as well as employment creation opportunities.

5.4.3 Population Stability

The majority of residents in the area are South African citizens, with a very low influx of citizens from the SADC countries. It therefore does not seem as if the area is challenged by a massive inflow of immigrants to the area. This could be due to the lack of urbanisation in the area and limited job opportunities, compared to urbanised and industrialised areas. One should, however, note that accurate figures are difficult to obtain because a large number of

immigrants enter the country illegally. Estimations indicate that there are a high number of immigrants in the Limpopo Province and planning in the Modimolle area should consider this.

5.4.4 Education and Skills Levels

According to the 2001 statistics, the majority of the population completed some form of schooling, although 11% has completed no schooling. As only 12% of the population have completed school, it has led to a large population without skills (MLM IDP, 2010). The MLM SDF (2010) provides the following figures based on a settlement database compiled for the Waterberg District Municipality in 2008:

Table 2: Education levels (2008)

Education levels in the MLM area				
No schooling	Primary	Secondary	Tertiary	Tertiary plus
30%	39%	28%	3%	1%

From the more recent figures, it thus does not seem as if the overall education levels have improved in the last couple of years.

In Ward 3 only 7% of the population completed school, while 23% have some form of secondary education. 32% of the Ward's population have only some form of primary education (StatsSA Census, 2001). Ward 1 has a similar profile where 31% have some form of primary education, 22% have some form of secondary education, and 8% have matriculated.

According to the Waterberg Biosphere Reserve, there are 180 school leavers each year in the Vaalwater area, of which approximately 50% do not have a school leaver's certificate (Waterberg Biosphere Reserve: Skills training facilitation project, 2010).

The MLM area has 59 primary schools and 7 secondary schools. Due to the lack of secondary schools and tertiary education facilities, it is unlikely that the youth can easily obtain a higher level of education. Limited services at the schools worsen the situation (MLM IDP, 2010). The nearest Further Education and Training College is located within Lephalale which is approximately 80 km from Vaalwater (Waterberg Biosphere Reserve: Skills training facilitation project, 2010).

The above figures and status of the educational facilities give a clear indication of the unskilled labour force within and surrounding the study area. As a result of the above a large part of the population in the MLM and the study area are employed in semi-skilled and unskilled positions (approximately 53%) (MLM IDP, 2010).

5.5 Employment and Income

5.5.1 Employment Status

The MLM IDP (2010) stated that the unemployment rate in the municipal area is 22% and the employment rate is 60%. The percentage of the population which falls within the not economically active group is 18%, which includes those persons that are either not able to work or those who choose not to work.

An analysis of the 2008 school leavers from the area done in 2010 indicates a worse scenario than the above. According to the analysis, 73% were unemployed, 15% were unpaid volunteers seeking work experience, 9% were in higher education or skills training, 0% had started their own businesses, and 2% were formally employed (Waterberg Biosphere Reserve: Skills training facilitation project, 2010).

The unemployment of locals in the area thus remains a concern. A large part of school leavers also move away from the area due to the lack of tertiary institutions. There is thus still a great need for poverty alleviation projects and employment creation, especially in the rural areas under the Modimolle Local Municipal's jurisdiction due to the relative "young" population in the area.

5.5.2 Employment Sectors

Together, the community services and agriculture sectors employ the majority of the people (53%) within the MLM. Of this percentage, the agricultural sector contributes 24% to the employment in the area and community services (including government services) are responsible for employing 27% of the population with employment. Other economic sectors that also contribute largely to employment are trade (16%) and manufacturing (10.8%) (MLM IDP, 2010).

From 1996 to 2007, the community services, finance, trade and construction sectors have shown an increase in employment. During the same period, however, the transport, electricity, manufacturing, mining, and agricultural sectors have shown a decline in employment contribution.

A concerning factor is the decline in the agricultural sector (MLM IDP, 2010). This leads to limited absorption capacity within the local economy. No reasons for this decline were provided, although it could be attributed to the conversion of agricultural practices to game farming industries which, in most cases, employ fewer individuals.

5.5.3 Income

The majority of the households (88%) within the MLM are living below the poverty level, which means that a large percentage of the households are earning less than R3 200 per month (approximately R38 400 per annum). The large no income households group, within

the municipality, can be a reflection of the relatively young population (MLM SDF, 2010) & (MLM IDP, 2010).

The majority of households in Ward 1 and Ward 3 earn between R2001 and R6 000 per year (StatsSA Census, 2001). Even if there has been a slight improvement in this situation since 2001 it is fair to state that the majority of households in the study area thus still live under severe poor conditions.

5.6 Community Resources

5.6.1 Natural Resources and Land-Use

The MLM is characterised by prominent rivers, such as the Mokolo River and Nylsvlei, which dominates the landscape, as well as settlement patterns characterised by townships, farms and informal settlements (MLM IDP, 2010).

5.6.2 Infrastructure

The town of Modimolle is strategically located in close proximity to the N1. The town further developed next to the R33 which connects the eastern section of the municipality to the western section. The R33 is mainly used to access Vaalwater, Alma, Thabazimbi, and Lephalale. Due to the high volumes of heavy vehicles and other smaller vehicles making use of this road, it is in a poor state. The road, however, is being upgraded to a national road (MLM IDP, 2010), but the extent of heavy vehicles that services the development in Lephalale causes problems and leads to deteriorating road conditions and dangerous driving conditions. At this stage it does not seem as if the upgrades improved the overall condition of the road.

The rest of the MLM area is serviced by gravel roads linking farms and rural areas to the major routes and towns.

Local roads in the study area include the tarred Vaalwater-Melkriver Road (R518), a gravel turn-off from this road (Sterkstroom Road) and the "Naaupoort-Olievenfontein" gravel road which links with the Sterkstroom Road and the Vier-en-Twintig-Riviere Road.

5.6.3 Housing

The municipal area is characterised by townships, farms, and informal settlements with different types of housing structures. The housing backlog (approximately 3 000 structures), which is worsened by displaced families evicted from farms due to the shift from general agricultural practices to game farming, remains challenging (MLM IDP, 2009).

5.6.4 Electricity

Both Eskom and the municipality provide electricity in the area. The MLM is thus an electricity service provider in the urban core and currently has a total of 23MVA capacity to supply the community. Out of the 23MVA, Modimolle town has 20MVA of which its optimum

utilisation is 18MVA. Vaalwater has a transformer of 3MVA and is currently using 2.8 MVA. There is a need for additional capacity of 20 MVA in Modimolle Town and 10 MVA in Vaalwater to enable further development. A huge backlog in terms of electricity provision exists as the MLM needs to supply 2 555 households with electricity and according to a representative of the MLM approximately 80% of the settlements and proposed townships within the MLM do not have electricity. In addition, the MLM has to contribute R36 million to Eskom for the upgrading of the substation near Modimolle (MLM IDP, 2010 & Minutes of meeting, 2 August 2010).

Eskom provides the rural and farm areas with electricity although various property owners indicated that they do experience frequent power outages from this supply. The majority of farmers thus own generators for back-up purposes.

5.6.5 Water

The MLM is a water service authority municipality and has approximately 17,000 registered households. The following table provides a summary of the water provision and usage within the MLM area (MLM IDP, 2010):

Table 3: Water Provision and Usage

WATER USAGE AND PROVISION IN MLM				
	Piped water inside dwellings	Piped water inside the yard	Access to water on a community stand	Access from boreholes
PERCENTAGE OF HOUSEHOLDS	23%	28%	13%	3%

The Vaalwater area has a shortage of sufficient water supply. In some extensions water carts are used to supply the community. The situation is unlikely to improve in the near future as sufficient water sources have been identified on private farms and due to the high property prices, it is doubtful that the MLM would easily obtain these sources (MLM IDP, 2010).

5.6.6 Waste and Sanitation

Modimolle and the town of Vaalwater each have one landfill site. The legal status of the landfill in Vaalwater is compromised by the encroachment of Leseding onto the site. Rehabilitation of the landfill, however, is under way (MLM IDP, 2010). The formal areas in the urban core are thus the only areas to receive conventional refuse removal services (MLM SDF, 2010).

The Modimolle sewer treatment plant is currently running at its full capacity of 3ML/day. Expansions have been undertaken although it seems as if these would not fully address the

remaining demand. This issue poses challenges with respect to future development in the municipality. Vaalwater are currently using sewer ponds, but the plant is still overflowing with possible negative environmental consequences (MLM IDP, 2010).

5.6.7 Community Health and Safety Services

The MLM has four clinics, two hospitals and two mobile clinics. More than half of the population (59%) are approximately fifteen minutes (2.5 km) away from the nearest health facilities (MLM IDP, 2010). The HIV/AIDS prevalence levels in the WDM have been the highest since 2004 when compared with other districts in the province. Young people between the ages of 18 and 35 years are especially vulnerable, although Vaalwater is less of a hotspot than Lephalale and Thabazimbi. This could be attributed to the mines in those areas (WDM IDP, 2010).

There are three police stations in the municipal area, namely at Modimolle, Vaalwater and Alma (MLM IDP, 2010). Fire fighting services are a district function and the MLM only provides the service at an agency level. The unit is currently understaffed and there is a definite need to settle personnel in the Vaalwater area to effectively provide this service (MLM IDP, 2010).

5.7 Tourism Sectors

The main tourism activities in the MLM area are mainly concentrated around the Waterberg Biosphere Reserve and to a lesser extent around the towns in the area. The towns thus form an important link in the tourism support chain as indicated in the MLM SDF (2010). Most of these tourism activities are also dependent on private initiatives, such as the numerous game farms of varying sizes within the area, which limit access to information regarding these initiatives.

5.7.1 Waterberg Biosphere

Biosphere Reserves are areas of terrestrial and coastal eco-systems which are internationally recognised within the framework of the United Nations Education, Scientific, and Cultural Organisation's (UNESCO's) Man and Biosphere Programme. The Waterberg Biosphere Reserve was established in 2001 as one of five biospheres in South Africa, and stretches from Marakele National Park in the south west to Wonderkop nature reserve in the north east. Entry to the area is usually through Vaalwater (www.waterbergbiosphere.org).

The biosphere consists of three areas, namely the core area (114 571ha); the buffer zone (150 000ha) and a transition zone of 150 000ha. The core area comprises proclaimed nature reserves with the buffer and transition zones filling the areas in between. These areas are currently being reviewed (MLM SDF, 2010). A small portion of the farm Goedgevonden KR 104 is located within the transition zone of the Biosphere Reserve and the north-western beacon of the farm boundary borders the Waterberg Biosphere Reserve's buffer zone. However, the area to be utilised for the proposed facility does not fall within the Biosphere

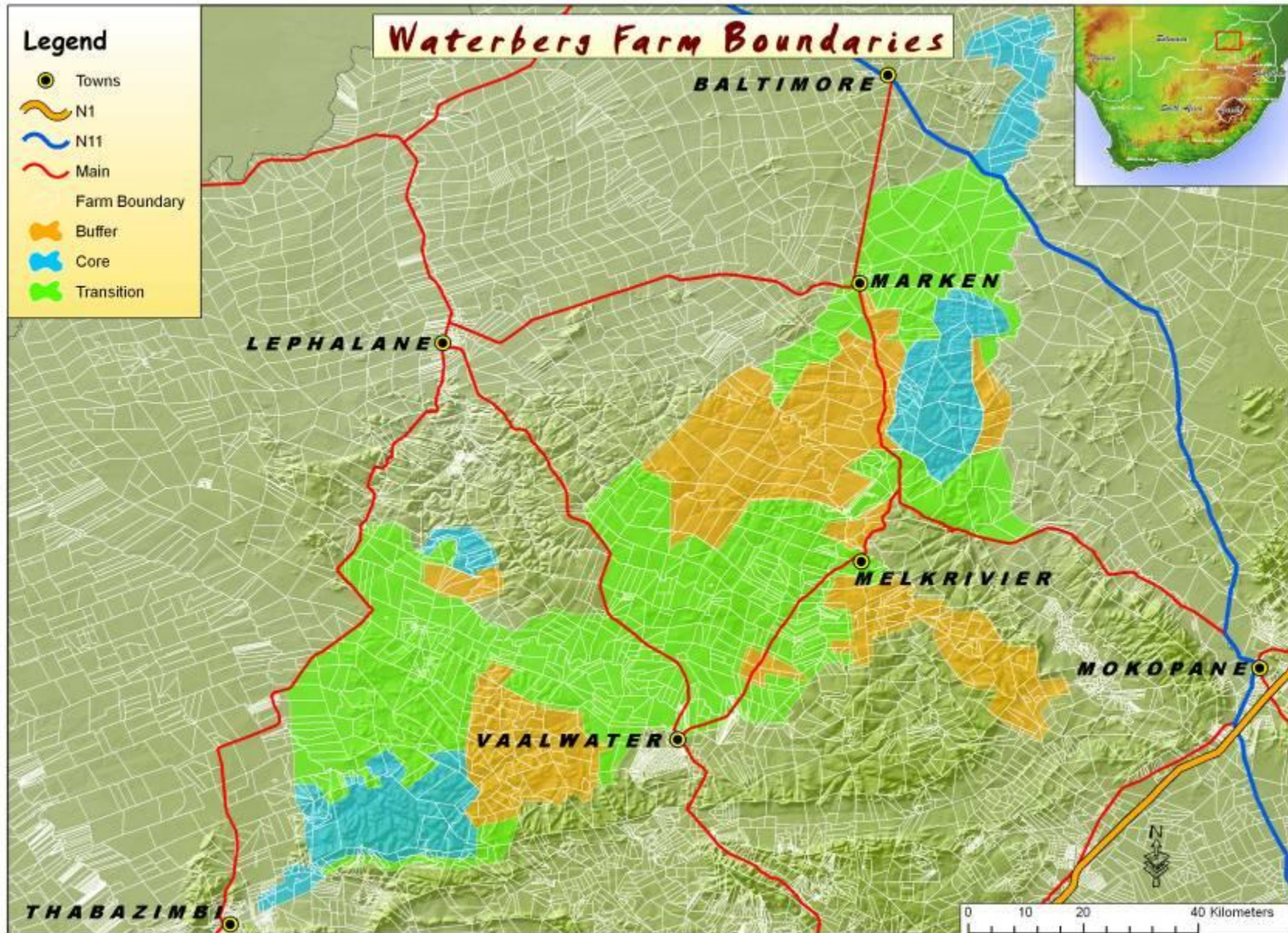
Reserve. Within the transitional zone limited agricultural and infrastructural developments are permitted. (Savannah Environmental: Draft Environmental Scoping Report, 2010). Please refer to the maps below (Source: www.waterbergbiosphere.org and Savannah Environmental).

