REPORT NO 01

BIOTHERM MARALLA WEST WIND FACILITY

SOCIO-ECONOMIC SCOPING REPORT

PUBLIC

SEPTEMBER 2016

WSP | PARSONS BRINCKERHOFF

BIOTHERM MARALLA WEST WIND FACILITY

SOCIO-ECONOMIC SCREENING REPORT

BioTherm Energy (Pty) Ltd

Type of document (version)
Public

Project no: 47579
Date: September 2016

WSP | Parsons Brinckerhoff
WSP House, Block A
1 on Langford, Langford Road, Westville

Tel: +27 31 2408860
Fax: +27 31 2408861
www.wspgroup.com
www.pbworld.com

QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Draft			
Date	March 2016	July 2016		
Prepared by	Bathabile Msomi	Danielle Sanderson		
Signature				
Checked by	Danielle Sanderson	Hilary Konigkramer		
Signature				
Authorised by	Hilary Konigkramer	Hilary Konigkramer		
Signature				
Project number	47579	47579		
Report number	001	001		
File reference	DBN/ES_Live Projects	DBN/ES_Live Projects		

PRODUCTION TEAM

CLIENT

BioTherm Energy (Pty) Ltd	Irene Bezuidenhout

WSP | PARSONS BRINCKERHOFF

Director	Hilary Konigkramer
Senior Consultant	Danielle Sanderson
Assistant Consultant	Bathabile Msomi

TABLE OF CONTENTS

TABLES

FIGURES

Acronyms

Acronym	Description
ADI	Area of Direct Impact
AII	Area of Indirect Impact
BioTherm	BioTherm Energy (Pty) Ltd
DEADP	Department of Environmental Affairs and Development Planning
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
ha	Hectare
IDP	Integrated Development Plan
LED	Local Economic Development
MW	Megawatt
NCGPDS	Northern Cape Provincial Growth and Development Strategy
REDZ	Renewable Energy Development Zones
REIPPP	Preferred bidder Renewable Energy Independent Power Producer Procurement
SALT	South African Large Telescope
SDF	Spatial Development Framework
SEIA	Social and Environmental Impact Assessment
SIA	Socio-economic Impact Assessment
WSP	WSP Environmental (Pty) Ltd

1 INTRODUCTION

Biotherm Energy (Pty) Ltd (BioTherm) propose to develop a renewable energy wind facility within the Western Cape, namely the Maralla West Wind Facility (the proposed project). WSP Environmental (Pty) Ltd (WSP) has been appointed to undertake a Social and Environmental Impact Assessment (SEIA) for the renewable energy project in order to obtain the necessary Environmental Authorisations (EA). WSP is undertaking a Socio-economic Impact Assessment (SIA) in support of the SEIA.

The SEIA is divided into two phases, firstly the Scoping Phase, and secondly and Environmental Impact Assessment (EIA) Phase. This report comprises the initial socio-economic screening in support of the Scoping Phase of the SEIA.

1.1 AIMS, OBJECTIVES AND LIMITATIONS

The purpose of the SIA is to determine the potential positive and negative impacts of the proposed wind projects, as well as the related infrastructure, on the local and regional socio-economic environment. The key objectives in the scoping process are to:

- Contextualise the socio-economic landscape of the proposed projects
- Describe the socio-economic receiving environment;
- Identify the potential socio-economic aspects and impacts of the proposed project; and
- Undertake a screening assessment of these impacts thereby identifying the key impacts to be taken forward into the EIA phase study.

The socio-economic scoping was undertaken as a desktop assessment. A desktop assessment is considered a suitable methodology for the scoping phase of the SIA, as it provides broad baseline information for the Scoping Phase of the EIA process.

The limitation of a desktop assessment is that the specialist does not have first-hand experience of the site, and related socio-economic activities, and therefore there is the potential for socio-economic issues to be distorted through review of secondary information only.

1.2 PROPOSED PROJECT DESCRIPTION

The proposed Maralla West Wind Facility site is located approximately 33 km south of the town of Sutherland (**Figure 1**). The site falls within the Karoo Hoogland Local Municipality, Northern Cape. The facility is proposed to include an up to 250 MW power facility (6 400 ha).

Access to the proposed project site is from a secondary road (unnamed) 15 km from the R354. The properties on which the proposed Maralla Wind Facility will be located are listed below:

- Remaining Extent of Farm 3 Roodeheuvels 180
- Remaining Extent of Farm Annex 3 Roodeheuvels 181
- Portion 1 of Farm Wolven Hoek 182
- Portion 2 of Farm Wolven Hoek 182

PROPOSED INFRASTRUCTURE

The proposed project will utilise wind turbines to generate electricity, which will feed into the National Power Grid. A typical wind turbine consists of four primary components namely: a foundation unit, a rotor, a tower and a nacelle[1].

The proposed project will consist of up to 125 wind turbines with a generating capacity of 1.5 and 4 MW each. The primary components associated with each wind farm site include:

- Up to 125 turbines with up to 120m hub height and up to a 150m rotor diameter;
- Access and internal roads (up to 6.0 m wide and up to 60 km of road network);
- Fencing;
- Onsite Independent Power Producers substation which will occupy an area of approximately 2.25ha (up to 132kV);
- 132kV Power lines (servitude of up to 65m) which will link the facility to grid;
- A medium voltage collector network to connect individual turbines to the substation;
- Operation and maintenance building
- Temporary and permanent laydown areas; and
- Administration, control and warehouse buildings.

The proposed infrastructure and related components associated with the proposed project are illustrated in **Figure 2.**

1.3 ALTERNATIVES

SITE ALTERNATIVES

The proposed project site has been selected based on several criteria such as terrain, land suitability, site extent, site and surrounding land use, and accessibility of the site. For the purpose of the EIA process, no other site alternative has been considered for the proposed project. The hilly and mountainous terrain and current land use makes the selected site best suited for the proposed project. No other site alternatives have therefore been assessed.

TECHNOLOGY ALTERNATIVES

The proposed wind turbine technology will be selected based on the best available technology for the location and power generation requirements. No details of this technology are available at the time of this study. No other renewable energy technologies have been considered for the proposed project due to the hilly and mountainous terrain.

