

# **HYPERION SOLAR PV DEVELOPMENT 2 AND ASSOCIATED INFRASTRUCTURE, NORTHERN CAPE PROVINCE**

## **ADDENDUM TO THE SOCIAL SCOPING REPORT – SOCIAL IMPACT ASSESSMENT Dated: April, 2019**

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## EXECUTIVE SUMMARY

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### INTRODUCTION

The Social Impact Assessment Report was generated for Hyperion Solar Development 2, a commercial photovoltaic energy generation facility proposed on the remaining extent of the Farm Lyndoch 432. The property the site is located on is situated some 16 km north of the town of Kathu and falls within Ward 07 of the Gamagara Local Municipality. Gamagara is one of the three local municipalities that fall under the John Taolo Gaetsewe District Municipality in the Northern Cape Province.

The Scoping Report (dated August 2018) generated for this project is extensive and of a high quality and adequately describes the project, legislation and policy applicable to the project and the social environment within which the project will unfold. It was clear from the scoping report that the project would probably have a limited effect on the social environment; however, the impacts were only identified in the scoping reports and as such were not assessed.

### APPROACH TO STUDY

In order to fulfil the requirement of assessing these impacts without duplicating previous efforts the social scoping report were used as a basis on which to identify and assess the impacts associated with this project. To compliment this additional data such as the Comments and Responses Reports applicable to the project, the findings of other specialists and a broad based literature scan was also used and integrated into this assessment.

### IMPACTS IDENTIFIED

The social impacts that were identified in associated with the project were as follows:

#### **Construction Phase**

##### *Health and social wellbeing:*

- Annoyance, dust and noise
- Increase in crime
- Increased risk of HIV infections
- Influx of construction workers and work seekers
- Hazard exposure

##### *Quality of the living environment:*

- Disruption of daily living patterns
- Disruptions to social and community infrastructure

*Economic:*

- Job creation and skills development
- Socio-economic stimulation

**Operational Phase**

*Quality of the living environment:*

- Transformation of the sense of place

*Economic:*

- Job creation and skills development
- Socio-economic stimulation

**Cumulative impacts**

*Health and social wellbeing:*

- Risk of HIV and AID

*Quality of the living environment:*

- Sense of place
- Service supplies and infrastructure, and

*Economic.*

These impacts are assessed and optimisation and mitigation measures are attached as appropriate in respect of this assessment. As a result of this assessment pre and post mitigation assessment scores are presented in the following table.

**PRE AND POST MITIGATION COMPARISON OF IMPACTS**

<b>Construction Phase</b>					
<b>Environmental parameter</b>	<b>Issues</b>	<b>Rating prior to mitigation</b>	<b>Average</b>	<b>Rating post mitigation</b>	<b>Average</b>
<b>Health &amp; social wellbeing</b>	Annoyance, dust and noise	-30		-25	
	Increase in crime	-28		-18	
	Increased risk of HIV infections	-60		-42	
	Influx of construction workers	-35		-30	
	Hazard exposure.	-28		-24	
			Negative Medium Impact		Negative Low Impact
<b>Quality of the living environment</b>	Disruption of daily living patterns	-28		-24	
	Disruptions to social and community infrastructure	-32		-28	
			Negative Medium Impact		Negative Low Impact
<b>Economic</b>	Job creation and skills development	+35		+40	
	Socio-economic stimulation	+45		+50	
			Positive Medium Impact		Positive Medium Impact
<b>Operational Phase</b>					
<b>Quality of the living environment</b>	Transformation of the sense of place	-70		-65	
			Negative High Impact		Negative High Impact
<b>Economic</b>	Job creation and skills development	+45		+50	
	Socio-economic stimulation	+65		+70	
			Positive Medium Impact		Positive High Impact

Social Impact Assessment for the Hyperion Solar PV Development 2, Northern Cape Province.

<b>No-go Alternative</b>					
<b>Environmental parameter</b>	<b>Issues</b>	<b>Rating prior to mitigation</b>	<b>Average</b>	<b>Rating post mitigation</b>	<b>Average</b>
<b>No project</b>		-75	<b>-75</b>	No mitigation measures	
			Negative High Impact		
<b>Cumulative Impacts</b>					
		<b>Overall impact of the proposed project considered in isolation</b>		<b>Cumulative impact of the project and other projects in the area</b>	
<b>Health &amp; social wellbeing</b>	Risk of HIV	-42		-64	
	Increase in crime	-18	<b>-30</b>	-60	<b>-62</b>
			Low Medium Impact		Negative High Impact
<b>Quality of the living environment</b>	Sense of place	-65		-80	
	Services, supplies & infrastructure	-24	<b>-44.5</b>	-60	<b>-70</b>
			Negative High Impact		Negative High Impact
<b>Economic</b>	Economic	+65	<b>+65</b>	+80	<b>+80</b>
			Positive High Impact		Positive High Impact

## **FINDINGS**

Regarding the impacts associated with the project it was found that most apply over the short term in respect of the construction phase of the project. Of these impacts all can be mitigated to within acceptable ranges and there are no fatal flaws associated with the construction of the project. It was also found that with regard to the energy needs of the country and South Africa's need to reduce its carbon emissions that the project fits with international, national, provincial and municipal policy. Accordingly, the project carries with it a significant benefit and as such is deemed acceptable. It should be noted that the expected benefits associated with the project, which include generation of electricity from renewable sources and local economic and social development, outweigh the perceived impacts associated with the project.

In respect of the access road alternatives the preferred social alternative is for Alternative 4. Notwithstanding this, however, considered together with the findings of the agricultural and heritage specialists Alternative 1 is also considered favourable.

Considering the impacts discussed above it is evident that the cumulative impacts associated with changes to the social environment of the region are more significant than those specifically attached to a single project. On a negative front there are two issues associated with developments in the region that are of most concern. The first of these issues is the change to the sense of place of the area. The second is the potential, through an influx of labour and an increase in transportation of material and equipment to construction sites, of the risk for the prevalence of HIV to rise in an area that has a relatively moderate HIV prevalence rate. It is important that the relevant authorities recognise these issues and find ways of mitigating them to ensure that they do not undermine the benefit that renewable energy projects bring, both to the region as well as to the country as a whole. This, however, is beyond the scope of individual projects as it would need to be addressed at a regional or even on a national basis.

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## TABLE OF CONTENTS

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Executive Summary .....	ii
List of Tables .....	ix
List of Figures .....	ix
Qualifications and Experience of Specialist.....	x
Declaration of Independence .....	xii
1. Introduction.....	1
1.1. Approach to study .....	1
1.2. Project description .....	1
1.3. Access road alternatives.....	5
1.4. Impact assessment technique.....	8
1.5. Assumptions and limitations.....	9
1.6. Assumptions .....	9
1.7. Limitations.....	9
2. Identification of Potential Impacts.....	10
2.1. Health and social wellbeing.....	10
2.1.1. Annoyance, dust noise.....	10
2.1.2. Increase in crime .....	11
2.1.3. Increased risk of HIV infections.....	11
2.1.4. Influx of construction workers.....	12
2.1.5. Hazard exposure .....	12
2.2. Quality of the living environment .....	13
2.2.1. Disruption of daily living patterns.....	13
2.2.2. Disruption to social and community infrastructure .....	13
2.2.3. Transformation of the sense of place .....	13
2.3. Economic.....	14
2.3.1. Job creation and skills development .....	14

2.3.2. Socio-economic stimulation .....	14
2.4. Cultural impacts .....	15
3. Impact Assessment.....	15
3.1. Planning and design phase .....	15
3.2. Construction phase .....	15
3.3. Operational phase.....	24
3.4. Decommissioning phase .....	27
4. Assessment of No-Go Alternative .....	28
5. Assessment of access road alternatives .....	29
6. Cumulative Impacts .....	35
6.1. Risk of HIV infections.....	39
6.2. Increase in crime.....	40
6.3. Transformation of Sense of place .....	40
6.4. Disruption of Services, supplies and infrastructure.....	41
6.5. Economic.....	42
6.6. Assessment of cumulative impacts .....	43
7. Environmental management plan.....	51
8. Conclusion and Recommendations.....	57
9. Bibliography .....	59



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**LIST OF TABLES**

---

Table 1:	Annoyance dust and noise .....	16
Table 2:	Increase in crime .....	17
Table 3:	Increased risk of HIV infections .....	18
Table 4:	Influx of construction workers .....	19
Table 5:	Hazard exposure .....	20
Table 6:	Disruption of daily living patterns .....	20
Table 7:	Disruption to social and community infrastructure.....	22
Table 8:	Job creation and skills development .....	23
Table 9:	Socio-economic development.....	24
Table 10:	Transformation of the sense of place .....	25
Table 11:	Job creation and skills development .....	26
Table 12:	Socio-economic stimulation .....	27
Table 13:	No project alternative .....	29
Table 14:	Annoyance dust and noise – Access road alternatives .....	30
Table 15:	Hazard exposure – Access road alternatives .....	31
Table 16:	Disruption of daily living patterns – Access road alternatives .....	32
Table 17:	Transformation of the sense of place – Access road alternatives.....	33
Table 18:	Access road alternative preference.....	34
Table 19:	Renewable energy projects within a 30 km radius of the proposed project ....	36
Table 20:	Risk of HIV.....	44
Table 21:	Increase in crime .....	45
Table 22:	Transformation of Sense of place .....	46
Table 23:	Disruption of service, supplies and infrastructure .....	47
Table 24:	Economy.....	48
Table 25:	Impact summary .....	49

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**LIST OF FIGURES**

---

Figure 1:	Hyperion Solar Development 2 locality map .....	2
Figure 2:	Hyperion Solar Development 2 layout map.....	4
Figure 3:	Access road alternatives .....	7
Figure 4:	Renewable energy developments in the area.....	38

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## QUALIFICATIONS AND EXPERIENCE OF SPECIALIST

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### **Qualifications:**

University of South Africa: B.A. (Honours) – 1984

Henley Management College, United Kingdom: The Henley Post-Graduate Certificate in Management – 1997

Rand Afrikaans University: M.A. (cum laude) – 1999

Rand Afrikaans University: D. Litt. et Phil. – 2000

### **Projects:**

The Social Impact Assessment (SIA) for the Gautrain Rapid Rail Link; The impact assessment for the Australian – South African sports development programme; SIA for Kumba Resources, Sishen South Project; Evaluation of a Centre for Violence Against Women for The United Nations Office on Drugs and Crime; SIAs for the following Exxaro Resources Ltd.'s mines, Leeuwpan Coal Mine Delmas, Glen Douglas Dolomite Mine Henley-on-Klip, Grootegeluk Open Cast Coal Mine Lephalale; SIA for the South African National Road Agency Limited (SANRAL) on Gauteng Freeway Improvement Project; SIA for SANRAL on the N2 Wild Coast Toll Highway; Research into research outputs of the University for the University of Johannesburg; SIA for Waterfall Wedge housing and business development in Midrand Gauteng; SIA for the Environmental Management Plan for Sedibeng District Municipality; Social and Labour Plan for the Belfast Project on behalf of Exxaro Resources Ltd; SIA for the Transnet New Multi-Product Pipeline (Commercial Farmers) on behalf of Golder Associates Africa (Pty) Ltd; SIA for the Proposed Vale Moatize Power Plant Project in Mozambique on behalf of Golder Associates Africa (Pty) Ltd; SIA for Kumba Resources Ltd.'s proposed Dingleton Resettlement Project at Sishen Iron Ore Mine on behalf of Water for Africa (Pty) Ltd; SIA for Gold Fields West Wits Project for EcoPartners; SIA for the Belfast Project for Exxaro Resources Ltd; SIA for Eskom Holdings Ltd.'s Proposed Ubertas 88/11kV Substation on behalf of KV3 Engineers (Pty) Ltd; SIA for the Mokolo and Crocodile River (West) Water Augmentation Project for the Department of Water and Sanitation on behalf of Nemaï Consulting and the Trans Caledonian Water Authority; Assisted Octagon Consulting with the SIA for Eskom's Nuclear 1 Power Plant on behalf of Arcus GIBB Engineering & Science. SIA for the 150MW Photovoltaic Power Plant and Associated Infrastructure for Italgast Energy (Pty) Ltd, on behalf of Kalahari Survey Solutions cc. SIA for Eskom Holdings Limited, Transmission Division's Neptune-Poseidon 400kV Power Line on behalf of Nemaï Consulting. Ncwabeni Off-Channel Storage Dam for

security of water supply in Umzumbe, Mpumalanga. Social Impact assessment for Eskom Holdings Limited, Transmission Division, Forskor-Merensky 275kV ±130km Powerline and Associated Substation Works in Limpopo Province. Social impact assessment for the proposed infilling of the Model Yacht Pond at Blue Lagoon, Stiebel Place, Durban. ABC Prieska Solar Project; Proposed 75 MWp Photovoltaic Power Plant and its associated infrastructure on a portion of the remaining extent of ERF 1 Prieska, Northern Cape. Sekoko Wayland Iron Ore, Molemole Local Municipalities in Limpopo Province. Langpan Chrome Mine, Thabazimbi, Limpopo; Jozini Nodal Expansion Implementation Project, Mpumalanga, on behalf of Nema Consulting; SIA for Glen Douglas Dolomite Burning Project, Midvaal Gauteng, on behalf of Afrimat Limited; SIA for Lyttelton Dolomite mine Dolomite Burning Project, Marble Hall Limpopo on behalf of Afrimat Limited; Tubatse Strengthening Phase 1 – Senakangwedi B Integration for Eskom Transmission on behalf of Nsovo Environmental Consulting; Department of Water and Sanitation, South Africa (2014). Environmental Impact Assessment for the Mzimvubu Water Project: Social Impact Assessment DWS Report No: P WMA 12/T30/00/5314/7. Umkhomazi Water Project Phase 1 – Raw Water Component Smithfield Dam - 14/12/16/3/3/3/94; Water Conveyance Infrastructure - 14/12/16/3/3/3/94/1; Balancing Dam - 14/12/16/3/3/3/94/2. Umkhomazi Water Project Phase 1 – Potable Water Component: 14/12/16/3/3/3/95. Expansion of Railway Loops at Arthursview; Paul; Phokeng and Rooiheuwel Sidings in the Bojanala Platinum District Municipality in the North West Province for Transnet Soc Ltd; Basic Social Impact Assessment for the Cato Ridge Crematorium in Kwazulu-Natal Province; SIA for the Kennedy Road Housing Project, Ward 25 situated on 316 Kennedy Road, Clare Hills (Erf 301, Portion 5); Eskom's Mulalo Main Transmission Substation and Power Line Integration Project, Secunda;

Regularly lecture in the Department of Sociology at the University of Johannesburg and collaborated with Prof. Henk Becker of Utrecht University, the Netherlands, in a joint lecture to present the Social Impact Assessment Masters course via video link between the Netherlands and South Africa. Presented papers on Social Impact Assessments at both national and international seminars. Published on both a national and international level.