The Biosphere's Environmental Management Framework which is currently being compiled could change the boundaries of the Biosphere as it is expected that it would extend to the south-east and to a lesser extent to the north-west. An Environmental Management Plan for the Waterberg Biosphere Reserve is also being compiled under the guidance of the WDM and the Department of Environmental Affairs (DEA) (Personal communication: Dr. R. Baber: 2 August 2010).

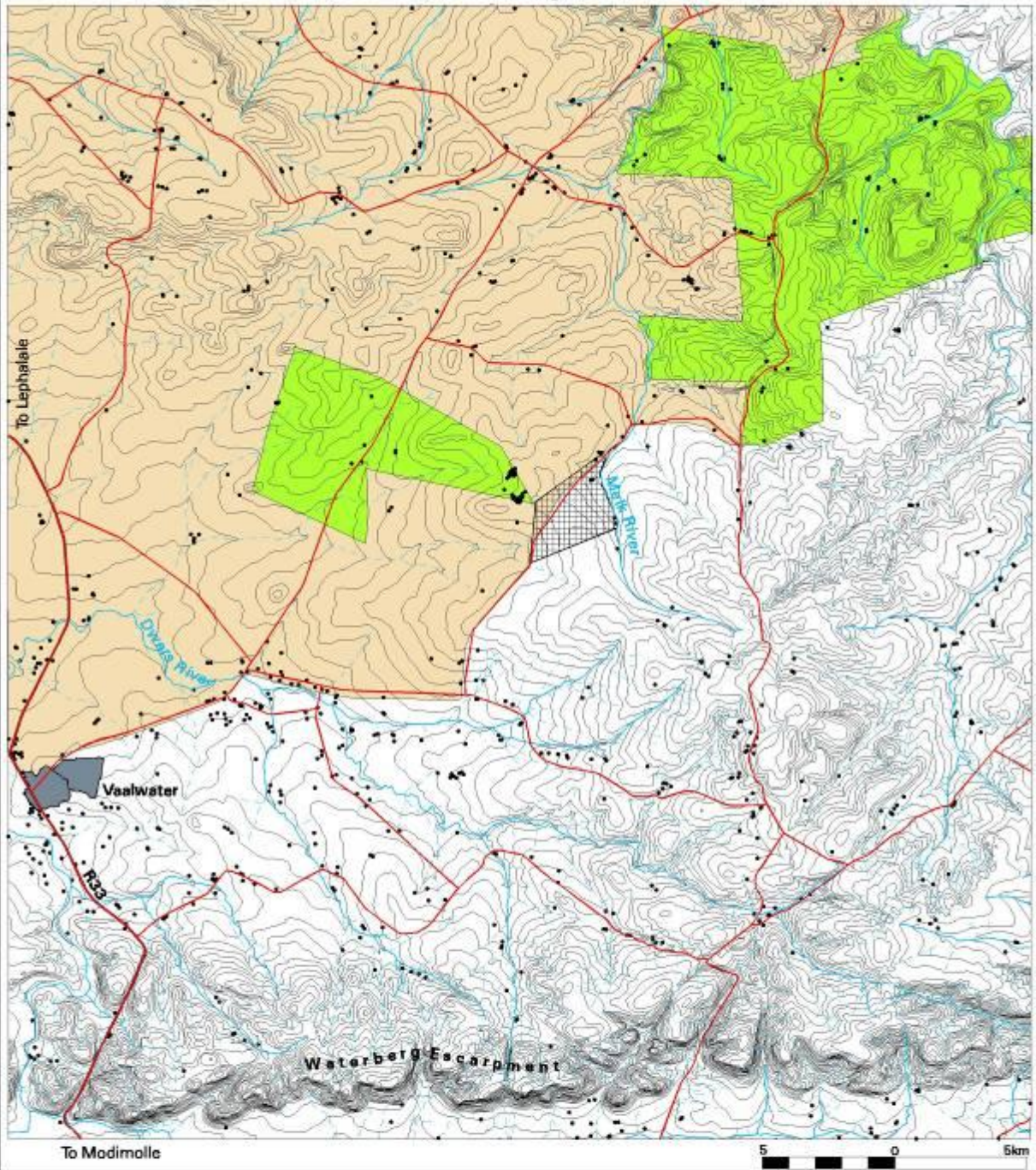
The biosphere covers a substantial part of the MLM area in the north and plays a critical role in the conservation efforts and eco-tourism sector in the district (MLM SDF, 2010). Usually a biosphere can only protect its environment through the commitment of the communities, farmers, conservation agencies, and local government departments. The long-term vision is thus focused on conservation efforts, enhancing the potential of eco-tourism in the area, conserving the sense of place of the Waterberg and the potential establishment of conservancies (Personal communication: Dr. R. Baber: 2 August 2010).

The proposed Waterberg Biosphere Reserve's skills development programme is focused on the communities on the plateau, including Leseding and other rural communities in the study area. The aim is to create individuals with a readiness for work. School leavers thus receive short courses, learnerships, and apprenticeships. The aim is to have 420 beneficiaries of this skills training and capacity building programme per year (Personal communication: Dr. R. Baber: 2 August 2010).



Biospheres are usually environmentally unique areas that could be negatively affected by human activities that may physically change the natural environment. According to the MLM's SDF it was stated that "The biospheres do not necessarily exclude any development but it is sensitive to development other than conservation and eco-tourism. There are however, extensive development in the area such as rural villages and formally proclaimed towns. Parts of the biosphere are also areas showing a high potential for crop farming" (MLM SDF, 2010).





Proposed Thupela Waterberg Photovoltaic Plant



LEGEND

-  Farm identified for Photovoltaic Plant
-  Arterial Road
-  Secondary Road
-  Perennial River
-  Non-perennial River
-  Settlement/Homestead/Structure
-  Town/Built-up Area

-  Waterberg Biosphere Reserve Buffer Zone
-  Transitional Area

Note:
Core (Moepel) area not shown on map
(i.e. it falls outside of the study area)



5.7.2 Waterberg Meander

Linked to the Waterberg Biosphere Reserve, is the Waterberg Meander Route which displays various tourist attractions, sites of interests (cultural geological and environmental), accommodation facilities and community projects. The main routes forming part of the Meander include the R33, R518, R510 and includes areas between Modimolle, Mokopane, Mookgophong, Vaalwater, Marken, and Lephalale (Waterberg Meander Vol. 1, 2009).

Tourist attractions in close proximity to the study area forming part of Waterberg Meander Route include the following:

- The church of St. John the Baptist at 24 Rivers designed by Sir Herbert Baker;
- The Elizabeth Hunter Studio at the E.A. Davidson Memorial Farm School on the farm Vier-en-Twintig-Riviere;
- The Vier-and-Twintig Riviere site of Internment where the British came upon a group of Boer women and children in 1901; and
- The Beadle craft workshop and shop on the farm Klipfontein employing locals from the farm Boschdraai (also referred to as Triple 'B' Ranch). The visitor centre also displays the history of the Baber family in the Waterberg, farms changing farming practices and the lives of the local communities. Essential oils produced on the farm can also be bought.

5.7.3 Game Farms

Various large game farms in the Waterberg area which play a significant role in the conservation and tourism sector include reserves such as Welgevonden, Lapalala Wilderness, Entabeni, Dinaka, and so forth. These establishments and reserves are not situated in close proximity to the proposed site for the PV facility.

5.7.4 Guest Farms and Lodges

For the purpose of the study, guest houses and guest farms are referred to as those accommodation facilities which are less expensive, situated on privately owned farms (less than 2 000 ha) where game and bird viewing, hiking, cycling and so forth forms part of the recreational activities that can be undertaken on the property. These guest houses are then also utilised as accommodation facilities by the property owners (temporarily or permanently).

According to the Waterberg Tourism Association, it is not compulsory for property owners operating accommodation facilities such as lodges to formally register their lodges with them. A formal definition of a lodge is thus not available. For the purpose of the study "lodges" are referred to as boutique lodges or hotels on large properties (larger than 2 000 ha) which can

accommodate various visitors at a time with the intention of catering for national and international visitors who seek holiday destinations hosting the “big five”.

From information obtained during the study, it appears that the majority of property owners within close proximity to the site fall within the “guest farms” category.

5.7.5 *Hunting Establishments*

For the purpose of this report, hunting establishments refer to those private initiatives whereby foreign and local hunters visit private properties, mainly during the hunting season, to hunt game and who are then accommodated on the properties for the duration of their stay.

From the information obtained from the surrounding property owners, hunting activities are not undertaken on the properties in the study area and therefore no hunting establishments are located in close proximity to the site.

5.7.6 *Recreational activities and cultural tourism*

The main recreational activities that can be undertaken in the Waterberg area include game and bird viewing, horse riding or horseback safaris, cycling, hiking and so forth. These activities can also be undertaken on the properties in close proximity to the site, although only some are formally advertised such as Horizon Horseback Safaris.

Cultural tourism in the Waterberg refers to opportunities provided to tourists to engage with local communities in their authentic rural setting (Waterberg Meander Vol. 1, 2009). From information obtained the Lehlabile Cultural Tours are situated on the Sterkstroom Road in relative close proximity to the proposed site.

5.7.7 *Local ventures*

As indicated above the majority of the property owners surrounding the site can be referred to as “guest farms.” Those guest farms larger than 800 ha in the direct vicinity of the site include the farm Sterkstroom KR 103 and a Portion of the farm Schoongezicht KR 107 (owner Mr. M. Jurgens), Remaining Extent of the farm Schoongezicht KR 107 (Mr. D. Breedt) and Vier-en-Twintig Rivier KR 102/2 (owner Mr. and Mrs. H. van Herwaarden).

The other guest farms in the study area are smaller than 800 ha but do contain game and provide accommodation facilities and thus game viewing opportunities.

Although the majority of property owners in the direct surrounding area to the site refer to their accommodation facilities as lodges, these are only referred to as accommodation facilities (guest houses) for the purpose of the SIA, as per the definition detailed in 5.7.4 above.