[1] *Generating components, including the generator, gearbox, drive train, and brake assembly*

Figure 1: Site Location of proposed Maralla West Wind Facility

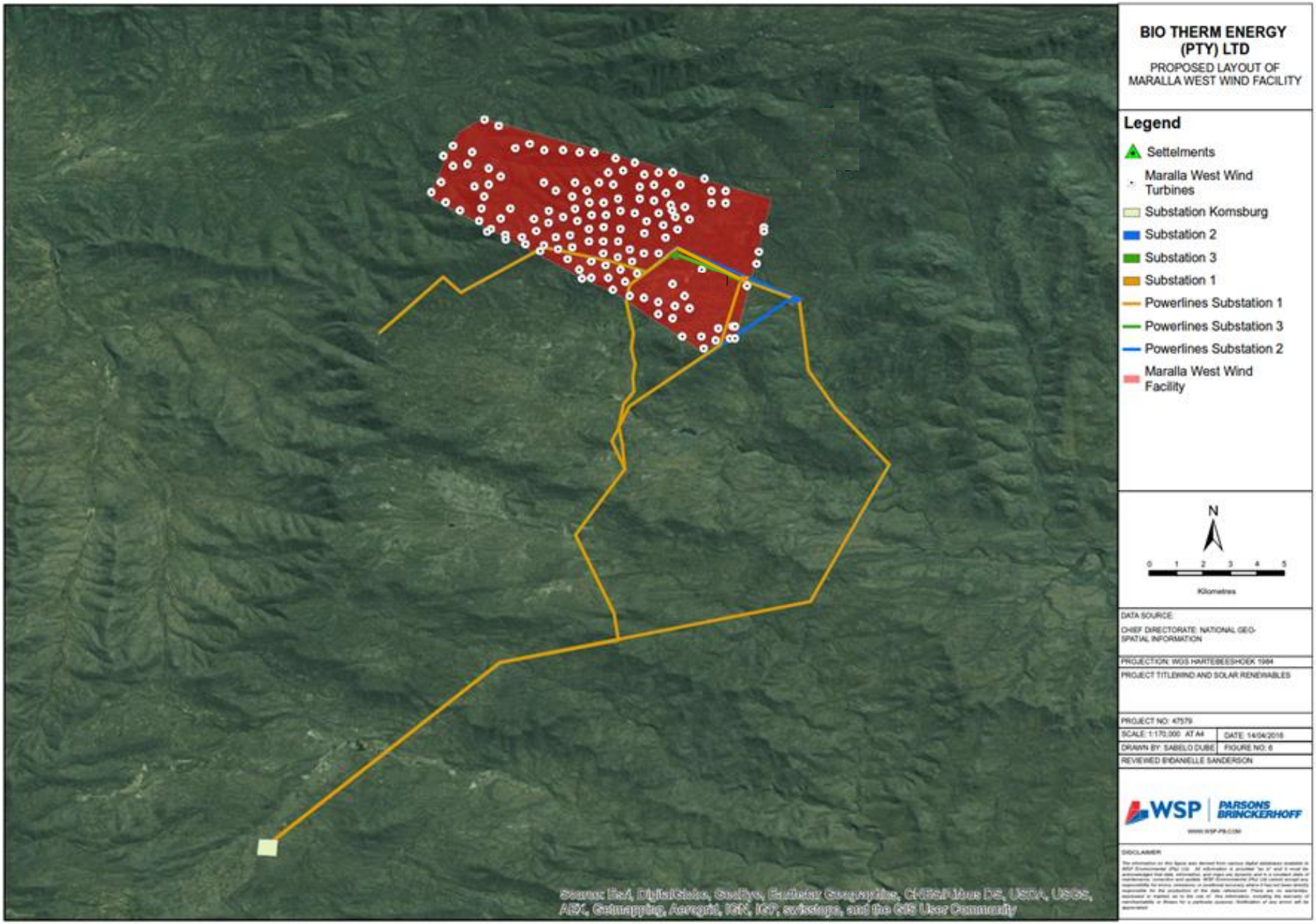


Figure 2: Proposed Maralla West Wind Facility Layout

LAYOUT ALTERNATIVES

The layout alternatives that are proposed for the Maralla West facility include:

- Substations:
  - Internal - *three options* for internal (step up) substation
- Power line routes
  - Internal - *four options* for internal lines to each step up substations (12 total)

One of each of the above will be selected for detailed assessment following the Scoping Phase.

NO-GO ALTERNATIVE

The no-go option needs to be considered and assessed in an objective manner during the SEIA process for the proposed project. This alternative would result in the status quo remaining, i.e. the proposed project would not be developed.

NO-GO ALTERNATIVE

The no-go option needs to be considered and assessed in an objective manner during the SEIA process for both proposed projects. This alternative would result in the status quo remaining, i.e. the proposed project will not be developed.

2 APPROACH AND METHODOLOGY

The approach to the socio-economic screening assessment for the Scoping Phase has included the following:

- Desktop review;
- Description of the socio-economic context of the project;
- Preliminary identification of potential impacts associated with the proposed project; and
- Development of a plan of study for the SIA.

2.1 DESKTOP REVIEW

The following data sources and reports were reviewed to determining the socio-economic context of the proposed project:

- 2011 National Census Data (Statistics South Africa, 2012)
- Namakwa District Municipality Draft Integrated Development Plan: 2015-2016 (Namakwa District Municipality, 2015)
- Central Karoo District Municipality 3rd Generation Integrated Development Plan: 2012-2017 (Central Karoo District Municipality, 2012)
- Northern Cape Provincial Growth and Development Strategy (Northern Cape Province, 2004)
- Project information and reports on similar projects

2.2 DESCRIPTION OF THE SOCIO-ECONOMIC CONTEXT OF THE PROJECT

The description of the socio-economic receiving environment of the proposed project comprises the regional, local and site-specific information, including population statistics, landuses and economic activities. This provides context to the potential socio-economic impacts and allows the screening of these impacts in line with the impact screening approach.

2.3 PRELIMINARY IDENTIFICATION OF POTENTIAL IMPACTS

The screening phase provides insight into the nature of the local social and economic environment, and the potential socio-economic issues that may arise from the proposed project. This step provides a preliminary description of these issues and the potential anticipated socio-economic impacts within the appropriate context.

2.4 IMPACT SCREENING PHASE

The screening phase includes an impact screening process developed by the environmental assessment practitioner (WSP) to assess the significance of identified impacts. The screening tool will allow any impacts of very low significance to be excluded from the detailed study in the impact assessment phase (i.e. the SIA). The screening tool is based on two criteria, namely probability and severity, as described in **Table 1**, **Table 2** and **Table 3**.

Table 1: Screening Assessment Matrix

		Severity / Beneficial Scale			
		1	2	3	4
Probability Scale	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	High

Table 2: Probability Scale

4	**Definite** Where the impact will occur regardless of any prevention measures
3	**Highly Probable** Where it is most likely that the impact will occur
2	**Probable** Where there is a good possibility that the impact will occur
1	**Improbable** Where the possibility of the impact occurring is very low

Table 3: Severity / Beneficial Scale

4	**Very severe** An irreversible and permanent change to the affected system(s) or party (ies) which cannot be mitigated.	**Very beneficial** A permanent and very substantial benefit to the affected system(s) or party (ies), with no real alternative to achieving this benefit.

3	**Severe** A long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	**Beneficial** A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
2	**Moderately severe** A medium to long term impacts on the affected system(s) or party (ies) that could be mitigated.	**Moderately beneficial** A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	**Negligible** A short to medium term impacts on the affected system(s) or party (ies). Mitigation is very easy, cheap, less time consuming or not necessary.	**Negligible** A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

2.5 PLAN OF STUDY FOR EIA

The potential impacts identified in the screening phase will require further investigation during the EIA phase. A plan of study, including details on the process to be followed, is provided as a way forward for the detailed desktop SIA.