**Affiliation:**

The South African Affiliation of the International Association for Impact Assessment.

Registered on the database for scientific peer review of iSimangaliso GEF project outputs.

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## DECLARATION OF INDEPENDENCE

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I, Neville Bews, as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favorable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;

- all the particulars furnished by me in this specialist input/study are true and correct;  
and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

A handwritten signature in blue ink, appearing to be 'N. Bews', written over a light blue circular stamp.

Name of Specialist: Neville Bews

Date: 01 April, 2019

## **1. INTRODUCTION**

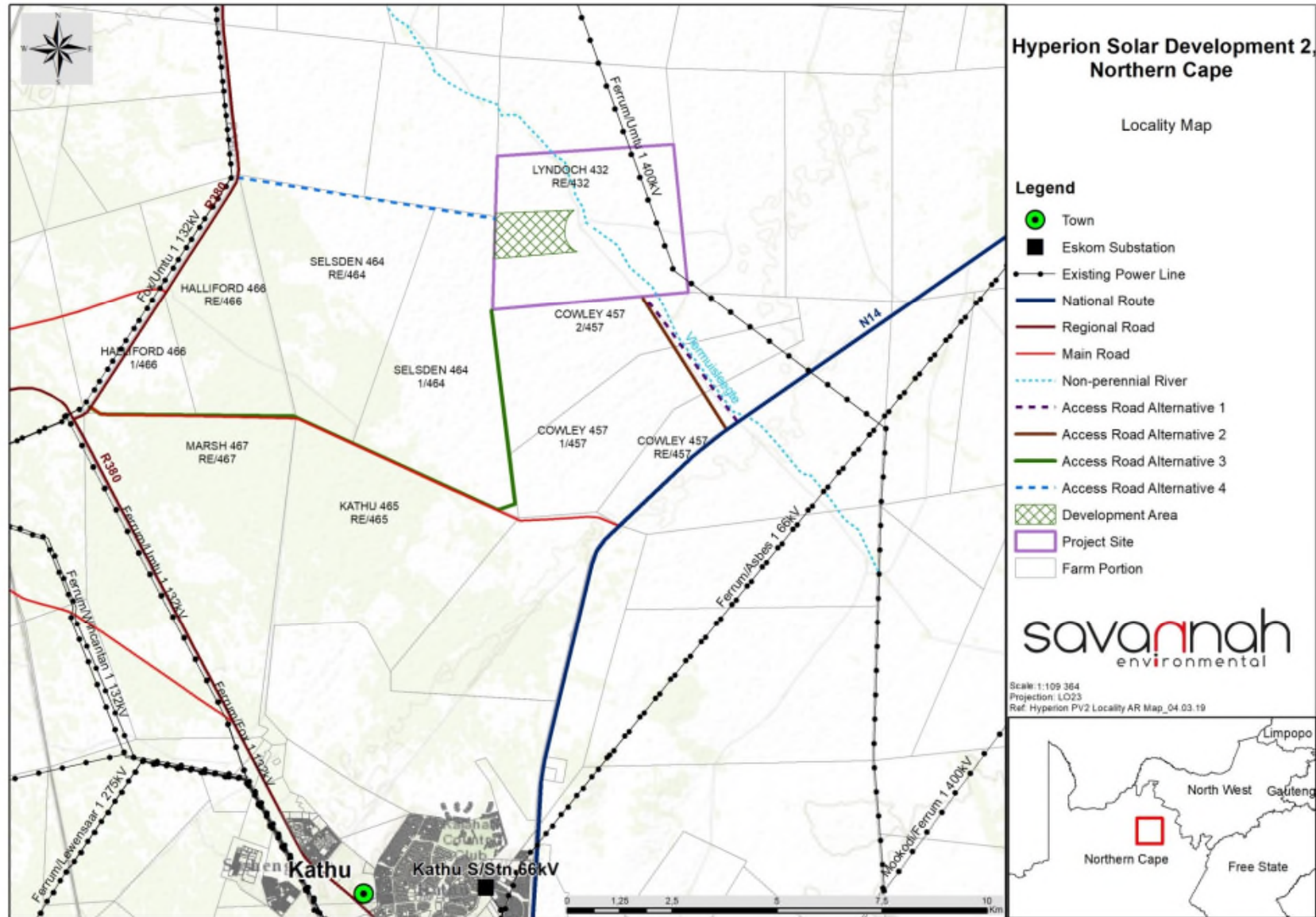
The Social Impact Assessment – Scoping Report was generated for Hyperion Solar Development 2 in August 2018. This reports was extensive and of a high quality and adequately describing the project, legislation and policy applicable to the project and the social environment within which the project will unfold. It was clear from these scoping report that the project was most likely to have a limited affect on the social environment, however, the impacts were listed in the scoping reports and as such, were not assessed.

### **1.1. APPROACH TO STUDY**

In order to fulfil the requirement of assessing these impacts without duplicating previous efforts, the social impact assessment scoping report was used as a basis on which to identify and assess the impacts associated with this project. To compliment this additional data such as the Comments and Responses Reports applicable to the project, the findings of other specialists and a broad based literature scan was also used and integrated into this assessment.

### **1.2. PROJECT DESCRIPTION**

Hyperion Solar Development 2 is proposed on the Remaining Extent of the Farm Lyndoch 432 (the project site) as illustrated in **Figure 1**. This farm is located approximately 16 km north of Kathu in the Gamagara Local Municipality (LM) and within the greater John Taolo Gaetsewe District Municipality (DM), in the Northern Cape Province. Each project will be designed to have a contracted capacity of up to 75 MW, and will make use of fixed-tilt, single-axis tracking, or dual-axis (double-axis) tracking photovoltaic (PV) solar technology for the generation of electricity.



Map courtesy of Savannah Environmental (Pty) Ltd  
Figure 1: Hyperion Solar Development 2 locality map

Hyperion Solar Development 2 will comprise the following key infrastructure and components:

- Arrays of PV panels (static or tracking PV system) with a contracted capacity of up to 75 MW.
- Mounting structures to support the PV panels.
- On-site inverters (to convert the power from Direct Current (DC) to Alternating Current (AC)), and distribution power transformers.
- An on-site substation to facilitate the connection between the project and the Eskom electricity grid.
- A new 132 kV power line between the on-site substation and the national grid<sup>1</sup>.
- Cabling between the project's components (to be laid underground where practical).
- Battery storage mechanism with a storage capacity of up to 300 MWh.
- Water purification plant.
- Site Offices and Maintenance Buildings, including workshop areas for maintenance and storage.
- Batching plant.
- Temporary laydown area.
- Internal access roads and fencing around the development area.
- Main access road to the development area. Four alternatives are currently being considered in this regard.

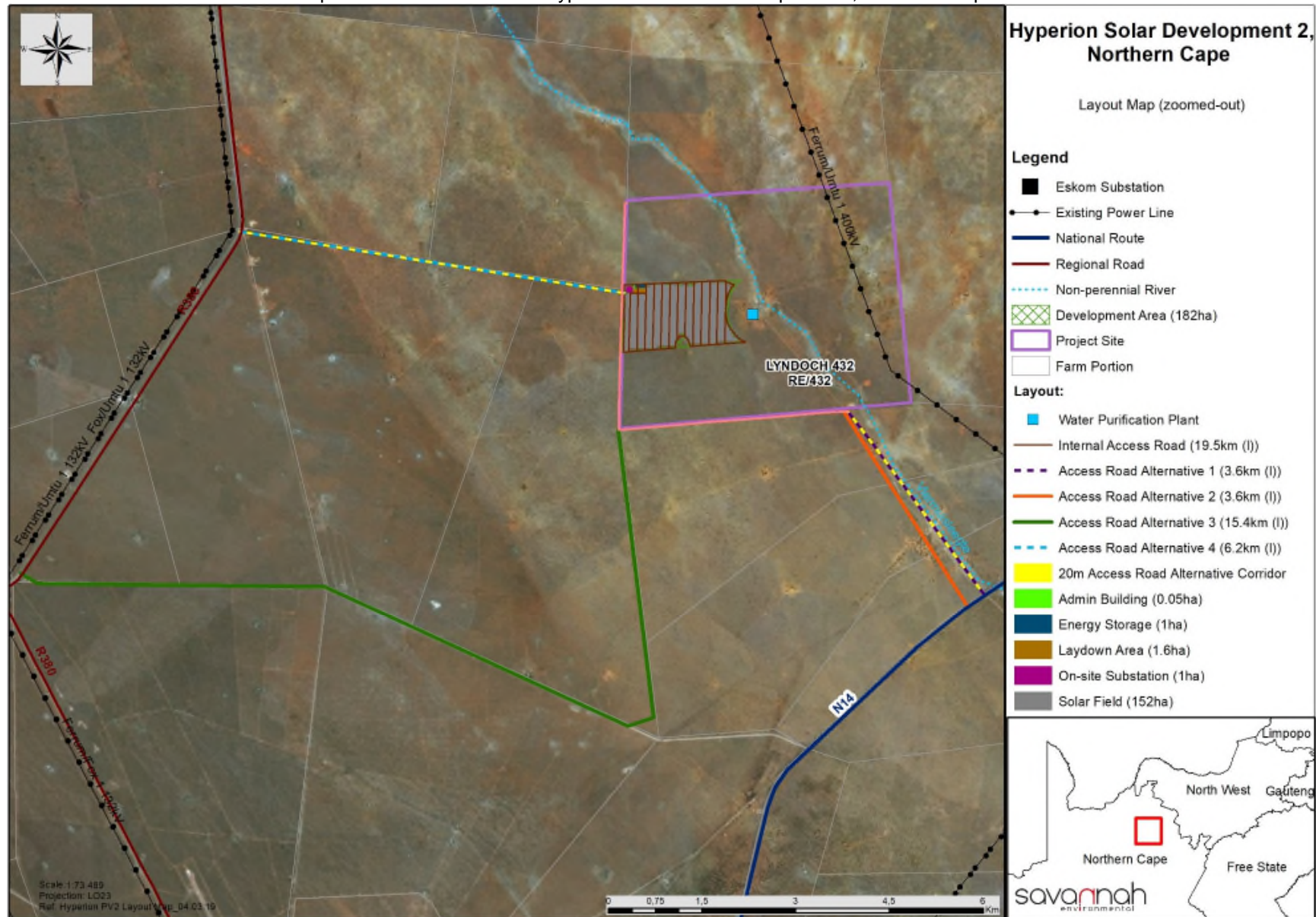
The layout map of Hyperion Solar Development 2 is illustrated in **Map** courtesy of Savannah Environmental (Pty) Ltd

Figure 2.

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<sup>1</sup> The construction of the 132 kV overhead power line will be assessed as part of a separate Basic Assessment process which will consider feasible alternatives for the power line route.





Map courtesy of Savannah Environmental (Pty) Ltd

**Figure 2: Hyperion Solar Development 2 layout map**

### **1.3. ACCESS ROAD ALTERNATIVES**

Based on the outcome of meetings and consultations with affected landowners and the Department of Agriculture, Forestry and Fisheries (DAFF) during the Scoping Phase, the following four access road alternatives, as depicted in **Figure 3**, were identified for consideration for Hyperion Solar Development 2.

#### **Alternative 1**

This alternative formed part of the Scoping Phase and entails the upgrade of approximately 3.6 km of the existing T26 gravel road situated between the project site and the N14 national road. The existing road will be upgraded from approximately 5 to 9 meters in width and will traverse four properties; the Remaining Extent of the Farm Lyndoch 432; Portion 1, 2 and the Remaining Extent of the Farm Cowley 457.

#### **Alternative 2**

This is a new alternative identified for consideration in the EIA process. Alternative 2 entails the establishment of a new access road approximately 3.6 km in length and 9 m in width. The new access road is proposed to be located adjacent to the existing T26 gravel road and will traverse four properties; the Remaining Extent of the Farm Lyndoch 432, Portion 1, 2 and the Remaining Extent of the Farm Cowley 457.