Local activities and ventures undertaken on the surrounding properties include the following:

Table 4: Local Activities and Ventures

Farm	Owner	Dwellings	Main Activities
Boschdraai KR 60/1	Mr. C. Baber	Private house Settlement with app. 350 people	Cattle farming
Sterkstroom KR 105 & 105/3	Mr. T. Eloff	Private house	Cattle farming Game
Sterkstroom KR 105/4	Mr. W. van Rooyen	One accommodation facility which can accommodate app. 60 individuals	Guest house Cattle farming Game and bird viewing
Sterkstroom KR 105/7	Mr. and Mrs. T. Hyam	One accommodation facility	Guest house Game and bird viewing
Goedgevonden KR 104	Mr. C. Baber	Kudu Lodge Guest House	Accommodation facilities Cattle farming
Naauwpoort KR 106 & KR 106/2	Mr. C. Hachmann	Accommodation facility which can accommodate app. 100 individuals	Guest house Game and bird viewing
Sterkstroom KR 103 & Portion of Schoongezicht KR 107	Mr. M. Jurgens	App. three different guest houses	Accommodation facilities Game and bird viewing General recreational activities
Remaining extent of the farm Schoongezicht KR 107	Mr. D. Breedt	None at moment, but planning to develop guest houses	Accommodation facilities Game and bird viewing General recreational activities
Vier-en-Twintig River KR 102/2	Mr. and Mrs. H. van Herwaarden	Vier-en-Twintig Riviere Lodge	Lodge

Farm	Owner	Dwellings	Main Activities
			Game and bird viewing
Bellevue KR 99/1	Juan (surname unknown)	Unknown	Unknown
Bellevue KR 101 & Bellevue KR 98/3	Mr. C. Baber	Accommodation facilities	Cattle farming
Bellevue KR 98/1	Mr. and Mrs. N. Heal	Three houses (cottages)	Recreational

5.8 Profile of the local economy

The economy of the MLM and the Vaalwater area is dominated by agricultural activities (game, cattle, and crop farming). The game farming and hunting industries have grown over the past fifteen years with numerous farmers converting from cattle farming to game farming (MLM IDP, 2009). No records, however, could be found to calculate this trend. Eco-tourism activities and game farming generally provide fewer jobs than the traditional agricultural activities. The traditional agricultural sector (cattle and crops), as well as the game farming sector, however, still provides a large part of the employment opportunities in the area, followed by trade and accommodation, then community services, government services and construction industries.

According to the MLM IDP (2009) some of the economic weaknesses in the area include the unavailability of skills to match the economic comparative sectors, as well as the fact that there is no clear marketing strategy to encourage and support business development and investment in the area. Other challenges include:

- Increasing population growth trend;
- Higher incidence of HIV/AIDS compared to both the WDM and Limpopo Province;
- High levels of poverty;
- Limited access to basic services; and
- Limited productive activity in the primary economic sectors (i.e. agriculture and mining). (MLM IDP, 2010).

The Modimolle local economy is showing signs of strong growth in the primary and services sectors which support the fact that the economy is based on production in the primary

sectors. The services component is also starting to play a more important role to support the activities in the primary sector (MLM SDF, 2010).

The Waterberg area has significant potential for further development (especially tourism, hunting and eco-tourism activities) due to its favourable location, distance from main centres like Gauteng, the absence of malaria as well as the scenic beauty and natural diversity of this area. The area's economic base, as indicated in the Economic Development Plan (EDP) for the Limpopo Province, lies largely within the tourism sector and the MLM's IDP (2010) identified tourism thus as the main strength of the area. In addition, the Waterberg District Council listed the tourism sector highly on the priority list.

The Modimolle area also has various deposits of silica and investigations are underway to determine the exploitability of this reserve.

6. IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE

The construction timeframe for the proposed PV facility is expected to be between six and nine months and the main construction activities that are planned include, fencing of the site, creation of fire breaks, setting up of connections points by Thupela Energy with some input from Eskom, cable laying, mount installation, installation of inverters and associated electronics, and the construction of the required buildings.

Impacts associated with this phase of the project is thus of a short duration, temporary in nature, but could have long term effects on the surrounding environment.

The following social impacts are anticipated during the construction of the proposed PV facility on the farm Goedgevonden KR 104:

6.1 Employment creation

6.1.1 Discussion

Employment opportunities could be created during the construction phase as a large part of the construction activities would entail manual labour such as the erection of the fence, creation of fire breaks, cable laying, and mount installation. Workers would thus receive induction training on site to undertake the various repetitive tasks. During the entire process they would be supervised. Other construction activities would include manual labour associated with the construction of building structures (i.e. visitors centre, crèche, and kitchen). Specialists would be used for the installation of the inverters and associated electronics.

In total approximately fifty (50) construction workers would be on site on average, increasing to approximately one hundred and twenty six (126) construction workers during the peak construction period. It is therefore fair to state that at least fifty construction workers could be employed for the average length of the construction period (six months), but that this figure could increase for shorter periods. Additional security personnel would be appointed

from the start of the construction process (Personal communication: Dr. P. Calcott: August 2010).

Therefore, concerning employment creation, the proposed PV facility would have definite short-term positive impacts, especially if local labour (e.g. individuals from the farm Boschdraai and Leseding) were used. The farm Boschdraai cannot supply all the residents with permanent employment and short-term opportunities in close proximity to the farm would thus be beneficial to the unemployed, especially young school leavers. There would also be an opportunity for the employment of individuals from Leseding and other areas within the MLM area. At this stage it is even estimated that approximately hundred and twelve (112) jobs could be provided to individuals within the MLM area (which could include residents from Boschdraai and Leseding) during the construction phase (Information received: Dr. P. Calcott: September 2010)

As previously indicated (also refer to Section 5.5.1), the unemployment rate in the study area is approximately 22%. Recent studies undertaken by the Waterberg Biosphere Reserve even indicate an unemployment rate of the 2008 school leavers in the area as 73%. There are therefore various individuals in the area in search of employment, even if the opportunities are only temporary. As indicated above it is also foreseen that it would be possible to make use of local labour for a large section of the construction activities. Opportunities for SMMEs to be considered for some of the construction activities also exist.

Employment of locals and the involvement of local SMMEs would thus definitely enhance the social benefits associated with the project. Failure to involve the local population, emerging contractors, and SMMEs during construction could lead to negative attitude formation against the proposed project and the project proponent.

It should furthermore be noted that infrastructural development type projects usually create expectations that numerous job opportunities for the local community members will be generated. This perception is even more so in cases where the implementation and construction is actually taking place in close proximity to rural settlements. Unrealistic expectations concerning job creation should thus be guarded against.

6.1.2 Assessment Table

Nature: Employment creation during the Construction Phase		
	Without mitigation	With mitigation
Extent	Regional (4)	Regional (4)
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (44)	Medium (55)
Status (positive or	Positive	Positive

Nature: Employment creation during the Construction Phase	
negative)	
Reversibility	Yes
Irreplaceable loss of resources?	No
Can impacts be mitigated?	Positive impacts can be enhanced
Mitigation:	
<ul style="list-style-type: none"> • Employment of local community members (e.g. source labour from Boschdraai and Leseding or the immediate environment) should be undertaken where possible. • The applicant and its EPC partner should ensure an equitable process whereby locals and previously disadvantaged individuals (women) are taken into account. • The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the construction process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses and SMME's from the local sector. • A local labour desk should be set-up (if not already established) in the beneficiary communities by the main contractor or project proponent to co-ordinate the process of involving local labour. • Communication efforts concerning job creation opportunities should refrain from creating unrealistic expectations. 	
Cumulative impacts:	
<ul style="list-style-type: none"> • Improvement in quality of life even if only for a short duration • Possible economic downfall of individuals after the period of employment has lapsed as they have become used to a certain income level. 	
Residual impacts:	
<ul style="list-style-type: none"> • Capacity building and skills development of those involved in the construction phase of the project 	

6.2 Skills inequities

6.2.1 Discussion

Economic inequities refers to the degree to which employment opportunities created by the proposed project match the actual job skills present in the local communities or the unemployed sector.

Education levels in the study area and status of the educational facilities give a clear indication of the unskilled labour force within and surrounding the study area (also refer to Section 5.4.4). As a result a large part of the population in the MLM and the study area are employed in semi-skilled and unskilled positions (approximately 53%). Detailed skills of the Boschdraai residents and Leseding were not readily available, but based on information

sourced with regards to the sectors in which most of the adult population in the study area is employed in, and based on the existing occupations; one could conclude that unskilled and semi-skilled labour could, thus, be sourced from the residents of Boschdraai and Leseding, and possibly from the immediate environment.

6.2.2 Assessment Table

Nature: Skills inequities during the Construction Phase		
	Without mitigation	With mitigation
Extent	Regional (4)	Regional (4)
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (44)	Medium (55)
Status (positive or negative)	Positive	Positive
Reversibility	Not applicable	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced	
Mitigation:		
<ul style="list-style-type: none"> A broad-based approach should be followed to identify and involve relevant organisations which could assist the main contractor and project proponent in identifying people whose skills may correspond with the job specifications. In cases for the semi-skilled jobs, where the relevant skills do not exist, training should be provided to willing local community members to enable them to fill the positions. 		
Cumulative impacts:		
<ul style="list-style-type: none"> Capacity building and skills development of those involved in the construction phase of the project 		
Residual impacts:		
<ul style="list-style-type: none"> Capacity building and skills development of those involved in the construction phase of the project 		

6.3 Capacity building and skills training

6.3.1 Discussion

Capacity building and skills training during the construction phase will range from training labours in assembly and installation of panel mounts through to more advanced skills, such as electrical wiring (Personal communication: Dr. P. Calcott, 2010).

Capacity building and skills training would thus have the greatest impact if the skills would be transferable to other type of construction or electricity generation related projects.

6.3.2 Assessment Table

Nature: Capacity building and skills training		
	Without mitigation	With mitigation
Extent	Regional (4)	Regional (4)
Duration	Very short duration (1)	Medium-term (3)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (44)	High (65)
Status (positive or negative)	Positive	Positive
Reversibility	Not applicable	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced	
Mitigation:		
<ul style="list-style-type: none"> • In cases for the semi-skilled jobs, where the relevant skills do not exist, training should be provided to willing local community members to enable them to fill the positions. • Capacity building initiatives could link in with the planned capacity building and skills training initiatives to be undertaken as part of the Waterberg Biosphere Reserve's outreach programmes. • As part of Thupela Energy's social responsibility it could consider contributing funds for the initiation phase of the Waterberg Biosphere Reserve's Skills Training Facilitation Project. • The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the construction process. 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Capacitated individuals 		

Nature: Capacity building and skills training
<ul style="list-style-type: none"> • Enhancement of skills levels of individuals involved in construction process
Residual impacts:
<ul style="list-style-type: none"> • Capacitated individuals • Enhancement of skills levels of individuals involved in construction process

6.4 Inflow of outside workforce

6.4.1 Discussion

It is estimated that an average number of fifty (50) construction workers would be required on site on a daily basis. During peak construction periods this could increase to approximately one hundred (100) workers. No construction workers would be housed on site and no construction camp for accommodation purposes would be built (Personal communication: Dr. P. Calcott, 2010).

Due to the size of the construction workforce it is evident that the impacts associated with the inflow of temporary workers to the area could result in various negative impacts on the surrounding property owners and possibly on local communities. These impacts relate to the following:

- Additional pressure on the local infrastructure (e.g. water, sanitation) in the area during working hours;
- Littering on site with the possibility of waste blowing to surrounding farms impacting on the health of animals and the visual aesthetics of the area;
- Possible misconduct of construction workers;
- Possible conflict between the local communities (e.g. residents at Boschdraai, Leseding and local farm workers) and the "outside" workforce;
- Crime levels are noted to be low in the study area. The influx of outsiders to an area is usually perceived to increase the crime levels in such an area. Similar security concerns are also prevalent among the property owners in the study area as it is highly likely the crime could increase due to the inflow of outsiders; and
- An inflow of workers and the associated construction activities (vehicle movement, noise, dust) could result in temporary intrusion impacts on surrounding property owners and tourists;
- The possible increase in the HIV/Aids prevalence, as the study area already shows high incidences of HIV/Aids; and

- The development of informal vending “stations” where food and small goods are sold could, if not properly managed, also lead to littering, and possible pollution of water sources.

The negative social impacts associated with the inflow of workers are expected to manifest predominantly during the peak periods of the construction phase of the project. The intensity would depend on whether local labour would be used and the actual percentage of workers that would be from the local labour pool.

6.4.2 Assessment Table

Nature: Inflow of outside workforce		
	Without mitigation	With mitigation
Extent	Site of development and surrounding area (2)	Site of development and surrounding area (2)
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (36)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Local labourers should be employed where possible. • Local labourers should remain at their existing residences and no workers can be allowed on site during night time. No workers should thus be accommodated on site at night. • Working hours should be kept to normal working hours. • Before construction commences, representatives from the MLM, community leaders, community-based organisations and the surrounding property owners, should be informed of the details of the contractors, size of the workforce and construction schedules. • Construction workers should be easily identifiable by wearing uniforms and even identity tags. • Local community organisations and policing forums / neighbourhood watches must be informed of the presence of the outside workforce. • Care should be taken to avoid conflict between the local communities and the “outside” 		

<p>Nature: Inflow of outside workforce</p> <p>workforce.</p> <ul style="list-style-type: none"> • Sufficient water and sanitation facilities should be provided for the workers on site during the construction period. • The construction site should be properly managed to avoid any environmental pollution (due to inadequate water and waste infrastructure and services) and littering. • Informal vending stations should not be allowed on or near the construction site. Construction workers should preferably receive daily meals and beverages to avoid the need for a vending station. • Information distributed as part of the existing HIV/Aids awareness campaigns should again be focused on and communicated to the local workforce.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Additional pressure on infrastructure • Littering could have a negative impact on animals with subsequent economic losses for the property owners • Possible increase in criminal activities in the area
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Possibility of outside workers remaining in the area after construction has ceased

6.5 Inflow of jobseekers

6.5.1 Discussion

According to information obtained by the local municipality it was found that the majority of residents in the area are South African citizens, with a very low influx of citizens from the SADC countries. It therefore does not seem as if the area is challenged by a massive inflow of immigrants to the area, but due to the economic and political climate in most southern African countries and the global economic fluctuations, the inflow is expected to continue.