3 SOCIO-ECONOMIC CONTEXT

3.1 REGIONAL CONTEXT

NORTHERN CAPE PROVINCE

The proposed site is located within the Northern Cape Province (**Figure 1**). The Northern Cape is the largest province within South Africa, and has the country's smallest population, with a population density of approximately 1 person per square kilometre (Statistics South Africa, 2016). The climate of the province is predominantly arid, with the Orange River (located in the north) providing the most significant water source for the province.

Key economic activities within the province include agriculture and mining. The climatic conditions lend itself towards extensive sheep, goat, and cattle rearing, which is the main farming activity in the province. Farmers in the province contribute to 6.1% to South African agriculture and 6.6% of the province's economy (Statistics South Africa, 2012).

Mining is, however, the leading contributor to the province's economy, which includes diamond, iron, manganese, titanium, zinc, lead, and copper mines in various areas of the province. The Northern Cape mining industry makes up nearly 7% of South Africa's total mining value and contributes 23.4% to the provinces total economy.

There are a number of small economic contributors, which are nonetheless important to the local economy. These include tourism (Kgalagadi Transfronteir Park, Namaqua National Park, and Richtersveld world Heritage Site) and technology (the Square Kilometre Array and South African Astronomical Observatory and the Southern African Large Telescope (SALT)).

The Namakwa District Municipality is one of five districts of the Northern Cape Province and comprises six local municipalities. The municipality is extensive, covering approximately a third of the province, extending from the Namibian border in the north, Atlantic Ocean to the west, and through to the central region of the Karoo dessert in the south. The district is the least populated in the province with just over 100 000 people, with a population density of 0.91 people per square kilometre (Statistics South Africa, 2016).

The main contributor to the local economy of the Namakwa District Municipality is the mining sector (52% to GDP), which includes including iron, manganese, and zinc extraction (Namakwa District Municipality, 2012). Other economic activities include mariculture, agriculture and community services (Namakwa District Municipality, 2012). The mining sector is the largest employer within the municipality, although recent trends show the sector to be in decline. A decline in employment opportunities in the mining sector emphasises the need to prioritise alternative sectors (Namakwa District Municipality, 2012).

3.2 LOCAL CONTEXT

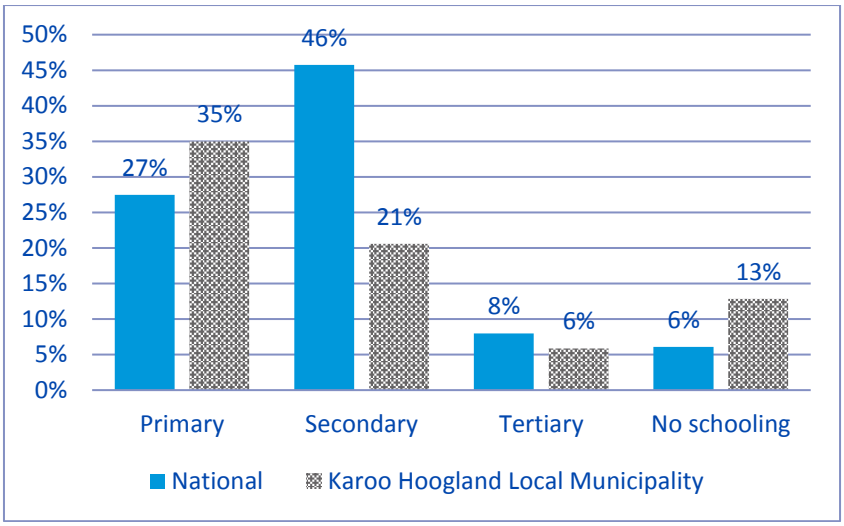
KAROO HOOGLAND LOCAL MUNICIPALITY

The proposed Maralla West Wind Facility site is located within the Karoo Hoogland Local Municipality, which forms part of the Namaqua District Municipality, in the southernmost area of the Northern Cape. The three main towns in Karoo Hoogland are Williston, Fraserburg and Sutherland (Karoo Hoogland IDP, 2015).

The human settlement within the Karoo Hoogland Local Municipality is concentrated within urban area, with farming communities and settlements being dispersed across the municipality. The population is 12 588, with a population density of 0.4 persons per square kilometre (Statistics South Africa, 2012). The groups representing the highest percentages of the municipality's population are Coloured (79%), followed by White (15%) and Black African (6%) (Statistics South Africa, 2012).

The service levels within the local municipality are moderate with 73.4% of the households having access to electricity for lighting, 58.5% for cooking and 46.4% for heating. This is due to majority (73.3%) of the population residing in urban areas. Sixty-two percent of the municipality's water service is provided by the municipality and other water services, while 33.8% is sourced from boreholes. Refuse removal services level are moderate, as 62.7% of households have their refuse removed by the local authority. Sanitation levels are low with only 39.4% having flush toilets connected to a sewer system. A lack of infrastructure has been identified by the Karoo Hoogland IDP as one of the key a priority development needs (Karoo Hoogland Local Municipality, 2015).

The education levels within the local municipality are low compared to the national average, as indicated in **Figure 3**. Areas with low levels of education and skills generally present a lower level of economic employment than populations with higher education levels, as indirect opportunities through entrepreneurship are also lost. There are therefore likely to be low numbers of skilled individuals available for employment within the Karoo Hoogland Local Municipality.



Data sourced from: Stats South Africa, 2012

Figure 3: Education levels – Karoo Hoogland Local Municipality

The income levels of the municipality's population are low, with 42.5% earning less than R1600 per month. The unemployment levels are 6.5% higher than national levels, with 33.2% of the potential labour force being unemployed in comparison to the national unemployment levels of 26.7% (as of the first quarter 2016) (Statistics South Africa, 2012 and 2016).

The Karoo Hoogland Local Municipality is characterised by an arid and mountainous environment. The low potential grazing, non-arable land is suited for sheep and game farming, and consequently agriculture and tourism are the main local economic contributors (Karoo Hoogland Local Municipality, 2010).

3.3 LOCAL ECONOMIC ACTIVITIES

AGRICULTURE

KAROO HOOGLAND LOCAL MUNICIPALITY

The Karoo Hoogland Local Municipality has very limited arable land and poor soil conditions, which makes it ideally suited for grazing (Karoo Hoogland Local Municipality, 2010). Sheep farming is therefore the key agricultural and economic driver. Other agricultural activities include ostrich rearing, and limited, intensive crop farming.

TOURISM

KAROO HOOGLAND LOCAL MUNICIPALITY

Tourism plays a secondary, but important, role within the Karoo Hoogland local economy. Sutherland is home to the SALT (14 km from Sutherland), which provides a technology tourism opportunity. In addition, agri-tourism and eco-tourism (including an extinct volcano) attract visitors nationally and internationally.