#### **Alternative 3**

Alternative 3 entails the establishment of a new access road approximately 5.1 km in length and 9 m in width and the upgrade of approximately 10.3 km of the existing T25 gravel road from approximately 5 m in width to 9 m in width. This alternative was previously known as Alternative 2 in the Scoping Phase and was realigned in order to avoid the protected Kathu Forest. Alternative 3 will traverse five properties; the Remaining Extent of the Farm Lyndoch 432, Portion 1 of the Farm Selsden 464, the Remaining Extent of the Farm Kathu 465, Portion 1 of the Farm Halliford 466 and the Remaining Extent of the Farm Marsh 467.

#### **Alternative 4:**

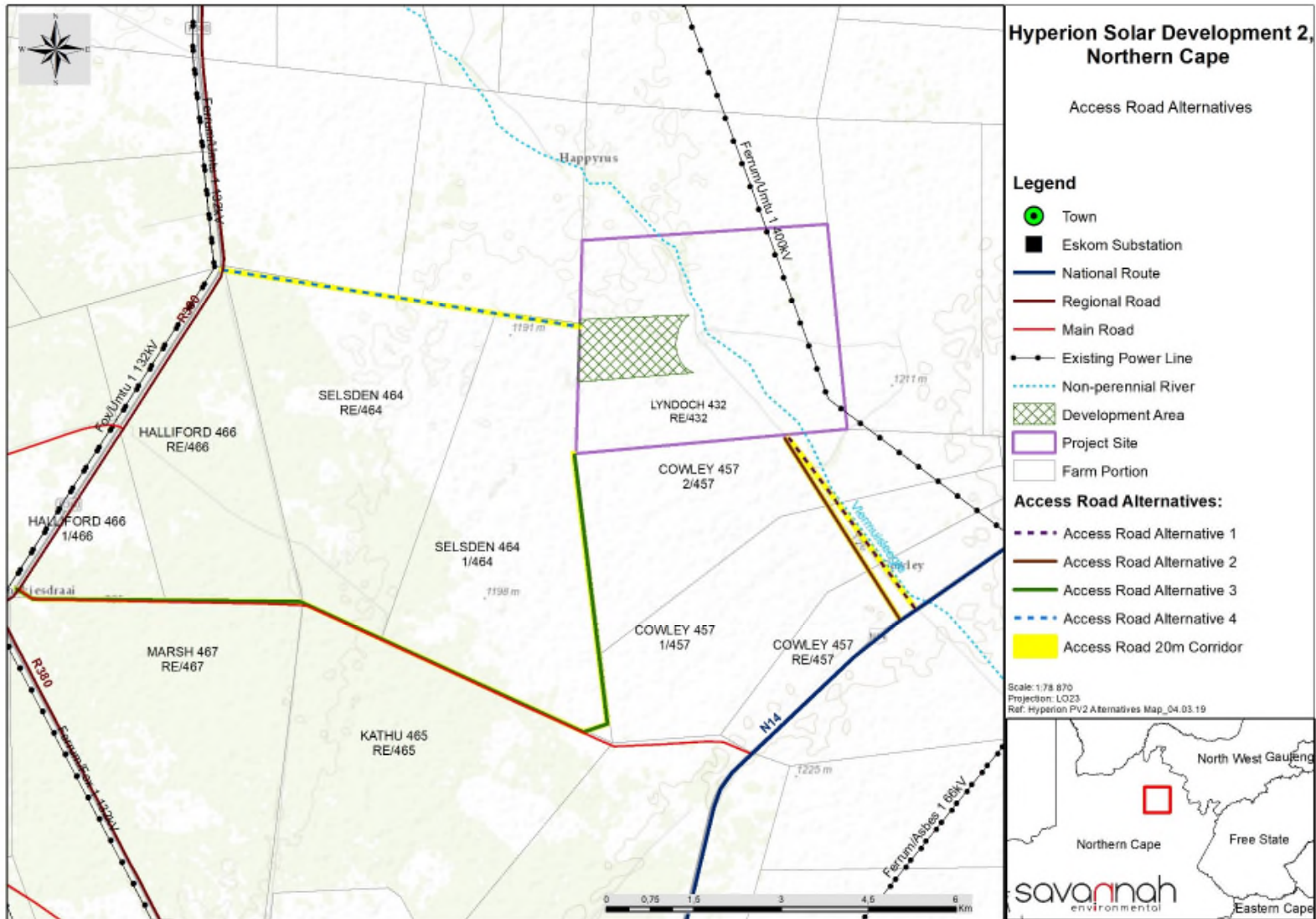
Access Road Alternative 4 entails the establishment of a new access road approximately 6.2 km in length and 9 m in width situated between the western boundary of the project site and the R380 regional road. This alternative was proposed by the DAFF as an additional alternative which will traverse four properties; the Remaining Extent of the Farm Lyndoch

432, Portion 1 and the Remaining Extent of the Farm Selsden 464 and the Remaining Extent of the Farm Halliford 466.

A 20 m wide corridor for all four alternatives has been considered and assessed during the EIA Phase in order to determine the most preferred route from an environmental perspective.

Map courtesy of Savannah Environmental (Pty) Ltd

Figure 3: Access road alternatives



## 1.4. IMPACT ASSESSMENT TECHNIQUE

The impact assessment technique, which is provided by the lead environmental consultant Savannah Environment, is as follows:

- The **nature**, which includes a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 was assigned as appropriate (with 1 being low and 5 being high).
- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1.
  - The lifetime of the impact will be of a short duration (2 – 5 years) – assigned a score of 2.
  - Medium-term (5 – 15 years) – assigned a score of 3.
  - Long term (> 15 years) – assigned a score of 4.
  - Permanent – assigned a score of 5.
- The **magnitude**, quantified on a scale from 0 – 10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which is determined through a synthesis of the characteristics described above and can be assessed as low, medium or high.
- The **status**, which shall be described as either positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** was then calculated by combining the criteria in the following formula:

$$S = (E+D+M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 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).

## **1.5. ASSUMPTIONS AND LIMITATIONS**

The following assumptions and limitations apply in respect of this report.

### **1.6. ASSUMPTIONS**

It is assumed that the technical information provided by the project proponent, Hyperion Solar Development 2, as well as by the environmental consultants, Savannah Environmental, was credible and accurate at the time of compiling the report. It is also assumed that the data provided by the various specialists as used in this report are credible and accurate.

### **1.7. LIMITATIONS**

The demographic data used in this report was sourced from Statistics South Africa and is based on data gathered during Census 2011. This data is somewhat outdated but where possible is supplemented with the latest Stats SA's survey data such as the Mid-year population estimates and the Quarterly Labour Force Survey. The limitation of this is that this survey data is restricted to a provincial level and does not extend down to a municipal level.



## **2. IDENTIFICATION OF POTENTIAL IMPACTS**

The social impact variables considered across the project are in accordance with Vanclay's list of social impact variables clustered under the following main categories as adapted by Wong (Vanclay, 2002; Wong, Social Impact Assessment: The principles of the US and International Version, Criticisms and Social Impact Variables, 2013) and include:

1. Health and social well-being
2. Quality of the living environment (Liveability)
3. Economic
4. Cultural.

These categories are not exclusive and at times tend to overlap as certain processes may have an impact within more than one category.

### **2.1. HEALTH AND SOCIAL WELLBEING**

The health and social wellbeing impacts related to the project include:

- Annoyance, dust noise
- Increase in crime
- Increased risk of HIV infections
- Influx of construction workers and work seekers
- Hazard exposure.

#### **2.1.1. ANNOYANCE, DUST NOISE**

Annoyance, dust and noise will be more evident during the construction phase of the project, as construction activities will result in disruptions and the generation of dust and noise from construction vehicles and equipment. Site specific activities such as site clearance and the deliveries of materials, equipment, plant and the transportation of the workforce along unsealed access roads will generate the most dust and noise. Dust that accumulates on foliage and grasses that is used for grazing may result in that foliage and those grasses becoming unpalatable for livestock and/or game. This may in turn have an effect on farming activities within the vicinity of the project site and along the access road over the construction period. Access road alternatives 1, 2 and 3 are in close proximity to residential, commercial and/or farming activities.

Over the operational phase of the project far less disruption, dust and noise is expected in the vicinity of the project site, however, along the unsealed access road dust and noise can

be generated by traffic travelling to and from the project site. This is particularly relevant in respect of access road alternatives 1, 2 and 3, as they are in close proximity to residential, commercial and/or farming activities.

### **2.1.2. INCREASE IN CRIME**

The project straddles the Kuruman and Kathu police precincts. Both areas have a relatively high crime level as both precincts incorporate urban areas. In this regard Kuruman had a total of 3 760 crimes reported in 2018 with Kathu having a total of 2 634 reported crimes. Because these precincts incorporate urban areas they are not good indicators of crime in the vicinity of the project as the area surrounding the project is more rural in nature. There are, however, no separate crime statistics for the specific area that the project is located in apart from those applying to the Kathu and Kuruman precincts.

It is often opportunistic crimes such as stock theft, the abuse of alcohol and relationship related crimes that are associated with construction activities. With this in mind it would be pertinent for the developers to ensure that processes are put in place through which any suspected criminal activities associated with the project can easily be communicated and swiftly addressed. The construction phase carries with it a higher risk of associated criminal activities than would be the case during the operational phase of the project.

### **2.1.3. INCREASED RISK OF HIV INFECTIONS**

With an HIV prevalence rate of 23.2% amongst antenatal women in 2013, the John Taolo Gaetsewe District Municipality had a relatively moderate HIV prevalence rate. This placed the district as the 15<sup>th</sup> lowest districts of the 52 districts across the country the country. The fact that sexually transmitted diseases tend to be spread by construction and transport workers, together with the high prevalence of HIV across the rest of South Africa, opens the area to a high risk of HIV infections (Singh & Malaviya, 1994; Ramjee & Gouws, 2002; Meintjes, Bowen, & Root, 2007; World Bank Group, 2016; Bowen, Dorrington, Distiller, Lake, & Besesar, 2008; Bowen P. , Govender, Edwards, & Cattell, 2016; Kikwasi & Lukwale, 2017; Bowen P. , Govender, Edwards, & Lake, 2018). This risk is likely to be at its highest during the construction phase of the project as the construction workforce increases and material and equipment is delivered to site. During the operational phase of the project, when the workforce stabilises at a much lower level, the risk of HIV infections is likely to subside.



Due to the relatively low prevalence of HIV in the area and the risks associated with construction and transport workers, it is important that this issue be given serious attention and that the appropriate mitigation measures are implemented and the situation is closely monitored throughout the construction and operational phases of the project. The risk of the spread of HIV is most prevalent on a cumulative basis and is addressed as such under Section 6: Cumulative Impacts below.

#### **2.1.4. INFLUX OF CONSTRUCTION WORKERS**

During construction the workforce is likely to peak at approximately 500 workers of which 60% will be low skilled, 25% semi-skilled and 15% skilled with construction workers being sourced locally as far as is feasible. During the operational phase the workforce will comprise of a total of 65 workers of which 70% will be semi-skilled and 30% skilled.

It is possible that the influx of construction workers could have an impact on the family structures and social networks of local communities. This is particularly relevant in situations where workers are accommodated amongst local communities and/or where they frequent the same recreational facilities as local communities. These risks may be associated with:

- Alcohol and/or drug use
- Relationship formation and/or the disruption of existing relationships
- Prostitution
- Pregnancies, and the
- Spreading of sexually transmitted diseases.

#### **2.1.5. HAZARD EXPOSURE**

The use of heavy equipment and vehicles and an increase in vehicle traffic within the vicinity of all construction sites will result in an increased risk to the personal safety of people and animals. Of particular concern are increased hazards faced by pedestrians, cyclists and motorists with emphasis on vulnerable groups such as children and the elderly. Excavation work and trenches also pose a hazard to the safety of people, particularly children and animals, who may fall into these works and who may have difficulty in getting out.

There will also be an increased risk of fires due to the likelihood of construction workers lighting fires for cooking and for warmth during cold periods. Nevertheless, with the recommended mitigation measures being successfully put in place this can be controlled.

## **2.2. QUALITY OF THE LIVING ENVIRONMENT**

The following quality of the living environment impacts are related to the project.

- Disruption of daily living patterns
- Disruptions to social and community infrastructure
- Transformation of the sense of place.

### **2.2.1. DISRUPTION OF DAILY LIVING PATTERNS**

Disruptions to daily living patterns are likely to be minimal and restricted to the construction phase of the project. This impact will mainly be associated with the site and the main access road. These disruptions are only likely to be associated with the delivery of materials and machinery to site and the transportation of workers to and from site.

### **2.2.2. DISRUPTION TO SOCIAL AND COMMUNITY INFRASTRUCTURE**

With the workforce associated with the construction phase peaking at approximately 500 workers, it is unlikely that in isolation the project will have any significant effect on social and community infrastructure in the area. However, on a cumulative basis, considering the activities currently taking place and planned for the area, there is likely to be a significant impact with regard to the disruption of social and community structures in the region. This impact is dealt with in greater depth under Section 5 Cumulative Impacts below.