Even if limited numbers of additional outsiders (from other provinces) or foreigners come to the area in search of employment, it is possible that the small number of outsiders and foreigners already present in the area could come into conflict with the local community members in search of employment. The inflow of jobseekers (foreigners or locals) to the site is thus anticipated to occur and could even materialise prior to the construction phase when people become aware of the proposed project.

The majority of negative social impacts associated with the inflow of jobseekers are usually experienced if the jobseekers, especially those not originally from the area, remain in the area for long periods or even after construction has stopped. This could result in added

pressure on the existing infrastructure and services and even in an increase in crime levels and conflict between locals and the jobseekers.

6.5.2 Assessment Table

Nature: Inflow of jobseekers		
	Without mitigation	With mitigation
Extent	Site of development and surrounding area (2)	Site of development and surrounding area (2)
Duration	Medium term (3)	Short term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (44)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes to a certain extent	
Mitigation:		
<ul style="list-style-type: none"> • Thupela Energy, local leaders and the MLM should jointly develop a transparent communication and recruitment process to minimise the influx of jobseekers to the area. • The recruitment process and the use of contractors should be clearly communicated to the local communities. • Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process. • The communication strategy of Thupela Energy and its EPC partner regarding the proposed project should ensure that unrealistic employment expectations are not created. • A representative of Thupela Energy or its EPC partner could attend community meetings arranged within the various wards to discuss the employment and recruitment process. 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Added pressure on service delivery and the existing infrastructure with resultant additional socio-economic burdens for the MLM and surrounding property owners 		
Residual impacts:		
<ul style="list-style-type: none"> • Possible permanent settlement of job seekers in the area with associated cumulative impacts as indicated above 		

6.6 Impacts on agricultural practices

6.6.1 Discussion

The site proposed for the construction of the PV facility is currently used for harvesting of cattle fodder (i.e. pasture purposes). This agricultural practice would thus have to cease and could result in negative economic impacts if the fodder harvested here cannot be substituted elsewhere or if alternative grazing areas cannot be found for the cattle currently being fed on the fodder. It is however planned to allow the grazing of sheep on site between the panels which would result in some agricultural practices continuing on site.

As the property owner of the farm Goedgevonden KR 104 also owns other properties in the area it is assumed that this negative impact has been considered and that it can be successfully mitigated.

6.6.2 Assessment Table

Nature: Impacts on agricultural practices		
	Without mitigation	With mitigation
Extent	Site of development (1)	Site of development (1)
Duration	Medium term (3)	Short term (2)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Improbable (2)
Significance	Medium (44)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Fodder harvested on site should be substituted elsewhere Alternative grazing areas should be found 		
Cumulative impacts:		
<ul style="list-style-type: none"> None expected 		
Residual impacts:		
<ul style="list-style-type: none"> None expected 		

6.7 Traffic related impacts

6.7.1 Discussion

During the construction phase the actual construction vehicles (e.g. excavators or bulldozers) would probably be stored on site and movement of these vehicles between the construction site and source areas would be kept to the minimum. A large number of delivery vehicles (large trucks of some being between 20 to 30 tons) would have to access the site for the delivery of the mounts, panels, and electrical equipment. Concrete footings would be used and concrete will be mixed in a designated area on-site. At this stage the number of vehicles is estimated at a minimum of 150 trucks and a maximum of 200 trucks for the duration of the construction period which would result in approximately two heavy vehicles per day. The frequency of the trips cannot yet be determined (Personal communication: Dr. P. Calcott, 2010). It should be noted that the number of trucks could change as it would also be dependent on the finalisation of the construction methods.

The construction related vehicles would most probably make use of the tarred Modimolle-Vaalwater Road (R33) and the tarred Vaalwater-Melkrivier Road (R518) and then turn-off onto the Sterkstroom or Vier-en-Twintig-Riviere gravel roads to access the site.

Concerns were raised concerning the possible impact of heavy construction vehicles speeding on the gravel roads when travelling to and from the construction site. The impact on the safety of other road users, as well as pedestrians (especially children) could materialise near the access road to the farm Boschdraai (from the Sterkstroom gravel road) where approximately 350 individuals reside. Other social impacts refer to the effect of an increase in heavy traffic on the surface of the gravel roads. It is anticipated that the large number of construction vehicles would have a definite detrimental impact on the gravel roads which could last for a couple of years. It should, however, be noted that a Traffic Impact Assessment was undertaken as part of the EIA.

If locals from Boschdraai (app. 8 km from the proposed site) and Leseding (app. 25 km from the proposed site) would be employed during the construction period, they would be transported from their existing residences to the site and back on a daily basis. This would result in an additional increase in heavy vehicles (e.g. buses) on the local roads. Concerns in this regard again relate to the safety of other road users and pedestrians, but also to the impact of the increase in traffic on the surfaces of the local roads.

Any access to properties surrounding the proposed site is not expected to be affected during the construction phase. Property owners that have to pass the construction site to access their farms would thus have continuous access to their properties. Noise and dust impacts and possible delays when property owners have to wait to pass heavy vehicles on the local access road would be particularly intrusive to the surrounding property owners of the farms Schoongezicht KR 107 and Sterkstroom KR 103.

Irrespective of the number of trucks, it is fair to state that the increase in heavy vehicles on the local roads would potentially have a detrimental impact on the road conditions. The intensity of the impact would thus depend on the actual figures (numbers of trucks and frequency) which cannot be determined at this stage. Also refer to the Traffic Impact Assessment.

6.7.2 Assessment Table

Nature: Traffic related impacts		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short term (2)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (44)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes to some extent	
Mitigation:		
<ul style="list-style-type: none"> • The contractor should arrange meetings with affected residents (farm owners) before construction commences. During these meetings, the contractor's plans, procedures and schedules, as well as the anticipated intrusion impacts should be clarified. • Residents of the farms Schoongezicht KR 107 and Sterkstroom KR 103 should be allowed access to their properties at all times. • The movement of construction vehicles through the local area should be limited to off-peak periods (if possible) to minimise adverse impacts on the movement of pedestrians (individuals walking to and from work and schoolchildren) and to a lesser extent on private vehicular traffic. • Signs should preferably be erected at strategic locations throughout the area, warning residents, and visitors about the hazards around the construction site and the presence of heavy vehicles. • Strict vehicle safety standards should be implemented and monitored. • Construction vehicles should keep to the speed limits. • The local gravel access roads should be graded (possibly every six months) by the project proponent to limit the degradation of the road surface. 		
Cumulative impacts:		

Nature: Traffic related impacts
<ul style="list-style-type: none"> Poor road and surface conditions which are unlikely to be attended to by the MLM
Residual impacts:
<ul style="list-style-type: none"> Poor road and surface conditions which are unlikely to be attended to by the MLM

6.8 Impacts on tourism

6.8.1 Discussion

The greater Waterberg area, as well as the areas surrounding the proposed site are host to numerous recreational, cultural and tourism related facilities (game farms, guest farms, lodges and so forth – also refer to Section 5.7).

During the construction phase one could expect some impacts on the tourism industry due to the increased construction vehicle movement, noise pollution, because of the actual construction activities, and negative visual impacts associated with the construction site. These intrusions would be more marked where tourism related facilities are in close proximity to the actual construction site and where the construction site can be seen. Some short term negative impacts in this regard could thus be experienced by some of the surrounding property owners. The intensity of this impact, however, is difficult to establish as it would also be dependent on the experience of the tourist of the quality of the area and sense of place.

It is however, believed that these temporary negative impacts would not result in long term negative financial impacts for the local tourism sector or for the property owners who occasionally entertain visitors on their guest farms.

It should furthermore be noted that local accommodation facilities in close proximity to the site could benefit during the construction period, as the members of the specialist construction team or any outside workers could make use of local establishments for the duration of their stay in the area.

6.8.2 Assessment Table

Nature: Impacts on tourism		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (40)	Medium (33)

Nature: Impacts on tourism		
Status (positive or negative)	Possibly Negative and Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Mitigation measures concerning the anticipated traffic related impacts would also be applicable. • The construction phase should preferably not coincide with the main tourist season (if any) to limit the temporary impact on the tourism industry. • Construction activities should be limited over weekends, on public holidays and specific tourist related activities, festivals and/or events held in the area • Members of the specialist construction teams should preferably be accommodated at guest farms or lodges in the area 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Possible further positive economic spin-offs and returns of members of the specialist teams to the area as tourists • Exposure of the Waterberg area to various individuals with possible future positive impacts on the tourism sector 		
Residual impacts:		
<ul style="list-style-type: none"> • None anticipated 		

6.9 Safety and Security

6.9.1 Discussion

Concerns concerning an increase in crime levels are usually dependent on the perceived magnitude of the risk due to the size of the “outside” workforce that would be present in the area during the construction phase.

Even though no construction workers are expected to be accommodated on site, an inflow of workers could, as a worst case scenario and irrespective of the size of the workforce, pose some security risks. Criminals could also use the opportunity due to “outsiders” being in the area to undertake their criminal activities. Materials and goods would be stored on site in some type of storage facility for the duration of the construction period, and this in itself can lure criminals to the area. Safety of individuals residing in the area and animals, especially

rare game species such as rhinoceros, sable antelope, buffalo, and so forth remain of concern.

The negative impacts associated with the inflow of workers could, however, be limited should a local labour force be used. The crime rates are said to be low in the MLM area and the proposed project should thus avoid any actions that could increase the risk of criminal activity.

Safety at and around the construction site should be ensured by limiting any fire risks, fencing off the construction area to avoid unauthorised access of especially school children and by employing security personnel. In this regard, the project proponent indicated that it is planned to establish a fire capability on site from the start of the construction phase, which could include a fire fighter and individual man pack sprayers. Permanent security personnel would be on site for the duration of the construction period.

Construction related accidents are also always a concern when construction activities are undertaken. Local doctors and ambulance facilities for accidents would be used and it is anticipated that there would be sufficient capacity for minor emergencies. Major emergencies could be problematic as the nearest hospital is located at Modimolle, but due to the type of activities undertaken, major emergencies are unlikely to occur.

6.9.2 Assessment Table

Nature: Safety and security		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (40)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes to some extent	
Mitigation:		
<ul style="list-style-type: none"> Employing local community members could minimise the potential for criminal activity or perceived perception of an increase in criminal activity due to the presence of an outside workforce. 		

<p>Nature: Safety and security</p> <ul style="list-style-type: none"> • Screening of workers that apply for work could be useful to lessen perceived negative perceptions about the outside workforce. • Construction workers should be easily identifiable by wearing uniforms and even identity tags. • Local community organisations and policing forums must be informed of the presence of the outside workforce. • Care should be taken to avoid conflict between the local communities and the “outside” workforce • The property owners surrounding the construction area should be involved during the construction process by communicating the construction schedule and movement of workers with these representatives. • Property owners and their workers, as well as local communities (e.g. Boschdraai due to their location to the site) and their community structures should be motivated to be involved in crime prevention and by reporting crimes. • The construction site should be fenced and access to the area controlled. • Permanent security personnel should be at the site for the duration of the construction period. • Security personnel should be aware of the possibility of animal theft and poaching and should be able to identify possible criminal elements and/or criminal activities in this regard. • Procedures and measures to prevent, and in worst cases, attend to fires should be developed in consultation with the surrounding property owners
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Possible increase in crime levels with subsequent possible economic losses or in worst-case scenarios loss of lives of animals and individuals
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Same as above

6.10 Impact on infrastructure and services

6.10.1 Discussion

As indicated above under Section 6.7, the local roads would be under pressure due to the number of heavy construction vehicles that would make use of these roads during the construction phase with consequences lasting longer than the construction period. This issue, however, would not again be discussed here.

No other impacts on existing infrastructure and services are anticipated during the construction period, except when a power outage would be experienced for a few hours when

the connection to the grid would be undertaken (Personal communication: Dr. P. Calcott, 2010).

Concerning the impact on infrastructure and services, the reader is also referred to the Traffic Impact Assessment that has been undertaken as part of the EIA.