RENEWABLES

There are a number of proposed renewable energy projects within the Karoo Hoogland (and neighbouring Laingsburg) Local Municipality. The dominant strong winds throughout the province make the region an ideal location for wind farms. There are a number of proposed and existing

developments situated within a 50 km radius of the proposed Maralla West project site (**Table 4**). The presence of multiple approved and proposed wind and solar energy farms within the vicinity of the proposed project site creates an opportunity for infrastructure sharing. Currently, however, only three of the proposed surrounding facilities have been awarded preferred bidder status by the Department of Energy.

Table 4: Renewable energy projects in proximity to the Maralla West Wind Facility

Wind Farm (Developer)	Capacity	Distance from site	Status of development
Roggeveld Wind Energy	140MW	11 km	Environmental Authorisation granted (Preferred bidder REIPP Round 4)
Nxuba (Soerwater) Wind Farm	139.4MW	10.9 km	Environmental Authorisation granted (Preferred bidder REIPP Round 4)
Karusa Wind Farm	142MW	13 km	Environmental Authorisation granted (Preferred bidder REIPP Round 4)
Suurplaat Wind Facility	1200MW	34 km	Environmental Authorisation granted
Hidden Valley Wind Farm	150MW	6 km	Environmental Authorisation in progress
Leeuwren Valley	300MW	25 km	Environmental Authorisation in progress
Mainstream Renewable Power Sutherland Wind and Solar PV	811MW	0 km	Environmental Authorisation granted
Inca Sutherland Solar PV (Kakhals Valley)	10MW	20 km	Environmental Authorisation granted

3.4 LOCAL COMMUNITIES

MARALLA WEST WIND FACILITY

The proposed Maralla West project site lies 33 km south of the town of Sutherland, within an area used predominantly for extensive sheep grazing. There is a number of farming related activities within the proposed Maralla West site and within the surrounding areas, with Sutherland being the closest town to the proposed site (**Figure 4**). A description of these communities is provided in **Table 5**.

Table 5: Description of local settlements and towns – Maralla West

Relevance to the site	Settlement name	Distance and direction from site	Description
Within site boundary	Aurora Farm	1 600 m from eastern border	Comprised of several buildings, and planted pastures. This settlement is currently occupied (son of the landowner), but is not within proximity to any of the proposed structures on site.
Adjacent to site boundary	Welgemoed	1.8 km north east	Both farming settlement includes of several buildings and planted pastures.
	Komsberg	1.9 km east	
Within 10 km of site boundary	Surrounding farm settlements	2.9 km northeast 3.7 km southeast	There are several small settlements along the Komsberg and MeintjiesPlaas River and tributaries surrounding the proposed site.

Relevance to the site	Settlement name	Distance and direction from site	Description
		3.9 km southeast 4.7 km south	These are predominantly sheep farms, with planted pastures or lucerne[2].
Closet towns	Sutherland	32 km north	Sutherland is historically an agricultural service centre, catering for the surrounding farming community. The town includes tourism activities and is a key technology centre in South Africa, with the South African Astronomical Observatory and the (SALT). The town has a population estimated at 2 836 people and approx. 718 households[3].

3.5 SOCIO-ECONOMIC POLICY AND PLANNING CONTEXT

PROVINCIAL POLICIES

NORTHERN CAPE

The main objectives of the Northern Cape Provincial Growth and Development Strategy (2004 – 2024) include:

- Promoting growth, diversification and transformation of the provincial economy;
- Poverty eradication through social development; and
- Enhancing Infrastructure for economic growth and social development.

The strategy also identifies energy as one of the sectors that will promote growth and development within the province (Northern Cape Provincial, 2004). The proposed wind power project therefore falls within the Northern Cape economic development strategies, by improving infrastructure and employment generation.

DISTRICT AND LOCAL MUNICIPAL POLICIES

CENTRAL KAROO DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN (2012-2017)

NORTHERN CAPE

The IDP documents developed by the Namakwa District Municipality and Karoo Hoogland Local Municipality provide socio-economic context to the proposed project, and highlight the potential social and economic requirements and opportunities within the region.