### **2.2.3. TRANSFORMATION OF THE SENSE OF PLACE**

Photovoltaic facilities are highly visible due to their large size, reflective surfaces and geometry. Consequently, local communities perceive these facilities as having a negative impact on the landscape and as such limiting to their quality of life (Chiabrando, Fabrizio, & Garnero, 2011) as a result of the transforming of the sense of place of the area. However, some researchers have found mixed reactions to the visual impacts of these facilities with those who link positive economic benefits to nearby large-scale facilities tending to see these projects in a more positive light (Carlislea, Kaneb, Solan, & Joed, 2014; Visschers & Siegrist, 2014). It seems a more reliable indication of public opinion towards renewable energy sources is attached to the evaluation process. In this regard when people evaluate renewables on an abstract level they tend to be more positive than when evaluating them at a more concrete level (Sütterlin & Siegrist, 2017).

From a visual perspective it is concluded by the visual specialist that the;

*“Identified visual impacts are all assessed as low. Appropriate mitigation measures can also reduce anticipated impacts further.*

*There is no reason from a landscape and visual impact perspective why the proposed development should not proceed. (Environmental Planning and Design, 2019, p. 48).*

## **2.3. ECONOMIC**

The economic impacts related to the project include.

- Job creation and skills development and
- Socio-economic stimulation.

### **2.3.1. JOB CREATION AND SKILLS DEVELOPMENT**

The project will lead to the creation of both direct and indirect job which will have a positive economic benefit within the region. In this regard there are approximately 500 direct jobs associated with the construction phase of the project and approximately 65 over the operational phase. During the construction phase approximately 60% of these direct job opportunities will be for low and non-skilled workers with ~25% going to semi-skilled and ~15% to skilled workers.

During the operational phase ~70% of the job opportunities will be for low and unskilled workers. Many of the beneficiaries are likely to be historically disadvantaged members of the community and the project will provide opportunities to develop skills amongst these people. Labour costs have been estimated to between R30 million during construction.

### **2.3.2. SOCIO-ECONOMIC STIMULATION**

Apart from these jobs the project is also likely to stimulate the local economy and again this is likely to be most significant at a cumulative level. At the project level there will be an economic contribution attached to the Hyperion Solar Development 2. This contribution will be in the form of disposable salaries and the purchases of services and supplies from the local communities in and around the region.

Projects which form part of the DoE’s REIPPP Programme are required as part of their bidding requirements to contribute towards local economic development (LED) and social upliftment initiatives within the area in which they are proposed. In addition, they are

required to spend a percentage of their revenue on socio-economic and enterprise development, as well as allocate ownership shares to local communities that benefit previously disadvantaged communities around the project. A portion of the dividends generated by each development also needs to be invested into LED projects and programmes. The proposed development therefore has the potential to contribute positively towards socio-economic development and improvements within the local area.

## **2.4. CULTURAL IMPACTS**

At a social level it is likely that any cultural impacts would be associated with sensitive archaeological and/or heritage sites that may be found and as such are addressed in the heritage assessment.

## **3. IMPACT ASSESSMENT**

The impacts as they apply to both the construction and operational phase of the project will be assessed below and mitigation and optimisation measures will be suggested as is appropriate.

### **3.1. PLANNING AND DESIGN PHASE**

An investigation was undertaken to assess the viability of the choice of site and it was found that due to climatic conditions and current land use the site was suitable for a solar energy facility. Further to this it is evident that the project fits with legislation and key planning and policy documentation. In this regard renewable energy facilities are supported on a national, provincial and municipal level.

### **3.2. CONSTRUCTION PHASE**

Most of the impacts discussed above apply over the short-term to the construction phase of the project and include:

- Annoyance, dust and noise
- Increase in crime
- Increased risk of HIV infections
- Influx of construction workers
- Hazard exposure
- Disruption of daily living patterns
- Disruptions to social and community infrastructure
- Economic

- Job creation and skills development
- Socio-economic stimulation.

Each of these impacts is assessed below with mitigation and optimisation measures being suggested in **Table 1** to **Table 9**.

**Table 1: Annoyance dust and noise**

<b>Nature:</b> Annoyance dust and noise		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local = 1	Local = 1
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Low = 4	Minor to Low = 3
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>Medium (-30)</b>	<b>Low (-25)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Wet gravel roads on a regular basis or alternatively use biodegradable dust suppressants.</li> <li>• Ensure that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.</li> <li>• Ensure all vehicles are roadworthy and drivers are qualified and made aware of the potential noise and dust issues.</li> <li>• Appoint a community liaison officer to deal with complaints and grievances from the public.</li> </ul>		
<b>Cumulative impacts:</b>		
Other construction activities in the area will heighten the nuisance impacts, such as noise, dust and wear and tear on roads		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• Dust may settle on vegetation discouraging livestock and game from browsing in the area affected by dust.</li> </ul>		

**Table 2: Increase in crime**

<b>Nature:</b> Increase in crime		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional = 2	Regional = 2
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Low = 4	Minor to Low = 3
<b>Probability</b>	Highly probable = 4	Probable = 3
<b>Significance</b>	<b>Low (-28)</b>	<b>Low (-18)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing.</li> <li>• Fence off construction site and control access to these sites.</li> <li>• Appoint an independent security company to monitor the site.</li> <li>• Appoint a community liaison officer.</li> <li>• Encourage local people to report any suspicious activity associated with the construction site to the community liaison officer.</li> <li>• A grievance mechanism must be prepared and communicated to surrounding landowners and local communities, to ensure that the project proponent, EPC Contractor, and sub-contractors remain responsible and accountable, and to facilitate the identification and implementation of additional mitigation measures if required.</li> <li>• Prevent loitering within the vicinity of the construction camp as well as construction sites by recruiting off site in visa an offsite recruiting office/agent, whatever is most appropriate.</li> </ul>		
<b>Cumulative impacts:</b> With the various projects planned for the area it is possible that on a cumulative basis this would increase crime levels in the region.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• If crime levels do rise in the area it may take some time before they are restored to the previous low level.</li> <li>• Depending on the crimes committed victims may suffer long-term effects as a result of their experience.</li> </ul>		

**Table 3: Increased risk of HIV infections**

<b>Nature: Increased risk of HIV infections.</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional = 4	Regional = 4
<b>Duration</b>	Long-term = 4	Long-term = 4
<b>Magnitude</b>	Moderate to High = 7	Moderate = 6
<b>Probability</b>	Highly probable = 4	Probable = 3
<b>Significance</b>	<b>High (-60)</b>	<b>Medium (-42)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	Yes	Yes
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Ensure that an onsite HIV and AIDS policy is in place and that construction workers are exposed to a health and HIV/AIDS awareness educational programme within the first month of construction.</li> <li>• Provide voluntary and free counselling, free testing and condom distribution services to the workforce.</li> </ul>		
<b>Cumulative impacts:</b>		
The development of other facilities and associated infrastructure would increase the risk of HIV in the area and would need to be addressed.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• The area currently has a relatively low HIV prevalence rate and any increase in this rate would have serious consequences that could last over an extended period.</li> <li>• People contracting HIV and their families will suffer life changing consequences.</li> </ul>		

**Table 4: Influx of construction workers**

<b>Nature: Influx of construction workers</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional = 2	Regional = 2
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Low = 4	Low to Minor= 3
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>Medium(-35)</b>	<b>Medium (-30)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Communicate the limitation of opportunities created by the project through Community leaders and Ward Councillors to prevent an influx of job seekers;</li> <li>• Develop and implement a local procurement policy which prioritises “locals first” to prevent the movement of people into the area in search of work.</li> <li>• Draw up a recruitment policy in conjunction with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy.</li> </ul>		
<b>Cumulative impacts:</b> With the various projects being undertaken in the area the influx of workers could reach significant level which could lead to an increase in crime in the area.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• There is the risk that some workers remain in the area in the hope of finding employment with other projects planned for the region. This risk is, however, reduced as most workers will be recruited locally.</li> </ul>		



**Table 5: Hazard exposure**

<b>Nature: Hazard exposure</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional = 2	Regional = 2
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Low = 4	Minor to Low = 3
<b>Probability</b>	Highly probable = 4	Highly probable = 4
<b>Significance</b>	<b>Low (-28)</b>	<b>Low (-24)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Ensure all construction equipment and vehicles are properly maintained at all times;</li> <li>• Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly;</li> <li>• No open fires are allowed on the site;</li> <li>• A grievance mechanism must be prepared and communicated to surrounding landowners and local communities, to ensure that the project proponent, EPC Contractor, and sub-contractors remain responsible and accountable, and to facilitate the identification and implementation of additional mitigation measures if required.</li> <li>• Where necessary training should be provided on the implementation of the grievance mechanism to ensure that those who are most likely to be affected by the project are suitably knowledgeable on how to raise concerns and have these addressed.</li> <li>• Compile and implement a Fire Management and Emergency Preparedness and Response Plan.</li> <li>• Follow the recommendations in the Traffic Management Plan.</li> </ul>		
<b>Cumulative impacts:</b> With a possible increase in heavy vehicle traffic and an increase in workers associated with the various projects planned for the area there is likely to be an increased risk of hazard exposure including fire risk.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• With an increased risk of hazard exposure there is the possibility that people may be injure or killed which will place a burden on their families.</li> </ul>		

**Table 6: Disruption of daily living patterns**

<b>Nature: Disruption of daily living patterns</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>

<b>Extent</b>	Regional = 2	Regional = 2
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Low = 4	Minor to Low = 3
<b>Probability</b>	Highly probable = 4	Highly probable = 4
<b>Significance</b>	<b>Low (-28)</b>	<b>Low (-24)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes

**Mitigation:**

- Follow the recommendations in the Traffic Management Plan;
- Ensure that, at all times, people have access to their properties as well as to social facilities.
- All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.
- Heavy vehicles should be inspected regularly to ensure their road safety worthiness.
- Avoid heavy vehicle activity during “peak” hours (when children are taken to school, or people are driving to work).
- The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if damaged due to construction activities.

**Cumulative impacts:** With the various projects planned for the area it is possible that there will be an increase in the disruptions of living patterns, especially due to an increase in traffic.

**Residual impacts:**

- It is unlikely that any disruption of community patterns will persist after construction.

**Table 7: Disruption to social and community infrastructure**

<b>Nature: Disruptions to social and community infrastructure</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional = 3	Regional = 3
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Low = 4	Minor to Low = 3
<b>Probability</b>	Highly probable = 4	Highly probable = 4
<b>Significance</b>	<b>Low (-32)</b>	<b>Low (-28)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>Regularly monitor the effect that construction is having on infrastructure and immediately report any damage of infrastructure to the appropriate authority;</li> <li>Ensure that where communities' access is obstructed that this access is swiftly restored to an acceptable state.</li> </ul>		
<b>Cumulative impacts:</b> There is a risk that social and community infrastructure in the area will be disrupted due to the increase in similar projects in the area.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>If disrupted social and community infrastructure is not swiftly restored there is a risk that local communities may experience an extended loss in this respect.</li> </ul>		

**Table 8: Job creation and skills development**

<b>Nature: Job creation and skills development</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	Regional = 3	Regional = 3
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Minor to Low = 3	Low = 4
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>Medium (+35)</b>	<b>Medium (+40)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be optimised</b>	Yes	Yes
<b>Enhancement:</b>		
<ul style="list-style-type: none"> <li>• Wherever feasible, local residents should be recruited to fill semi and unskilled jobs;</li> <li>• Women should be given equal employment opportunities and encouraged to apply for positions;</li> <li>• A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction;</li> <li>• A procurement policy promoting the use of local business should, where possible, be put in place and applied throughout the construction phase.</li> <li>• As far as possible local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria should be used.</li> </ul>		
<b>Cumulative impacts:</b> Job creation and skills development in the region could rise as a result of the various projects planned for the area.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• Job creation and skills development may help in addressing poverty and low living standards in the region and improve skills and experience in the local area.</li> </ul>		

**Table 9: Socio-economic development**

<b>Nature: Socio-economic development.</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional = 2	Regional = 2
<b>Duration</b>	Short-term = 1	Short-term = 1
<b>Magnitude</b>	Moderate = 6	Moderate to High = 7
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>Medium (+45)</b>	<b>Medium (+50)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be optimised</b>	Yes	Yes
<b>Enhancement:</b>		
<ul style="list-style-type: none"> <li>• A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase.</li> <li>• A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g. construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created and companies listed thereon should be invited to bid for project-related work where applicable.</li> </ul>		
<b>Cumulative impacts:</b> The various projects planned for the area could have a positive impact on the regional economy due to the opportunity for local capital expenditure.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• The project could assist in upgrading the skills of local community members and growth in local business.</li> </ul>		

### 3.3. OPERATIONAL PHASE

The social impacts that apply to the operational phase of the project are:

- Transformation of the sense of place and
- Economic
  - Job creation and skills development
  - Socio-economic stimulation

These impacts are assessed below in **Table 10** to **Table 12** and mitigation and optimization measure are suggested in each case.