6.10.2 Assessment Table

Nature: Impact on Infrastructure development and maintenance		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Short term (2)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (44)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Mitigation measures with regards to the anticipated traffic related impacts would also be applicable Construction schedules should be discussed and finalised with the MLM and other affected stakeholders Timeframes for power outages should be communicated to the affected parties 		
Cumulative impacts:		
<ul style="list-style-type: none"> None anticipated 		
Residual impacts:		
<ul style="list-style-type: none"> None anticipated 		

6.11 General intrusions

6.11.1 Discussion

Apart from the dust and noise pollution expected to occur as a result of the construction vehicle movement (discussed under Section 6.7), the construction activities at the

construction site would also include increased dust and noise levels, as well as some negative visual impacts associated with the construction site.

Residents and property owners along the roads used, especially those with dwellings in close proximity to the roads and site would thus be negatively impacted on by the dust created by the heavy vehicles and noise created by the construction teams.

6.11.2 Assessment Table

Nature: General intrusions		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (40)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Construction should take place during normal working hours and the contractor should limit construction activities with potential noise impacts to non intrusive times. • Ensure that all vehicles comply with noise abatement regulations. • The adjacent property owners must be informed of the construction schedule • Gravel roads at the construction sites frequently used by construction vehicles and areas where the vegetation has been removed should be sprayed with water to suppress dust. • Construction vehicles should be in good working order to limit any potential for pollution 		
Cumulative impacts:		
<ul style="list-style-type: none"> • None anticipated 		
Residual impacts:		
<ul style="list-style-type: none"> • None anticipated 		

7. IMPACTS ASSOCIATED WITH THE OPERATIONAL PHASE

The operational phase of a PV facility is between 30 and 50 years and thus viewed as a long term process. The operating hours are from approximately ninety minutes pre-dawn to just before sunset, seven days a week. The main operational activity will be the manual adjustment of the solar panel mounts

Depending on the type of project, the impacts usually associated with this phase are therefore perceived by affected parties to be more severe. The duration of these impacts, however, should not only be the critical issue, but aspects such as the extent, the intensity and significance would have to be considered. Aspects rated high would thus warrant intense mitigation measures.

The following section provides a description of the impacts anticipated to occur during the operational stages of the proposed facility:

7.1 Employment creation

7.1.1 Discussion

In total approximately ninety (90) individuals could be employed with approximately forty (40) people on site at any given time, apart from the security personnel. One shift would be undertaken per day, but the security personnel would cover three shifts per day. A team of around thirty (30) panel operators will be on site from just pre-dawn to just pre-dusk every day. They will work in teams, with a supervisor, turning panel mounts. The canteen that would serve basic food and beverages to the workers would be run by approximately two (2) individuals.

Night maintenance would predominantly consist of panel cleaning. This will principally be done without water, either with big dusters or compressed air. Occasionally dirt would have to be removed with water cleaning. A small team (i.e. 2 to 3 individuals) will work across the site cleaning one panel each at a time.

Therefore, long-term direct job opportunities for locals exist. Secondary employment opportunities for locals would refer to the security personnel and catering services. The farm Boschdraai hosts two villages with a total of 350 residents or approximately 50 families. Those falling within the working age category and who are currently unemployed (especially young unemployed school leavers), could thus secure permanent employment at the PV facility. There would also be a further opportunity for individuals from Leseding and the entire MLM area to be employed.

Over and above the direct employment opportunities that would be created during the operational phase of the facility, a number of downstream benefits may emerge due to the increased income of some, although it is not possible to determine in which sectors it would be spent.

Overall, the employment creation as part of the operation and management of the PV facility would thus improve the quality of life among the beneficiaries (employees).

7.1.2 Assessment Table

Nature: Employment creation		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Definite (5)
Significance	Medium (52)	Medium (65)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced	
Enhancement:		
<ul style="list-style-type: none"> • Employees should be sourced from Ward 3 and Ward 1, then from the wider area. • Contractors should capacitate locals where practical. • The project proponent should consider training and capacity building programmes to lessen the skills disparity • The skill requirements should be communicated to the local community leaders and community based organisations • The Contractors and/or Thupela Energy should make use of local recruitment agencies or other relevant community based organisations to obtain a list of jobseekers • An equitable process whereby minorities and previously disadvantaged individuals (women) are taken into account should be implemented. 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Through the employment of locals other anticipated negative social impacts could be mitigated • Improved quality of life of those employed • Increased purchasing power of those employed through the project. • Indirect benefits to businesses 		

Nature: Employment creation
<ul style="list-style-type: none"> • Stimulation of local economy
Residual impacts:
<ul style="list-style-type: none"> • Skilled and capacitated individuals

7.2 Skills inequities

7.2.1 Discussion

Economic inequities refers to the degree to which employment opportunities created by the proposed project match the actual job skills present in the local communities or the unemployed sector. The following positions would be available:

- General Manager: 1
- Production supervisor: 1
- Technical manager (overseeing the technical aspects of the site, mostly high power electrical skills): 1
- Technical assistants: 2
- Security personnel: 18
- Mount and panel operators (unskilled labourers): 57 (This figure could increase based on the number of jobs per MW capacity created in this field, which could increase the total number of employees to approximately ninety (90) people as indicated in Section 7.1)

In addition there could be two (2) cooks employed and two (2) cleaning and administrative personnel.

The majority of skills therefore required for the operation and management of the facility fall within the unskilled to semi-skilled category. Some highly skilled personnel would also be required.

More than half of the population within the working age category in the MLM are employed in semi-skilled and unskilled positions. All the positions are thus expected to be sourced from the local labour pool and even the unemployed sector.

Through training and skills development, the proposed project would provide employees from the local community with transferable skills and could thus result in the overall improvement of the quality of life of those involved.

The visitors centre in itself, which would have a strong educational focus, would assist in local capacity building as it would:

- Assist with the social upliftment of local communities through site visits and educational tours undertaken by local school children and/or tourists; and
- Assist in creating awareness concerning renewable energy sources in general.

7.2.2 Assessment Table

Nature: Skills inequities		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Definite (5)
Significance	Medium (52)	Medium (65)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes, impacts can be enhanced	
Mitigation:		
<ul style="list-style-type: none"> • A broad-based approach should be followed to identify and involve relevant community based organisations and/or local recruitment agencies which could assist the main contractor in identifying people whose skills may correspond with the job specifications. • In cases for the middle to lower skilled jobs, where the relevant skills do not exist, training should be provided to willing local community members to enable them to fill the positions. • Capacity building initiatives could link in with the planned capacity building and skills training initiatives to be undertaken as part of the Waterberg Biosphere Reserve's outreach programmes. • As part of Thupela Energy's social responsibility it could consider contributing funds for the initiation phase of the Waterberg Biosphere Reserve's Skills Training Facilitation Project. 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Through the employment of locals other anticipated negative social impacts could be mitigated • Capacity building through skills development as part of the project 		
Residual impacts:		
<ul style="list-style-type: none"> • Capacity building through skills development as part of the project 		

7.3 Capacity building and skills training

7.3.1 Discussion

During the operational phase, further individually tailored made training programmes would be embarked upon which would be undertaken in association with accredited training operators. Employees will be given paid leave to attend, and attendance will be seen as part of their work, and thus compulsory.

Should employees leave the facility in search of work elsewhere in the field they would be equipped with portable skills. With the cooperation of accredited training facilities, Thupela Energy would facilitate the process whereby they assist employees in finding work elsewhere (if required).

Capacity building and skills training would thus have the greatest impact if the skills would be transferable to other type of construction or electricity generation related projects.

The visitor centre would have a strong educational and awareness creation focus. Exposure to large numbers of schoolchildren would also enhance the capacity building initiatives of the facility.

7.3.2 Assessment Table

Nature: Capacity building and skills training		
	Without mitigation	With mitigation
Extent	Regional (4)	Regional (4)
Duration	Short term (2)	Medium-term (3)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (48)	High (65)
Status (positive or negative)	Positive	Positive
Reversibility	Not applicable	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced	
Mitigation:		
<ul style="list-style-type: none"> Capacity building initiatives could link in with the planned capacity building and skills training initiatives to be undertaken as part of the Waterberg Biosphere Reserve’s outreach programmes. As part of Thupela Energy’s social responsibility it could consider contributing funds for the 		

Nature: Capacity building and skills training
<p>initiation phase of the Waterberg Biosphere Reserve’s Skills Training Facilitation Project.</p> <ul style="list-style-type: none"> • The project proponent and contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME’s during the operational phase. • The project proponent should invest in improving the quality of life of employees and their families through the provision of capacity building and skills training programmes • School excursions to the visitors centre should be arranged between the project proponent and local school representatives
Cumulative impacts:
<ul style="list-style-type: none"> • Capacitated individuals • Enhancement of skills levels of individuals involved in operation and management of facility
Residual impacts:
<ul style="list-style-type: none"> • Capacitated individuals • Enhancement of skills levels of individuals involved in operation and management of facility

7.4 Impact on the municipality

7.4.1 Discussion

Thupela Energy is responsible for funding of the project. Although the project falls within the jurisdiction of the MLM, the municipality will not contribute to the project. It is thus not anticipated that the proposed project would have any financial bearing on the MLM, although it could assist in improving the overall service delivery by strengthening the local electricity grid. This would be possible by reducing the amount of power that would be needed from Modimolle for Vaalwater, thereby creating additional supply for its own supply needs in the Modimolle area.

A huge backlog in terms of electricity provision exists as the MLM needs to supply 2 555 households with electricity. In addition, the MLM has to contribute a substantial amount to Eskom for the upgrading of the substation near Modimolle (MLM IDP, 2010 & Minutes of meeting with representatives of WDM and MLM, 2010). From a social perspective this enhancement of the electricity supply could assist the MLM to improve the quality of life of various individuals in settlements currently without power. Additional power could also be available for the development of business and economic activities in the area.

7.4.2 Assessment Table

Nature: Impact on Municipality		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)

Nature: Impact on Municipality		
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Definite (5)
Significance	Medium (52)	Medium (65)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced	
Mitigation:		
<ul style="list-style-type: none"> Ensure that locals benefit from the improved electricity supply by assisting the MLM in providing a stable electricity supply to some without electricity 		
Cumulative impacts:		
<ul style="list-style-type: none"> Improvement in quality of life of various individuals benefiting through the improvement of the local electricity supply Possible positive economic spin-offs due to the improved and stable electricity supply 		
Residual impacts:		
<ul style="list-style-type: none"> Same as above 		

7.5 Impact on energy efficiency

7.5.1 Discussion

The Waterberg area receives its electricity from the Matimba Power Station in Lephalale. The Vaalwater substation receives its power from Modimolle. One reason for the system being rather fragile is due to the length of the transmission and distribution lines stretching from Lephalale to Modimolle and Vaalwater. Currently capacity problems are experienced at the Modimolle and Vaalwater substations.

Power outages in the area are quite common which have negative social impacts on the residents as food deteriorates and water shortages are experienced as water needs to be pumped from boreholes. The water shortages could thus have severe negative impacts on the farming community when they are unable to supply their animals with adequate quantities of water, as well as community members that have to go without water for extensive periods. The more affluent property owners have taken steps to mitigate the negative impacts by investing in back-up generator systems.

The proposed PV facility could potentially assist in mitigating the above electricity supply problems. Through the generation of additional electricity, power can be fed back into the system to individual consumers through the VS (i.e. Vaalwater/Sterkstroom) or the VG (Vaalwater/.....) lines, as well as to the Vaalwater substation. In addition, this would cumulatively be beneficial to the larger Waterberg area (Personal communication: Dr. P. Calcott: August 2010).

It should also be noted that although solar power is intermittent, it could still be sufficient to ensure that fridges be functioning for some time during the day. Adequate water quantities can then also be pumped during specific periods during the day. The proposed PV facility could thus address the two most pressing electricity issues mentioned above and property owners would then be less reliant on their back-up generator systems during power outages.

The increase in power security because of the proposed PV facility could thus significantly improve the quality of life for many people such as those property owners with extensive farming practices, rural communities dependent on pumped borehole water, and property owners with tourism accommodation facilities (e.g. lodges and guest farms).

It should, however, be noted that the alleviation would only be applicable during the day time and that one would have to rely on a back-up system from Eskom during the night time or during rainy weather.

7.5.2 Assessment Table

Nature: Impact on energy efficiency		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (39)	Medium (52)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced	
Mitigation:		
<ul style="list-style-type: none"> Ensure that locals benefit from the improved electricity supply by assisting the MLM in providing a stable electricity supply to some without electricity 		

Nature: Impact on energy efficiency
<ul style="list-style-type: none"> Liaise with Eskom with regards to the end beneficiaries receiving the additional power to ensure a system whereby locals really receive the benefits of the improved electricity supply
Cumulative impacts:
<ul style="list-style-type: none"> Improvement in quality of life of various individuals benefiting through the improvement of the local electricity supply Possible positive economic spin-offs due to the improved and stable electricity supply
Residual impacts:
<ul style="list-style-type: none"> Same as above

7.6 Local procurement

7.6.1 Discussion

Apart from the technical components it is expected that some local procurement of goods, materials and services could occur which would result in positive economic spin-offs. This aspect, however, would be dependent on the outcome of the tender process.