[2] Cape Farm Mapper - Crop Census 2013
[3] Statistics South Africa, 2012

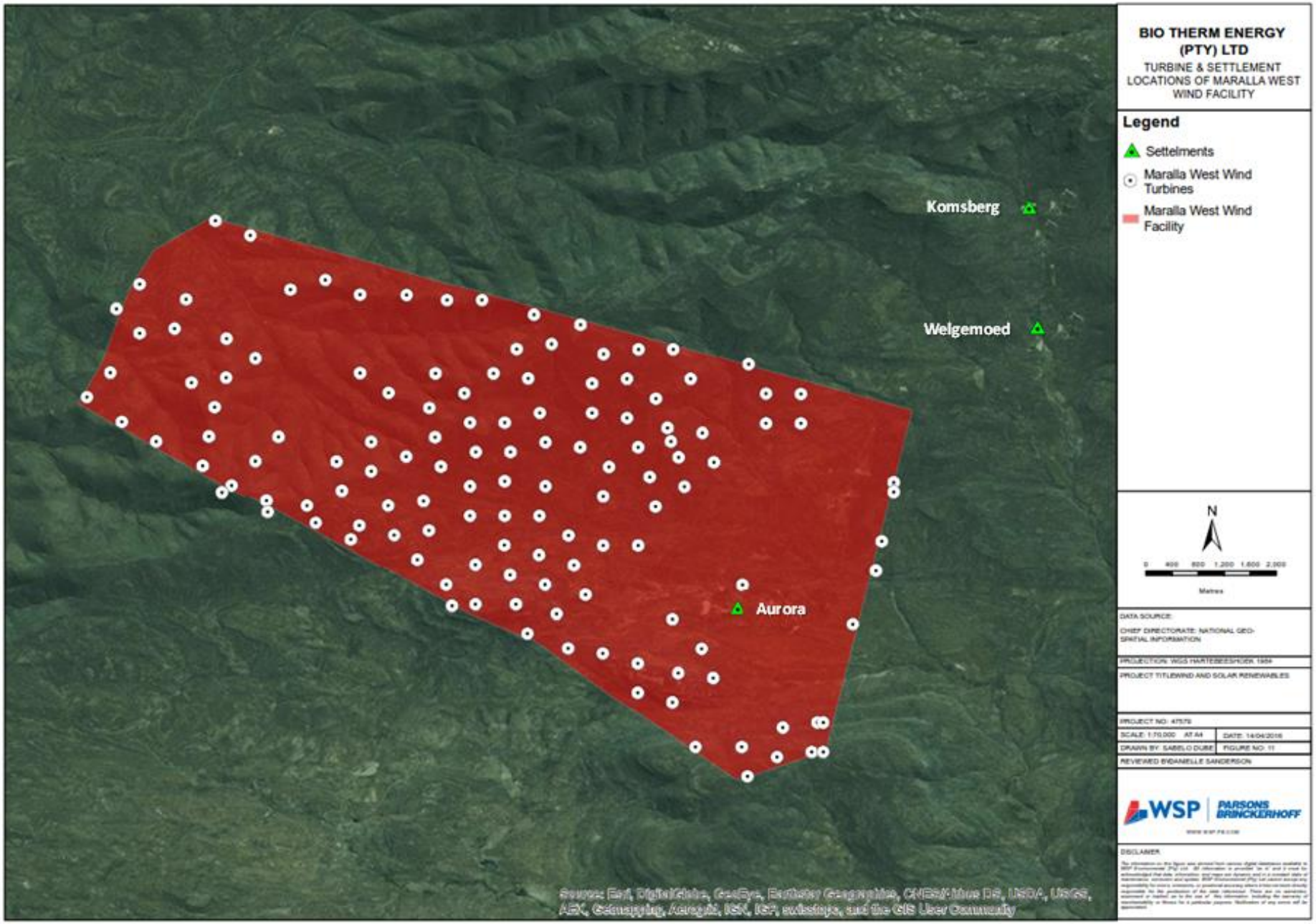


Figure 4: Location of settlements in proximity to the Maralla West site

NAMAKWA DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN

The Namakwa District Municipality Draft IDP (2015-2016) identifies promoting the improvement of living conditions and economic development of local communities as a key objecting for the municipality (Namakwa District Municipality, 2015). A key focus area within the IDP is the optimal utilisation of natural resources in various sectors and this includes renewable energy (Namakwa District Municipality, 2015).

The key strategic objectives of the Namakwa District Municipality IDP (Namakwa District Municipality, 2015) relevant to this study are as follows:

- Create of job opportunities, as part of the Expanded Public Works Programme; and
- Ensure sustainable economic and social transformation in the district.

The proposed project has the potential to promote job creation, as well as sustainable economic and social growth through upskilling of local community, diversifying the local economic sector, and potentially uplifting the local communities in the long-term.

KAROO HOOGLAND LOCAL MUNICIPALITY INTEGRATED DEVELOPMENT PLAN (2015-2016)

The Karoo Hoogland Local Municipality views spatial development as crucial in identifying programmes and projects for development of land within the municipality. The IDP identifies spatial development, service delivery and LED as three of the key performance areas that require tangible development within the municipality. The IDP also identifies the need to attract potential investors through incentive programmes.

Renewable energy is a key LED opportunity for the Karoo Hoogland Local Municipality, which will result in spatial development (in an otherwise undeveloped area of the municipality). The proposed Maralla Wind Facility is therefore aligned with the local municipality's IDP.

4 ALTERNATIVES ASSESSMENT

WSP has considered the project alternatives specific to the infrastructure to service the proposed project in context with the potential socio-economic impacts.

SITE ALTERNATIVES

Wind Facility

There is currently farm infrastructure within the boundary of the proposed Maralla West Wind facility. This infrastructure is not currently being utilised by the farmer. It is understood that the land owner will be compensated for the use of the proposed site, via a lease agreement and a percentage of the revenue generated by the proposed facility. This agreement with the land owner is understood to be in place.

The screening phase impacts of the proposed project are therefore considered in terms of the preferred site described in **Section 1.2**.

5 POTENTIAL IMPACT IDENTIFICATION

5.1 CONSTRUCTION PHASE

EMPLOYMENT OPPORTUNITIES AND SKILLS DEVELOPMENT

A labour force will be required for the development of the proposed project. These individuals are likely to be sourced from outside of the local area (regionally and nationally) as the majority of the opportunities are highly specialised. Skilled employment to the local and surrounding communities will be very limited due to skills shortages. There is, however, the potential for short-term local employment opportunities for unskilled and semi-skilled individuals (e.g. general labour, security, cleaning staff). BioTherm aims to fulfil 60% of the employment opportunities generated by the proposed facility from the local communities, or as far as practically possible. The generation of employment opportunities has the potential to have a positive social impact given the high levels of unemployment in the region.

The proposed development of the numerous renewable projects in the local area is also likely to develop a local skills base, which could support the proposed projects. There may, however, be an opportunity for the proposed project to develop local skills prior to the development of the project. This would provide further benefit to the local communities.

LOCAL ECONOMIC DEVELOPMENT OPPORTUNITIES

The demand for services, as well as goods and materials during the construction phase of the proposed project has the potential promote LED. The provision of services, such as accommodation, catering, and transport associated with the workers and contractors on site could encourage entrepreneurship, and local business growth and development. This could contribute towards alleviating high local unemployment. The low levels of education are, however, a hindrance to this, as education is known to provide a basis that assists households and individuals to perceive and embark on economic opportunities offered by new economic activities (Schultz, 1980 in van der Suis *et al*, 2003). The proposed project could, however, provide a means of facilitating this through partnerships with local authorities.

DISTURBANCES TO LOCAL COMMUNITIES

The proposed project is situated in rural areas, with a low population and scattered agricultural settlements. The nearest urban areas (small towns) are over 20 km from the respective sites.

The construction phase has the potential to result in a disturbance to the local urban areas, including the influx of skilled and unskilled employment seekers from outside the local area posing. The presence of non-residents can pose a risk to existing social structures and networks. In addition, disturbances to local farming communities may include:

- An increase in traffic on rural roads;
- A disruption to tourism activities;
- An increase in dust and noise from construction activities; and
- Increased risk of livestock poaching.

Details on the number of potential employees, as well as temporary housing and services provision for labour and contractors, will need to be investigated further during the SIA.

INCREASE IN COMMUNICABLE DISEASES AND REDUCED PUBLIC HEALTH

An influx of labour to the area may have a negative impact on the overall public health levels of the area. It is anticipated that up to 60% of construction phase employees will be sourced locally (or as far as possible). An increase in construction workers may, however, be associated with an increase in unwanted social behaviour, such as alcohol and drug use, and an increased likelihood of contracting communicable diseases. This potential impact is likely to affect urban areas predominantly, as this is where labour are likely to be housed and spend leisure time.

CHANGE IN LANDSCAPE AND SENSE OF PLACE

The proposed project site is situated in an area that is largely undeveloped, but with scattered settlements, numerous power lines, roads and farming infrastructure. During the construction phase there will be clearing of vegetation, movement of machinery on and near the site, as well as construction of infrastructure and access roads. The visual impact of the construction phase may be affect to settlements on and adjacent to the proposed project sites. Other receptors that may be impacted by a change in landscape are the users of the R354 arterial road, specifically tourists visiting the area. This could potentially be a positive impact. Findings of the Visual Impact Assessment will be considered during the SIA.

DAMAGE TO AND LOSS OF FARMLAND

The current activities within, and adjacent to, the proposed project site are limited to extensive sheep farming and intensive crop farming. These areas are considered non-arable, low potential grazing land. The construction phase activities have the potential to impact the agricultural potential, due to soil compaction, erosion and contamination. In addition, construction workers and construction related activities have the potential to increase the risk of veld fires (e.g. open cooking fires and welding). Fires can reduce the available grazing on the site (if grazing continues during the construction phase) and potentially damage surrounding grazing areas and settlements if the fires spread beyond the site boundaries.