**Table 10: Transformation of the sense of place**

<b>Nature: Transformation of the sense of place.</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional = 4	Regional = 4
<b>Duration</b>	Long-term = 4	Long-term = 4
<b>Magnitude</b>	Moderate = 6	Low to Moderate = 5
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>High (-70)</b>	<b>High (-65)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Apply the mitigation measures suggested in the Visual Impact Assessment Report;</li> <li>• Communicate the benefits associated with renewable energy to the broader community;</li> <li>• Ensure that all affected land owners and tourist associations are regularly consulted;</li> <li>• A Grievance Mechanism should be put in place and all grievances should be dealt with in a transparent manner;</li> <li>• The mitigation measures recommended in the Visual and Heritage and Palaeontology Impact Assessments should be followed.</li> </ul>		
<b>Cumulative impacts:</b> There is a significantly high risk that the projects planned for the area will transform the sense of place of the area.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• Once the project has been decommissioned it will take some time and effort to restore the area's original sense of place.</li> </ul>		

**Table 11: Job creation and skills development**

<b>Nature: Job creation and skills development</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	Regional = 2	Regional = 2
<b>Duration</b>	Long-term = 4	Long-term = 4
<b>Magnitude</b>	Minor to Low = 3	Low = 4
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>Low (+45)</b>	<b>Low (+50)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be optimised</b>	Yes	Yes
<b>Enhancement:</b>		
<ul style="list-style-type: none"> <li>• Implement a training and skills development programme for locals;</li> <li>• Work closely with the appropriate municipal structures in regard to establishing a social responsibility programme.</li> <li>• The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.</li> </ul>		
<b>Cumulative impacts:</b> The various projects planned for the area could contribute towards job creation in the region.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• Job creation and skills development may help in addressing poverty and low living standards in the region.</li> </ul>		

**Table 12: Socio-economic stimulation**

<b>Nature: Socio-economic stimulation</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	Regional = 4	Regional = 4
<b>Duration</b>	Long-term = 4	Long-term = 4
<b>Magnitude</b>	Low to Moderate = 5	Moderate = 6
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>High (+65)</b>	<b>High (+70)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be optimised</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Ensure that the procurement policy supports local enterprises;</li> <li>• Establish a social responsibility programme either in line with the REIPPP BID guidelines or equivalent;</li> <li>• Work closely with the appropriate municipal structures with regard to establishing a social responsibility programme;</li> <li>• Ensure that any trusts or funds are strictly managed in respect of outcomes and funds.</li> </ul>		
<b>Cumulative impacts:</b> The various projects planned for the area could have a positive impact on the regional economy and the contribution towards the national grid could have a significant positive national impact.		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• The project could assist in upgrading the skills of local community members and in strengthening the national grid.</li> </ul>		

### **3.4. DECOMMISSIONING PHASE**

Decommissioning will lead to the loss of jobs and the revenue stream associated with the project that stimulated the local economy. It is estimated that the project has a lifespan of approximately 20 years and there is the possibility that after this period the infrastructure could be replaced with more up-to-date technology that would extend the life of the photovoltaic plant. This would, however, depending on the situation at the time of decommissioning. Although the loss of a job is significant and can be devastating on an individual and family level, the total number of jobs under threat could be insignificant as the operational staff complement is estimated at 25 with 15 being skilled and probably able to find alternative employment.



Decommissioning will result in a limited number of jobs being created over a short period of time as components are dismantled and the site is cleared. Although positive, this will be a rather insignificant benefit considering the size of the facility and the time period attached to decommissioning.

Considering the relatively long time period to decommissioning, the uncertainty of what would exactly occur, and the significance of the impact in isolation it would be rather meaningless to attach assessment criteria to decommissioning at this point. However, prior to decommissioning the following mitigation measures are suggested.

#### **Decommissioning mitigation measures**

- Ensure that a retrenchment package is in place;
- Ensure that staff have been trained in a manner that would provide them with saleable skills within the job market;
- Ensure that the site is cleared responsibly and left in a safe condition.

#### **4. ASSESSMENT OF NO-GO ALTERNATIVE**

The no project alternative would mean that the social environment is not affected as the status quo remains. On a negative front it would also mean that all the positive aspects associated with the project would not materialise. Consequently, there would be no job creation, no revenue streams into the local economy and municipal coffers and a lost opportunity to enhance the national grid with a renewable source of energy. Considering that Eskom's coal fired power stations are a huge contributor to carbon emissions the loss of a chance to supplement the National Grid through renewable energy would be significant at a national, if not global level. The Intergovernmental Panel on Climate Change (6 October 2018, p. 15) has warned that that Co<sup>2</sup> emissions need to be reduce by 45% from 2010 levels by 2030 and to zero by 2050. This basically means that the countries heavy reliance on coal powered energy generation must be replaced with more environmentally friendly modes of energy generation. The no-go alternative is assessed in **Table 13**.

**Table 13: No project alternative**

<b>Nature: No project alternative</b>	
	<b>Without mitigation</b>
<b>Extent</b>	Regional = 5
<b>Duration</b>	Long-term = 4
<b>Magnitude</b>	Moderate = 6
<b>Probability</b>	Definite = 5
<b>Significance</b>	<b>High (-75)</b>
<b>Status (positive or negative)</b>	Negative
<b>Reversibility</b>	Yes
<b>Irreplaceable loss of resources</b>	Yes
<b>Can impacts be optimised</b>	No

## 5. ASSESSMENT OF ACCESS ROAD ALTERNATIVES

Based on the outcome of meetings and consultations with affected landowners and the DAFF during the Scoping Phase, the four access road alternatives were identified for consideration as described under Section 1.2 Access Road Alternatives above.

In this regard it was pointed out by a landowner in an email dated 30/10/2018 that:

*“We have received documentation regarding the proposed access road to Lyndoch solar facility. Our farms, Oupos and Uitkoms, are some of the farms that will be influenced by option 2 access road. In option 2, the road is proposed to meet T25 at a sharp (almost 90 degrees) bend. Taking into consideration that T25 already has very high traffic, the proposed road in option 2 will be hazardous. An entrance can't be made on that sharp bend, since you don't have a clear view of oncoming traffic on the other side of the bend. Traffic also moves quite fast on that part of the road. Thus, we strongly oppose to option 2 access road to Lyndoch solar facility using T25.”*

In addition to this the T25 gravel road is an unsealed road with limited traction, thus adding to the risks referred to above. “Option 2” as referred to above has been updated to Alternative 3 within the context of this report.

Taking this into account the impacts as they affect the access road alternatives are assessed in **Table 14** to **Table 17**.

**Table 14: Annoyance dust and noise – Access road alternatives**

<b>Nature:</b> Annoyance dust and noise as a result of traffic and construction activities.								
	<b>Alternative 1</b>		<b>Alternative 2</b>		<b>Alternative 3</b>		<b>Alternative 4</b>	
	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)
<b>Duration</b>	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)
<b>Magnitude</b>	Moderate (6)	Low (4)	Moderate (6)	Low (4)	Moderate (6)	Low (4)	Low (4)	Minor to Low (3)
<b>Probability</b>	Highly probable (4)	Highly probable (4)	Highly probable (4)	Highly probable (4)	Highly probable (4)	Highly probable (4)	Highly probable (4)	Highly probable (4)
<b>Significance</b>	<b>Medium (-36)</b>	<b>Low (-28)</b>	<b>Medium (-36)</b>	<b>Low (-28)</b>	<b>Medium (-36)</b>	<b>Low (-28)</b>	<b>Medium (-28)</b>	<b>Low (-24)</b>
<b>Status (positive or negative)</b>	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
<b>Reversibility</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No	No	No	No	No	No	No
<b>Can impacts be mitigated</b>	Yes		Yes		Yes		Yes	
<b>Mitigation:</b>								
<ul style="list-style-type: none"> <li>• Wet gravel roads on a regular basis.</li> <li>• Ensure that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.</li> <li>• Ensure all vehicles are roadworthy and drivers are qualified and made aware of the potential noise and dust issues.</li> <li>• Appoint a community liaison officer to deal with complaints and grievances from the public.</li> </ul>								
<b>Residual Impacts:</b> Once construction ceases there should be minimal residual impact associated with announce, dust and noise.								

**Table 15: Hazard exposure – Access road alternatives**

<b>Nature:</b> Exposure to hazards associated with construction activities and the delivery of heavy machinery and equipment to site.								
	<b>Alternative 1</b>		<b>Alternative 2</b>		<b>Alternative 3</b>		<b>Alternative 4</b>	
	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)
<b>Duration</b>	Short-term (1)	Short-term (1)	Short-term (1)	Short-term (1)	Short-term (1)	Short-term (1)	Short-term (1)	Short-term (1)
<b>Magnitude</b>	Moderate/High (7)	Moderate (6)	Moderate/High (7)	Moderate (6)	Moderate/High (7)	Moderate (6)	Low (5)	Low (4)
<b>Probability</b>	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)
<b>Significance</b>	<b>Medium (-45)</b>	<b>Medium (-40)</b>	<b>Medium (-45)</b>	<b>Medium (-40)</b>	<b>Medium (-45)</b>	<b>Medium (-40)</b>	<b>Medium (-35)</b>	<b>Low (-30)</b>
<b>Status (positive or negative)</b>	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
<b>Reversibility</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No	No	No	No	No	No	No
<b>Can impacts be mitigated</b>	Yes		Yes		Yes		Yes	
<b>Mitigation:</b>								
<ul style="list-style-type: none"> <li>• Ensure all construction equipment and vehicles are properly maintained at all times.</li> <li>• Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly.</li> <li>• Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to.</li> <li>• Make staff aware of the dangers of fire during regular tool box talks.</li> <li>• A grievance mechanism must be prepared and communicated to surrounding landowners and local communities, to ensure that the project proponent, EPC contractor, and sub-contractors remain responsible and accountable and to facilitate the identification and implementation of additional mitigation measures if required.</li> <li>• Where necessary training should be provided on the implementation of the grievance mechanism to ensure that those who are most likely to be affected by the project are suitably equipped in the mechanism of raising concerns and having these addressed.</li> <li>• Compile and implement a Fire Management and Emergency Preparedness Response Plan.</li> </ul>								
<b>Residual Impacts:</b> Where existing roads are upgraded, as in the case of Alternative 1 and the section along the existing T25 gravel road in respect of Alternative 3, there could be a beneficial impact associated with the upgrade and the application of mitigation measures. This, however, will depend on dust and noise suppression mitigation measures being strictly and consistently adhered to. In respect of new sections of road needing to be constructed in respect of Alternatives 2, 3 and 4, even where mitigation measures are successfully and consistently applied the opening of the area will result in access associated with dust and noise that was previously non-existent.								

**Table 16: Disruption of daily living patterns – Access road alternatives**

<b>Nature:</b> Disruption of daily living patterns due to construction activities and deliveries of machinery and heavy equipment to site.								
	<b>Alternative 1</b>		<b>Alternative 2</b>		<b>Alternative 3</b>		<b>Alternative 4</b>	
	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)
<b>Duration</b>	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)	Short-term (2)
<b>Magnitude</b>	Moderate (7)	Moderate (6)	Moderate (7)	Moderate (6)	Moderate (7)	Moderate (6)	Low (5)	Low (4)
<b>Probability</b>	Highly probable (4)	Probable (3)	Highly probable (4)	Probable (3)	Highly probable (4)	Probable (3)	Highly probable (4)	Probable (3)
<b>Significance</b>	<b>Medium (-40)</b>	<b>Low (-27)</b>	<b>Medium (-40)</b>	<b>Low (-27)</b>	<b>Medium (-40)</b>	<b>Low (-27)</b>	<b>Medium (-32)</b>	<b>Low (-21)</b>
<b>Status (positive or negative)</b>	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
<b>Reversibility</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No	No	No	No	No	No	No
<b>Can impacts be mitigated</b>	Yes		Yes		Yes		Yes	
<b>Mitigation:</b>								
<ul style="list-style-type: none"> <li>• Ensure that, at all times, people have access to their properties as well as to social facilities.</li> <li>• All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.</li> <li>• Heavy vehicles should be inspected regularly to ensure their road safety worthiness.</li> <li>• The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if damaged due to construction activities.</li> </ul>								
<b>Residual Impacts:</b> As long as adequate site clean-up is undertaken there should be no residual impacts.								

**Table 17: Transformation of the sense of place – Access road alternatives**

<b>Nature:</b> Transformation of the sense of place due to the construction and use of the road over the operational phase of the project which is likely to result in a change along the road corridor associated with:								
<ul style="list-style-type: none"> <li>• Announce, dust and noise</li> <li>• Hazard exposure and</li> <li>• Disruption in daily living patterns.</li> </ul>								
	<b>Alternative 1</b>		<b>Alternative 2</b>		<b>Alternative 3</b>		<b>Alternative 4</b>	
	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)	Local (1)
<b>Duration</b>	Long-term (4)	Long-term (4)	Long-term (4)	Long-term (4)	Long-term (4)	Long-term (4)	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Moderate (6)	Low (4)	Moderate (6)	Low (4)	Moderate (6)	Low (4)	Moderate (6)	Low (4)
<b>Probability</b>	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)	Definite (5)
<b>Significance</b>	<b>Medium (-55)</b>	<b>Medium (-45)</b>	<b>Medium (-55)</b>	<b>Medium (-45)</b>	<b>Medium (-55)</b>	<b>Medium (-45)</b>	<b>Medium (-55)</b>	<b>Medium (-45)</b>
<b>Status (positive or negative)</b>	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
<b>Reversibility</b>	Difficult to reverse	Difficult to reverse	Difficult to reverse	Difficult to reverse	Difficult to reverse	Difficult to reverse	Difficult to reverse	Difficult to reverse
<b>Irreplaceable loss of resources</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Can impacts be mitigated</b>	Yes		Yes		Yes		Yes	
<b>Mitigation:</b>								
<ul style="list-style-type: none"> <li>• Wet gravel roads on a regular basis.</li> <li>• Ensure all vehicles are roadworthy and drivers are qualified and made aware of the potential noise and dust issues.</li> <li>• Ensure that, at all times, people have access to their properties as well as to social facilities.</li> <li>• All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.</li> <li>• Apply the mitigation measures suggested in the Visual Impact Assessment Report.</li> <li>• A Grievance Mechanism should be put in place and all grievances should be dealt with in a transparent manner.</li> <li>• Appoint a community liaison officer to deal with complaints and grievances from the public.</li> </ul>								
<b>Residual Impacts:</b> The residual impact would be the long-term change in the sense of place of the area that is likely to stretch over the operational phase of the project.								