The impact of the project on the procurement of local businesses and previously Historically Disadvantaged South Africans (HDSAs) can therefore not be determined at this stage. It is, however recommended that the project proponent commits itself to involving locals (HDSAs and SMMEs) in the procurement of capital goods, consumables and services, if these are locally available.

Local procurement could result in indirect economic spin-offs and benefits such as increased income, and expansion of other local economic sectors.

7.6.2 Assessment Table

Nature: Local procurement		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (39)	Medium (52)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	

Nature: Local procurement	
Irreplaceable loss of resources?	No
Can impacts be mitigated?	Positive impacts can be enhanced
Mitigation:	
<ul style="list-style-type: none"> Local sourcing of materials to assist in providing more economic and employment opportunities for the local people 	
Cumulative impacts:	
<ul style="list-style-type: none"> Stimulation of and support to local businesses and local economy which could ensure that benefits accrue to the local communities 	
Residual impacts:	
<ul style="list-style-type: none"> Same as above 	

7.7 Impact on sense of place

7.7.1 Discussion

The social impact associated with the impact on the sense of place relates to the change in the landscape character and visual impact of the proposed PV plant. The permanent visual impact on property owners in the area was assessed as part of the Visual Impact Assessment (VIA). The following discussion should thus be read from a social perspective as the impact on the sense of place, but also in conjunction with the VIA. It should further be noted that the assessment was based on the maximum height of 6 m above ground level of the facility's panels/mounts. However, indications are that these could be lowered to approximately 4 m above ground level.

PV facilities can have significant visual impacts and the proposed PV facility has the potential to alter the landscape character and therefore negatively affect the sense of place. Due to the rural character of the area, there is limited existing disturbance by infrastructure such as roads, transmission lines, telephone poles, dwellings, other developments, and so forth. The impact of the PV facility on the visual environment would, however, differ based on the receptors' perception of such a facility. Some people could view the facility as having a significant negative impact on the beauty of the landscape, while others could view them in a positive light and even use the presence of the facility and the concept of "green energy" as part of the area's marketing efforts. The majority of individuals consulted and property owners in the study area have a deep appreciation for the beauty of the natural bushveld and tranquillity of the area. It is thus believed that the PV facility would, by most property owners, be negatively experienced.

It is anticipated that the facility would not be clearly visible from the local gravel road to the north of the site (24 Rivers-Naauupoort-Olievenfontein gravel road), but only from limited sections on this road. This would thus result in a limited impact on tourists travelling on this road. Those travellers and property owners making use of the local entrance road to access their respective farms (e.g. the farms Schoongezicht KR 107 and Sterkstroom KR 103) and the Kudu Lodge accommodation facility on the farm Goedgevonden KR 104 would, however, be able to clearly view the PV facility. It should be noted that the farm Sterkstroom KR 103 also has another entrance on the southern border of the farm. From a social perspective this impact would only occur when the travellers are opposite to the site, and irrespective of the travellers sentiment with regards to the sense of place, it is not anticipated that it would have a continuous negative impact on the traveller or property owners' experience of the area.

From a social viewpoint, the farms nearest to the facility, that are perceived to be mostly affected by the change in the sense of place and change in the landscape character include the farms Sterkstroom KR 105/4, Naauupoort KR 106, Goedgevonden KR 104, Schoongezicht KR 107 and Sterkstroom KR 103.

The PV facility would be visible from the farm Sterkstroom 105/4 to the north of the farm Goedgevonden KR 104. According to the property owner and the VIA it would definitely be visible from the property's accommodation facility which can house approximately forty individuals. The farm Sterkstroom KR 105/4 is categorised as a guest farm for the purpose of the study (also refer to Section 5.7.4). Visitors are not usually present on a daily basis and the accommodation facility is mainly used over weekends (Personal communication with Mr. Van Rooyen: 4 August 2010). From a social point of view it is anticipated that visitors to the farm Sterkstroom KR 105/4 would not continuously look at the facility while enjoying their stay at the property, or while busy with their team building exercises or while on a game drive. The undisturbed view of the bushveld from the north to the south east and to the north remains and the vegetation absorption capacity should also be taken into consideration. The perception of the impact of the facility on the sense of place of each visitor though could differ and the intensity of the impact is thus difficult to quantify.

Kudu Lodge, which is situated on the farm Goedgevonden 104, is in very close proximity to the proposed site and the PV facility would be visible from this accommodation facility. The PV facility would thus have a definite visual and intrusion impact on this facility and to a lesser extent on the accommodation facilities on the farms Naauupoort KR 106, Schoongezicht KR 107, and Sterkstroom KR 103. The less significant impact on the latter two farms is due to the further distance of these farms' accommodation facilities from the proposed PV facility. The vegetation absorption capacity on the two farms would assist in mitigating this impact and it is thus not believed that the facility would be continuously visible to visitors to these properties. Concerning all three of these farms, the undisturbed view to the south and east would remain. Visibility of the facility concerning farms further to the north such as Sterkstroom KR 105/7, Sterkstroom KR 105, and Sterkstroom KR 105/3 are anticipated to be less and only from certain viewpoints of these properties and not from the existing accommodation facilities on these farms.

It is not anticipated that the facility would be visible to the farms to the west of the farm Goedgevonden KR 104 as the facility is proposed on the south-eastern section of the farm. Accommodation facilities on these farms are thus further away from the proposed site and property owners of and/or visitors to these farms would probably not pass the facility when accessing these farms.

Again, however, the perception of the impact on the facility on the sense of place could differ for each visitor and the intensity of the impact is again difficult to quantify. As indicated above, the facility could be positively experienced due to it being perceived as “green energy” which could even enhance the marketing potential of the area to those concerned and/or interested in the development of renewable energy sources.

Concerns were also raised concerning reflection from the panels. Should this be present, the negative visual impact on some of the surrounding properties would be worsened. It has, however, been guaranteed by the project proponent that there would not be any reflection as the panels are designed to absorb the sunlight (Minutes of meeting with adjacent property owners, 2010).

Even though the impact on the sense of place could result in negative impacts on the visitors’ experience of the area and in extreme cases result in negative economic impacts, the impact on the sense of place is still rated as moderate (with mitigation) as the intensity of the impact would be dependent on each affected individual’s perception and the possibility that some individuals would view the facility in a positive sense due to its contribution to the environment as a renewable energy source. From a social perspective, however, it remains critical that the proposed PV facility development should give ultimate priority to the mitigation of the negative visual impacts. Concerns about the success of mitigation measures remain.

7.7.2 Assessment Table

Nature: Impact on sense of place		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Definite (5)	Highly probable (4)
Significance	Medium (60)	Medium (48)
Status (positive or negative)	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	

Nature: Impact on sense of place	
Can impacts be mitigated?	To a very limited extent
<p>Mitigation:</p> <ul style="list-style-type: none"> • The design and specific positioning of the plant should aim to minimise the possible negative visual impact of the facility on the surrounding property owners. • The panel mounts should have the lowest height practically possible. • The contours of the site should be used to assist in determining the location with the least negative visual impact (possible concealment behind elevated areas). • The site should preferably be located in such a way that exposure to the local roads are as slight as possible. • The vegetation absorption capacity should be utilised as far as possible to minimise the negative visual impact. • It should be ensured that there is no reflection from the panels. • The design of buildings should blend in with surrounding environment • Lighting issues should receive the attention it deserves to avoid any light pollution at night • The mitigation measures of the Visual Impact Assessment should be strictly implemented 	
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Negative impact on sense of place could result in negative perceptions of visitors concerning the scenic quality of the area, which could again in worst case scenarios result in them refraining from visiting the area again. • Possibility that the proposed PV facility create possibilities for other developments to be established in the area 	
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Distinct change in rural character and quality of the area 	

7.8 Impacts on surrounding property owners

7.8.1 Discussion

This aspect refers to the possible impact of the PV facility and activities undertaken on site on the following:

- The daily living and movement patterns of the surrounding property owners;
- Surrounding land-uses; and
- Guest farms, guest houses, and accommodation facilities.

Only one of the neighbouring property owners (Vier-en-Twintig-Riviere KR 102/2) is currently operating a formal privately owned guest farm. The PV facility is not in close proximity to the dwellings on this property. Kudu Lodge is on the farm Goedgevonden KR 104 and therefore does not qualify as neighbouring property. The property owners consulted, however, indicated that various "lodges" are planned on the different properties. It thus seems as if there is a move to extend their existing tourism facilities to cater for national and international tourists.

From observations and discussions with the surrounding property owners the impression was created that the existing accommodation facilities include various private houses which could accommodate groups of people who would be visiting these private game farms, mainly on a weekend basis. Furthermore it is questionable whether these property owners have already formally marketed their facilities to visitors around the globe and who are unknown to them. It seems as if the visitors still include groups of people known to the property owners or their families. In addition no signboards advertising these facilities could be observed. This situation makes it difficult to assess the impact of the proposed PV facility on these types of visitors, the frequency of visits and so forth, as no official published information regarding such visitors are available.

Once operational, the impact on the daily living and movement patterns of neighbouring residents is expected to be minimal and intermittent (e.g. the increase in traffic to and from site). The traffic related impacts in this regard are discussed under Section 7.12 and will thus not again be elaborated on. Even though various property owners are of the opinion that the proposed development does not "fit in" with the existing surrounding land uses (game and cattle farming), it is not anticipated that any activities undertaken as part of the operation and maintenance of the PV facility would negatively affect the surrounding property owners' daily living patterns. They would thus be able to continue their game or cattle farming practices without interference from the PV facility as the facility:

- Is expected to create limited noise;
- Is expected to have no negative impacts on the air quality;
- Could generate positive tourism interests with subsequent increase in lodge or guest farm occupancy rates.

Should the surrounding property owners receive improved and stable electricity supply, it could even have positive impacts on their quality of life.

The visitors centre with its main aim of education regarding solar energy and environmental issues would attract visitors to the site and the area. At this stage the number of visitors and vehicles coming to the facility cannot be determined. An inflow of outsiders to the area, however, could result in negative intrusion impacts on the daily living patterns of the surrounding property owners. Mitigation measures in this regard would therefore have to be considered.

However, it is *not* anticipated that the presence and visual impact of the PV facility, even though it could affect the visitor’s sense of place, would result in less visitors coming to the area. The negative impact on the surrounding property owners with regards to the operation and management of their farms as “guest farms” with accommodation facilities is thus rated as moderate and expected to be responsive to mitigation.

7.8.2 Assessment Table

Nature: Impacts on surrounding property owners		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (60)	Medium (48)
Status (positive or negative)	Negative / Positive	Neutral / Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To a certain extent	
Mitigation:		
<ul style="list-style-type: none"> Mitigation measures listed under Section 7.12.2 should be applicable Effective management of the facility and visitors centre to avoid any environmental pollution focusing on water, waste and sanitation infrastructure and services, and limiting any increase in noise levels (due to visitors) and so forth The project proponent could consider the provision of free electricity to surrounding property owners to enable them to also experience positive impacts associated with the facility 		
Cumulative impacts:		
<ul style="list-style-type: none"> Negative impact on sense of place could result in negative perceptions of visitors concerning the scenic quality of the area, which could again in worst case scenarios result in them refraining from visiting the area again. Possibility that the proposed PV facility create possibilities for other developments to be established in the area 		
Residual impacts:		
<ul style="list-style-type: none"> Distinct change in rural character and quality of the area 		

7.9 Impact on tourism activities

7.9.1 Discussion

Four tourist attractions of the Waterberg Meander are situated in close proximity to the proposed site, namely the Church of St. John the Baptist and the Elizabeth Hunter Studio. These are situated on the farm Vier-en-Twintig-Riviere. The Beadle Craft Workshop and Shop is on the farm Klipfontein to the north of the proposed facility and can be accessed via the Sterkstroom Road. Lehlabile Cultural Tours is also situated on this road.

It is assumed that visitors to these facilities (that would not be interested in visiting the proposed PV facility and/or who possibly perceive the facility in a negative light) would most probably make use of the tarred Vaalwater-Melkriver Road after which they would use the gravel road to Vier-en-Twintig Riviere to access the first two tourist attractions. It is thus unlikely that visitors (when travelling from Vaalwater) would always pass the proposed site to the north on the local "Naaupoort-Olievenfontein" gravel road which links with the Sterkstroom Road and the Vier-en-Twintig Rivers Road. It is furthermore anticipated that the visitors travelling from Vaalwater to the Beadle Craft Workshop and Shop as well as to the Lehlabile Cultural Tours would make use of the tarred Vaalwater-Melkriver Road and then turn off on the Sterkstroom Road to access the facility. However, visitors to other attractions forming part of the Waterberg Meander situated to the north and east of the site would be more likely to pass the proposed site to the north. As indicated elsewhere, it is not anticipated that the facility would be clearly visible from the local gravel road to the north of the site. Should visitors briefly see the facility when passing by it is not expected that it would severely impact on their tourism experience in such a negative way that they would:

- Refrain from visiting the area in future;
- Recommend to other tourists to refrain from visiting the area.