The loss of grazing land and damage to settlements could result in an impact on local farmers and employees through loss of production potential. It is understood, however that the sites selected for the turbines are in high-lying areas, unsuitable for grazing. In addition, the footprint of the footprint of the wind farm is as little as 5% of the total farm size, and therefore the loss to grazing land is likely to be minimal.

The impact of the proposed project on the loss of available grazing land, as well as the viability of allowing grazing during the operational phase, will be assessed further during the SIA.

5.2 OPERATIONAL PHASE

INCREASED EMPLOYMENT AND BUSINESS OPPORTUNITIES

The initial operational phase of the proposed project is estimated to be approximately 20 years. Professional and skilled positions are likely to be sourced from outside of the local municipality due to the specialised nature of the activity, including national and even international recruitment. The proposed project will have a positive impact by providing skilled, semi-skilled and unskilled job opportunities (e.g. security and cleaners) during the operational phase. It is anticipated that up to 60% of the operational employment opportunities will be sourced from local communities, as far as practically possible.

This may improve the current low employment and lack of skills within the local municipality. The number and type of employment opportunities will determine the impact of the operational phase on socio-economic landscape, and will be assessed further in the SIA.

INCREASED LOCAL ECONOMIC DEVELOPMENT OPPORTUNITIES

The proposed project is situated in rural areas and are likely to require the provision of supplementary services, such as catering, accommodation, and transport in surrounding centres. This could increase the development of existing and new local business opportunities. The proposed project therefore has the potential to promote LED through sourcing of services and materials locally where possible. The majority of the permanent staff are likely to reside within the local towns, which would provide a source of income for local residents through service provision to these individuals. This has the potential to contribute positively to the local economy.

CHANGE IN LANDSCAPE AND SENSE OF PLACE

The Maralla West site is located 46 km from the N1 and 13 km from the R354. The closest route is a secondary (farm access) road, which runs through the proposed site from the R354 to Laingsburg. The closest settlement outside of the boundary is a farm settlement, which less than 500m north of site boundary. The operation of the wind turbines has the potential to affect the sense of place for local farming communities through changes in visual landscape and sense of place, but is unlikely to have an impact on tourism and local business.

The site is located within an area identified as one of the eight REDZ within South Africa, approved by the DEA as part of the REIPP process. There are three approved wind power facilities, which are due to commence construction within the next 12 to 24 months. The local landscape is therefore likely to be transformed significantly. The overall potential impact of the proposed facility will be assessed further in the EIA phase.

IMPACT ON TOURISM

Tourism is an important economic activity for both the Karoo Hoogland and (and neighbouring Laingsburg) Local Municipality. Studies in the United Kingdom have reported a positive interest by tourists in visiting windfarms and some have developed visitor centres (Isle of Anglesey County Council, 2012).

The proposed project is located 32 km from the nearest tourism centre of Sutherland and 13 km from the nearest tourism route (R354). The proposed project is, therefore, unlikely to have a notable impact on tourism within the local context, as it is not easily accessible to the public.

5.3 DECOMMISSIONING PHASE

LOSS OF PERMANENT EMPLOYMENT AND LOCAL ECONOMIC DEVELOPMENT

There is unlikely to be a loss of permanent employment opportunities following the closure and decommissioning of the proposed wind farms as BioTherm is likely to relocate staff to a new site or renew the Power Producer Agreement after the initial 20-year operational phase. Should the facility be decommissioned, a small number of local employment opportunities may be lost. The local economy is likely to have changed (as a result of the REDZ) and therefore these individuals could potentially be absorbed by other facilities in the local area.

GAIN OF SHORT TERM EMPLOYMENT

The decommissioning phase may require a limited number of short-term, unskilled or semi-skilled labourers for the decommissioning and dismantling of the proposed project facilities This will increase short term employment opportunities for local communities, however is likely to be sourced on a regional or national level. The impact will be assessed further during the SIA.

CHANGE IN LANDSCAPE AND SENSE OF PLACE

The decommissioning of the wind farm infrastructure may improve the visual and aesthetic value of the area. The disturbed areas will be rehabilitated to pre-project land capability improving the aesthetic and visual aspect of the landscape. This may restore tourism and sense of place to the local communities.

DISTURBANCES TO LOCAL COMMUNITIES

The decommissioning of the proposed project has the potential to result in a number of disturbances to the local communities:

- An increase in traffic on rural roads;
- A disruption to tourism activities;
- An increase in dust and noise from construction activities; and
- Increased risk of livestock poaching;

Details on the number of potential employees, as well as temporary housing and services provision for labour and contractors, will need to be investigated further during the SIA.

5.4 CUMULATIVE IMPACTS

There are several proposed renewable wind and solar projects (as described in **Section 0**) within the vicinity of the proposed projects. Three of these have been selected as preferred bidders in terms of the REIPPP procedure. It is noted, however, that the size of land transformed by the proposed windfarms in the local area is unlikely to be significant in context of the extensive farms that characterise the local area. The nature of the current socio-economic landscape is rural (agricultural-based, with some tourism). The proposed transformation to a REDZ centre could potentially change the nature of the local area and influence local economic activities within the local area. The potential impacts are discussed below.

INCREASED LOCAL ECONOMIC AND SKILLS DEVELOPMENT

The proposed project has the potential to collectively contribute towards the local, regional and national economies through employment opportunities and skills development, as well as developing support services for the projects. The combined potential need, and the potential development of, services and skills locally as a result of the number of renewable projects, could promote education, tertiary training and entrepreneurship, and make skills and services more prevalent in the local population. .

LOSS OF REGIONAL AGRICULTURAL POTENTIAL

There is the potential for loss of agricultural land with the development of the wind farms. Cumulative impacts associated with the loss of farmland have the potential to impact on the livelihoods of the affected land owners and occupiers (farmers and staff), service providers to these farms (which may lie outside of the study area).

It is noted, however, that there size of land transformed by the proposed windfarms in the local area is unlikely to be significant in context of the extensive farms (large), and the sites are generally selected to be on high-lying areas unsuitable for grazing. The land owners are also likely to be compensated through purchase or lease agreements with the operators. The overall loss to agriculture is not considered significant.

INCREASE IN COMMUNICABLE DISEASES AND REDUCED PUBLIC HEALTH

The influx of workers for several sites in the local area could result in an increase of communicable diseases and other social impacts, such as increased alcohol and drug abuse. The cumulative impacts may be long term and permanent on communities (both rural and urban) within the vicinity of the proposed projects. It is crucial that measures to prevent such social impacts are put in place to prevent long-terms social deterioration.

CHANGE IN SENSE OF PLACE

The visual impact of wind farms can affect a large area as they are visible from a distance. The site is located within an area identified as one of the eight REDZ within South Africa and it is noted that there are three approved wind power facilities, which are due to commence construction in the next few years. The sense of place is therefore likely to change before the construction phase commences. The overall potential cumulative impact of the proposed facility will be assessed further in the EIA phase.