Considering the above assessment the social preference that has emerged favours Alternative 4 over all other alternatives due to farming and residential activities along alternatives 1, 2 and 3 as indicated in **Table 18**. In addition, with respect to Alternative 3, the danger posed by the intersection with the access road and the unsealed gravel road T25 is also considered. Notwithstanding this, however, the Soil, Land Use, Land Capacity and Agricultural Potential Assessment indicate a preference for Alternative 1 based on the following reason.

*“...as it will be on soil already affected by traffic and the impacts on soil and land capability will only be for the widening of the existing road”* (TerraAfrica Consult cc, 2019, p. 34).

This is also acceptable on a social basis.

From a heritage perspective it is indicated that.

*“Given that (1) the Alternative 1 alignment is already disturbed (current farm access road), (2) there is a potential positive cumulative impact through enhancing our understanding of the regional archaeological sequence, and (3) reuse of this alignment would prevent the destruction of currently undisturbed areas, Alternative 1 is seen as the overall preferred alternative access road from a heritage point of view”* (ASHA Consulting (Pty) Ltd, 2019, p. 34).

**Table 18: Access road alternative preference**

<b>Key</b>		
<b>PREFERRED</b>	The alternative will result in a low impact	
<b>FAVOURABLE</b>	The impact will be relatively insignificant	
<b>LEAST PREFERRED</b>	The alternative will result in a high impact / increase the impact	
<b>NO PREFERENCE</b>	The alternative will result in equal impacts	
<b>Alternative</b>	<b>Preference</b>	<b>Reasons (incl. potential issues)</b>
<b>ACCESS ROADS</b>		
Access Road Alternative 1	Favourable	Farming activities along the road corridor, however, preferred from an agricultural potential and heritage perspective.
Access Road Alternative 2	Least preferred	Due to farming activities along the road corridor.
Access Road Alternative 3	Least preferred	Due to farming activities along the road corridor and junction with T25 unsealed gravel road.
Access Road Alternative 4	Preferred	Only obvious activities are quarrying activities in the vicinity of the junction with the R380.

Notwithstanding the fact that a clear social preference has emerged in respect of the various access road alternatives, this is not compelling in that the impacts along all route alternatives can be mitigated to acceptable levels. Consequently, the social preference can be overridden by either technical and/or biodiversity requirements if these requirements are compelling.

## 6. CUMULATIVE IMPACTS

Over the last five years South Africa has experienced a proliferation in the number of renewable energy facilities being constructed across the country. Accordingly, the government has identified eight Renewable Energy Development Zones (REDZs) and embarked on an initiative, the Renewable Energy Independent Power Producer Procurement Program (REIPPPP), in an effort to channel private sector expertise and investment into grid-connected renewable energy in South Africa. Although the project does not fall within one of these REDZ and is some distance away, situated at a point some 147 km northwest of REDZ 5, 124 km southeast of REDZ 6 and 122 km northwest of REDZ 7 calculated along a straight line, it is surrounded by a number of other PV facilities. Apart from these PV facilities Sishen Airport at ~10 KM, Kathu at ~12 km and Kumba Iron Ore Mine at ~14 km, all fall within a 14 km radius of the project.

On a more project specific basis the following projects listed in **Table 19** have been identified within the region and as such are illustrated in **Map** courtesy of Savannah Environmental (Pty) Ltd Figure 4. Although surrounded by industrial and urban areas the project falls within a rural setting and is close to the PV facilities listed below. Consequently, the following social issues need to be considered on a cumulative basis:

*Health and social wellbeing*

- Risk of HIV

*Quality of the living environment*

- Sense of place
- Service supplies and infrastructure and

*Economic.*

These impacts are considered below and assessed below.



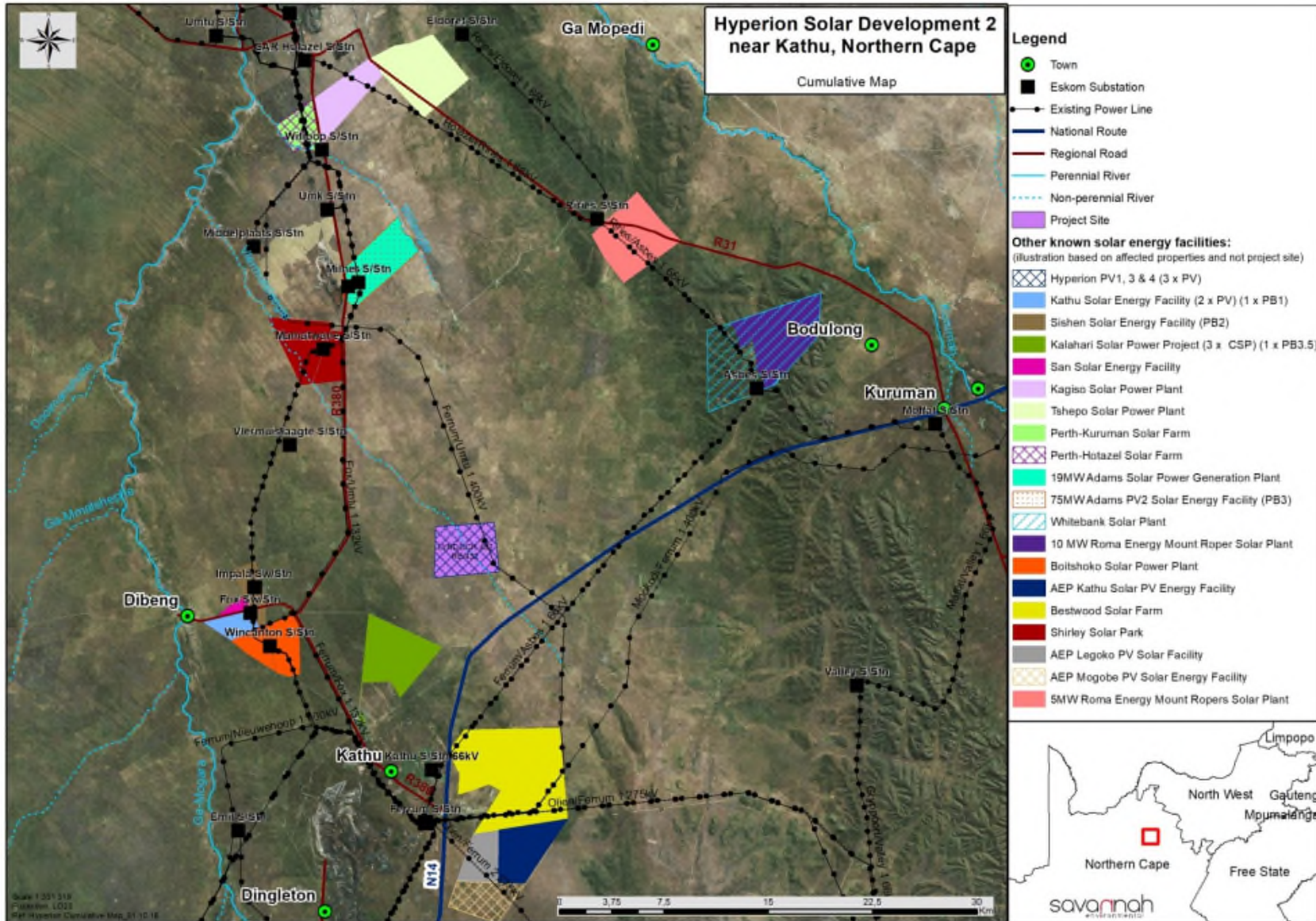
**Table 19: Renewable energy projects within a 30 km radius of the proposed project**

Project Name	DEA Reference Number(s)	Location	Approximate distance from Hyperion Solar Development 2	Project Status
Kalahari Solar Power Project (CSP) (1 x 100 MW project)	12/12/20/1994/1	Remaining Extent of the Farm Kathu 465	~9.3 km south west	Preferred Bidder (already constructed)
Kalahari Solar Power Project (CSP) (1 x 150 MW project)	12/12/20/1994/2	Remaining Extent of the Farm Kathu 465	~9.3 km south west	Approved
Kalahari Solar Power Project (CSP) (1 x 150 MW project)	12/12/20/1994/3	Remaining Extent of the Farm Kathu 465	~9.3 km south west	Approved
Bestwood Solar Farm (PV)	12/12/20/1906	Remaining Extent of the Farm Bestwood 459	~14 km south	Approved
Boitshoko Solar Power Plant (PV) (1 x 115 MW project)	14/12/16/3/3/2/935	Remaining Extent of Portion 1 of the Farm Lime Bank 471	~15.4 km south west	Approved
Sishen Solar Farm (PV) (1 x 75 MW project)	12/12/20/1860	Portion 6 of the Farm Wincanton 472	~15.8 km west	Preferred Bidder (already constructed)
Kathu SEF (PV) (1 x 75 MW project)	12/12/20/1858/1	Portion 4 of the Farm Wincanton 472	~15.8 km west	Preferred Bidder (already constructed)
Kathu SEF (PV) (1 x 25 MW project)	12/12/20/1858/2	Portion 4 of the Farm Wincanton 472	~15.8 km west	Approved
Shirley Solar Park (PV) (1 x 75 MW project)	14/12/16/3/3/2/616	Portion 1 of the Farm Shirley 367	~17.9 km north west	Approved
Adams Solar Power Generation Plant (PV) (1 x 19 MW project)	12/12/20/2566	Remaining Extent of the Farm Adams 328	~22 km north	Approved
Adams PV SEF (PV) (1 x 75 MW project)	12/12/20/2567	Remaining Extent of the Farm Adams 328	~22 km north	Preferred Bidder (already constructed)

Social Impact Assessment for the Hyperion Solar PV Development 2, Northern Cape Province.

<b>Project Name</b>	<b>DEA Reference Number(s)</b>	<b>Location</b>	<b>Approximate distance from Hyperion Solar Development 2</b>	<b>Project Status</b>
AEP Kathu Solar PV Energy Facility (PV) (1 x 75 MW project)	14/12/16/3/3/2/911	Remaining Extent of the Farm Legoko 460	~22.4 km south	Approved
AEP Legoko PV Solar Facility (PV) (1 x 75 MW)	14/12/16/3/3/2/819	Portion 2 of the Farm Legoko 460	~22.4 km south	Approved
Roma Energy Mount Roper Solar Plant (PV) (1 x 10 MW project)	14/12/16/3/3/1/474	Portion 4 of the Farm Whitebank 379	~25 km north east	Approved
Whitebank Solar Plant (PV) (1 x 10 MW project)	14/12/16/3/3/1/475	Portion 4 of the Farm Whitebank 379	~25 km north east	Approved
Mogobe PV SEF (1 x 75 MW project)	14/12/16/3/3/2/820	Portion 1 of the Farm Legoko 460	~25 km south	Approved
Roma Energy Mount Ropers Solar Plant (PV) (1 x 5 W project)	14/12/16/3/3/1/1753	Remaining Extent of the Farm Mount Roper 321	~25.7 km north east	Approved
Perth – Kuruman Solar Farm (PV) (1 x 75 MW project)	14/12/16/3/3/2/761	Remaining Extent of the Farm Pert 276	~30 km north	Approved
Perth – Hotazel Solar Farm (PV) (1 x 75 MW project)	14/12/16/3/3/2/762	Remaining Extent of the Farm Pert 276	~30 km north	Approved
Kagiso Solar Power Plant (PV) (1 x 115 MW project)	14/12/16/3/3/2/934	Remaining Extent of the Farm Pert 276	~30 km north	Approved
Tshepo Solar Power Plant (PV) ( 1 x 115 MW project)	14/12/16/3/3/2/936	Remaining Extent of Farm 275	~30 km north	Approved

Social Impact Assessment for the Hyperion Solar PV Development 2, Northern Cape Province.



Map courtesy of Savannah Environmental (Pty) Ltd

Figure 4: Renewable energy developments in the area

## **6.1. RISK OF HIV INFECTIONS<sup>2</sup>**

With an HIV prevalence rate of 17.5%, when compared to all other provinces across the country as assessed in 2013, the Northern Cape Province is the province with the lowest HIV prevalence rates. At a district level the John Taolo Gaetsewe District Municipality had the fifteenth lowest HIV prevalence rate across all districts in South Africa, with the HIV prevalence rate amongst antenatal women being at 23.2%. Consequently, the district within which the project is located, and some of the neighbouring districts, ZF Mgcawu (formally Siyanda) at 20.1% and Dr Ruth Segomotsi Mompati at 23.4%, have some of the lowest HIV prevalence rates across the country.