Visitors to Kudu Lodge on the farm Goedgevonden KR 104, the farm Sterkstroom KR 103, and the farm Schoongezicht KR 107 would have a clear view of the facility as they would pass directly in front of the entrance to the site. Again it is anticipated that it would only result in a temporary negative impact on these visitors. Should they, however, be able to continuously have a clear view of the facility (which is unlikely) when undertaking activities on the farms, such as cycling, game and bird viewing and so forth it could impact on their wilderness experience.

The probability is rather likely that tourists would return to an area where PV facilities are present if they had a pleasant overall holiday experience.

The above mentioned possible negative impact would thus not be applicable to those visitors who would be visiting the visitors centre as a tourist destination.

International and national tourists are also becoming increasingly aware of environmental issues, and the so-called "green tourism" sector of the market is globally showing some

growth. As the Waterberg area is largely reliant for its economic well-being on tourists, the proposed facility could even benefit local tourism through the following:

- It could become a popular tourist destinations with subsequent increased exposure of other tourism attractions in the area and the larger Waterberg area with possible cumulative increases in the occupancy of existing accommodation facilities (lodges and guest farms), as well as the future planned accommodation facilities;
- It could pave the way for tourism establishments, which benefit from the increase in a stable power supply, to advertise their establishments as facilities with a lower carbon-footprint; and
- The proposed visitors centre with the focus on environmental education and awareness creation in itself would stimulate local tourism and be beneficial to the tourism sector of the Waterberg in general.

The MLM SDF (2010) stated that “business and commercial activities should promote tourism activities.” The proposed PV facility could thus adhere to these guidelines as it would include a visitor centre which could promote tourism in the area.

From a social point of view it is thus believed that the possible temporary negative impacts in terms of tourism could be sufficiently mitigated to avoid any long term negative impacts on the local tourism industry. It is thus anticipated that the facility would rather be beneficial to the local tourism sector with potential subsequent positive financial impacts for those involved in this sector.

7.9.2 Assessment Table

Nature: Impact on tourism activities		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Medium (39)	Medium (52)
Status (positive or negative)	Potentially negative / Positive	Positive
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced / Potential negative impacts can be mitigated	

Nature: Impact on tourism activities
<p>Mitigation:</p> <ul style="list-style-type: none"> • The project proponent, representatives of the MLM, tourism operators, and property owners involved in the tourism sector should jointly investigate and promote the role which the visitors centre and PV facility could play concerning the local tourism industry. • The project proponent should work closely with the above mentioned role players when developing the visitors centre. • Repeat visits to the area, PV facility and visitors centre should be encouraged. • Guest farms, guest houses, camp sites, lodges, game farms and so forth could use the presence of the proposed PV facility for "green tourism" marketing purposes • The presence of the PV facility could be included in the Waterberg tourism bureau's information leaflets and visitors guides, as well as in the publications of the Waterberg Meander.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Increased visitors to the area with positive financial impacts on the local tourism sector
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Positive economic outcome due to increased tourism

7.10 Impact on Waterberg Biosphere

7.10.1 Discussion

Even though biospheres do not necessarily exclude any development, it is sensitive to development other than conservation and eco-tourism. A small portion of the farm Goedgevonden KR 104, which is the proposed site for the PV facility, is located within the transition zone of the Biosphere Reserve and the north-western beacon of the farm boundary borders the Waterberg Biosphere Reserve's buffer zone. The area to be utilised for the proposed facility however does not fall within the Biosphere Reserve. Within the transitional zone limited agricultural and infrastructural developments are permitted (Savannah Environmental: Draft Environmental Scoping Report, 2010).

Therefore the PV facility together with other development pressures, could have a negative impact on the Waterberg Biosphere Reserve's "sense of place", but it is not expected to have a direct negative impact on the conservation and community upliftment aims of the Waterberg Biosphere Reserve or any of the tourism related attractions linked to the biosphere as part of the Waterberg Meander.

It should also be noted that in certain sections of the Biosphere there are extensive development such as rural villages and formally proclaimed towns. Parts of the biosphere area also consist of areas showing a high potential for crop farming (MLM SDF, 2010).

The proposed PV facility could even have a positive impact if it is ensured that local people benefit from the facility by employment creation and if the facility is successful in acting as a new tourist attraction. It would then link with the aim of the Biosphere to "... ensure that local people benefit from the growing tourism industry..." (Waterberg Meander Vol. 2, 1009).

Representatives of the Waterberg Biosphere Reserve have indicated that "... in principal the Waterberg Biosphere Reserve is supportive of projects that will result in sustainable utilisation of natural resources whilst at the same time creating jobs..." (Comments: Dr. Anthony Roberts, 2010). There are, however, still concerns concerning the negative visual impact and subsequent impact on the "sense of place." As also discussed under Section 7.7 it is of the utmost importance to limit the negative visual impact of the facility. From a social perspective, it is however, doubtful, to how successful mitigation measures could be.

7.10.2 Assessment Table

Nature: Impact on Waterberg Biosphere		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4) (negative) Probable (3) (positive)	Probable (3) (negative) Probable (3) (positive)
Significance	Medium (52) (negative) Medium (39) (positive)	Medium (39) (negative) Medium (39) (positive)
Status (positive or negative)	Potentially negative / Positive	Potentially positive / Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To a very limited extent (negative impacts) Yes (positive impacts)	
<p>Mitigation: The mitigation measures as under Section 7.7.2 are also applicable to this section and are again listed:</p> <ul style="list-style-type: none"> • The design and specific positioning of the plant should aim to minimise the possible negative visual impact of the facility on the surrounding property owners. • The panel mounts should have the lowest height practically possible. • The contours of the site should be used to assist in determining the location with the least negative visual impact (possible concealment behind elevated areas). • The site should preferably be located in such a way that exposure to the local roads are as slight 		

<p>Nature: Impact on Waterberg Biosphere</p> <p>as possible.</p> <ul style="list-style-type: none"> • The vegetation absorption capacity should be utilised as far as possible to minimise the negative visual impact. • It should be ensured that there is no reflection from the panels. • The mitigation measures of the Visual Impact Assessment should be strictly implemented • The mitigation measures under Section 7.9.2 to enhance the positive impacts in terms of the tourism potential of the PV facility are also applicable
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Negative impact on sense of place. • Possibility that the proposed PV facility create possibilities for other developments to be established in the area
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Distinct change in rural character and quality of the area

7.11 Impact of rezoning

7.11.1 Discussion

The land under discussion is currently zoned as "agricultural." According to representatives of the MLM, the land identified for the proposed facility could be rezoned to "industrial." However, an application is being made for "Special Rezoning." There are different categories of industrial type zoning (e.g. light and heavy industrial). The correct land use category to be rezoned to would have to be finalised in consultation with the MLM and independent town planners (Minutes of the meeting with representatives of the WDM and MLM, 2010).

The WDM Strategic Development Framework (2010) indicated that "Activities in the core zones should be restricted to activities, which does not compromise the environmental integrity of the area, while the buffer and transition zones may allow for activities that are more intensive." At this stage it is thus not anticipated that the rezoning of the land would be in conflict with the WDM SDF, although it should be mentioned that the Waterberg Biosphere Reserve is currently developing its own Environmental Management Framework and Environmental Management Plan which could again guide the rezoning process.

Concerns from surrounding landowners concerning the rezoning of the land refer to the perception that the change in land use would be an intrusion on the existing land-uses in the area which mainly include game and cattle farming. Other concerns relate to the possibility that the proposed project could expand or could create a precedent for other similar developments in the area.

Property owners are furthermore concerned that rezoning would influence the status of their farms and their rights as property owners (e.g. the reimbursement for damages suffered in the event of fires) and even possible devaluation of their properties.

The social impacts in this regard thus relate to the impact on the "sense of place" and the safety risks associated with the proposed developments. These issues are dealt with under Sections 7.7 and 7.14.

7.11.2 Assessment Table

Nature: Impact of rezoning		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Medium (36)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes	
Can impacts be mitigated?	To some extent	
Mitigation:		
<ul style="list-style-type: none"> Any application for expansion of the facility should be carefully dealt with. Any possible expansion of the PV facility would have to be clearly communicated to the surrounding property owners and the relevant legislative processes would have to be followed. Also refer to Sections 7.7.2 and 7.14.2. 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possibility that the proposed PV facility create possibilities for other developments to be established in the area 		
Residual impacts:		
<ul style="list-style-type: none"> Distinct change in land-use 		

7.12 Impacts on traffic patterns

7.12.1 Discussion

The traffic impacts associated with the operation of the facility refers to the transportation of workers to and from the site, deliveries to the canteen, as well as to the visitors coming to the visitors centre. It has been estimated that approximately seven vehicles would be travelling to and from the site per day (Minutes of meeting with adjacent landowners, 2010).

As it is anticipated that local labour would be used, and that the thirty daily employees would have to be transported from either Boschdraai farm or Leseding and Vaalwater to the site and back to their individual residences. At this stage it is planned to use one or two buses for this purpose. Transportation would be done twice a day. The most obvious route from Vaalwater would be the tar road from Vaalwater to Melkrivier and then turning off at the Sterkstroom turnoff (approximately 24 km from Vaalwater) onto the gravel road leading to the site (approximately 10 km). This would thus result in two daily additional trips by one bus on the Vaalwater-Melkrivier road, as well as two daily additional trips by one bus on the Sterkstroom-Vier-en-Twintig-Riviere road.

These additional trips could result in limited intermittent noise and dust pollution, as well as safety risks associated with speeding on the local gravel roads. The Sea Para School on the gravel road has been closed but should this facility open again speeding should be intensely mitigated in this area.

Deliveries to the canteen would generate one additional trip every two to three days. The above trips and this increase in traffic are not seen to result in severe negative impacts. The main impact in this regard would rather be the trips undertaken to the visitors centre. At this stage the number and frequency of such trips cannot be finalised although it is anticipated that it would be one bus at a time. It can thus only be concluded that the additional traffic in this regard would have an intermittent and limited negative impact on the surrounding property owners and road users.

Impact on access to properties is not expected to be affected during the operational phase. The road leading to the site (turn off from Naauwpoort /Vier-en-Twintig Riviere / Olievenfontein Road) would still be available to the property owners of the farm Sterkstroom KR 103 and Schoongezigt KR 107 to use to access the respective farms.

7.12.2 Assessment Table

Nature: Impacts on traffic patterns		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)

Nature: Impacts on traffic patterns		
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Speeding on the local roads should be avoided for safety reasons and for dust creation. • The access road to the site could be upgraded to accommodate additional traffic volumes, as well as to create some safe viewing areas where passing motorists could stop to view the facility to limit the risk of accidents • Signage along the local roads should be put up to direct visitors to the facility to limit the risk of accidents 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Increased safety risks • Noise and dust pollution 		
Residual impacts:		
<ul style="list-style-type: none"> • None 		

7.13 Impacts on infrastructure and services

7.13.1 Discussion

A Traffic Impact Assessment would be undertaken as part of the EIA. The following discussion should thus be read from a social perspective and in conjunction with the TIA.

The MLM IDP (2010) stated that there is "insufficient budget for resealing, gravelling, and maintaining of roads." It is thus highly unlikely that the MLM or provincial government would attend to the upgrading of the gravel roads in the study area. Various concerns have been raised concerning the impact of heavy vehicles associated with the PV facility on the local roads not only during the construction phase, but also during the operational phase.

Although the issue of additional pressure on the existing water, sanitation and waste infrastructure and services were raised during consultation sessions it is considered that these would be addressed by the project proponent as they would supply these services on site. No additional impact on existing infrastructure and services are therefore expected.

7.13.2 Assessment Table

Nature: Impacts on infrastructure and services		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	To some extent	
Mitigation:		
<ul style="list-style-type: none"> Refer to mitigation measures as proposed under Section 7.12. 		
Cumulative impacts:		
<ul style="list-style-type: none"> Possible poor road conditions 		
Residual impacts:		
<ul style="list-style-type: none"> Possible poor road conditions 		

7.14 Safety related impacts

7.14.1 Discussion

It is not anticipated that the proposed PV facility would result in severe safety and security impacts. Should children or other individuals gain unauthorised access to the site it could, however, create safety risks. The site should thus be properly fenced and access controlled and managed by security guards to avoid such a situation. Thupela Energy indicated that they would employ security personnel on a permanent basis which would assist in mitigating the possible impact.