CHANGE IN TOURISM ACTIVITIES

The tourism industry within the local area may be affected by the change in landscape and sense of place as a result of the construction and operation of several renewables projects within the local area. The current tourism activities are reliant on scenic landscape and historical features within the local area. The change in landscape, and the potential for new opportunities in the renewable energy sector, could have an unintended impact on tourism. The benefits could include an increase in tourism through the development of visitor's centres. This impact will be qualitatively assessed further in the SIA.

5.5 NO GO OPTION

The no-go option would result in the status quo remaining. This would maintain the current sense of place, scenic value and quality of life for local residents. The economic benefits and development opportunities (including employment, service sector development and potentially tourism) that are anticipated as a result of the proposed project, will, however, be lost.

5.6 SCREENING ASSESSMENT

The screening tool (as described in **Section 2.4**) has been used to undertake a preliminary assessment of the identified potential socio-economic impacts. The rating and overall preliminary assessment of significance for the identified socio-economic impacts is provided in **Table 6.**

Table 6: Screening assessment of broad socio-economic impacts

PHASE	POTENTIAL IMPACT	PROBABILITY	SEVERITY/BENEFIT	SIGNIFICANCE	Status
CONSTRUCTION	■ Employment opportunities and skills development	2	2	**Low**	**Positive**
	■ Local economic development opportunities	3	3	**Medium**	**Positive**
	■ Disturbances to local communities	2	2	**Low**	**Negative**
	■ Increase in communicable diseases and reduced public health	2	2	**Low**	**Negative**
	■ Change in landscape and sense of place	2	2	**Low**	**Negative**
	■ Damage to and loss of farmland	3	2	**Medium**	**Negative**
OPERATIONAL	■ Increased employment and business opportunities	2	2	**Low**	**Positive**
	■ Increased local economic development opportunities	2	2	**Low**	**Positive**
	■ Change in landscape and sense of place	3	1	**Low**	**Negative**
	■ Impact on tourism	2	1	**Low**	**Positive**
DECOMMISSIONING	■ Loss of permanent employment and local economic development	2	1	**Low**	**Negative**
	■ Gain of short term employment	2	1	**Low**	**Positive**
	■ Change in landscape and sense of place	2	2	**Low**	**Positive**
	■ Disturbances to local communities	2	2	**Low**	**Negative**
CUMULATIVE IMPACTS	■ Increased local economic and skills development	2	2	**Low**	**Positive**
	■ Loss of regional agricultural potential	3	2	**Medium**	**Negative**
	■ Increase in communicable diseases and reduced public health	2	2	**Low**	**Negative**
	■ Change in sense of place	2	2	**Low**	**Negative**
	■ Change in tourism activities	2	2	**Low**	**Positive**

6 SOCIAL SENSITIVITY

6.1 AREA OF IMPACT

The Area of Direct Impact (ADI) is defined by the extent of the socio-economic impacts of the proposed project resulting from potential direct and indirect biophysical and other project impacts. For the screening purposes, the ADI is limited to an area of 20 km of the boundaries of the proposed sites. This was determined based on the existing farming settlements and road networks.

The Area of Indirect Impact (AII) is anticipated to extend beyond 20 km from the boundaries of the proposed sites. The AII is therefore likely to reflect the more regional impact.

The ADI and AII will both be investigated further in the SIA, and may be adjusted to align with the findings of the scoping phase and other specialist studies.

6.2 KEY SENSITIVITIES

MARALLA WEST WIND FACILITY

One settlement has been identified within the footprint of the proposed Maralla Phase 2 site on *Aurora Farm*. This is 1 redundant (unused) farm infrastructure, and the proposed project will not affect the farming activities. In addition the farm owner has entered into a lease agreement with BioTherm for the proposed site. The closest potentially sensitive receptors include:

- Welgemoed Farm (assumed to be house and infrastructure) (800 m north east of the site)
- Komsberg Farm (assumed to be house and infrastructure) (600 m north east of the site)

6.3 MAPPING

A social sensitivity map for the proposed project has been developed to present the settlements that may be directly and indirectly affected by the proposed project. The key settlements that are likely to be directly affected are indicated in **Figure 5** for the proposed project.

7 TERMS OF REFERENCE FOR THE IMPACT ASSESSMENT PHASE

7.1 KEY SOCIO-ECONOMIC ISSUE

The screening phase has identified a number of socio-economic impacts that may result from the proposed projects. The most significant potential impact is the displacement of farm owners and occupiers from the farms on which the proposed project is to be located.

There is currently little information available regarding these settlements. If sufficient information can be obtained during the EIA phase without a primary data collection (land owner and occupier interviews), a desktop assessment will be undertaken for the SIA. The need for primary data collection may, however, be reassessed during the SIA.