These figures are relatively low compared to other areas of the country which range from a rate of 20.3% in Limpopo and 40.1% in KwaZulu-Natal with the iLembe District Municipality having an HIV prevalence rate of 45.9% in 2013. Apart from the Western Cape, that had an HIV prevalence rate of 18.7% in 2013, the rest of the provinces sharing common borders with the Northern Cape Province all have relatively high HIV prevalence rates as indicated below;

North West = 28.2%

Free State = 29.8%;

Eastern Cape = 31.1%

With the influx of labour, particularly following the construction of the various renewable energy and mining projects within the region, the risk of HIV infections in the area is likely to rise significantly. It is well documented on both an international and local basis that the construction industry carries a high level of HIV which can be spread amongst the local communities, particularly through the spread of prostitution that follows the availability of disposable income (Meintjes, Bowen, & Root, 2007; Bowen, Dorrington, Distiller, Lake, & Besesar, 2008; Wasie, et al., 2015; Bowen P. , Govender, Edwards, & Cattell, 2016; Kikwasi & Lukwale, 2017; Bowen P. , Govender, Edwards, & Lake, 2018). It is also well documented on both an international and local level that HIV is also spread by truck drivers (Singh & Malaviya, 1994; Ramjee & Gouws, 2002; Strauss, et al., 2018) and there is likely to be an increase in truck drivers in the area as equipment and material is delivered to the various construction sites.

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<sup>2</sup> HIV prevalence rates are at 2013 figures based on The 2013 National Antenatal Sentinel HIV Prevalence Survey, South Africa.

With the area being extremely poor and the associated disposable income that will follow the construction workers and truck drivers to the area will heighten the risk of the spread of HIV infections across what is a relatively isolated region. In this regard The World Bank (2009, pp. 367-368) had indicated a strong link between infrastructure projects and health as:

*“Transport, mobility, and gender inequality increase the spread of HIV and AIDS, which along with other infectious diseases, follow transport and construction workers on transport networks and other infrastructure into rural areas, causing serious economic impacts.”*

## **6.2. INCREASE IN CRIME**

It is possible that due to increased construction activities in the area the perception may be created that there is an associated increase in job opportunities. This may result in job seekers descend on the region in the hope of gaining employment. These activities across the area may also attracted entrepreneurs to set up small businesses aimed at servicing the growing population. All this activity could also attract opportunists who may take advantage of the emerging situation which may lead to an increase in crime in the area. In 2018 Kuruman had a total of 3 760 crimes reported with Kathu having a total of 2 634 reported crimes. The issue of crime associated with construction sites is of growing concern across the country and needs serious attention to prevent it from getting out of hand. In this regard it has been reported that:

*“Armed gangs recently disrupted the R1.65bn Mtentu Bridge project in the Eastern Cape, and a R2.4bn oil-storage investment project at Saldanha in the Western Cape was halted on March 13 after people demanding to be part of the project burnt down properties, the SA Forum of Civil Engineering Contractors (Safcec) said in a March 18 letter addressed to finance minister Tito Mboweni” (Monteiro & Prinsloo, 2019)<sup>3</sup>.*

Consequently the increase in crime associated with developments in the area becomes a risk on a cumulative basis.

## **6.3. TRANSFORMATION OF SENSE OF PLACE**

Within a social context a sense of place includes a wide range of criteria, all or some of which add meaning to a particular area for individuals and groups. These criteria may include the vista, geography, urban layout, flora and fauna, community, history and

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<sup>3</sup> In this regard also see Creamer Media's Engineering News, 2019 and SAFCEC's "Letter to the Minister of Finance the Honourable Tito Mboweni, 2019" amongst others.

fragrance of a place amongst many others and are interpreted uniquely on an individual basis. Some individuals may embrace changes to the sense of place that others may reject and for some it may merely be a change in the demographics of an area that leaves them feeling threatened, vulnerable and insecure. Groups and group membership can help to reinforce the sense of place of an area and can also serve to reinforce fears and suspicions associated with pending changes to the sense of place. A sense of place has much to do with unique individual perceptions attached to the location and is subjective by nature.

With the number of PV facilities, sub-stations and transmission lines in the vicinity the sense of place of the area is transforming from what had more of a rural farming aura to take on more of an industrial character. The project, considered along with the various other projects in the area, is likely to accelerate this transformation thus changing the sense of place of the region. Some of the concerns associated with this change to the environment relate to glare and aircraft interference, particularly considering the proximity of Sishen Airport; the visual impact both static and dynamic along the N14 and R380 and land use transformation from farming to industrial. As this change will be associated with the clustering of several projects in the area it will need to be considered on a cumulative basis.

In respect of the visual impact the visual specialist has indicated that;

*“The possible cumulative effect of glare on Kathu Airport and the cumulative contribution of the proposed project are both assessed as low. This is largely due to the relatively effective mitigation measures that might be employed”*  
(Environmental Planning and Design, 2019, p. 48).

#### **6.4. DISRUPTION OF SERVICES, SUPPLIES AND INFRASTRUCTURE**

With the proliferation of renewable energy facilities in the area it is quite likely that the local authorities, currently hard pressed to deliver services due largely to the growth in mining activities in the area, according to the Gamagara LM IDP 2017 – 2022, will find it difficult to keep up with these developments. The influx of construction workers is likely to place pressure on accommodation and the need for both services and supplies. The urban area of Kathu, some 12 km south, southwest of the project is likely to bear the brunt of the demand for accommodation, services and supplies. On this basis market demands could inflate costs that may have a negative effect on local communities, particularly the poor, who may be forced to pay higher prices for essential supplies resulting in an escalation of the cost of living in the area. Social services such as medical and educational facilities could also be placed under pressure due to increased demand. Although this may reach its peak during

the construction phase it should be mitigated somewhat by the fact that the construction of the various project will be spread across different timelines, with some project commencing while other reach completion. Where numerous projects are entering into construction phase simultaneously, the project companies should engage to align efforts. Employing local people across the various projects and project phases may also assist in reducing the stress placed on services, supplies and infrastructure in the area.

During the operational phases it is likely that these demands will continue as operational staff take up more long-term residency in the area and are supported by service and maintenance personnel who may spend some time on site on a contractual basis. An influx of temporary maintenance and service workers is likely to last over the operational phase of the projects but is likely to settle within the medium term as the economy adjusts and the municipal authorities are able to respond to this growth.

## **6.5. ECONOMIC**

The cumulative economic impact of the project will be both positive and negative. The negative economic impacts, associated with a possible rise in living costs driven by market demand, are considered under the section above. Under this section the positive economic impacts will be addressed.

From a positive perspective the proliferation of renewable energy facilities within the region is likely to result in significant and positive cumulative impacts in the area in terms of both direct and indirect job creation, skills development, training opportunities, and the creation of business opportunities for local businesses. In this regard it is indicated in the IPPPP Quarterly Report, as at 31 March 2018, that in respect of South Africa as a whole and through the Independent Power Producers Procurement Programme, “ *..the REIPPPP is targeting broader economic and socio-economic developmental benefits*” and that “[t]o date, a total of 35 702 job years have been created for South African citizens, of which 30 763 were in construction and 4 938 in operations” (Independent Power Producer Office, 2018a, p. 36 & 40). In addition to this R20.6 billion has been committed to socio-economic development while the projected procurement spend is “*...R147.6 billion of which R55.5 billion has been spent to date.*” The municipalities within the area have identified renewable energy as a strategic economic opportunity in a region that previously had few such opportunities. This is indicated in the various IDPs and LEDs pertaining to the affected municipalities.

## **6.6. ASSESSMENT OF CUMULATIVE IMPACTS**

The cumulative impacts discussed above are assessed below in **Table 20** to **Table 24**. It must, however, be noted that this assessment is at a superficial level as any in-depth investigation of the cumulative effects of the various developments being planned for the region are beyond the scope of this study as they would require a broad based investigation on a far larger scale.



**Table 20: Risk of HIV**

<b>Nature:</b> Risk of HIV		
	<b>Overall impact of the proposed project considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Regional = 4	Regional = 4
<b>Duration</b>	Long-term = 4	Long-term = 4
<b>Magnitude</b>	Moderate = 6	High = 8
<b>Probability</b>	Probable = 3	Highly probable = 4
<b>Significance</b>	<b>Medium (-42)</b>	<b>High (-64)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	Yes	Yes
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense the following mitigation measures would need to be considered.		
<ul style="list-style-type: none"> <li>• Ensure that all companies coming into the area have and are implementing an effective HIV/AIDS policy;</li> <li>• Introduce HIV/ADS awareness programs to schools and youth institutions;</li> <li>• Carefully monitor and report on the HIV status of citizens in the region;</li> <li>• Be proactive in dealing with any increase in the HIV prevalence rate in the area.</li> </ul>		

**Table 21: Increase in crime**

<b>Nature:</b> Increase in crime		
	<b>Overall impact of the proposed project considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Regional = 2	Regional = 5
<b>Duration</b>	Short-term = 1	Long-term = 4
<b>Magnitude</b>	Low = 3	Moderate = 6
<b>Probability</b>	Probable = 3	Highly probable = 4
<b>Significance</b>	<b>Low (-18)</b>	<b>Medium to high (-60)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes

**Mitigation:**

Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense the following mitigation measures would need to be considered.

- Encourage contractors and local people to report any suspicious activity associated with crime to the appropriate authorities.
- Ensure that the local municipalities, police, security companies, and policing forums are alerted to the increased construction activities in the region and the risk it poses in respect of crime.
- Prevent loitering within the vicinity of the construction camp as well as construction sites.
- Manage the growth of informal settlements that may arise as a response to growing job opportunities by promptly alerting the appropriate authorities.
- Set up a community forum consisting of contractors, local and national government officials and

**Table 22: Transformation of Sense of place**

<b>Nature:</b> Sense of place.		
	<b>Overall impact of the proposed project considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Regional = 4	Regional = 4
<b>Duration</b>	Long-term = 4	Long-term = 4
<b>Magnitude</b>	Low moderate = 5	High = 8
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>High (-65)</b>	<b>High (-80)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	Yes
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense the following mitigation measures would need to be considered.		
<ul style="list-style-type: none"> <li>• Consider undertaking a cumulative impact assessment to evaluate the changes taking place across the area on a broader scale;</li> <li>• Form a regional work group tasked with addressing the effect of changes to the sense of place of the region;</li> <li>• Establish grievance mechanisms to deal with complaints associated with changes to the area;</li> <li>• Enlighten the public about the need and benefits of renewable energy;</li> <li>• Engage with tourism businesses and authorities in the region to identify any areas of cooperation that may exist.</li> </ul>		

**Table 23: Disruption of service, supplies and infrastructure**

<b>Nature: Service supplies and infrastructure</b>		
	<b>Overall impact of the proposed project considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Regional = 2	Regional = 4
<b>Duration</b>	Short-term = 1	Long-term = 4
<b>Magnitude</b>	Minor to Low = 3	Moderate to high = 7
<b>Probability</b>	Highly probable = 4	Highly probable = 4
<b>Significance</b>	<b>Low (-24)</b>	<b>High(-60)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated</b>	Yes	Yes
<b>Mitigation:</b>		
Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense the following mitigation measures would need to be considered.		
<ul style="list-style-type: none"> <li>Engage with the municipal authorities to ensure that they are aware of the expansion planned for the area and the possible consequences of this expansion;</li> <li>Ensure that local labour is recruited in respect of these developments in the area.</li> </ul>		

**Table 24: Economy**

<b>Nature: Positive economic impacts</b>		
	<b>Overall impact of the proposed project considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Regional = 4	Regional = 5
<b>Duration</b>	Long-term = 4	Long-term = 4
<b>Magnitude</b>	Low to Moderate = 5	Moderate to High = 7
<b>Probability</b>	Definite = 5	Definite = 5
<b>Significance</b>	<b>High (+65)</b>	<b>High (+80)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Yes	Yes
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be optimised</b>	Yes	Yes
<b>Enhancement:</b>		
Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense the following mitigation measures would need to be considered.		
<ul style="list-style-type: none"> <li>• Implement a training and skills development programme for locals;</li> <li>• Ensure that the procurement policy supports local enterprises;</li> <li>• Establish a social responsibility programme in line with the REIPPP;</li> <li>• Work closely with the appropriate municipal structures in regard to establishing a social responsibility programme;</li> <li>• Ensure that any trusts or funds are strictly managed in respect of outcomes and funds allocated.</li> </ul>		

The assessment of the cumulative impacts takes into consideration the impacts associated with solar energy facilities in the area and on this basis no fatal flaws associated with the cumulative impacts are evident at a social level. The impacts assessed above are summarised and a pre and post mitigation comparison is presented in **Table 25**.

Table 25: Impact summary

<b>Construction Phase</b>					
<b>Environmental parameter</b>	<b>Issues</b>	<b>Rating prior to mitigation</b>	<b>Average</b>	<b>Rating post mitigation</b>	<b>Average</b>
<b>Health &amp; social wellbeing</b>	Annoyance, dust and noise	-30		-25	
	Increase in crime	-28		-18	
	Increased risk of HIV infections	-60		-42	
	Influx of construction workers	-35		-30	
	Hazard exposure.	-28	<b>-36.2</b>	-24	<b>-27.8</b>
			Negative Medium Impact		Negative Low Impact
<b>Quality of the living environment</b>	Disruption of daily living patterns	-28		-24	
	Disruptions to social and community infrastructure	-32	<b>-30</b>	-28	<b>-26</b>
			Negative Medium Impact		Negative Low Impact
<b>Economic</b>	Job creation and skills development	+35		+40	
	Socio-economic stimulation	+45	<b>+40</b>	+50	<b>+45</b>
			Positive Medium Impact		Positive Medium Impact
<b>Operational Phase</b>					
<b>Quality of the living environment</b>	Transformation of the sense of place	-70	<b>-70</b>	-65	<b>-65</b>
			Negative High Impact		Negative High Impact
<b>Economic</b>	Job creation and skills development	+45		+50	
	Socio-economic stimulation	+65	<b>+55</b>	+70	<b>+60</b>
			Positive Medium Impact		Positive High Impact

Social Impact Assessment for the Hyperion Solar PV Development 2, Northern Cape Province.