The concerns of property owners concerning illegal poaching of game on the surrounding properties remain an issue which is difficult to respond to mitigation. An inflow of people to an area creates an opportunity for criminal elements. The recent number of rhinoceros poaching in the country worsens the property owners' fears in this regard.

The fire fighting services in the district and MLM area is currently understaffed and there is a need for additional personnel in the Vaalwater area. As the proposed facility could increase the risk of fires, it would be useful if attention could be given to the provision of some kind of fire fighting and emergency services on site to attend to any possible emergencies in the study area. The applicant has indicated their willingness to have some form of fire fighting capacity in the area that would be available for fire fighting in the wider area. The details and practical operations would thus be finalised as part of the final planning phases and operational aspects.

7.14.2 Assessment Table

Nature: Safety related impacts		
	Without mitigation	With mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • The site should be properly fenced. • Fire fighting and emergency services should be available on site. • Schoolchildren visiting the visitors centre should be supervised at all times to avoid accidents. • Normal operational safety guidelines should be adhered to. • Security personnel should be aware of the possibility of animal theft and poaching and should be able to identify possible criminal elements and/or criminal activities in this regard. • Procedures and measures to prevent, and in worst cases, attend to fires should be developed in consultation with the surrounding property owners. 		

Nature: Safety related impacts
Cumulative impacts:
<ul style="list-style-type: none"> Increased fire risk for neighbouring properties
Residual impacts:
<ul style="list-style-type: none"> Some safety and security risks

7.15 Health related impacts

7.15.1 Discussion

As the operations at the proposed PV facility would not result in any air pollution, the subsequent health impacts on communities and property owners in close proximity or sensitive receptors are deemed insignificant. Additional waste would however be generated by the employees on site. This impact is expected to be mitigated through the proper design of the facilities on site and waste management activities which are required to be implemented.

On a global scale the project is anticipated to have positive social and health related impacts through the “greener” technology that will be used (limited noise / no emissions and so forth).

7.15.2 Assessment Table

Nature: Health related impacts		
	Without mitigation	With mitigation
Extent	Local (2)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (1)	Probable (3)
Significance	Low (8)	Low (27)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Positive impacts can be enhanced	
Mitigation:		
<ul style="list-style-type: none"> Marketing of the “green” technology to be used can assist in awareness creation about the 		

Nature: Health related impacts
benefits of "green" technology.
<ul style="list-style-type: none"> Engineering aspects and the design of the facility should ensure no environmental pollution. Proper waste, water and sanitation infrastructure and facilities must thus be installed.
Cumulative impacts:
<ul style="list-style-type: none"> Wider awareness of "green" technology
Residual impacts:
<ul style="list-style-type: none"> Same as above

7.16 Noise impact

7.16.1 Discussion

Due to the rural characteristics of the area, existing noise levels are anticipated to be low. Noise generating sources could relate to:

- The number of workers that would be on site on a daily basis;
- The influx of visitors to the proposed development;
- Vehicle movement;
- Maintenance to be undertaken at night, especially due to the even lower ambient noise levels experienced at night; and
- Some instances where lawn mowers could be used to mow the grass between the panels instead of being the responsibility of the sheep grazing in between the panels.

Dwellings in close proximity to the area are limited and the closest sensitive receptors are on the surrounding farms which in some cases could be approximately 1 km or further away from the facility. From a social observation it is perceived that there could be limited intermittent noise impact on Kudu Lodge on the farm Goedgevonden KR 104 and possibly on the other farms surrounding the property. This noise impact could be irritating, but is not anticipated to be socially disruptive.

7.16.2 Assessment Table

Nature: Noise impact		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Very short duration (1)

Nature: Noise impact		
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Improbable (1)
Significance	Low (24)	Low (6)
Status (positive or negative)	Possibly negative	Neutral
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Employees should understand that excessive noise could be problematic and should thus attend to this issue in a sensitive manner • The use of lawnmowers should be kept to the minimum • Schoolchildren should be supervised at all times to try to keep noise levels to a minimum 		
Cumulative impacts:		
<ul style="list-style-type: none"> • None anticipated 		
Residual impacts:		
<ul style="list-style-type: none"> • Possible slight increase in noise levels at specific times only 		

7.17 Lighting pollution

7.17.1 Discussion

Due to the rural landscape of the area, no light pollution is currently experienced. Any illumination at night could have a negative impact on the sense of place especially on the surrounding farms.

Maintenance personnel that would undertake their work at night would probably use torchlight. In addition no high mast lights would be installed. Security lights would rather take the form of infrared security cameras and/or CCTV monitoring.

7.17.2 Assessment Table

Nature: Lighting pollution		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)

Nature: Lighting pollution		
Duration	Long term (4)	Long term (4)
Magnitude	Low (6)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Security lighting should be kept to the minimum • Lighting should be downward pointing and preferably no high mast lights should be installed • Security lights operating on motion sensors should be installed to minimise illumination of the area 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Possible change of landscape character especially at night 		
Residual impacts:		
<ul style="list-style-type: none"> • Possible lighting pollution 		

8. CONCLUDING REMARKS

8.1 Attitude formation and potential for social mobilisation

Negative social impacts and the social desirability associated with the proposed project could result in attitude formation and follow-on social mobilisation against the project. At this stage there is some open attitude formation against the proposed project amongst some of the surrounding property owners. The most important factors which lead to the attitude formation include the following:

- The opinion that the facility should be situated in closer proximity to Vaalwater;
- The impact associated with the inflow of workers and visitors to the area;
- The perception that the surrounding residents would not receive any direct benefits from the facility and therefore the issue of receiving free electricity was raised on various occasions by different property owners;

- The perception that the proposed project could result in the devaluation of the surrounding properties due to the impact on the sense of place and negative visual impact (It should be noted that an Economic Impact Assessment has been conducted as part of the EIA and this document should be read in conjunction with the Economic Impact Assessment);
- The proximity of the facility to the Waterberg Biosphere Reserve and the possible impact of the facility on their status in the biosphere;
- The perception that the proposed facility would have a negative impact on the local tourism ventures, especially those of the Waterberg Meander.

The EIA process would attend to the issues above to determine the intensity of the various anticipated impacts, but it is recommended that a future transparent and comprehensible communication process should be embarked upon to address these. Thupela Energy should continue to communicate with the affected property owners at public forums attended by all the relevant role players. Sensitive issues should be dealt with accordingly.

8.2 General Conclusions

Based on the social assessment, the following general conclusions and findings should be noted:

- The potential negative impacts associated with the construction phase are typical of construction related projects and not just focused on the construction of the PV facility. These relate to the inflow of workers to the area, inflow of jobseekers, intrusion influences (e.g. noise pollution, increased vehicle movement and so forth), as well as safety and security issues. In most cases these impacts could respond to the mitigation measures proposed.
- Given the socio-economic profile of the population within the area, the possible job creation during the construction phase and operational phase of the proposed project is deemed as a significant positive injection into the area. It is anticipated that the unskilled and semi-skilled positions could be filled by local labourers.
- The majority of households in the study area live under severe poor conditions with low skills levels and low household income profiles. The proposed project could therefore assist in improving this situation for those who could obtain permanent employment at the facility. Even if it would only be a small contribution to the economic well-being of the larger population it should still be seen as a major positive impact on those affected.
- It is thus imperative that local labour be sourced otherwise no direct economic benefits would accrue to the locals. Preference should thus be given to the use of local labour during the construction and operational phases of the project as far as possible. Locals should also be allowed an opportunity to be included in a list of possible local suppliers and service providers.

- Failure to involve the local population, emerging contractors, and SMME's during construction could lead to negative attitude formation against the proposed project and the project proponent.
- The use of local labour could mitigate other negative social impacts associated with the inflow of outsiders.
- An inflow of outside jobseekers to the construction site is likely and could result in various negative impacts, but mainly if the jobseekers remain in the area after the construction has been completed.
- Capacity building and skills training among employees are critical and would be highly beneficial to those involved, especially if they receive portable skills to enable them to also find work elsewhere and in other sectors.
- The increase in construction vehicles would result in detrimental impacts on the local road conditions which could have lasting implications as it is not expected that the quality of the gravel roads would be sufficiently tended to by the MLM.
- Negative impacts on the local tourism sector are possible during the construction and operational phase although it is anticipated that these can be successfully mitigated and would not result in long-term negative financial implications. The local tourism industry can even benefit during the construction phase due to lodge occupancy by some construction team members. It is thus anticipated that the facility would rather be beneficial to the local tourism sector in the long term with potential subsequent positive financial impacts for those involved in this sector.
- Anticipated safety and security impacts during the construction phase remain a concern and should be sensitively and thoroughly dealt with.
- The MLM could benefit from the proposed project as a result from the improvement in the electricity supply in the area with subsequent positive economic spin-offs.
- Some local procurement of goods, materials and services could occur which would result in positive economic spin-offs
- The overall "sense of place" would be negatively influenced by the proposed project due to the facility's negative visual impact, and the change in land-use. In most cases it is extremely difficult to quantify the "soft" issues such as the impact on "sense of place" as the intensity would depend on each different individual's perception and experience of the area.
- It is, however, not anticipated that the proposed project would alter the host community's standard of living or quality of life or directly negatively impact on the activities undertaken on these properties, even though it would have a negative impact on the sense of place.

- The proposed PV facility would not be detrimental to the health of the host community, even though it would change the character of the area due to the visual impact associated with such a facility.
- It should be noted that the visual impact is a concern for the several property owners and this issue is not expected to be successfully mitigated.
- It is expected that the negative intrusion impacts associated with the project on the lifestyle within the area and activities undertaken on the farms, would remain high on the agenda of the surrounding residents, and directly affected landowners. Hence, if approved, the activities and management of the facility by Thupela Energy would in future still be closely monitored.
- The property owners' concerns concerning safety and security issues during the operational phase should be sensitively dealt with and be addressed as far as possible.
- The proposed PV facility could become a major tourist attraction in its own right and complement the existing tourism attractions in the area, thereby resulting in promoting a positive image of the area with resultant positive impact on the local tourism industry, economy, and environment.
- The project is anticipated to have positive social and health related impacts through the "greener" technology that will be used (limited noise / no emissions and so forth).
- On a global scale the project has the potential to assist in reducing carbon dioxide emissions which would thus have an ameliorating impact on global climate change.

From a social perspective it can be concluded that the proposed PV facility would not result in permanent damaging social impacts and that the socio-economic benefits associated with facility outweigh the negative social impacts. No negative social impacts that could be classified as fatal have been identified and there are no impacts of such a high significance that they could prevent the project from continuing. It is thus concluded that the proposed project is acceptable from a social point of view, if mitigation measures are strictly implemented.

9. RECOMMENDATIONS

From a social perspective the following recommendations are made:

- The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positives.
- The project proponent should not just use the possible employment opportunities to obtain support from the local communities, but should be committed to creating long

term employment and capacity building, thereby ensuring long-term sustainable development in the area.

- Construction related skills obtained by individuals during the construction phase should be transferable to other sectors beyond the construction industry as further major construction projects in the area are quite unlikely.
- As the area could experience an inflow of outside jobseekers, the project proponent, local leaders and the MLM should jointly develop a strategy to minimise the influx of jobseekers to the area
- The jobs created during the operational phase, however, will have a more marked impact on the local community if it is ensured that the benefits to the local community and youth are enhanced.
- Benefits concerning the project should accrue to locals, especially concerning the improvement in the local electricity supply.
- The negative visual impact of the facility on the surrounding area should receive the attention it deserves.

10. SOURCES CONSULTED

10.1 Documents

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www.waterbergbiosphere.org

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10.3 Consultation

The following individuals were consulted for the purpose of the Social Impact Assessment

Dr. R. Baber: Chairperson Waterberg Biosphere / Property Owner Farm Klipfontein / Manager: Farm Boschdraai

Ms. T. Baber: Property Owner Farm Klipfontein / Business Owner Beadle Craft Workshop and Shop

Mr. P. Siebe: Waterberg District Municipality

Mr. H. Phogone: Modimolle Local Municipality

Mr. H. and Mrs. M. van Herwaarden: Property owner Farm Vier-en-Twintig Rivier

Ms. Y. Fourie: Waterberg Tourism Office

Mr. T. Eloff: Property Owner Farm Sterkstroom KR 105/6 and 105/8

Mr. T. Hyam: Property Owner Farm Sterkstroom KR 105/7

Mr. R. Jurgens: Manager Farm Sterkstroom 102 and 103

Mr. D. Breedt: Property Owner Farm Schoongezigt Remaining Extent

Mr. N. and Mrs. C. Heal: Property Owners Farm Bellevue Portion 1 (Rainbows End)

Mr. W. and Mrs. W. van Rooyen: Property owner Farm Sterkstroom Portion 105/4