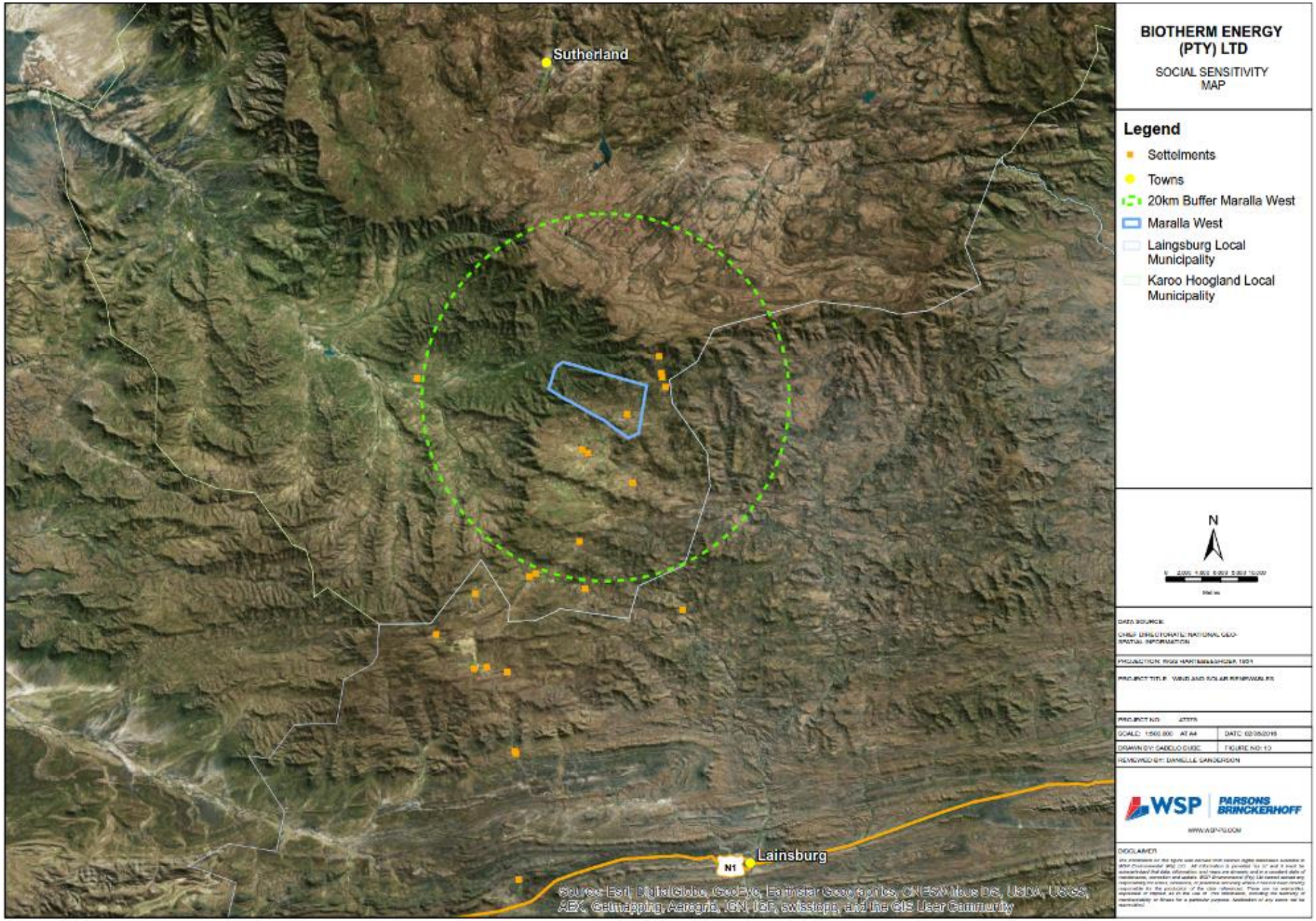


Figure 5: Sensitivity Map of the proposed Maralla West Wind Facility

7.2 PROPOSED METHODOLOGY

STAKEHOLDER ENGAGEMENT REVIEW

The stakeholder review will include a review of the Scoping Phase stakeholder engagement process. This process will allow for the assessment of key socio-economic issues relating to the proposed project. An outline of the proposed approach is provided below.

SPECIALIST REPORTS

The relevant specialist reports, or information, will be reviewed (if available), including:

- Visual Impact Assessment;
- Hydrological Assessment;
- Land Capability Assessment;
- Traffic Assessment; and
- Fauna and Flora assessment.

These reports will provide a better understanding of the biophysical and cultural landscape of the ADI. This area will be defined by the extent of the socio-economic impacts of the proposed project resulting from potential direct and indirect biophysical and other impacts. This review will also inform the SIA through providing insight into the possible socio-economic impacts, such as impacts on water provision, tourism and other aspects.

STAKEHOLDER ENGAGEMENT

There will be no direct stakeholder engagement undertaken during the SIA based on the assumption stated in **Section 7.1**. A review of the Scoping Phase stakeholder engagement and comments and response report will, however, be undertaken to obtain insight into the local social and socio-economic issues and inform the assessment of the potential socio-economic impacts.

7.3 IMPACT ASSESSMENT AND RECOMMENDATIONS

Following a review and interrogation of the above information, an assessment of potential the social and socio-economic impacts will be undertaken. This will make use of the EIA impact assessment criteria to assign significance to the potential identified impact. Recommendations, in line within international base practice, will also be provided to contribute towards socio-economic sustainability during all phases of the project.

7.4 REPORTING

The Draft SIA Report will be compiled, including the socio-economic context, potential impacts, assessment, and mitigation recommendations. Following stakeholder comment on the report, the final report will be updated and submitted with the final EIA Report.

8 CONCLUSION

The local and regional socio-economic landscape of the proposed project is characterised by mostly dry climatic conditions (and associated limited water resources), mountainous topography and sparse human settlement. These characteristics constrain local economic development, with the local economy being primarily based on extensive sheep grazing. Renewable energy, however, provides an opportunity for local economic development, but is also likely to result in a change the local sense of place.

The Scoping Phase socio-economic screening assessment has identified a number of positive and negative socio-economic impacts that may result from the proposed projects. The following key potential socio-economic issues should, therefore, be taken through to the SIA phase:

- Employment opportunities and skills development
- Local economic development opportunities
- Disturbances to local communities
- Change in landscape and sense of place
- Damage and loss of farmland
- Impact on tourism
- Increase in communicable diseases and reduced public health

There is currently little information available regarding the farm settlements. If sufficient information can be obtained during the EIA phase without a primary data collection (land owner and occupier interviews), a desk top assessment will be undertaken for the SIA. In the event that insufficient information can be obtained on these settlements via a desktop assessment, it may be required that primary data collection is undertaken during the SIA.

The SIA will also provide mitigation and recommendations to minimise the potential negative impacts, and maximise the potential socio-economic benefits. This will require an improved understanding of the proposed project impacts and social objectives of the proposed project, but will contribute towards the sustainability of this project within the context of the local socio-economic environment.

REFERENCES

- Central Karoo District Municipality (2012) 3rd Generation Integrated Development Plan 2012-2017.
- Wyngaard, AT (2006) An introduction to Economic Development in the Western Cape. Department of Economic Development and Tourism
- Department of Environmental Affairs and Development Planning (2007) Sustainable Energy Strategy for the Western Cape, Department of Environmental Affairs and Development Planning, Western Cape.
- Department of Energy (2015) State of Renewable Energy in South Africa, South Africa.
- Isle of Anglesey County Council (2012) The impacts of wind turbines on tourism – a literature review. Prepared by The Tourism Company, United Kingdom
- Karoo Hoogland Local Municipality (2010). Rural Spatial Development Framework/Land Development Plan, Karoo Hoogland Local Municipality, 2010.
- Karoo Hoogland Local Municipality (2015) Draft Revised Integrated Development Plan 2015-2016.
- Laingsburg Municipal (2012) Draft Integrated Development Plan 2012-217
- Namakwa District Municipality (2015) Draft Revised Integrated Development Plan Integrated Development Plan 2012-2017.
- Northern Cape Province (2004) Northern Cape Provincial Growth and Development Strategy (2004 – 2024).
- Social Impact Assessment for the Proposed Commercial Concentrated Solar Solis Power Energy (WSP Environmental (2014).
- van der Sluis, Justin; van Praag, Mirjam; Vijverberg, Wim (2003): Entrepreneurship Selection and Performance, Tinbergen Institute Discussion Paper, No.03-046/3
- Western Cape Province (2006) Western Cape Provincial Growth and Development Strategy: Draft, 2006, Department of the Premier.

WEBSITES:

- Statistics South Africa (2012). Census 2011.

  http://interactive.statssa.gov.za/superweb/login.do [Accessed in March 2016].
- Statistics South Africa (2016) http://www.statssa.gov.za/?page_id=737&id=1 [Accessed on 5 April 2016]
- Cape Farm Mapper - Crop Census 2013 http://gis.elsenburg.com/apps/cfm/
- [Accessed on 5 April 2016]