<b>No-go Alternative</b>					
<b>Environmental parameter</b>	<b>Issues</b>	<b>Rating prior to mitigation</b>	<b>Average</b>	<b>Rating post mitigation</b>	<b>Average</b>
<b>No project</b>		-75	<b>-75</b>	No mitigation measures	
			Negative High Impact		
<b>Cumulative Impacts</b>					
		<b>Overall impact of the proposed project considered in isolation</b>		<b>Cumulative impact of the project and other projects in the area</b>	
<b>Health &amp; social wellbeing</b>	Risk of HIV	-42		-64	
	Increase in crime	-18	<b>-30</b>	-60	<b>-62</b>
			Low Medium Impact		Negative High Impact
<b>Quality of the living environment</b>	Sense of place	-65		-80	
	Services, supplies & infrastructure	-24	<b>-44.5</b>	-60	<b>-70</b>
			Negative High Impact		Negative High Impact
<b>Economic</b>	Economic	+65	<b>+65</b>	+80	<b>+80</b>
			Positive High Impact		Positive High Impact

## 7. ENVIRONMENTAL MANAGEMENT PLAN

The following measures pertaining to the social impacts are to be included in the draft Environmental Management Plan.

<b>OBJECTIVE:</b> To ensure, as far as is reasonable and practical, an environment that is safe and without risk to the health of employees and the general public who come into contact with activities associated with the project.		
<b>Project component/s</b>	Project site including laydown areas and access road. Deliveries on public roads to and from the project site.	
<b>Potential Impact</b>	Hazards exposure to the public and employees associated with construction and operational activities and construction and operational related traffic.	
<b>Activity/risk source</b>	Construction and operational activities and project related traffic.	
<b>Mitigation: Target/Objective</b>	Safety of the workforce, visitors to site and the general public who may come into contact with project related components and/or activities.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Restrict public access to works area including construction areas, laydown and storage sites via appropriate security such as: <ul style="list-style-type: none"> <li>➤ Security fencing and appropriate signage;</li> <li>➤ The presence of security personnel.</li> </ul> Only allow site access after appropriate induction and use of appropriate personal protective equipment. Impose vehicle speed restrictions and display appropriate signage. Ensure use and storage of hazardous materials is in accordance with health and Safety regulations. Keep record of all accidents or transgressions of safety in accordance with OHS Act and implement corrective action. Ensure that fires are not permitted on site. Engage a safety officer.	Project developer in association with contractors.	Over the construction and operational phase of the project
<b>Performance Indicator</b>	Accident and incident tally and compliance with OHS Act.	
<b>Monitoring</b>	Comprehensive record of accidents and incidence and related investigations, findings and corrective action in accordance with the OHS Act.	



<b>OBJECTIVE:</b> Reduce dust generation and emissions from site works, plant and vehicle movements along access road.		
<b>Project component/s</b>	Clearing of site, construction activities, deliveries and daily traffic to and from site.	
<b>Potential Impact</b>	Degraded air quality and potential impact on human and animal health and accumulation of dust on vegetation used for grazing.	
<b>Activity/risk source</b>	Site clearance, construction activities and project related construction and operational traffic. Emissions from project related traffic.	
<b>Mitigation: Target/Objective</b>	To reduce and manage the potential exhaust emissions and dust impacts associated with construction activities and traffic travelling to and from the site.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<p>Wet gravel roads on a regular basis.</p> <p>Ensure that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.</p> <p>Ensure all vehicles are roadworthy and drivers are qualified and made aware of the potential noise and dust issues.</p> <p>Ensure that drivers adhered to speed limits.</p> <p>Re-vegetate disturbed areas as soon as is practical after construction.</p> <p>Appoint a community liaison officer to deal with complaints and grievances from the public.</p> <p>If complaints reach unacceptable levels an air quality survey should be undertaken in order to assess the situation, identify the source and rectify.</p>	Project developer in association with contractors.	Over the construction and operational phase of the project.
<b>Performance Indicator</b>	Frequency of complaints from the public and time laps between receiving and resolving complaints. Public satisfaction in having their complaints addressed. Overall public satisfaction.	
<b>Monitoring</b>	Maintain record of complaints containing full details including dates and times of significant events.	

<b>OBJECTIVE:</b> Control of the nuisance factor for surrounding communities.		
<b>Project component/s</b>	Project site including laydown areas and access road.	
<b>Potential Impact</b>	General nuisance factor resulting from construction and operational activities and associated traffic.	
<b>Activity/risk source</b>	Movement of heavy vehicles in delivering plant, equipment and PV components. Construction of the access road and traffic to and from the site over the operational phase.	
<b>Mitigation: Target/Objective</b>	To minimise the nuisance factor experienced by surrounding communities.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<p>Schedule the delivery hours to avoid peak hour traffic, weekends and evenings.</p> <p>Limit the need for transportation over long distances by sourcing as much materials and goods as is feasible from local suppliers.</p> <p>Alert traffic authorities well in advance of any heavy loads that will be transported on local roads and elicit their assistance in controlling traffic associated with the transportation of these loads.</p> <p>Alert workforce to the need to behave in a socially responsible manner, being considerate towards local residents.</p> <p>Establish a code of conduct for the workforce.</p> <p>When upgrading, constructing and maintaining the access road ensure that proper hazard warnings signage and traffic control mechanisms such as flags men and traffic control barriers, chevrons and traffic cones separating the road from the worksite are in place at all times.</p> <p>Restrict work activities that require power tools and plant that generates noise to normal working hours and limit such activities over weekends.</p> <p>Ensure that local by-laws are always adhered to.</p> <p>Appoint a community liaison officer.</p> <p>Ensure that a grievance/complaint reporting procedure is in place, appropriately implemented and that all submissions received are managed by:</p> <ul style="list-style-type: none"> <li>➤ Recording grievance submission date.</li> <li>➤ Keeping complainant informed of progress towards corrective action.</li> <li>➤ Keeping a record of corrective action taken and recording closure date.</li> </ul> <p>Introduce an incident reporting system to be tabled at weekly/monthly project meetings.</p>	Project developer in association with contractors.	Over the construction and operational phase of the project.
<b>Performance Indicator</b>	The frequency of complains laid and the time lag between notification of the complaint and resolution. Level of public satisfaction.	
<b>Monitoring</b>	Monitor and evaluate performance at weekly/monthly site meetings and report to contract manager.	

**OBJECTIVE:** Controlling of the spread of STDs and HIV

<b>Project component/s</b>	Migrant labour and transport workers.
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<b>Potential Impact</b>	Spread of STDs and HIV.		
<b>Activity/risk source</b>	Arrival of construction and transportation workers carrying STDs and/or HIV interacting with local communities during leisure hours. An increase in prostitution driven by an increase in exposable income in the area.		
<b>Mitigation: Target/Objective</b>	To minimise the risk of the spread of STDs and HIV in the area.		
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>	
<p>Implement an HIV/AIDS Awareness and Training Programme for the Contractor's workforce and if feasible the local community within two weeks of commencement of construction.</p> <p>Ensure that the HIV/AIDS Awareness and Training Programme is consistent with national guidelines and/or IFC's Good Practice.</p> <p>Focus on the recruitment of local labour which may help to stabilise the risk of the spread of HIV/AIDS by avoiding the need to introduce migrant labour during the construction phase.</p> <p>Provide voluntary and free counselling, free testing and condom distribution services.</p>	<p>Human resource department and project manager.</p> <p>Contractors.</p>	<p>Over the construction and operational phase of the project.</p>	
<b>Performance Indicator</b>	The stability of STDs and HIV infections amongst the workforce.		
<b>Monitoring</b>	This is difficult to monitor on an individual level as HIV status is confidential so can really only be monitored on a voluntary basis. Consultations with local clinics may provide some insight but this will depend on the availability of resources in the area and cooperation from the relevant health authorities.		

<b>OBJECTIVE:</b> Maximise the employment of local people and the services of local business during construction.		
<b>Project component/s</b>	Construction and operation of the facility, infrastructure and access road.	
<b>Potential Impact</b>	Employment opportunity for local people and business opportunity for local businesses.	
<b>Activity/risk source</b>	External contractors are likely to use their existing labour source and their existing supplier/service network resulting in lost opportunities for local workers and businesses.	
<b>Mitigation: Target/Objective</b>	Project developers should enter into agreements with contractors to support the use of local labour and businesses where ever feasible.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<p>Ensure that the majority of the low-skilled workforce is recruited locally, where possible.</p> <p>Undertake a skills audit to determine level of skills and establish the development and training requirements.</p> <p>Commence with skill development programmes within the first month of construction.</p> <p>Identify employment opportunities for women and ensure that women are employed on the construction site and are trained.</p> <p>Identify opportunities for local businesses and ensure that the services from local businesses are prioritised.</p>	Human Resources, Project developer and contractors.	From appointment of contractors and throughout the construction and operational phases.
<b>Performance Indicator</b>	Composition of labour force and value of procurement from local businesses. Level of skills imparted to local workforce.	
<b>Monitoring</b>	Human Resources and Finance function to monitor and report on through audits.	

<b>OBJECTIVE:</b> Minimising the risk of increased crime associated with the project.		
<b>Project component/s</b>	Construction and laydown areas.	
<b>Potential Impact</b>	Construction activities may result in opportunities for criminal activities, such as theft, damage to property, stock theft and alcohol related crime amongst others.	
<b>Activity/risk source</b>	Increased activity and human traffic in the area may lead to opportunistic crime.	
<b>Mitigation: Target/Objective</b>	To minimise the risk potential for local communities.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<p>Fence and secure the project site.</p> <p>Encourage contractors and local people to report any suspicious activity associated with crime to the appropriate authorities.</p> <p>Inform workers that trespassing onto adjoining private properties is not permitted.</p> <p>Ensure that the local municipalities, police, security companies, and policing forums are alerted to the increased construction activities in the region and the risk it poses in respect of crime.</p> <p>Prevent loitering within the vicinity of the construction camp as well as construction sites.</p> <p>Manage the growth of informal settlements that may arise as a response to perceived job opportunities by promptly alerting the appropriate authorities.</p>	Project developer and contractors.	Over the construction phase of the project.
<b>Performance Indicator</b>	Frequency of incidents of project related crime experienced.	
<b>Monitoring</b>	Keep a record of criminal incidents associated with the project and table it at weekly/monthly project meetings and report to project manager.	

<b>OBJECTIVE:</b> To manage the impact of the influx of construction workers on family structures and social networks.		
<b>Project component/s</b>	Workforce employed over the construction phase.	
<b>Potential Impact</b>	The behaviour of the workers who are accommodated within the local community.	
<b>Activity/risk source</b>	The after work hours interaction between the workers and local communities.	
<b>Mitigation: Target/Objective</b>	To minimise the disruptive affect that the workforce may pose for local communities.	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
As far as possible source low-skilled workers from local communities and surrounding areas. If feasible employ local contractors.	Project developer and contractors.	Over the construction phase of the project.
<b>Performance Indicator</b>	The frequency of complaints and incidents between the workforce and local communities.	
<b>Monitoring</b>	Maintain a full incident record and monitor and evaluate performance at weekly/monthly site meetings and report to contract manager.	

## 8. CONCLUSION AND RECOMMENDATIONS

Regarding the impacts associated with the project it was found that most apply over the short term in respect of the construction phase of the project. Of these impacts all can be mitigated to within acceptable ranges and there are no fatal flaws associated with the construction of the project. It was also found that with regard to the energy needs of the country and South Africa's need to reduce its carbon emissions that the project fits with international, national, provincial and municipal policy. Accordingly, the project carries with it a significant benefit and as such is deemed acceptable. It should be noted that the expected benefits associated with the project, which include generation of electricity from renewable sources and local economic and social development are likely to outweigh the perceived impacts associated with the project.

In respect of the access road alternatives the preferred social alternative is for Alternative 4. Notwithstanding this, however, considered together with the findings of the agricultural and heritage specialists Alternative 1 is also considered favourable.

Considering the impacts discussed above it is evident that the cumulative impacts associated with changes to the social environment of the region are more significant than those specifically attached to a single project. On a negative front there are two issues associated with developments in the region that are of most concern. The first of these issues is the change to the sense of place of the area. The second is the potential, through

an influx of labour and an increase in transportation of material and equipment to construction sites, of the risk for the prevalence of HIV to rise in an area that has a relatively moderate HIV prevalence rate. It is important that the relevant authorities recognise these issues and find ways of mitigating them to ensure that they do not undermine the benefit that renewable energy projects bring, both to the region as well as to the country as a whole. This, however, is beyond the scope of individual projects as it would need to be addressed at a regional or even on a national basis.

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